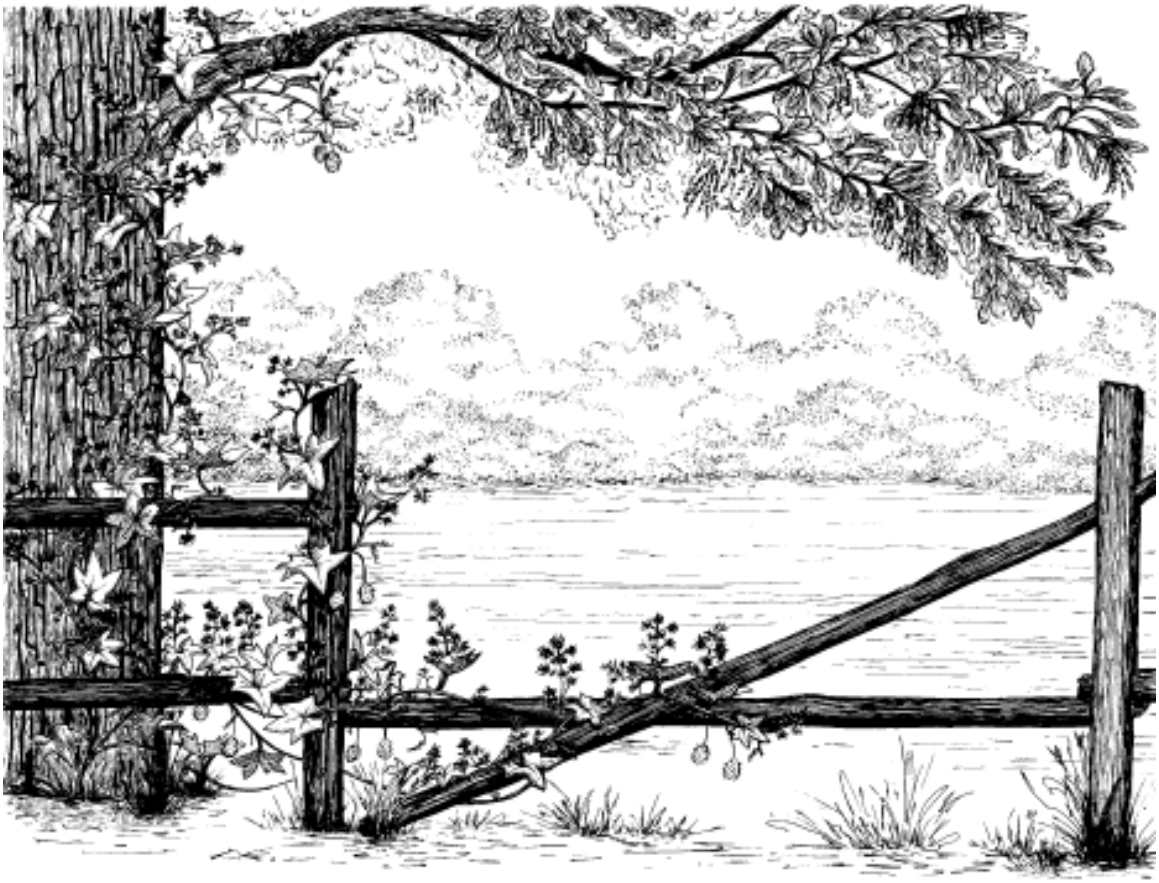
Eudicotyledons

Revised 14th of March 2015



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The Good Dicots

Dicotyledons, *Dicotyledones* n. (modern Botanical Latin *dīcotylēdones* (plural), from Greek δι-, di-, twice, &κοτυληδών, *kotyledon*, cup-shaped hollow or cavity) One of two major groups of the angiosperms distinguished by the presence of two opposite leaves, or cotyledons, in the embryo. Other typical characters of the Dicotyledons are characterized by reticulate leaf venation, floral organs usually in fours or fives, vascular bundles arranged a circle, a persistent primary root system developing from the radicle, & 2econdary thickening (present in trees & 2hrubs, usually absent in herbaceous plants). The Dicotyledons were long considered a homogenous entity. Only recently have they been split into two groups, the primitive angiosperms (magnoliids) & Rosidae (eudicots). (Stuppy & Kesseler 2008).

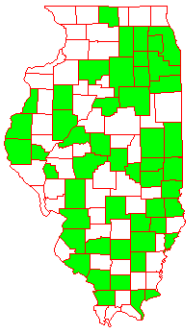
Angiosperms have traditionally been split into monocotyledons & dicotyledons, or plants with one or two seed leaves respectively.

One group of plants was problematic, & had two seeds leaves, but primitive flowers & some traits in common with monocots. That group is the Magnoliids, or primitive angiosperms, which see. The remainder of the dicots are called Eudicots, the prefix eu-, from Greek ἐὺς, *eus,* good, meaning the good dicots. The following manuscript deals with the Eudicots that are not treated in separate sections.

ACANTHACEAE Durende 1762 **ACANTHUS FAMILY** From the type genus *Acantha,* from Greek ἀκανθα, *akantha*, spine, thorn, prickle.

JUSTICIA Linnaeus **WATER WILLOW** *Acanthaceae Justicia* (jus-TIS-ee-a) New Latin, from James *Justice*, (1698-1763), Scottish horticulturist &botanist, & New Latin *–ia.* A genus of about 600 spp of perennial herbs or tender evergreen shrubs growing in water or wet places & having entire leaves & small flowers in long-peduncled axillary spikes or heads. Tropical & warm temperate North America. Often included in *Dianthera*. (dy-ANTH-er-uh)

Justicia americana (Linnaeus) Vahl *IA, MI WATER WILLOW, aka AMERICAN WATER WILLOW, *CARMANTINE D'AMÉRIQUE,* COMMON WATER-WILLOW, SPIKE JUSTICIA, (*americanus -a -um* (a-me-ri-KAH-nus) of the New World, American.) OBL


Justicia americana

Habitat: Submerged or exposed mudbars, sand bars, &gravelbars, the muddy shores of streams & on islands, & shallow water of lakes, ponds, or streams, often in slow running to stagnant water. Often excluding other vegetation. ***Native*** stands may grow in up to 3 feet of clean, clear water. In se USA, River and stream beds, in shallow water, often rooted in rocky shallows (w15). distribution/range: Common in most of Illinois except northwest part of the state. In Michigan, spp is found in more riparian habitats than lacustrine. One of the most common spp of seasonally variable aquatic habitats in the se USA. *J ovata* (Walter) Lindau LOOSEFLOWER WATER-WILLOW is found in southern Illinois.

Culture: propagation: This sp seldom forms seeds. Seeds are not in the trade & plants are in limited supply. 1,200,000 (jfn04) seeds per pound.

availability: Seed is not available. Limited availability as plants. Beaucoup Bucks at some nurseries.

asexual propagation: Division, single node stem cuttings in spring.

cultivation: Tolerant of seasonal water level changes.

Description: Erect, herbaceous, perennial forb; fibrous roots from rhizomes, forming large colonies; stems to 2.5(3.0)', stout, with prominent white lines; leaves opposite, elliptic to linear, to 6", distinctive white midvein entire length of the leaf; inflorescence of individual spikes on long peduncles from upper leaf axils; flowers white (purple, pink) with purple (white, pink, purple, violet), 5-merous, anthers purplish-red; fruit is a 0.5" brown capsule, tapering to stipe-like base, capsule 2-celled, cell 2-seeded; seeds when present 0.13" long, warty, verrucose; N. key features: ①Linear leaves with a white midrib, prominent white lines along the stem, colonial habit along shorelines. ②"Mat-forming perennial of river slackwater areas; leaves opposite, narrowly elliptical; flowers pale violet marked with dark purple, borne in axillary clusters near top of plant." (msue)

Comments: status: Native. Threatened in Illinois? & Michigan Endangered in Iowa. phenology: Blooms locally 6-8; 4-10. C3. The attractive flowers are reminiscent of small orchids. Used in water gardens, wetland & stream restorations. Local observations suggest that this sp is increasing because erosion from agricultural lands is increasing the mud load of our streams, thus creating more of the mudbar habitats (sw94). Sp is negatively impacted by agricultural runoff. Seed source Munchkin Land, several days walk east of Emerald City, a stream in the middle of the cornfield where the Scarecrow was found (*sp reproduces aggressively, vegetatively, setting little seed; most populations are potentially self-incompatible clones*). The seeds, when formed, are forcibly ejected from the capsules when ripe (Penfound 1940).

"Characteristic species of submerged or exposed mudbars in streams, often to the exclusion of other vegetation; muddy shores of streams and on islands; shallow water; generally in running water" (Ilpin)

Associates: Larval host for TEXAN CRESCENTSPOT BUTTERFLY. Nectar & pollen source. Attracts butterflies. Colonies provide important spawning areas for many fish spp & habitat for invertebrates. Plants are a minor food source for muskrats. Minimal deer resistance.

ethnobotany:

VHFS: Often included in the genus *Dianthera.* Basionym *Dianthera americana* Linnaeus 1753. [*Dianthera americana* L, *D americana* L var *subcoriacea* (Fern) Shinners, *Dianthera ensiformis* Walter, *Dicliptera americana (*L) AW Wood, *Ecbolium americanum* (L) Kuntze, *Justicia americana* (L) Vahl var *subcoriacea* Fern, *J linearifolia* Lam, *J mortuifluminis* Fern, *J umbratilis* Fern] Also *J pedunculosa* Vahl.

http://web4.msue.msu.edu/mnfi/explorer/species.cfm?id=13277

Justicia americana

Line drawings courtesy of Kentucky Native Plant Society.

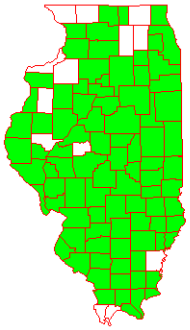
RUELLIA Linnaeus **RUELLIA, WILD PETUNIA** *Acanthaceae Ruellia* for the French herbalist, physician, & botanist, Jean *Ruel*, (*de la Ruelle*) Latinized *Ruellius*, (1474-1537 or 1539). About 300 (150) spp of the tropics & temperate North America, 4 spp in Illinois. Seen as *Ruellia* (Plumier) L.

Ruellia caroliniensis produces chasmogamous (outcrossed) flowers in the spring which rarely set fruit, while the cleistogamous (small, self-fertilized) flowers in the summer and early autumn produce abundant seeds. Other *Ruellia* species have been found to produce cleistogamous flowers from late Jun to the first frost. (Long & Uttal 1962)

RW Long & LJ Uttal, 1962. Some observations on flowering in *Ruellia* (*Acanthaceae*). Rhodora 64: 200-206.

Ruellia humilis Nuttall *MA, MI, NC, PA, WI HAIRY RUELLIA, aka FRINGE-LEAF RUELLIA, FRINGE-LEAF WILD PETUNIA, HAIRY WILD PETUNIA, LOW RUELLIA, LOW WILD PETUNIA, WILD PETUNIA, (*humilis -is -e* low growing, of low growth, dwarf, from Latin *humilis*, humble; submissive; on or near the ground, low, shallow.)

Habitat: Dry, hill, sand, & mesic prairies, limestone prairies, oak openings, dry open ground, gravelly hill prairies, sandy cemeteries that are occasionally mowed, shady gravelly soil. "Species is distributed on open ground; mowed sandy cemeteries; bluff escarpments; sand flats" (Ilpin). In se USA, "calcareous or mafic glades & woodlands, prairies" (w15). distribution/range: In most Illinois counties.



Ruellia humilis

Culture: ①"Cold moist stratification or fall sow. May prefer slightly cooler soils. Light cover." (mfd93) ②70 days cold moist stratification (pm09). ③Dormant seed or cold moist stratify 70 days (Wade 1995). ④Seeds germinate after about 60 days of cold moist stratification (he99). ⑤Moist cold stratify (100 days). ⑥No seed treatment needed (sh94). ⑦Fall plant or cold stratify for 2 to 3 months for best results. Sow seeds just below the soil surface at 70ºF & water." (ew12) ⑧ Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn). ⑨Seeds are produced in abundance but germination is low. ⑩GA3 works marvelously in greenhouse, enhancing germination & producing large plants (gni). Temperature sensitive. Growth rate moderate. Seedling vigor medium. Vegetative spread rate none. Seed spread rate slow.

seed counts & rates: 64,000 (pn02), 67,200 (aes10), 72,000 (sh94), 72,873 (gnha140, 83,200 (pm02, ew12), 87,476 (gnhe11), 150,000 (usda) seeds per pound. Sow 25 lb per acre or 10 ounces per 1000 (sh94). Yea right, OK Shirley.

availability: Available as seeds, bare root plants, & plugs. Seed demand is greater than supply; seed availability may be seasonal.

"*Ruellia humilis* Dry prairie. Blooms mid June to late August; PALE VIOLET. Harvest September. 1'; easy by method #1, blooming 2nd year; reliable if uninspiring garden plant." (rs ma)

asexual propagation: Root division? (lbj) "Stem cutting taken in June or July and treated with hormone give the best results. Hold the rooted cuttings in a cold frame until spring." (ljb)

cultivation: Space plants 0.75-1.0'. Noncompetitive neighbors. Dry mesic to dry soils, full sun to light shade. Tolerates low-fertility, wind-blown sandy soils. Tolerant of coarse, medium & fine textured soils. Anaerobic tolerance none. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement low. Salinity tolerance none. Shade tolerant. pH 4.5-7.5, 6.1-7.8, or 6.0-7.5. Prairie Moon reports this sp as potentially a bit aggressive & tolerating *Andropogon gerardii,* but we could use more of these problems.

Maintain moist soil. Feed in spring with rose fertilizer.

bottom line: Dormant seed for field establishment. Seed may have a short shelf life. Germ 7.8, 3.5, 2.0, sd 11.8, r2.0-22 (20)%. Dorm 84.3, 91, na, sd 13.5, r61-94 (33)%. Test 30, 27, 27, r27-37 days.**
Description: Native, erect, herbaceous, perennial forb; roots fine, hairline; stems 0.5-2.0', stems 4-angled, finely hairy; leaves opposite, mostly stalkless, toothless, with long hairs; flowers violet, blue or white, sometimes pinkish, 5-merous, 1.25-2.75" long, funnel shape; solitary, stalkless, growing from the leaf axils; fruit is a smooth capsule; N. key features:
Comments: status: Endangered in Maryland, Pennsylvania & Wisconsin. Threatened in Michigan & North Carolina. phenology: Blooms 6,7,8, 5-10. C3. In northern Illinois, collect seeds in September. Collect seeds in se Wisconsin in September (he99). The ripe seeds are forcefully ejected from the ripening pods, reported up to 10 feet (pm2012). (*Seed ecology suggests it evolved in open habitats where the catapult mechanism worked efficiently, not with big neighbors.*) The plant overwinters from an amazingly small subterranean bud on a network of very delicate, fine thread-like roots. It emerges a little late; so don't tear up its spot too early in spring. WILD PETUNIA does not like grassy competition in rich soils. Great in dry gardens, rock gardens, naturalizing in dry soils, & dwarf accents near walkways. Seed source nursery production from sand & gravel prairies, Bureau, Whiteside, & Lee cos.

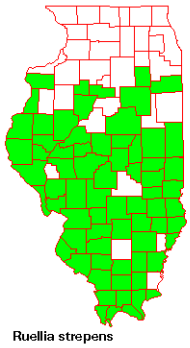
"Common on dry prairies, gravel hills, roadsides. The white form is quite uncommon." (ewf55)
Associates: Attracts songbirds, game birds, small mammals, hummingbirds, butterflies, & hummingbird sphinx moths. Larval host *Phyciodes (Anthanassa) texana* TEXAS CRESCENT BUTTERFLY & BUCKEYE. Reported as deer resistant.
VHFS: [*Dipteracanthus micranthus* Engelm & Gray, *D strepens* (L) Nees, *Ruellia caroliniensis*, *R ciliosa* Pursh var *longiflora* Gray, *R humilis* Nutt var *calvescens* Fern, *R humilis* Nutt var *depauperata* Tharp & FA Barkley, *R humilis* Nutt var *expansa* Fern, *R humilis* Nutt var *frondosa* Fern, *R humilis* Nutt var *humilis, R humilis* Nutt var *longiflora* (Gray) Fern, *R strepens* L var *cleistantha* Gray, *R strepens* L var *micrantha* (Engelm & Gray) Britt]




Ruellia humulis seedlings, GA3 treated seed

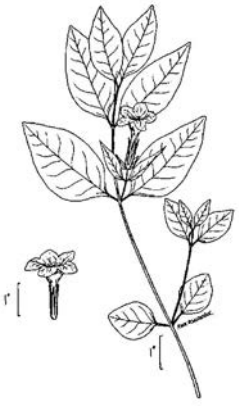
Seed photo Steve Hurst USDA-NRCS PLANTS Database. Not copyrighted image. Line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS *Wetland flora: Field office illustrated guide to plant spp.* USDA Natural Resources Conservation Service. Not copyrighted image.

Ruellia strepens Linnaeus * MA, MI, PA, WI SMOOTH RUELLIA, aka LIMESTONE PETUNIA, LIMESTONE RUELLIA, LIMESTONE WILD PETUNIA, RUEL, RUSTLING WILD PETUNIA, SHORT TUBE RUELLIA, (*strepens* rustling, making noise, from Latin *strepo, strepĕre,* to make a loud noise, shout confusedly, resound.)
Habitat: Low or rich woods, bases of bluffs in ravines & valleys. "Species is distributed in rich or low woods; ditches; base of bluffs in ravines and valleys" (Ilpin). In the se USA, calcareous forests (w08, 15). distribution/range:
Culture: ①70 days cold moist stratification (pm09). Growth rate moderate. Seedling vigor medium. Vegetative spread rate none. Seed spread rate slow. 300,000 (usda) seeds per pound.


Ruellia strepens

cultivation: Tolerant of medium & fine textured soils. Anaerobic tolerance medium. CaCO3 tolerance high. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerant. pH 6-8.5. Description: flowers blue, white or violet, 5-merous; N. key features:
Comments: status: Endangered in Maryland & Wisconsin. Threatened in Michigan & Pennsylvania. phenology: Blooms May to October. C3. Sp infrequently forms capsules (Ilpin).
Associates:
VHFS: [*Dipteracanthus micranthus* Engelm & Gray, *D strepens* (L) Nees, *Ruellia strepens* L var *cleistantha* Gray, *R strepens* L var *micrantha* (Engelm & Gray) Britt] Includes f *alba* Steyerm.





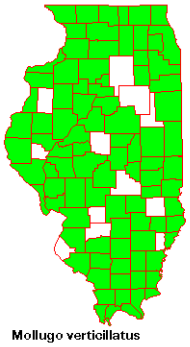
Ruellia strepens

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst USDA-NRCS PLANTS Database. - Not copyrighted image. 2nd line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS. *Wetland flora: Field office illustrated guide to plant species.* USDA Natural Resources Conservation Service. Not copyrighted image. Photo Robert H. Mohlenbrock. USDA SCS. 1989. *Midwest wetland flora: Field office illustrated guide to plant species*. Midwest National Technical Center, Lincoln. Provided by USDA NRCS Wetland Science Institute (WSI).

AIZOACEAE Rudolphi 1830 **CARPETWEED, FIG-MARIGOLD CARPETWEED FAMILY**

MOLLUGO Linnaeus **CARPETWEED** Placed by some authors in *Molluginaceae*.

Mollugo verticillata Linnaeus CARPETWEED, aka GREEN CARPETWEED, INDIAN CHICKWEED,
"Common in gardens, fields, & in waste places." (ewf55) "Species is distributed in waste areas; cindery railroad ballast; roadsides; lawns; gardens" (Ilpin).
distribution/range:
Blooms 6-10. C3.
The specific epithet is also seen as *verticillatus*. This sp is probably native to the American tropics & has recently spread northward. It may have a pre-Columbian presence in Tennessee. This taxon is considered weedy or invasive in some parts of its range or under certain applications (Haragan 1991, Uva et al 1997, Stubbendieck et al 1994, SWSS 1998).



Mollugo verticillatus

"*Mollugo verticillata* possesses intermediate C3-C4 photosynthetic pathway characteristics, such as well-defined bundle-sheaths with numerous C4-like chloroplasts, distinct palisade & spongy parenchyma as in C3 plants, & intermediate light to dark ratios of CO2 evolution, which have made the sp of particular interest in studies of the evolution & biochemistry of both photosynthetic pathways (Kennedy et al 1980)." (fna)

Mollugo verticillata

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Photo Robert H. Mohlenbrock. USDA SCS. 1989. *Midwest wetland flora: Field office illustrated guide to plant species*. Midwest National Technical Center, Lincoln. Provided by USDA NRCS Wetland Science Institute (WSI). . 2nd line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS. *Wetland flora: Field office illustrated guide to plant species.* USDA Natural Resources Conservation Service. Not copyrighted image.

AMARANTHACEAE AL de Jussieu 1789 **AMARANTH FAMILY**

ACNIDA Linnaeus **WATER HEMP** *Amaranthaceae Acnida* New Latin, from a- & Greek *knidē* nettle, sea nettle. Now included in *Amaranthus*. The following are included in *A. tuberculatus* (Moq.) J.D. Sauer.

Acnida altissima Riddell WATER HEMP, (*altissimus -a -um* (al-TIS-i-mus) highest, very high, very tall, tallest, *altus*, & *–issimus*, superlative suffix; the most so, to the greatest degree; most-, -est, such as largest, prettiest, whitest. Or high; deep or profound; shrill; lofty, noble; deep rooted; far-fetched; grown great.)
"Common on stream banks & other low ground." (ewf55)

Acnida subnuda (S Watson) Standley (*subnudus -a -um* nearly naked (as of hairs on leaves)).
"On sandy or muddy stream banks, being particularly common on Rock & Kishwaukee Rivers." (ewf55)

Acnida tamariscina (Nuttall) Wood (*tamariscina* like tamarisk.)
"Perhaps as common as *A altissima* but more likely to be found on sandy rather than on muddy stream banks. The circumscissle fruit in this is the only constant difference between the two spp." (ewf55)

AMARANTHUS Linnaeus 1753 **AMARANTH, PIGWEED** *Amaranthaceae Amaranthus* (*Amarantus*) everlasting, an alteration probably influenced by Greek *anthos* flower, of Greek Nicander's name αναραντον, *amaranton*, from neuter of ἀμάραντος, *amarantos* immortal, unfading, nonwithering, in reference to the long-lasting flowers, from α-μαραινω, *a-maraino,* (from α-, privation, & μαραίνειν, *marainein* to waste, wither, decay, quench); in other senses, from New Latin *Amaranthus*, alteration, probably influenced by Greek ανθος, *anthos*, of Latin *amarantus*, a flower, probably *Celosia cristata*, modification of Greek *amaranton.*

Amaranthus albus Linnaeus TUMBLEWEED, aka TUMBLEWEED AMARANTH, (*albus -a -um* (AL-bus) from Latin white, *albus*, adjective, particularly a dull rather than a glossy white, or dead white; pale; bright. A general white.**)**
distribution/range:
According to Sw94, this is "a semi-cosmopolitan weed of uncertain origin" but they italicize its name so it must be from the wrong side of the tracks. "A common weed of fields & other disturbed soils" (ewf55).

Amaranthus ambigens Standley (*ambigens* Latin *ambigen-us* of two kinds, mongrel, from *amb(i)*- both, & *-genus* -born, -natured. Absurdly referred by some to *genu* a knee! (OED))
distribution/range:
"According to Jones' Flora Illinois this was collected in the county by MS Bebb. It is not known to us & is a doubtful sp." (ewf55)

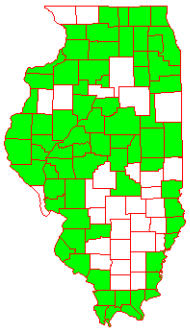
Amaranthus græcizans Linnaeus CREEPING AMARANTH, aka MATWEED AMARANTH, PROSTRATE PIGWEED, TUMBLEWEED, (*graecizans* to have a Greek form, from Latin *Græcizāre*, from *Græc-us.)* Introduced from the western United States. "A common weed of fields, roadsides, & waste places. (*A blitoides* Wats) (ewf55)

Amaranthus hybridus Linnaeus GREEN AMARANTH, aka SMOOTH AMARANTH, HYBRID AMARANTH, SMOOTH PIGWEED, (*hybridus -a -um* hybrid, mixed, of mixed parentage, mongrel, between two spp, sharing characteristics of both, from Latin *hybrida*, hybrid, noun, from *hibrida*, a mongrel or hybrid, & *–us*, adjectival Latinizing suffix.)
distribution/range:
"A common weed of fields, barn-lots, &c" (ewf55).

Amaranthus retroflexus Linnaeus ROUGH PIGWEED, aka REDROOT, ROUGH AMARANTH, (*retroflexus -a -um* reflexed, bent-backwards, bent backwards & forward, zigzag.)
distribution/range:
"Our most common pigweed." (ewf55)

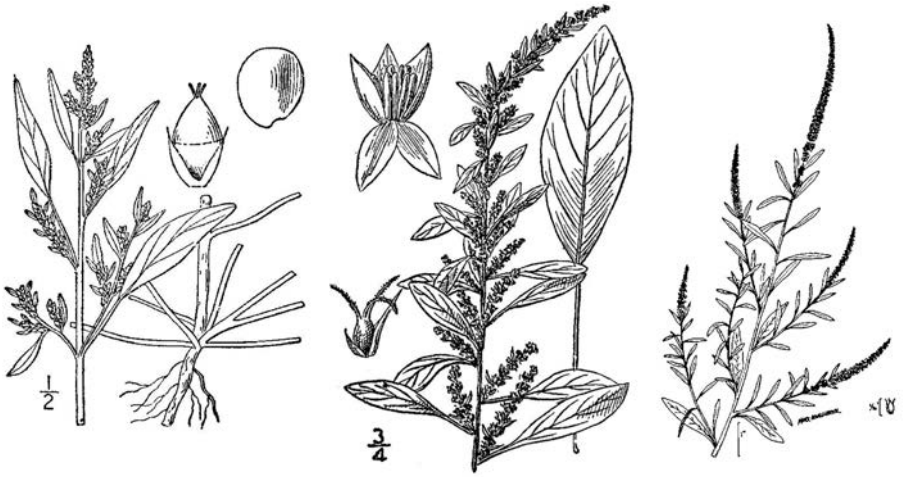
Amaranthus spinosus Linnaeus THORNY AMARANTH, aka SPINY PIGWEED, (*spinosus -a -um* spee-NO-sus having spines or thorns, spiny, thorny.)
"This tropical American weed is quite uncommon in the county. We have seen it only once, in a pasture near Camp Grant." (ewf55)

Amaranthus tuberculatus (Moquin-Tandon) JD Sauer ROUGH-FRUITED AMARANTH, aka ROUGH-FRUITED WATER-HEMP, TALL WATER-HEMP, (*tuberculatus -a -um* tuberculate, having tubercles, with tubercules or bumps, covered with small warty nodules.)
Habitat: Ditches & shores, sandbars & mudflats. distribution/range: "*Amaranthus rudis* probably was originally native to the Great Plains west of the Mississippi, from Texas to Iowa. *Amaranthus tuberculatus* likely had a more northern range, north of Missouri and Tennessee to the Great Lakes. The emerging evolutionary differentiation between the two related taxa was erased by agriculture and human-induced introduction and invasion. *Amaranthus tuberculatus* has become a major weed of agricultural fields and other disturbed habitats and is now introduced in parts of North America far outside its original range." (Mosyakin & Robertson in fna)


Amaranthus tuberculatus

Description: Erect or drooping, annual, up to 6' tall forb with many branches; roots minimum depth; stems; leaves; inflorescence of many densely-flowered, rounded, usually separated spikes from the leaf axils & at the end of the stem, flowers red-brown, tiny, 0-5-parted; fruit achene; N. key features: red to brown flowers, rounded dense flowers, separated spikes.
Comments: status: This taxon is considered weedy or invasive in some parts of its range or under certain applications (Stubbendieck et al 1994, SWSS 1998). phenology: Blooms 8-10. C4. Sp can be a weed of economic impact.
Associates: Larval host of *Pyrgus communis* COMMON CHECKERED-SKIPPER. Causes hayfever, anemophilous. Nonmycorrhizal.
VHFS: Sp is a polymorphic complex resulting from the "cultural mixing" of *A tuberculatus & A rudis.* The later is sometimes considered a separate species.

[*Acnida altissima* Riddell ex Moq, *A altissima* Riddell ex Moq var *prostrata* (Uline & WL Bray) Fern, *A altissima* Riddell ex Moq var *subnuda* (S Watson) Fern, *A concatenata* (Moq) Small, *A subnuda* (S Watson) Standl, *A tamariscina* (Nutt) AW Wood, *A tamariscina* (Nutt) AW Wood var *concatenata* (Moq) Uline & WL Bray, *A tamariscina* (Nutt) AW Wood var *prostrata* Uline & WL Bray, *A tamariscina* (Nutt) AW Wood var *tuberculata* (Moq) Uline & WL Bray, *A tuberculata* Moq, *A tuberculata* Moq var *prostrata* (Uline & WL Bray) BL Rob, *A tuberculata* Moq var *subnuda* S Watson, *Amaranthus altissimus* Riddell, *A ambigens* Standl, *A cannabinus* L var *concatenata* Moq, *A rudis* JD Sauer, *A tamariscinus* Nutt, *A tuberculatus* (Moq) JD Sauer var *prostratus* (Uline & WL Bray) BL Rob, *A tuberculatus* (Moq) JD Sauer var *subnudus* S Watson]



Amaranthus tuberculatus

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society as *Acnida tamariscina & Acnida tuberculata*. 3rd line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS. *Wetland flora: Field office illustrated guide to plant species.* USDA Natural Resources Conservation Service. Not copyrighted image. Photo Robert H. Mohlenbrock. USDA SCS. 1989. *Midwest wetland flora: Field office illustrated guide to plant species*. Midwest National Technical Center, Lincoln. Provided by USDA NRCS Wetland Science Institute (WSI). Illinois map courtesy of ILPIN.

FROELICHIA Moench 1794 **COTTONWEED, SNAKE-COTTON** *Amaranthaceae Froelichia* for Joseph Aloys von *Froelich*, 1766-1841, German physician & botanist who published on *Sonchus, Hieracium*, & *Gentian.* Genus of 16 species of annual & perennial herbs (shrubs) of temperate & tropical Western Hemisphere, with 5 species in northern North America.

Froelichia floridana (Nuttall) Moquin-Tandon var **campestris** (Small) Fernald *OH LARGE COTTONWEED, aka COMMON COTTONWEED, COTTONTAILS,. COTTONWEED, FLORIDA COTTONSEED, PLAINS SNAKECOTTON, PRAIRIE FROELICHIA, (*floridanus -a -um* of or from Florida, USA; *campestris -is -e* (cam-PES-tris) Latin of the fields, flat lands, or plains, by extension growing in fields.) upl

Habitat: Disturbed sand prairies; along railroads. "Open sand prairies, edges of woodlands in sandy soils, roadsides, railroad rights-of-way" (McCauley in fna).

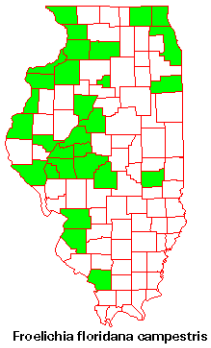
distribution/range: Naturalized in Queensland, Australia.

Culture: ①60 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of cold moist stratification (he99).

seed counts & rates: 368,000 (pm2002) seeds per pound.

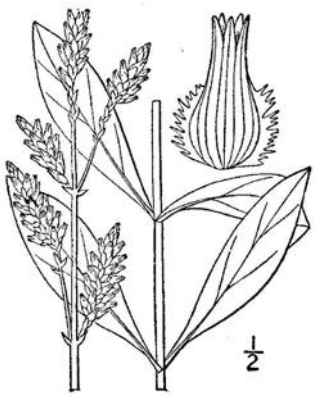
greenhouse & garden: Easy from seed, moist cold stratify 60 days or dormant seed in an unheated coldframe for insurance, have prop stock germ tested before planting untreated seed in greenhouse.

Description: Erect annual, 1.0-2.5', white flowers, leaves opposite. N 2*n* = 58+2.



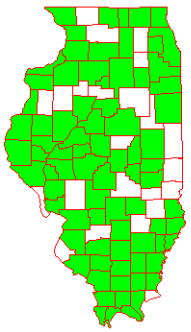
Froelichia floridana campestris

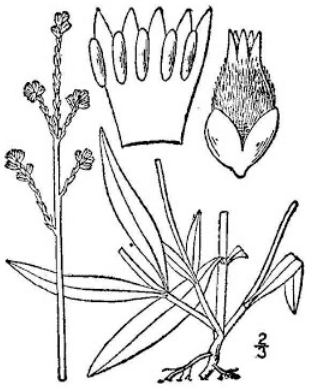
Comments: Status: Endangered in Ohio. This taxon is considered weedy or invasive in some parts of its range or under certain applications (Stubbendieck et al 1994). Phenology: Blooms 7,8,9, or 5-9. C4. In northern Illinois, collect seeds in September. Collect seeds in se Wisconsin in October (he99). Attractive seed heads.
Associates: Nonmycorrhizal.
VHFS: Basionym *Oplotheca floridana* Nuttall, Gen N Amer Pl 2: 79. 1818. [*Froelichia campestris* Small, *F floridana* var *campestris* (Small) Fernald, *F floridana* var *pallescens* Moquin-Tandon, *Gomphrena floridana* (Nuttall) Sprengel, *Oplotheca floridana* Nutt.] The type specimen was found along the Altahama River, as was the FRANKLIN TREE, *Franklinia altahama.*



Froelichia floridana campestris
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society as *F campestris.* Illinois map courtesy of ILPIN.

Froelichia gracilis (Hook) Moq. *CT SLENDER COTTONWEED, aka COTTONWEED, SLENDER SNAKECOTTON, (*gracilis -is -e* slender, gracefully slight in form.)
Native of southern Rockies, southern Plains, to Iowa, Missouri, & Texas.
Considered introduced in Arkansas, Louisiana, and east of the Mississippi River.
Widely spread along railroads over the last 100 years,
"This recently appeared in the C & NW RY near US No 51 & on the CB & Q RR south of Camp Grant & seams to be spreading rapidly" (ewf55).
Noxious weed in Connecticut. This taxon is considered weedy or invasive in some parts of its range or under certain applications (Assorted authors. 200_. State noxious weed lists for 46 states). Blooms 5-9. C4.
Basionym *Oplotheca gracilis* Hooker, Icon Pl. 3: plate 256. 1840. [*Froelichia braunii* Standl, *Oplotheca gracilis* Hook.]





Froelichia gracilis
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Illinois map courtesy of ILPIN.

APOCYNACEAE AL de Jussieu 1789 **DOGBANE FAMILY**

AMSONIA Walter ☠ **BLUESTARS** *Apocynaceae Amsonia* (am-SO-nee-a, or am-SOWN-ee-ah) commemorating Charles Amson, fl 1760, 18th century Virginia physician. Hardy perennial herbs having a milky juice, alternate entire leaves, & showy, starry bluish flowers in terminal cymes. Easy in most soils, sun or part shade. Germinates in 30 days. Native to east USA & eastern Asia (Japan), about 20 spp, 17 spp in North America, 1 in Japan. Foliage has a very nice yellow or orange fall color. Nectar source for Mourning Cloak butterflies. BLUESTARS contain a poisonous latex sap, which may cause a mild skin irritation. Fruits are follicaria.

Germination code B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF. (cu00). Older crowns are not easy to divide, but they may be separated in fall as the leaves yellow. Older clumps (15 years plus) die back in the center forming fairy circles, which are an interesting curiosity in a restoration, but may be unsightly to some in a formal planting.

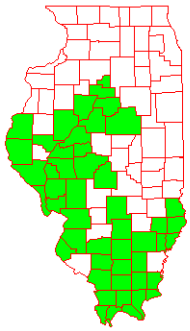
Amsonia illustris OZARK BLUE STAR, aka BLUE STAR, SHINING BLUE STAR, SHOWY BLUESTAR, SWAMP BLUESTAR,
Habitat: In Missouri, occurs in sandy or rocky soils on gravel bars or along streams in the Ozark region of the state (mbg). distribution/range: Ozarkian. Not mapped in BONAP 2016.
Culture: ①Fall plant or cold stratify at 40ºF for 1 months for best results. Sow just below the soil surface at 70ºF & water. (ew11) ② Sow at max 5ºC (41ºF) for 6 weeks, move to 20ºC (68ºF) for germ in a few days. If no germ in 3 wks, dig out seeds and give them 8 to 12 hr soak. (tchn) 31,200 (ew11) seeds per pound.

Moist soil half day sun. Bog or pond area. Full sun to partial shade.
Description: key features: Very similar in appearance to *Amsonia tabernaemontana*, except the leaves of the species are shinier, thicker & more leathery, & the seed pods are pendant (mbg).
Comments: status: phenology: Blooms
Associates: Nectar source for swallowtail butterflies. Deer resistant.
VHFS: Recognized in pug16.

Amsonia illustris
Photo by Leo Michels - Source: http://www.imagines-plantarum.de/ Public domain image.

Amsonia tabernaemontani Walt. *KY, TN (in part) BLUE STARS, aka BLUE MILKWEED, COMMON BLUESTAR, EASTERN BLUESTAR, (*tabernaemontani* (ta-ber-nie-mon-TAH-nee) tavern mountain, after Jakob Theodore Mueller von Bergzabern of Heidelberg (1520-1590) [*Bergzabern* self-Latinized as *Tabernaemontanus*] 16th century physician & herbalist, born in Bergzabern, Rhineland-Palatinate, Germany. Also as listed as *tabernaemontanus*, from *Mount Zabern*, Alsace, (Alsatia) France. *Zabern* is also known as *Saverne* in French or *Zawere* in Alsatian, at one time was known as *Tres Tabernae Cesaris*, Caesar's three taverns, where oxen were changed before ascending the *Col de Saverne* (Pass of Saverne) a natural pass in the north of the Vosges mountains, hence the name tavern mountain.)
Habitat: Rocky woods, limestone glades, ravines, thickets, moist or wet woods. distribution/range: Native immediately south of our area. Tiny Putnam Co in the upper Illinois River valley is the northern limit of this species & the genus' range.

Culture: ①Sow at max 5ºC (41ºF) for 6 weeks, move to 20ºC (68ºF) for germ in a few days. If no germ in 3 wks, dig out seeds and give them 8 to 12 hr soak. (tchn) ②Moist cold stratify, cut tip off one end of seed before sowing. 30,769 (gni) seeds per pound.


Amsonia tabernaemontana

asexual propagation: Self-sown plants near the mother plant can be transplanted in spring. Three-inch stem cuttings taken during flowering root but may not form crown buds.

cultivation: Space plants 1.0-2.0'. Mesic soils, full sun to partial shade. Hardy zones 3-8. Long lived. Older plants die out in the center forming fairy circles, & may benefit from division.

Description: Round clusters of starry light blue (sky blue) flowers in late spring early summer, willow-like leaves.

Comments: status: Variety *gattinger* Woods is native in Kentucky (Threatened), Mississippi, & Tennessee (Special Concern). phenology: Blooms spring, May-June, 4-6. C3. Seeds mature early fall. Established plants are largely (totally) carefree & shade tolerant. Our plants are in full sun, rich, mesic soils, & have survived 15 years of annual fire & benign neglect, shyly self-sowing, but not at any distance from the colony. Stunning in mass. Genetic source southern Illinois.

VHFS: Illinois has var *tabernaemontani* & var *salicifolia* (Pursh) Woodson, with narrowly lanceolate leaves more tapering to the base & usually glabrous beneath. Weakley (2015) lists variety *gattinger* from Illinois and notes the "varieties *tabernaemontana* & *salicifolia,* while strikingly different in there extreme expressions, have nearly the same distribution and do intergrade, they are probably are not worthy of recognition."

[*Amsonia amsonia* (L) Britton, nom inval, *Amsonia glaberrima* Woodson]







Amsonia tabernaemontani, old specimen developing a fairy circle, & pods

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society as *Amsonia amsonia*. Seed photo Tracey Slotta USDA-NRCS PLANTS Database. - Not copyrighted image. 2nd line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS. *Wetland flora: Field office illustrated guide to plant species.* USDA Natural Resources Conservation Service. Not copyrighted image. Illinois map courtesy of ILPIN.

APOCYNUM Linnaeus **DOGBANE, INDIAN-HEMP** *Apocynaceae Apocynum* New Latin, from Latin *apocynon, apocyni*, literally against-dogs, dogbane, from a Greek name used by Dioscorides for *Cionura oreophila*, αποκυνον, *apokynon,* from απο, *apo,* far from, against, & κυων, κυον, κυνος, *kyon, kyon, kynos,* a dog, a bitch. Redefined by Linnaeus, related to Latin *canis* & Sanskrit *sva. Apocynum venetum* is supposed to be poisonous to dogs. *Apocynon* is also Latin for a magic bone found in the left side of a venomous frog. *Apocynum* sp was referred to *Asbeba'mokodjibik'gisin,* meaning "bear root, it is found here & there'' (Ojibwa) (den28). A genus of about 12 spp of perennial herbs, of eastern & central Asia & North America, chiefly American, with opposite leaves & small white or pink flowers in corymbose cymes. Sap is a caustic, milky latex. Roots are medicinal. *A androsaemifolium* & *A cannabinum* were used in patent medicines under the name WANDERING MILKWEED (Eaton 1829).

DOGBANES are an important nectar source for many butterfly spp. Flowers provide nectar for *Satyrium titus* CORAL HAIRSTREAK, *S edwardsii* EDWARD'S HAIRSTREAK, & *Danaus plexippus* MONARCH.

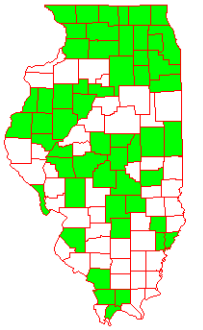
DOGBANES are larval host for *Chrysochus auratus* Fabricius, the DOGBANE LEAF BEETLE. Eggs are laid on the underside of leaves, & as they hatch, the larvae drop to the soil. Larvae are obligate root feeders, feeding on the roots of dogbane or the closely related milkweeds. Adults feed solely on dogbane or milkweed leaves. Small, ca 0.5", (8-11 mm), iridescent colors varying with observer's angle, green, copper, red orange, crimson, with blues; shiny & more colorful than the following, characteristic colors copper, green, brown.

The similar *Popilla japonica* JAPANESE BEETLE is commonly identified by its unique coloring. Appearing as an emerald dark green to black, the brown on the top of the insect give its identity away. This area of the body is also distinct in that it contains noticeable grooves running the length. Look for white spots or small tufts of white hair that seem to stick out along the side of its abdomen. Small, ca 7/16", 8-12 mm, characteristic colors green, brown, red, white, & copper. True generalist, feeding on leaves, flowers, & fruits of many spp, especially *Rosaceae.*

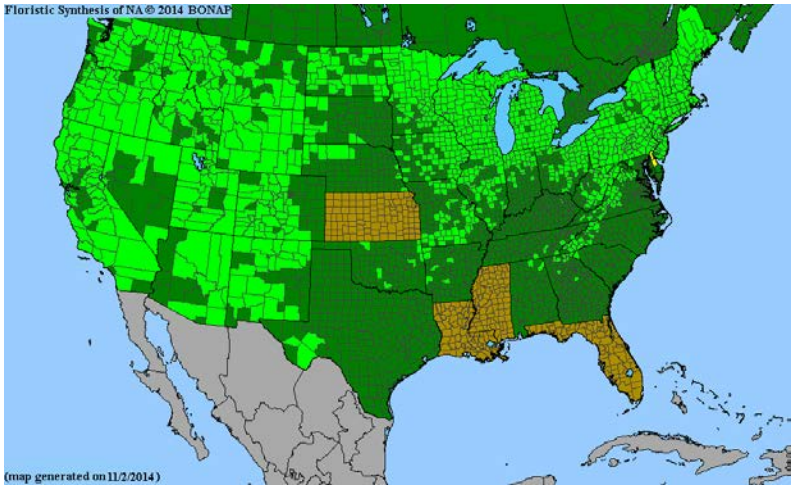
The USDA Plants Database (pug16) & Bonap16 place *A sibiricum* in synonymy with *A cannabinum,* recognizing *A androsaemifolium, A cannadinum*, & *A X floribundum* [*androsaemifolium* × *cannabinum*].

Apocynum androsaemifolium Linnaeus SPREADING DOGBANE, aka *APOCYN À FEUILLES D'ANDROSÈME,* BITTER ROOT, COMMON DOGBANE, DOGBANE, FLY-TRAP, MILKWEED, *Sasa'bikwan Ma'kwon'gic Odji'bik,* bear entrails root (Ojibwa), (*androsaemifolius -a -um Androsaemum* leaved, from Latin *Androsaemum-folium*, leaves like *Androsaemum* (now *Hypericum*), from *androsaemon, androsaem-*, from the Greek ανδροσαιμον, *androsaimon*, a name for *Hypericum perforatum*, from *aner*, man, & *aima,* blood, referring to the blood red sap (or berry juice), plus *-i-* connective vowel used by botanical Latin, & *folium,* leaf.) upl

Habitat: Mesic savanna, dry thickets & borders of woods (y), usually in open oak woods (sw94). Acidic soils, woodland edges & openings. "Species is distributed along roadsides; wood borders; previously burned areas." (Ilpin). In se USA, forests, woodlands, roadsides, pastures (w15). distribution/range: A common roadside plant in northern Wisconsin. "Occasional to common" in Illinois (Ilpin)!
Culture: ①No pre-treatment needed. Sowing outdoors in the spring is the easiest method (he99). ②Sow at 20ºC (68ºF), germinates in less than two wks (tchn). No treatment.


Apocynum androsaemifolium

seed counts & rates: 400,000 (jfn04) seeds per pound.
availability: This is not in the seed trade, or just barely. Prairie Seed Source may have sold it long ago. JF New Cardno lists packets (2016).
asexual propagation: On a small scale, division is most successful.
Description: Erect, herbaceous, perennial, native forb; 1.0-2.0'; flowers pink, drooping;
Comments: status: Potentially a weed of economic impact (Ilpin). phenology: Blooms 6,7,8. C3. Collect seeds September (he99). Landscaping, aggressively rhizomatous, fragrant. A seldom seed species in north central Illinois. with more seldom seen seed.
"Common, usually in dry places as the edge of woods, thickets, & railroads." (ewf55)
Associates: Seeds are dispersed by wind; seeds have a coma like a tiny milkweed seed. ethnobotany: Root used as medicinal plant by Ojibwa & Pottawatomie (sm32, 33). Used for heart palpitation, earache, a baby's cold (den28) root diuretic, sudorific, emetic, cathartic, & anthelmintic. Fiber used for fine sewing by Ojibwa, Menominee, & Pottawatomie (fiber makes strong fine threads) (sm32, 23, 33). Eaten ceremonially by Ojibwa (sm32) "Plant contains a strong bast fiber which may be used for tying articles; plant has emetic, cathartic, and diuretic properties."
VHFS: A hybrid complex with either or both *A cannabinum* or *A sibiricum* is known as *A X medium,* with its attendant varieties.



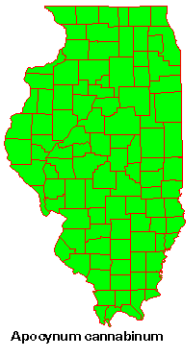
Apocynum androsaemifolium
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Illinois map courtesy of ILPIN. North America map courtesy of BONAP (2016)

Apocynum cannabinum Linnaeus HEMP DOGBANE, aka AMERICAN HEMP, AMYROOT, BITTERROOT, BLACK HEMP, BLACK INDIAN HEMP, BOWMAN'S ROOT, CANADIAN HEMP, CHOCTAW ROOT, COMMON DOGBANE, DOGBANE, HEMP DOGBANE, INDIAN HEMP, INDIAN HEMP DOGBANE, INDIAN PHYSIC, RHEUMATISM ROOT, RHEUMATISM WEED, WILD COTTON, (*cannabinus -a -um* like cannabis or hemp, hence resembling hemp, from the Greek κανναβις, *kannabis,* for hemp, & *–inus*, belonging to or resembling, alternately from Greek κανναβις αγρια, *kannabis agria,* a name used by Dioscorides for the leaves of hemp-agrimony, wild hemp.)
Habitat: Open woods, thickets, & borders of woods (ry64), disturbed areas. In the se USA, forests, woodlands, roadsides, pastures (w15). distribution/range: In every Illinois county.
Culture: ①No pre-treatment needed. Sowing outdoors in the spring is the easiest method (he99). ②Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn). ③Germinates in 1-3 weeks (JLH). Growth rate moderate. Seedling vigor medium. Vegetative spread rate none.

seed counts & rates: 415,384 (gnh11), 442,105 (gnh13), 500,000 (usda, ecs), 589,993 (gnaec03) seeds per pound.

cultivation: Not for the meek & timid. Anaerobic tolerance medium. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerant intermediate. pH 4.5-7.0. For large restorations only, planted late in the development of the site.

bottom line: Dormancy varies from year to year. Spring may be reasonably successful half the time, but dormant seed to increase germination & establishment. Debeard (or decoma!). Germ 80.7, 88, na, sd 20.7, r41-99 (58)5. Dorm 32.9, 10.5, na, sd 38, r0.0-99 (99)%. Test 32, 29, na, r28-38 days. (#5)**


Apocynum cannabinum

greenhouse & garden: Seed is non dormant (gni seed tests). The seed is reported to be short lived.

Description: Erect, herbaceous, perennial, native forb, to 3.3-4.0' tall; aggressively rhizomatous, from woody, creeping rootstocks, forming open colonies, 12" minimum root depth; leaves ovate, 2.0-6.0" long; flowers greenish white, bell-like; followed by paired pods, slender, red-brown; seeds small with coma.

Comments: status: This spp is considered invasive in part of its range. phenology: Shoots emerge May & June. Blooms May to August. Collect seeds October-November. Pods persist into the winter & spring. In March, 2012, we have many pods splitting open & dispersing seeds on nearby burned soils. The flossy seeds are also available for nest building. Once established, the colonies can become quite large, 50+' diameter. The small tufted seeds blow around late fall & establish new clones. Species has extensive colonies along John Deere Expressway, I-74, & north Brady Street in Quad Cities, in the ditches & the median. It leads one to question the USDA salinity tolerance rating of none. Plants grown without competition produce 150 pods per plant, 81 seeds per pod, & 12,150 seed per plant. Debearded seed goes from 92 to 82% viability in seven months storage. Seed source Tampico, Whiteside Co.

"Common on railroads, roads, the edge of woods, often forming large patches in damp or dry places. Much like the two following spp (*A pubescens* & *A sibericum*)." (ewf55)

The landscaping in the cloverleaves & intersections of I-80 near Coral Ridge Mall, Coralville, Iowa (I-80, Rt 218, & Rt 6) is dominated with natives, including several *H maximillianii* plantings. The sunflower is used in mass plantings, always at some distance from the road, with some adjacent to tall grass monocultures (plugged plantings), & in one case, behind & overtopping limestone walls. (*The town landscape is tied together with walls, "outcrops" & strategic boulders of local limestone at key intersections*. *Very Cool*.) Monocultures of *Apocynum cannabinum* are counterpoised with the grasses & sunflowers, & are in brilliant yellow-gold fall color when the sunflowers are in full bloom. Quite striking but ephemeral! The fall color of a large stand is spectacular, vivid yellow in contrast to the green, cool season grass associates. It makes a great statement, even at 70 mph on the interstate. The color is hard to name, especially for we who are Munsell Color Chart challenged & have misplaced our thesaurus. It is not gold, bronze, yellow, nor honey; a rich yellow, yellower than our local switch grass in fall, & more brighter than buttery. Hmm, yellow brick road, perhaps. There are many spontaneous colonies on interstate interchange infields that are interesting interjections in the insipid, ignominious, monotonous, mowed turf. *Apocynum* are insubstantial bloomers, but they are important nectar plants & have two seasons of substantial color. The *Apocynum* leaves fall, leaving the slender, naked red stems with a poor-man's red-twig dogwood effect. Very attractive fall & winter colors.

As agriculture has shifted from the moldboard plow to minimum-till & no-till, there has been an ecological shift in weed problems & spp. Without the annual disturbance cycle of intense cultivation, light obligate germinating annual weeds have been joined by perennial weeds, many rhizomatous, including *Helianthus grosseserratus* & *A cannabinum*. The latter is a significantly problematic plant in soybeans, especially in Ohio, Missouri, & Virginia. *A cannabinum* is sensitive to 2,4 D drift, which may kill the tender top growth & prevent flowering for the year (Genesis fields 2012).

Associates: Poisonous to livestock. Fibers used by orioles & other songbirds for nest materials. Important nectar source, visited by JUNIPER HAIRSTREAKS, PECK'S SKIPPER, ants, native bees, honeybees, & mason wasps.

ethnobotany: Fibers used for thread & cordage, including bowstrings & fishnets, by Native Americans. Fibers used for best fine cordage by Ojibwa (Smith 1933). Identified in Sauk-Fox bag, Ohio Hopewell fabric, & Adena fabric (Whitford 1941). The stems with fiber are available fall into the following summer.

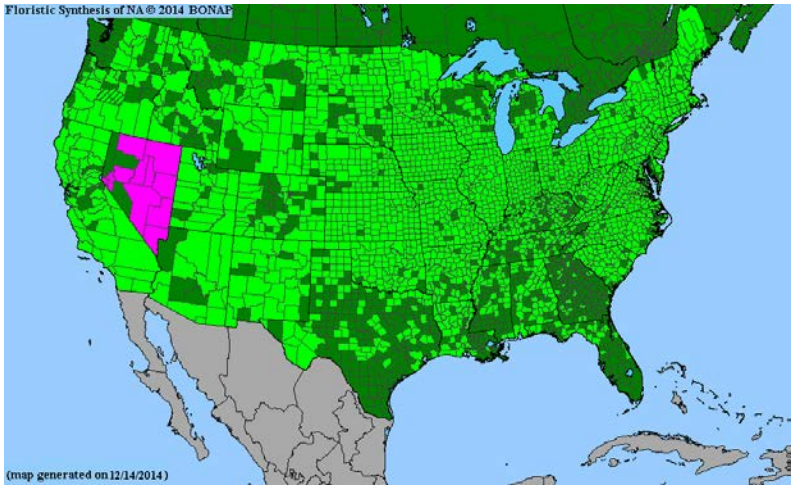
The latex sap was chewed like gum. ☠ Fairly toxic. The root contains cardioactive glycocides. The root is medicinal & used as an emetic & cardiac stimulant. The root was also used to treat rheumatism, to induce sweating, & vomiting. The milky latex has been used to treat warts. The plant is said to have shown some anti-tumor activity.

VHFS: Sw94 include var *pubescens* (Mitch) A DC with the typical variety. "*A pubescens* R Br Much the least common of the three. Harrison avenue road near the gas terminal. (var *pubescens* (Mitchell) A DC) (ewf55)

TM Webster & J Cardina, 1999, *Apocynum cannabinum* Seed Germination & Vegetative Shoot Emergence, *Weed Science*, Vol 47, No 5 (Sep-Oct, 1999), pp. 524-528.

TM Webster, J Cardina, & SJ Woods, 2000, *Apocynum cannabinum* interference in no-till *Glycine max*, *Weed Science*, Vol 48, pp 716-719.



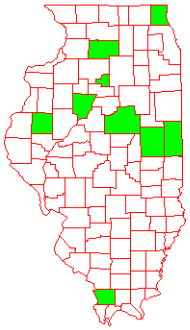


Apocynum cannabinum

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society as *A cannabinum & A pubescens.*

2nd line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS. *Wetland flora: Field office illustrated guide to plant species.* USDA Natural Resources Conservation Service. Not copyrighted image. Illinois map courtesy of ILPIN. North America map courtesy of BONAP (2016), includes *A sibiricum.*

Apocynum medium Greene INTERMEDIATE DOGBANE. aka *Apocynum* ×*floribundum* Greene (pro sp.) [*androsaemifolium* × *cannabinum*]



Habitat: Open woods in Illinois. In se USA, forests, woodlands, roadsides, pastures (w15). distribution/range: Newfoundland west to BC, south to GA, TX, CA, and Mexico.

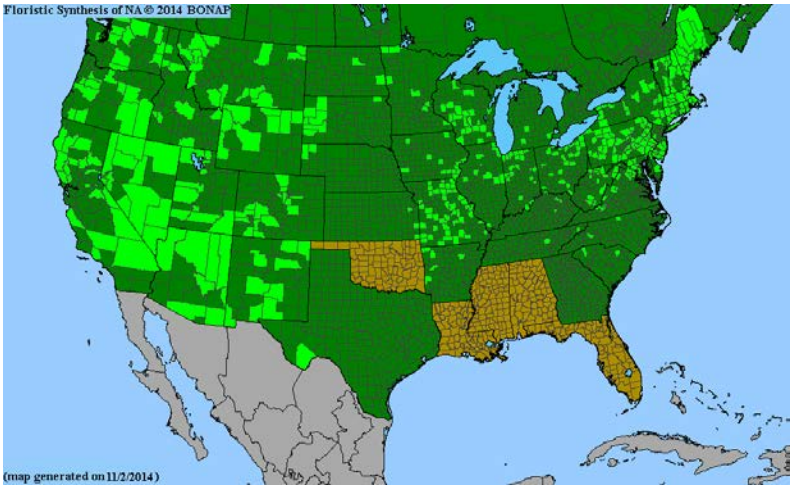
Blooms Jun-Jul. Ripens Sep-Oct.

Sometimes treated as a hybrid, but occurring in populations seemingly lacking one or both of the alleged parents (*A. androsaemifolium* × *cannabinum*), and given credence here as a hybrid-derived species (w15).

Much variability in characteristics. Blooms 5-8. C3.

Pin says only vegetative reproduction.

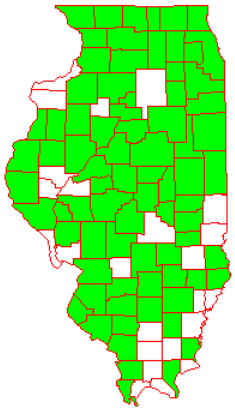
VHFS: [*Apocynum jonesii* Woodson, *A medium* Greene var. *floribundum* (Greene) Woodson, *A medium* Greene var *leuconeuron* (Greene) Woodson, *A medium* Greene var *lividum* (Greene) Woodson, *A medium* Greene var *sarniense* (Greene) Woodson, *A medium* Greene var *vestitum* (Greene) Woodson, *A milleri* Britton]



Apocynum medium

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society as *A medium & A milleri.* Illinois map courtesy of ILPIN. North America map courtesy of BONAP (2016

Apocynum sibiricum Jacquin *MD CLASPING-LEAVED DOGBANE, aka CLASPING DOGBANE, INDIAN HEMP, PRAIRIE HEMP, (*sibiricus -a -um* from Siberia, Siberian.)


Apocynum sibiricum

Habitat: Dry, mesic & wet prairies, rocky or sandy soils, & rocky woods. In Illinois, "rocky woods; gravelly sites such as along railroads; wet meadows; river bottoms prairies" (Ilpin). In se USA, Forests, woodlands, riverside scour areas, roadsides, pastures (w15). distribution/range: Known from ne Asia.
Description: Erect, herbaceous, perennial, native forb; to 3.0'; fruit is a follicle with hairy seeds.
Comments: status: Endangered & extirpated in Maryland. phenology: Blooms 6-8. C3.

"The most common of the three. In the same place as *A cannabinum* & differing mainly in having sessile leaves." (ewf55)
Associates: Pollinated by long-tongued bees, short tongued bees, other *Hymenoptera*. Seed fluff used in bird nests. Plant contains a strong bast fiber which may be used for tying articles (Ilpin).
VHFS: USDA & Bonap16 lump this within *A cannabinum*. [*Apocynum cannabinum* L var *hypericifolium* (Aiton) A Gray, *A hypericifolium* Aiton, *A sibiricum* Jacq var *cordigerum* (Greene) Fern, *A sibiricum* Jacq var *farwellii* (Greene) Fern, *A sibiricum* Jacq var *salignum* (Greene) Fern]

Apocynum sibericum
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society.

VINCA Linnaeus **VINCA, PERIWINKLE** *Apocynaceae Vinca* New Latin, short for Latin *pervinca* periwinkle, perhaps from *per*, through & *vinca*, from Latin *vincere*, to wind around or bind, from *vincio*, to bind, a reference to the shoots. A genus of about 7 spp of vines of Europe, North Africa, & central Asia.

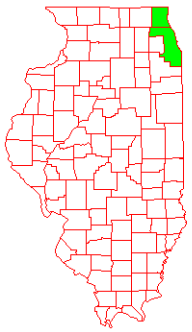
Vinca minor Linnaeus COMMON PERIWINKLE, aka MYRTLE, (*minor* Latin less, smaller, lesser.) Introduced from Europe, persistent & spreading from cultivation. "Used as a ground cover in gardens & tends to escape & persist" (ewf55).

ARALIACEAE AL Jussieu 1789 **GINSENG FAMILY, ARALIADS** A family of about 47 genera & 1325 spp of trees, shrubs, vines, & rarely herbs, mainly of the tropics; *sensu stricto*, north temperate regions. Small flowers with 5 petals & 5 stamens in close-set clusters alternate to petals. Flowers in racemous umbels. Compound leaves either alternate or in 3's Sepals 5; Petals 5. Fruits baccate or dry, 3 to 5-celled, with 1 albuminous seed in each cell. Several spp were formerly used medicinally. *Hydrocotyle* is often included here.

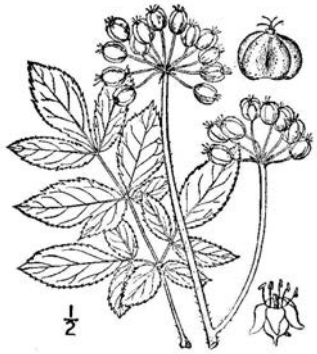
ARALIA Linnaeus **ARALIA, HERCULES-CLUB, SARSAPARILLA, SPIKENARD** *Araliaceae Aralia* (a-RAH-lee-a) New Latin derivation uncertain, from French-Canadian name *aralie*, probably originating from Iroquoian. Many early references to this name are to a Jamaican plant (OED). A large genus 30-70 spp of widely distributed often-aromatic trees, shrubs, vines, & trees with compound leaves & umbellate flowers,

mainly in eastern North America, eastern Asia, & southeastern Asia. Fruit is a berry crowned with the remains of the calyx & styles, mostly 5-celled & 5-seeded.

Aralia hispida Ventenat *IN, MD, OH BRISTLY SARSAPARILLA, aka Bristly SPIKENARD, DWARF ELDER, *STEIFHAARIGER ANGELIKABAUM* (G), WILD ELDER, (*hispidus -a -um* HIS-pi-dus bristly, fine hairy, hairy rough)

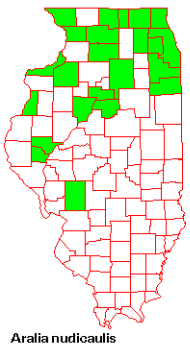

Aralia hispida

Habitat: Dry, open woods, in sandy sterile soil, often in recently burned areas.
distribution/range: Northern Illinois is at the southern limit of the sp range.
Culture:
Description: Erect, perennial, 6"-36" tall forb; bark; stems leafy & bristly below; leaves twice pinnately-divided, sharply toothed, the stalks shorter than the leaf blade; inflorescence with usually 2-25 loosely-clustered, globose umbels; flowers yellow to white, 5-merous; fruits blackish, berry-like, naseous; N. key features: ①Stems leafy & bristly below. Stem shrubby at base, hispid with prickles, herbaceous above. ②"Sharply bristled near base; leaves twice pinnate, several umbels in a terminal inflorescence" (Ilpin).
Comments: status: Endangered in Indiana, Maryland, & Ohio. phenology: Blooms June to July, 6-8. C3.
Associates:
VHFS:



Aralia hispida
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Illinois map courtesy of ILPIN.

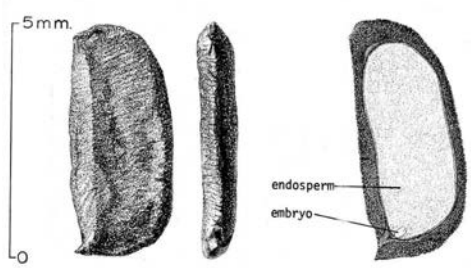
Aralia nudicaulis Linnaeus WILD SARSAPARILLA, AMERICAN-SARSAPARILLA, *ANGÉLIQUE À TIGE NUE* (F), *KRYPARALIA* (SW), *NACKTSTÄNGLIGE* ARALIE (G), RABBITROOT, *SALSEPAREILLE* (F), SHOTBUSH, SMALL-SPIKENARD, VIRGINIA-SARSAPARILLA, WILD LICORICE, *Wabos'odji'bik,* rabbit root, (Ojibwa) (*nudicaulis -is -e* new Latin, naked stemmed, from Latin *nudus -a -um,* naked, nude, & Greek καυλός, *kaulos,* stem.)
FACU


Aralia nudicaulis

Habitat: Calcareous swamps, tamarack bogs, mesic & rocky calcareous woodlands. "Common in woods in moist & dry places." (ewf55) In Illinois, "Species is distributed in many habitats, including: acid dune woodlands, rocky woods, calcareous swamps" (Ilpin). distribution/range: Northern Illinois is at the southern limit of the sp range.
Culture: propagation: ①Seeds exhibit morpho-physiological dormancy. Seeds are placed in cold moist stratification for 60 to 70 days. Germination occurs at 30ºD/20ºN C alternating temperature cycle. (bb01)
Description: Erect, perennial, native forb; large, fleshy root, giving rise to leafstalk & scape; 8"-20" tall, no proper stem, stems not leafy or bristly; bark; leaf basal, with 3 together on an erect stalk up to 20" long, finely toothed, each pinnately-divided into 3-5 parts; inflorescence of usually 3 stalked, rounded umbels together on a leafless stalk arising directly from the base of the plant; flowers white, 5-merous; fruits blackish, berry-like; N. key features: ①Stems not leafy or bristly; usually 3 umbels; together on a leafless stalk; fruit blackish, berry-like, leaves basal, with 3 together, scape naked, shorter than the leaf;

bearing the few umbels. ②Stem is barely rising out of the ground, smooth bearing a single long-stalked leaf & a naked flowering stem with several umbels; fruit is nearly black" (Ilpin).
Comments: status: phenology: Blooms May-June. C3.
Associates: ethnobotany: Root used as medicinal plant by Ojibwa & Pottawatomie (sm32, 33). Used by Ojibwa as a remedy for the blood & applied to sores (den28) roots "gently" stimulant, diaphoretic, alterative. Used as a fish lure on nets by Ojibwa (sm32).

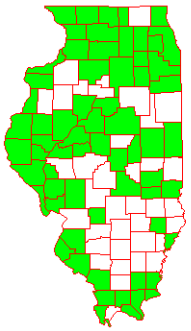
JM Baskin & CC Baskin, 2001. Propagation protocol for production of Container (plug) *Aralia nudicaulis* plants In: Native Plant Network. URL: http://www.NativePlantNetwork.org (accessed 2016/02/19). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.



Aralia nudicaulis

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst USDA-NRCS PLANTS Database. - Not copyrighted image. Seed drawing courtesy of USDA Forest Service, USDA-NRCS PLANTS Database. Illinois map courtesy of ILPIN.

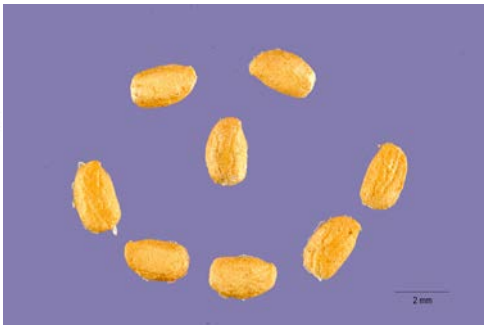
Aralia racemosa Linnaeus *RI SPIKENARD, aka AMERICAN SPIKENARD, *AMERIKANISCHE ARALIE* (G), HUNGRY-ROOT, INDIANROOT, LIFE-OF-MAN, *LUNDARALIA* (SW), OLD-MAN'S-ROOT, PETTYMORREL, SMALL-SPIKENARD, SPICEBERRY, SPIGNET, *O'kadak' Aya'bidjidji'bikugi'sin,* implying adhesiveness (*racemosus -a -um* ra-kay-MO-sus in racemes, for the elongated inflorescence; New Latin from *racemus*, the stalk or a cluster of a bunch of grapes, & *–osus,* plenitude or notable development, with a raceme, a cluster of flowers each on their own stalk & arranged along a single central stem) upl


Aralia racemosa

Habitat: Mesic woodland, rich woods & thickets, dense shade, north facing slopes, calcareous rocky ravines, & calcareous swamps. "Uncommon in moist woods & more frequent in ravines; Kishwaukee River ravines, the "dells" of Hall Creek, Ashley Forest preserve." (ewf55) In Illinois, "Dolomite cliffs; calcareous rocky ravines, dense shade" (Ilpin). distribution/range: The most widespread sp in the genus.
Culture: ①Cold moist stratify 60 days. Best planted outdoors in the fall. (pm09). ②Sow at max 5ºC (41ºF), germination irregular, often several months (tchn). 216,000; 528,000 (pm02) seeds per pound.

③"Berries collected in late August. Seeds extracted from pulp with running water over a screen. Seeds sown fresh as soon as possible after collection. Sow date was early September. Seeds were hand sown 2 to 3 seeds per cell to compensate for possible lower germination rates. Seed was covered with a thin layer of coarse vermiculite and watered in under a mist system. Flats were grown for 8 weeks in a fully automated shaded greenhouse under an automated mist system set at 3 seconds of mist every 30 minutes. Air temperature was set at 65 F & bottom heat was run at 70ºF. Flats were moved to a shaded quonset for 16 weeks. Temperatures were kept as close to 38ºF as possible but not allowed to go below freezing. The soil surface was kept moist. Flats were then moved to a fully automated greenhouse. Temperatures were initially set at 58ºF days & 54ºF nights & raised to 68ºF days & 64ºF nights after 2 weeks. Day length was extended to 12 hours using HID lights. The soil surface was kept moist until germination occurred." (Thomas 2007)

bottom line: Macerate, dormant seed immediately, moist cold stratify, or refrigerate at 33-38º until pretreated or planted.
Description: Erect, perennial, 3'-7' (10) tall, native forb; thick aromatic root; stems leafy, not bristly; leaves widely-spreading, sharply & often doubly toothed, the 3 main divisions pinnately-divided; inflorescence of many, rounded umbels in a spreading, branched cluster (compound panicle) up to 12" long; flowers white, 5-merous, fruits dark purple, berry-like; N. key features: ①3'-7', stem leafy, not bristly; flowers many in a spreading branched cluster; fruit dark purple, berry-like, umbels numerous, small, arranged in a decompound panicle. ②"Few widely spreading leaves, slightly downy; inflorescence a large panicle of umbels" (Ilpin).
Comments: status: Special Concern in Rhode Island. phenology: Blooms July-August, 6-8. C3. One of the largest herbaceous plants in our flora. Landscaping, shaded borders & large shaded gardens.
Associates: ethnobotany: Young tips available in spring blooms July August. Roots used as medicinal beverage by Menominee (sm23). Roots used by Menominee for food & young tips used by Pottawatomie in soup (sm33). Ojibwa & Pottawatomie used it for medicine. "One old man (Ojibwa) cultivates a patch of this plant." (Reagan 1928) Used for coughs by Ojibwa (den28) root alterative, & stimulant. "The root is pleasant to taste & highly esteemed as an ingredient in small beer."
VHFS: [*Aralia racemosa* L subsp *racemosa*]
SC Thomas, 2007. Propagation protocol for production of Container (plug) *Aralia racemosa* L. plants one gallon container; In: Native Plant Network. URL: http://www.NativePlantNetwork.org (accessed 2016/02/19). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.

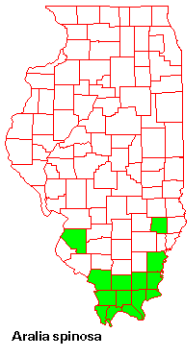




Aralia racemosa
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Tracey Slotta USDA-NRCS PLANTS Database. - Not copyrighted image. Illinois map courtesy of ILPIN.

Aralia spinosa Linnaeus DEVIL'S WALKING STICK, aka ANGELICA TREE, HERCULES' CLUB, PRICKLY-ASH, (*spinosus -a -um* (spee-NO-sus) spiny for the spiny stem & petioles.)
Habitat: Moist or wet woods, bluffs, riverbanks, roadsides. distribution/range: Southern ⅓ of Illinois. This sp is considered introduced, persisting & spreading in Wisconsin.

Culture: Growth rate moderate. Seedling vigor medium. Vegetative spread rate none. May spread slowly from seed. 131,000 (usda, ecs) seeds per pound.

①Seeds ripen in fall and are readily consumed by birds. Unripe seeds are not viable, collect when fruits are deep purple. Ferment of clean in blender. Blending scarifies the seed, and fermented seed will benefit from scarification. Fall sowing outdoors produces consistent germination. Code B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, G chemical inhibitors, (I seeds require scarification because of an impermeable seed coat). (cu02)



cultivation: Tolerant of coarse, medium, & fine textured soils. Anaerobic tolerance low. CaCO3 tolerance high. Drought tolerance low. Fertility requirement high. Salinity tolerance none. Shade tolerance intermediate. pH 7.2.

Description: Shrub or small tree to 20 to 35'; 30" minimum root depth; leaves alternate, pinnately compound; umbel of white or green flowers; seeds are flattened, ca 1/16" long, & hard. key features: ①"Stem, branches, petioles, leaf-rachis are prickly; umbels are numerous in terminal compound panicle; leaves doubly or triply pinnately compound as much as four feet long; flowers with purple stalks; black, spherical berries." (Ilpin)

Comments: status: phenology: Blooms June to July. Seed clusters mature in late fall. C3.

Associates: Songbirds, upland birds, terrestrial furbearers, & small mammals feed on fruit. Medium to low palatability to grazers & browsers. Flowers are a nectar source for the Great Purple Hairstreak butterfly, *Atlides halesus.*

ethnobotany: Emetic & cathartic.

VHFS: [*Aralia elata* (Miq) Seem, *A spinosa* auct non L, *Dimorphanthus elatus* Miq]

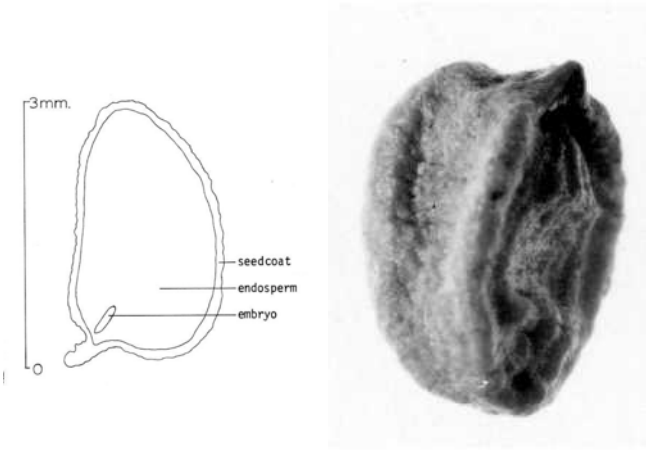
Aralia spinosa

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Seed photo Steve Hurst USDA-NRCS PLANTS Database. - Not copyrighted image. 2nd line drawing Mark Mohlenbrock, USDA-NRCS PLANTS Database / USDA NRCS. *Wetland flora: Field office illustrated guide to plant species.* USDA Natural Resources Conservation Service. Not copyrighted image. Photos

Robert H. Mohlenbrock. USDA SCS. 1989. *Midwest wetland flora: Field office illustrated guide to plant species*. Midwest National Technical Center, Lincoln. Provided by USDA NRCS Wetland Science Institute (WSI). Seed photo courtesy of the US Forest Service USDA-NRCS PLANTS Database. Illinois map courtesy of ILPIN.

KALOPANAX Miquel 1863 **CASTOR ARALIA** *Araliaceae Kalopanax* Greek *kalos* beautiful, & *panax*, closely related genus in the same family.

Kalopanax septemlobus (Thunb ex A Murray) Koidz CASTOR ARALIA, (*septemlobus -a -um* New Latin seven-lobed, from *septem*, seven, & *lobus*, lobed or lobes.)
Introduced, moist soils, rarely escaped tree to 80'; leaves palmate, 5-7 lobes, thorns on underside; flower 5 parted; blooms August to September. distribution/range: South central Wisconsin.
VHFS: [*Kalopanax pictus* (Thunb) Nakai]



Kalopanax septemlobus

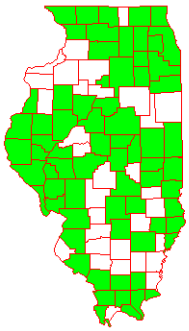
PANAX Linnaeus **GINSENG** *Araliacea Panax* is a reference to a plant in the *Aralia* family, usually the genus *Panax*, which includes the Ginseng plant; *panax* comes from two Greek words, which mean heal all afflictions, or cure all, & for Karl Linnaeus, it was considered a panacea. *Panax* is derived from classical Latin *panacēa*, any of various plants reputed to have universal healing powers; a concept also personified as the daughter of Aesculapius from Hellenistic Greek πανάκεια, *panakeia*, a plant reputed to have universal healing powers, universal remedy, from Hellenistic Greek πανακής, *panakes,* all-healing. Also Greek, all-remedy, *panak-, panax*, from *panakeia*, from *panakēs* all-healing, panacea (from *pan-* & *-akēs*-from *akeisthai* to heal) & *-ia* -y; akin to Greek *akos* remedy.

Eleven (14) spp of perennial herbs of the cooler climates of eastern North America (2 spp ?) & eastern Asia (9-12 spp ?) with aromatic, fleshy, tuberous roots, compound verticillate leaves in single whorl, & a solitary umbel of flowers; fruits baccate, 2 to 3-celled; cell 1-seeded.

Seeds are hydrophilic & mature late summer. One to two seeds per red berry. Remove from pulp & sow immediately or store moist. If using purchased seed, be sure it has been properly stored & soak 20 minutes in 10% bleach solution to kill fungus. Germination is hypogeal, transplant three seedlings into deep containers. Transplant to garden in fall. Code B seed will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, * seed is hydrophilic, intolerant of dry storage, G chemical inhibitors. (cu00)

Panax quinquefolium Linnaeus *CT, MA, MA, MI, NH, NY, NC, PA, RI, TN AMERICAN GINSENG, aka *AMERIKANSK GINSENG* (SW), *AMERIKANISCHER GINSENG* (G), FIVE FINGERS, GINSENG, *GINSENG D'AMÉRIQUE* (F), *KANADISCHER GINSENG* (G), OCCIDENTAL GINSENG, SANG, SHENG, TARTAR ROOT, *XI YANG SHEN* (C), American Indian *Garantoquen,* manlike, similar to Chinese *jen-shen* or *rénshēn* also meaning manlike, in reference to the branched root. (*quinquefolius -a -um* kwing-kwee-FO-lee-us with 5 leaves, or leaflets, from Latin *quinque,* five, & *folium, folii,* leaf) The English pronunciation ginseng is based on a Japanese reading of the Chinese characters. The scientific name literally means cure-all five-leaved.
Habitat: Shaded woods, in rich soil. "Uncommon in mesophytic woods; Spring Creek woods, Mulford woods, Camp Hillcrest & the maple woods on Newburg road." (ewf55) distribution/range:

Culture: ①Seeds are recalcitrant, remove pulp, wash clean, briefly dry 2-3 days, store clean seeds in a ziplock in the refrigerator until dormant seeded; or store in moist peat moss in a refrigerator at 34-38ºF until spring planting in the garden or lath house.



Description: Erect, perennial, native, forb, 8"-24" tall; roots fusiform, long, white to beige, fleshy, branching like a human torso; stems solitary; leaves single whorl of 3, palmately-divided into usually 5 stalked, toothed leaflet turning yellow in the fall; inflorescence a solitary, round umbel from the leaf axils; flowers white to green, 5-merous; fruits bright scarlet, berry-like, fleshy pulp with a hard seed; N 2n = 48. key features: ①8-24" tall; roots long, branching; flower solitary umbel; leaves in a single whorl of 3, usually 5 stalked, toothed leaflets, root fusiform, leaflets oval, acuminate, serrate, petiolate. ②"Roots fusiform (thick near middle and tapering near ends); leaflets longstalked; berry bright red" (Ilpin).

Comments: status: Endangered in Maine & Rhode Island. Exploitably vulnerable in New York. Special Concern in Connecticut, Massachusetts, North Carolina, & Wisconsin. Special Concern & Commercially Exploited in Tennessee. Threatened in Michigan & New Hampshire. Vulnerable in Pennsylvania.

phenology; Blooms July, 7-8. C3.

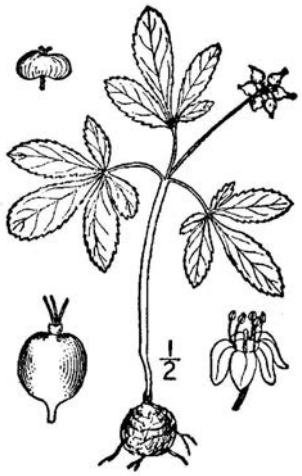
Associates: ethnobotany: Used as medicinal plant by Pottawatomie & Menominee (sm23, 33). Native Americans also sold roots to whites. Once considered a cure all, still a very popular herb, used as a stimulant & a tonic, leaves sometimes used in tea.. In 1986, this sp was endangered in 31 states, due to over collecting for the commercial herb industry.

VHFS: *Aralia quinquefolia* (Linnaeus) Decaisne & Planchon, *Ginseng quinquefolium* (L.) Wood, A.W]

Panax quinquefolia

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Fruit & seed images from Robert J Gibbons; USS National Seed Herbarium, https://npgsweb.ars-grin.gov/gringlobal/ImageDisplay.aspx?type=taxonomy&id=4238 Illinois map courtesy of ILPIN.

Panax trifolius Linnaeus DWARF GINSENG, aka DWARF GROUNDNUT, GROUNDNUT, GROUND NUT is in reference to the round, tuberous roots, very deep in the earth in proportion to the size of the plant.
Habitat: Shade to partial shade of woods, & bottomlands, in rich soil. distribution/range: Known from se Wisconsin & northern Indiana.
Culture:
Description: Erect, perennial, native forb, 4"-8" tall; roots globose, tuberous; leaves single whorl, finely toothed, palmately-divided into 3-5 stalkless leaflets, serrate, lance-oblong, sub-sessile; inflorescence a solitary, round umbel; flowers white to pink (pure white), 5-merous; fruits yellow, berry-like, 3-seeded; N.
key features: ①Roots globose, tuberous; leaflets wedge-lanceolate, serrate, subsessile
Comments: status: phenology: Blooms May-June.
Associates:
VHFS:

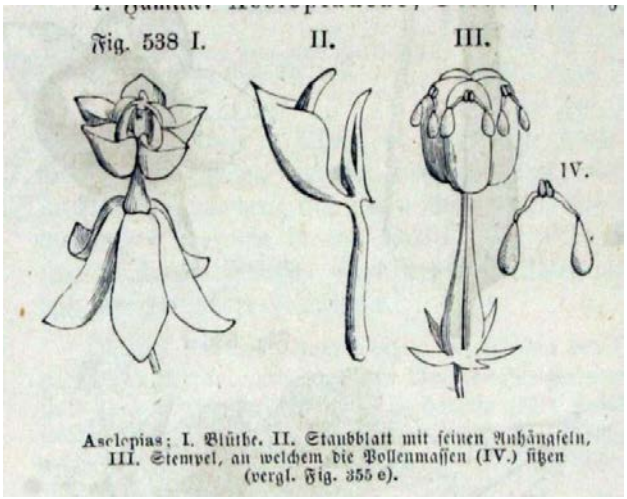


Panax trifolius
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society.

ASCLEPIADACEAE Some authors cite overwhelming evidence placing *Asclepiadaceae* as a tribe in *Apocynaceae*.

ASCLEPIAS Linnaeus **MILKWEED, SILKWEED** *Asclepiadaceae Asclepias* (ass-KLEP-ee-ass, or a-SKLAY-pee-as) New Latin, from Latin name for swallowwort (*Cynanchum vincetoxicum*), from Greek *asklepias*, from the name for *Aesculapius, Asklepios*, mythic physician-hero, sometimes worshiped as a god of medicine, as a reference to the plant's medicinal properties. *Aesculapius* was the student of Chiron the Centaur & perfected the knowledge of medicinal plants. "*Aesculapius* was so good at healing the sick that it was even believed he could give life to the dead. This rumor worried Hades (the ruler of the dead) & he complained to Zeus. Zeus feared that all men might become immortal & killed *Aesculapius* with a lightning bolt."

"The ancient symbol of *Aesculapius* is a snake coiled around a wooden staff. This symbol has become the traditional symbol of medicine seen today. In the book of Genesis, Moses held up a serpent on a staff as an example of Christ, to heal the Jews."
(http://www.alabamaplants.com/Pinkopp/Asclepias_amplexicaulis_page.html, accessed 2/19/07)



Picture modified from Thomé, Otto Wilhelm-*Lehrbuch der Botanik fur Gymnasien, Realschulen, forst- und landwirthschaftliche Lehranstalten, pharmaceutische Institute etc. sowie zum Selbstunterrichte. 2. Auflage.* (1872)-Permission granted to use under GFDL by Kurt Stueber.

A genus of about 100 spp of perennial herbs, vines, & tender shrubs found in tropical & temperate North & Central America with flowers having a corona of five concave hoods each of which bears a slender horn. Sometimes included in the *Apocynaceae.* A very popular tropical silkweed currently in the trade is actually a tropical agricultural weed. Fruits are follicles with seeds bearing a coma or floss. Some spp attract songbirds & hummingbirds. Important larval food & nectar source for butterflies. All are excellent nectar plants. Lepidopteran associates include: host & nectar *Danaus gilippus* QUEEN BUTTERFLY; *Danaus plexippus*, MONARCH BUTTERFLY feeds on nectar from all milkweed spp; larval host *Euchaetes egle* MILKWEED TIGER MOTH, *Melitta curcurbitae* SQUASH VINE BORER MOTH; nectar source *Callophrys gryneus*, Juniper Hairstreak; *Callophrys niphon*, Eastern Pine Elfin; *Euphydryas phaeton*, BALTIMORE CHECKERSPOT BUTTERFLY, *Lycaena dione*, GRAY COPPER, *Papilio polyxenes* BLACK SWALLOWTAIL, *P troilus,* SPICEBUSH SWALLOWTAIL, *Polygonia interrogationis* QUESTION MARK, *Satyrium acadica* ACADIAN HAIRSTREAK BUTTERFLY, *S edwardsii* EDWARDS' HAIRSTREAK BUTTERFLY, *Speyeria aphrodite* APHRODITE FRITILLARY BUTTERFLY, *S cybele* Great SPANGLED FRITILLARY BUTTERFLY, *S idalia,* Regal FRITILLARY BUTTERFLY, *Strymon melinus,* GRAY HAIRSTREAK BUTTERFLY; & *Vanessa cardui* PAINTED LADY BUTTERFLY.

Monarch butterflies, *Danaus plexippus*, are specific to milkweeds, the only plants upon which eggs are laid. Eggs are laid on the underside of young leaves & as the larvae eat, they absorb the cardiac glucosides in the milkweeds, which become a chemical defense. Adults retain this toxicity. MONARCH, QUEEN (*D. gilippus*), & VICEROY BUTTERFLIES are Müllerian mimics. All are toxic & have co-evolved similar warning patterns to avoid predation.

☠ All *Asclepias* spp have cardiac glucosides & are somewhat toxic to humans, livestock, & other animals. Toxicity varies from person to person, but children are especially vulnerable because of their curiosity & small size. In spite of the toxins, properly cooked flowers, shoots, & pods were eaten. The sap of some spp causes skin irritation.

Most spp have a milky sap. *A tuberosa* has a clear sap, & the milkiness of *A verticillata* sap may be hard to determine.

Most spp germinate adequately if dry stored & surface sown, but germination is quicker & more uniform if seed is cold moist stratified. Code (A seed will germinate within 4 weeks sown at 70ºF), B seed will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, H seeds require light to germinate (cu00). Best grown as potted material lined out the first year, & not carried over, or as bare root material, or sown in their permanent locations. Many spp totally resent life in a pot, with most individuals winterkilled. MILKWEEDS have thick, tuberous roots that may become infected if damaged. They resent disturbance &, once established, it is best to not transplant or try to divide them. Upland spp will develop crown rot if kept too moist too long. Mulching MILKWEED beds is not advised.

Asclepias amplexicaulis JE Smith *NH, VT CLASPING MILKWEED, aka BLUNT-LEAVED MILKWEED, CURLY MILKWEED, SAND MILKWEED, (*amplexicaulis -is -e* amplexicau'lis (am-plex-i-KAW-lis) Modern Latin, clasping or encircling the stem, embracing the stem, or stems clasped, when the leaf is dilated at the base & embraces the stem; from Latin *amplexus, amplexus,* m, an embrace, from *amplector*, *amplecti,*

amplexus sum, surround, encircle, embrace, clasp; esteem; cherish; surround, include, grasp, *-i-,* connective vowel used by botanical Latin, & Latin noun *caulis, caulis* m., from the Greek καυλος, *kaulos,* the stem or stalk of a plant; or from Greek αμπλεκτος-καυλος, *amplektos-kaulos.*) (Published by Sir James Edward Smith (1759-1828), a British botanist & a founder of Linnaean Society.) upl
Habitat: Sand prairies, sandy sunny oak barrens, & sand savannas. distribution/range:
Culture: ①30 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of cold, moist stratification (he99). ③Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn).

38,400 (pm11), 39,168 (gnh13) seeds per pound.

bottom line: Limited seed test data indicate dormant seeding is strongly required. Germ 14%. Dorm 84%. Test 35 days. (#1).**
Description: Native, erect, herbaceous, perennial forb; roots from a stout caudex; stems 1-3 feet; leaves 2-5 pair of cordate-clasping tomentulose leaves, with wavy margins & pink midrib, leaves greenish or purplish; solitary terminal umbel of greenish-purple (pink) flowers; N. key features: ①Erect glabrous stem, sessile, clasping leaves, & pinkish-green flowers.
Comments: status: Potentially Threatened in Ohio. Threatened in New Hampshire & Vermont.
phenology: Blooms mid-June to mid-July. Collect seed October (he99). In northern Illinois, collect seed late July-August. We have observed three colonies in very sandy soil that have survived cultivation & row cropping.

"Rather common in the sand areas, the sandy prairies about Camp Grant & to a less extent on high prairies" (ewf55).
Associates:
VHFS: [*Asclepias gladewitzii* Farw, *A obtusifolia* Michx, *A rotundifolia* Raf]

Asclepias amplexicaulis

Asclepias curassavica Linnaeus SUNSET FLOWER, aka BLOODFLOWER, COTTON BUSH, INDIAN ROOT, SCARLET MILKWEED, SILKWEED, (*currassavicus -a -um* (ku-ra-SAH-vi-kus) of or from Curaçao, in the West Indies in the Caribbean.) This is an introduced, annual in our area, orange-flowered milkweed that came into the Midwest market several years ago. Some marketed its seed as *A tuberosa* to restorationists & growers, creating a Hell of a mess. It is still marketed as an ornamental, perhaps as "Annual Butterflyweed". It may winter over & persist in the southeastern USA. ①No pretreatment needed. Soak seeds in hot water for 24 hours, then sow seeds on soil surface at 70ºF & water. (ew11) 176,000 (ew11), 186,000 (apl) seeds per pound. Attracts butterflies & hummingbirds.

Asclepias exaltata Linnaeus POKE MILKWEED, aka TALL MILKWEED, (*exaltatus -a -um* exalted, raised high, very tall, erect, lofty, commanding.) The common name is referring to the leaves resembling those of *Phytolacca americana.* The sp was once called *A phytolaccoides* Pursh. upl
Habitat: Dry-mesic to mesic savanna, rich woodland to moist deciduous forest. "Woodland openings, rich mesic woodlands, sandy woodlands, upland rocky woodlands, wooded slopes, areas along paths in woodlands, & woodland borders" (Hilty). distribution/range: Widely distributed by uncommon through Illinois. Our state is near the western limit of the sp range.
Culture: ①30 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of cold, moist stratification, or no pre-treatment needed, sowing outdoors in the spring is the easiest method. (he99) ③Fall

plant or cold stratify at 40ºF for 1 months for best results. Sow just below the soil surface at 70ºF & water. Moderately difficult. (ew11). ④Sow at +2 to +4ºC (34-39ºF) for 4 wks in moistened sand, move to 20ºC (68ºF) for germination (tchn). Dormant seed-light.

48,000 (pm02, ew11, aes10), 75,600 (gn) seeds per pound.

cultivation: Space plants 24-36". Tolerates open bright shade along forest edges, & partial to full shade. Average to rich loam or sandy loam soils with adequate organic matter, well watered but well drained. Neutral to slightly acidic soils. Hardy to Zone 5, maybe 4.

bottom line: Limited seed test data indicate dormant seeding is strongly required. Germ 11-18%. Dorm 71-85%. Test 22 days. (#3).**

Description: Native, erect or ascending, herbaceous, perennial forb; taprooted; stems 1-3, 1.0-1.5', to 3-5(-6) feet in some habitats & parts of its range, stems dark greenish purple to light green, producing 1-6 umbels; leaves opposite, petioles 1-3" (2.5-7.5 cm), elongated, narrow elliptic ending in a sharp tip, up to11 inches but generally 2-10" (5-25 ½ cm) long & 1-4" (2.5–10 cm) wide; top of the leaf is smooth & underside is hairy, veins in the leaves have a purple tone to them in contrast to the green color of the leaves; inflorescence pendulous umbell with few flowers (to 20), pedicles purplish; flowers white, with a lavender or green tint, corolla, hoods, & horns light pink, aromatic; pods spindle-shaped, long & narrow up to 6.0" (15 cm) long, erect.; N. key features:

Comments: status: phenology: Blooms 6,7,8. In northern Illinois, collect seeds October. In southeastern Wisconsin, collect seeds October (he99). Uncommon, seldom abundant. One of the most shade tolerant Midwestern milkweeds. Some woodland colonies will not manifest themselves every year (sw94). Seed source nursery plantings, genetic source Tomahawk Bluffs, LaSalle Twp, LaSalle Co; Ogle Co, Brick Road?.

"*A phytolaccoides* Pursh Poke Milkweed. Not uncommon in woods usually in damp places. Woods east of Roscoe & woods in Rock Cut." (ewf55 as *A phytolaccoides*)

Associates: Attracts SILVER-SPOTTED SKIPPERS, PEARL CRESCENTS, CLOUDYWINGS, GREAT SPANGLED FRITILLARIES & TIGER SWALLOWTAILS. Butterfly larval host. Nectar source for bees. Deer resistant. One site notes rabbits love the plant, while other sources state mammalian herbivores avoid milkweeds.

ethnobotany: All parts of the plant are toxic. Toxic only in large quantities. Symptoms include, vomiting, stupor, weakness, spasms. Toxic Principle: cardiac glycosides & resinoids.

VHFS: [*Asclepias bicknellii* Vail, *A phytolaccoides* Pursh] A hybrid with *A syriaca* is known in part of its range.

Asclepias exaltata

Asclepias hirtella (Pennell) Woodson TALL GREEN MILKWEED, aka BARRENS MILKWEED, GREEN MILKWEED, PRAIRIE MILKWEED, (*hirtellus -a -um* somewhat or rather hairy, covered with short stiff hairs, minutely hairy, pubescent.) upl

Habitat: Flat sandy prairies, dry prairies. Full sun.

Culture: ①Cold moist stratify 60 days (Wade). ②30 days cold moist stratification (pm09). ③Seeds germinate after about 60 days of cold, moist stratification, or no pre-treatment needed, sowing outdoors in the spring is the easiest method. (he99) ④Fall plant or cold stratify at 40ºF for 2 to 3 months then move to 70ºF. Some seeds may take two seasons to sprout. Moderate difficulty. (ew11) ⑤Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn). Moist cold stratify, easy from dry (?) stratified seed. 68,800 (pm02 & ew11), 88,889 (gn) seeds per pound.

"*Asclepias hirtella* Mesic, dry, esp. sandy prairie. Blooms late July, early August; GREENISH. Harvest late September. 2'; only method #1 tried. Only SEEDLING TRANSPLANT method tried; seedlings weak first two years; flowers 3rd year." (rs ma)

Description: Native erect perennial, forb; 2.0' stout stems with linear leaves; flowers white-green;

Comments: status: phenology: Blooms 6,7,8. Collect seeds September-October (he99).

"In Sugar River sand area it is locally frequent being usually near the edge of boggy places; it is also very uncommonly found on low prairies. Also known in Ogle Co." (ewf55 as *Acerates hirtella* Pennell)

Associates: Pollinated by *Diptera*, bees. Attracts butterflies. Said to be deer resistant.

VHFS: [*Acerates hirtella*] "*A longifolia* & *A hirtella* are closely related; the two taxa have sometimes been treated as distinct only at the rank of subsp (see synonymy) or as "very distinct varieties" (Turner 2009)" (Weakley 2011). This may be sometimes incorporated into *A longifolia* (BONAP 2010), which is a coastal wet pine savanna spp.

BL Turner, 2009, Taxonomy of *Asclepias hirtella* & *A longifolia* (*Apocynaceae*). Phytologia 91: 308-311

Asclepias hirtella

Asclepias incarnata Linnaeus SWAMP MILKWEED, aka PINK MILKWEED, ROSE MILKWEED, SWAMP SILK WEED, *Bu'giso'win,* swimming (Ojibwa) (*incarnatus -a -um* (in-kar-NAH-tus) flesh-colored, flesh-pink,

from Middle English *incarnat*, from Late Latin *incarnatus*, past participle of *incarnare,* to make flesh, make fleshy, incarnate, from Latin *in-* in- & *carn-, caro* flesh, akin to Greek *keirein* to cut. Contrary to some sources, it does not mean blood-red. *Incarnata* refers to fleshy for the flowers, obviating the bogus common name RED MILKWEED. If it were RED MILKWEED, it would be called *A rubra,* or *A sanguinea,* but, wait, there really are plants with those names. Hmmm.) obl

Habitat: Wet meadows with organic rich soils, seasonally inundated areas, swamps, wet thickets & ditches, & shores, marshes, acidic bogs to moist calcareous habitats. West of Tipton, Iowa, it grows in the median of I-80 in an alkaline/saline environment. distribution/range:

Culture: ①"Moist cold treatment or fall sow. Light cover. Good germination" (mfd93). ②30 days cold moist stratification (pm09). ③Seeds germinate after about 60 days of cold, moist stratification, or no pre-treatment needed, sowing outdoors in the spring is the easiest method. (he99) ④Fall plant or cold stratify at 40ºF for 1 month. Then sow on the soil surface at 70ºF & water. Moderately difficult. (ew11) ⑤Sow at +2 to +4ºC (34-39ºF) for 4 wks in moistened sand, move to 20ºC (68ºF) for germination (tchn). ⑥10 days moist stratification improves germination, but not necessary for good greenhouse crop. Field sow fall, spring, early summer. (pnnd). ⑦Needs stratification for 30 days (sh94). Growth rate moderate. Seedling vigor low. Vegetative spread rate slow. 63,148 (gna07), 64,007 (gnhenv02), 67,200 (wns01), 70,000 (usda, ecs), 72,000 (pn02, shirley94, aes10) to 72,500 (ew11), 72,640 (jfn04), 76,800 (pm02), 83,119 (gna04), 83,200; 94,296 (gn07), 113,700 (gn), 119,160 (gna05), 137,326 (gnh06) seeds per pound. Seeded alone plant 25 lbs per acre or 10 oz per 1000 (sh94).

cultivation: Space plants 1.5-2.0'. Said to be clay soil tolerant. Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance none. Fertility requirement medium. Salinity tolerance none according to USDA, but AES reports some salt tolerance, & our observations by state other possibilities. Shade intolerant. pH 5.0-8.0 (usda), or pH 5.0-7.0.

bottom line: Dormancy varies from year to year. Spring may be reasonably successful 1 out of 3 years, but dormant seed to increase germination & establishment. Flipflop species. Possible crossover species. Germ 54, 57, 12, sd 24.7, r12-92.5 (80.5)%. Dorm 31.8, 30, 50, sd 24.4, r1.0-81 (80)%. Test 33, 31, 25, r21-58 days. (#29).**

Light, or GA3; moist cold stratify (10-30) or dormant seed, moist to saturated soils. One source reports easy from dry stratified seed. Reported to self sow.

Description: Native, erect perennial, forb; 2.0-6.0'. Pink flowers in our area, but, north of northern Illinois, this sp does have a redder flower than our ecotype. If your planting contains deep dark pink to reddish plants, it is not local northern Illinois ecotype.

Comments: status: This plant is considered invasive in some parts of its range. (Stubendieck et al 1994, Whitson et al 1996) phenology: Blooms 6,7,8. Attractive cut flowers & dried seed pods. Landscaping, pollinator gardens, rain gardens, moist swales & wetland restoration. Individual plants may be short lived, 3-4 (-5) years.

"Common in such wet places as ditches, sloughs, & streambanks. A very pale form is uncommon." (ewf55)

Seed sources nursery production & from drainage ditches & farmed wetlands, Somonauk Twp, DeKalb Co.

Associates: Butterfly host & nectar plant, including: larval host *Danaus plexippus* MONARCH BUTTERFLY; nectar source *Amblyscirtes carolina* CAROLINA ROADSIDE-SKIPPER, *Anatryone logan* DELAWARE SKIPPER, *Atalopedes campestris* SACHEM, *Euptoieta claudia* VARIEGATED FRITILLARY BUTTERFLY, *Hylephila phyleus* FIERY SKIPPER, *Panoquina ocola* OCOLA SKIPPER, *Papilio cresphontes* GIANT SWALLOWTAIL, *Poanes viator* BROAD-WINGED SKIPPER, *Poanes yehl* YEHL SKIPPER, *Polites peckius* PECK'S SKIPPER, *Pompeius verna* LITTLE GLASSYWING, *Phyciodes tharos* PEARL CRESCENT BUTTERFLY, *Speyeria diana* DIANA FRITILLARY BUTTERFLY. Pollinated by *Diptera* & bees. Flowers also visited by *Diptera.* Attracts hummingbirds, including RUBY-THROATED HUMMINGBIRD. Deer resistant.

ethnobotany: Flower buds are available for food in early summer. Used for food by Menominee (sm23). Used as medicinal plant by Ojibwa (den28) root alterative, anthelmintic, cathartic, & emetic. Fiber used for twine by Ojibwa (Gilmore 1933). Identified in Ohio Hopewell & rock shelter textiles (Whitford 1941).

VHFS: Weakley (2007) notes variety *incarnata*, WESTERN SWAMP MILKWEED, & variety *pulchra* (Ehrh ex Willd) Pers. EASTERN SWAMP MILKWEED. Rare occasional white specimens are found in the wild or production plots (in our experience, 2 out of approximately 50,000), with white cv "Ice Ballet", "Ice Follies", & "Milkmaid" available. Several pink & rose selections are also available.




Asclepias incarnata

Asclepias lanuginosa Nuttall WOOLLY MILKWEED, aka SIDE-CLUSTER MILKWEED, (*lanuginosus -a -us* woolly, from Latin *lanuginosus*, downy, woolly.)
distribution/range:

"Scarce, being found only on dry prairies & usually those that are sandy or gravelly; prairie hillside along the C & NW Ry at 18th street in East Rockford, prairie on the IC RR at 20th street road east of Rockford, & the gravel hills that border Rock River. In Boone Co on a high prairie near Irene & in Ogle Co on a limestone prairie south of the village of Kishwaukee." (ewf55 as *Acerates lanuginosa* Nuttall) Known from Jarret Center Prairie, Byron Forest Preserve.

Associates: Larval host for ??? *Vide infra*.

VHFS: [*Acerates lanuginosa* (Nutt) Decne, *A monocephala* Lapham ex Gray, *Asclepias nuttalliana* Torr, *A otarioides* auct non E Fourn]


Asclepias lanuginosa & friend, Jarret Center Prairie, Byron, Illinois

Asclepias meadii
"Asclepias meadii Mesic prairie. Blooms June; GREENISH. Harvest August. We have only 2-year seedlings, raised by method #1; seedlings very weak, have not bloomed. Seed from Missouri." (rs ma)

Asclepias purpurascens Linnaeus *CT, MA, MI?, RI, TN, WI PURPLE MILKWEED, (*purpurascens*, becoming purple, purplish) facu
Habitat: Mesic savanna, open oak woodlands, woodland edges, wet mesic prairies. Timber clays. Favors mesic prairies & open woodland edges. Many populations occur on calcium rich soils. In the se USA, it grows in "openings in moist bottomlands and swamp forests, perhaps mostly on soils derived from mafic or calcareous" (w12). "Not common. Edge of dry woods, roads, roads, & railroads." (ewf55)
distribution/range: Once common in New England, now rare due to habitat destruction.
Culture: ①Moist cold stratify (20-30 days) or dormant seed outdoors, light (Code C Ken Schaal). ②30 days cold moist stratification (pm09). ③Seeds germinate after about 60 days of cold, moist stratification, or no pre-treatment needed, sowing outdoors in the spring is the easiest method. (he99) ④Fall plant or cold stratify at 40ºF for 2 to 3 months then move to 70ºF. Some seeds may take two seasons to sprout. Moderately difficult. (ew11) ⑤Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn). Growth rate medium. Plants resent root disturbance & are best planted in permanent location while small (Rice 1988). 72,000 (pm02), 76,800 (ew11), 82,256 (jfn04) seeds per pound.
asexual propagation: Careful division in spring(?).
cultivation: Space plants 15-18". Full sun to partial shade. Clay soil tolerant.
Description: Native, erect, herbaceous, perennial forb; roots; stems 1.5-2.5(3.2)', stout, puberulent; leaves opposite, decussate, short petiolate; terminal umbel of purple (red/purple) flowers, occasionally one or two axillary umbels; N. key features: ①Similar to *A syriaca* but *A purpurascens* has terminal umbel, glabrous corolla lobes, & pinnate-veined leaves with pointed tips, & smooth, downy follicle on a deflexed pedicel, while the former has umbels in three or more (2-6) leaf axils, hairy corolla lobes, net-veined leaves, & a downy follicle with numerous wart-like conical projections. (*A syriaca forma inermis lacks warts on its follicle.*) Similar to *A sullivantii* but the leaves have evident petioles & are wedge shaped at the base.
Comments: status: Special Concern in Connecticut, Tennessee, & Michigan? Endangered in Massachusetts & Wisconsin. Historical in Rhode Island. phenology: Blooms mid-June to mid-July or August. Collect seed in se Wisconsin September (he99), in n. Illinois late September to early November. Plants are similar to *A syriaca*, but the flowers are more pink to red-purple. Landscaping, shade gardens, shaded butterfly gardens. Plants are self-fertile & much less aggressive than COMMON MILKWEED. It is said to be an indicator sp of oak-hickory savannah remnants.
Associates: Butterfly host & nectar plant. Monarch larval host. A favorite nectar plant of GREAT SPANGLED FRITILLARY. Also pollinated by bees & *Lepidoptera*. Nectar attracts RUBY-THROATED HUMMINGBIRD. Watch for slug damage. Deer resistant.
ethnobotany: ☠ All parts of the plant contain cardiac glucosides & resinoids, toxic only in quantities. The symptoms include vomiting, stupor, weakness, & spasms. The sap has been used to remove warts.
VHFS: [*Asclepias amoena* L, *A compressa* Moench, *A dasyypus* Raf, *A lasiotis* Raf, & *A gonialis* Raf (Woodson 1954), *A purpurascens* Walter, *Vincetoxicum purpurascens* C Morren & Decaisne]




Asclepias purpurascens in a wet mesic planting, plus pods.

Asclepias quadrifolia Jacquin WHORLED MILKWEED, aka FOURLEAF MILKWEED, (*quadrifolius -a -um* four-leaved, with four leaves or leaflets, with four leaves diverging from one point.)
Known but not mapped from Knox Co Illinois.
In the se USA, "Moist to dryish forests and forest margins, most common on mafic and calcareous substrates; common (rare in DE)" (w12). distribution/range:
"We have found this only once, at the edge of a woods northwest of Pecatonica" (ewf55). Flowers sweet scented.

Asclepias quadrifolia, Knox Co

Asclepias rubra Linnaeus RED MILKWEED, aka PURPLE SAVANNA MILKWEED, TALL PINK BOG MILKWEED,
In the se USA, "Pocosin ecotones, wet pine savannas, sandhill seeps, seepage swamps. June-July; July-September" (w12). distribution/range: Native south & east of our area. Species is included as a recent addition to the Midwest native trade.
Fall plant or cold stratify at 40ºF for 1 month for best results. Then sow on the soil surface at 70ºF & water. (ew11) 80,000 (ew11) seeds per pound.

Asclepias speciosa Torrey SHOWY MILKWEED, aka GREEN MILKWEED, SILKWEED, (*speciosus -a -um* spee-kee-O-sus beautiful, showy, spectacular, splendid, good-looking, from Latin *speciosus*, adjective, beautiful, handsome, good-looking; attractive, appealing; presentable, respectable, imposing; spectacular, brilliant, &c.)
Habitat: distribution/range: Native in the western United States.
Culture: ①Cold moist stratify 60 days or direct sow in fall when soil temperature is below 54 degrees (after Wade). ②30 days cold moist stratification (pm09). ③No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11) ④Sow at 20ºC (68ºF), germinates in less than two wks (tchn).

⑤Dormant seed or cold moist stratify 1-2 months & spring plant (pots). 57,344 (wns01), 72,000 (pm02), 86,400 (ew11), 87,000 (apl) seeds per pound.

cultivation: Space plants 24-36".

Description: Native, erect, perennial forb; flowers pink-purple, open, starlike.

Comments: status: phenology: Blooms ?

Associates: Attracts butterflies & hummingbirds. Larval host of Monarch *Danaus plexippus.*

Asclepias sullivantii Engelm. ex A Gray *MI, MN, WI SULLIVANT'S MILKWEED, aka PRAIRIE MILKWEED, SMOOTH MILKWEED, (for William Starling *Sullivant* (1803-1873), distinguished muscologist & bryologist, see also *Sullivantia* in the *Saxifragaceae*) upl

Habitat: Wet meadows, moist roadsides, & mesic prairie. "Common, being about as frequent as *A syriaca*" (ewf55). Ah! those were the days, my friend. distribution/range:

Culture: ①"Moist cold treatment or fall sow. Light cover. Good germination." (mfd93). ②30 days cold moist stratification (pm09). ③Seeds germinate after about 60 days of cold, moist stratification, or no pre-treatment needed, sowing outdoors in the spring is the easiest method (he99). ④Fall plant or cold stratify at 40ºF for 2 to 3 months then move to 70ºF. Some seeds may take two seasons to sprout. Moderately difficult. (ew11) ⑤Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn). 64,000 (aes10), 64,800; 69,324 (gna11), 68,846 (gnh13), 72,000 (pm02), 78,400 (ew11), 83,776 (wns02), 84,394 (gnarh04), 84,800 (jfn04), 129,511 (gnarh04) seeds per pound.

"*Asclepias sullivantii* Moist to mesic prairie. Blooms July; PINK. Harvest October. 3'; method #1; seedlings weak 1st year, bloom 3yd year. Does well in garden, foliage & flowers attractive. Seedlings easy to raise & transplant, but usually seem to be out-competed in restoration plots; good as a garden plant." (rs ma)

cultivation: Space plants 18-24".

bottom line: Genesis test data indicate 70% of lots require dormant seeding. Flipflop species. Germ 37, 27, na, sd 26.3, r12-85 (73)%. Dorm 55.1, 67, na, sd 27.8, r9.0-85 (76)%. Test 28, 28, 28, r12-40 days. (#10:2).

Moist cold stratification is usually needed, but one source cites easy from dry stratified seed.

Description: Native, erect, herbaceous, perennial forb, entire plant hairless; stems 2.0-3.0'; leaves with short red petioles, pink midveins, & smooth margins; flowers pinkish-green (rose or mauve), cordate based (somewhat clasping),

Comments: status: Threatened in Michigan, Minnesota, & Wisconsin. phenology: Blooms 6,7,8. In northern Illinois, collect seed September to early October. Collect seeds in se Wisconsin in October (he99). Rhizomatous, will spread under ground in favorable habitats several years after planting. Seed genetic sources wet roadsides, Loraine Twp, Henry Co, Center Prairie, Wyanet Township, Bureau Co, & Norway, LaSalle Co, & from a nice population on I-80 shoulders west of Mokena, Grundy Co.

Associates: Butterfly plant. Host for Monarch larvae. Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera, Diptera, Lepidoptera*, & *Coleoptera*. Attracts Ruby-throated Hummingbirds. Reported as deer resistant.



Asclepias sullivantii

Asclepias syriaca Linnaeus COMMON MILKWEED, aka SILKWEED, VIRGINIAN SILK, *Ini'niwunj,* ''manlike'' (Ojibwa) (*syriacus -a -um* Syrian, of or from Syria, from Latin *syriacus* Syrian, from Greek *syriakos*, from Syria, COMMON MILKWEED was early introduced into Europe from the eastern USA & thought by Linnaeus to come from Syria.) upl

Habitat: Ubiquitous, thickets, roadsides, & dry fields, dry to mesic prairies. “Roads, railroads, waste places, &c” (ewf55). distribution/range:
Culture: ①30 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of cold, moist stratification, or no pre-treatment needed, sowing outdoors in the spring is the easiest method. (he99) ③“10 days moist stratification improves germination, but not necessary for good greenhouse crop. Field sow fall, spring, early summer.” (pnnd). ④No pretreatment needed. Sow seeds on the soil surface at 70ºF & water. Slow to germinate. Somewhat difficult. (ew11) ⑤Dormant seed or moist cold stratify (90). ⑥Sow at 20ºC (68ºF), germination slow (tchn). 64,000 (pm02, jfn04, ew11, aes10, 66,706 (gnh13), 70,000 (ecs), 72,000 (pn02), 78,963 (gna11), 96,926 (gna03), 97,394 (gna04), 144,287 (gna06) seeds per pound.

cultivation: Space plants 18-24”. Tolerates clay soils. Full sun to partial shade.

bottom line: Dormancy varies from year to year. Spring may be reasonably successful half the time, but dormant seed to increase germination & establishment. Flipflop species. Possible crossover species. Germ 44.3, 47.5, 20, sd 28.8, r7.0-89 (82)%. Dorm 42, 33, 33, sd 27.7, r7.0-84 (77)%. Test 32, 28, 28, r22-52 days. (#12).**

Description: Native, erect, perennial forb; spreads from deep rhizomes; stems 3.0-5.0', hairy; leaves large opposite, ovate to elliptical, hairy; inflorescences in upper leaf axils, 20-130 flowers per inflorescence; flowers pink to pale-purple; pods hairy & warty.

Seeds need light to germinate, shallow cover. GA3 may help germination.

Comments: status: Several authorities consider this plant invasive, even though the destruction of its habitat is influencing Monarch migration patterns (usda). phenology: Blooms 6,7,8. In northern Illinois, collect seed September to early October. Collect seeds in se Wisconsin in September-October (he99). A wildly successful plant. Very aggressive, often weedy, thrives along roadsides. Our plants are thoroughly naturalized, & in spite of picking the seed, they are on the increase. Where common milkweed grows in grass fields, it seems resistant to glyphosate & 2, 4D. Its coarseness & weedy image are easily overlook when you consider the plants importance to monarch butterflies. Seed source Tampico, Whiteside Co.

Associates: Butterfly plant. Larval host *Danaus plexippus* MONARCH BUTTERFLY, nectar source *Achalarus lyciades,* HOARY EDGE, *Anatryone logan* DELAWARE SKIPPER, *Atalopedes campestri*s SACHEM, *Celastrina ladon* SPRING AZURE BUTTERFLY, *Chlosyne nycteis* SILVERY CHECKERSPOT, *Colias eurytheme* ORANGE SULPHUR, *Dolba hyloeus* PAWPAW SPHINX, *Epargyreus clarus* SILVER-SPOTTED SKIPPER, *Euphyes bimacula* TWO-SPOTTED SKIPPER, *E vestris* DUN SKIPPER, *Euptoieta claudia* VARIEGATED FRITILLARY BUTTERFLY, *Eurytides marcellus* ZEBRA SWALLOWTAIL, *Hesperia ottoe* OTTOE SKIPPER, *Parrhasius m album* WHITE M HAIRSTREAK BUTTERFLY, *Pholisora catallus* COMMON SOOTYWING, *Poanes hobomok* HOBOMOK SKIPPER, *Poanes zabulon* ZABULON SKIPPER, *Polites mystic* LONG DASH, *P mystic* LONG DASH, *P peckiu*s PECK'S SKIPPER, *Polygonia interrogationis* QUESTION MARK BUTTERFLY, *Pompeius verna* LITTLE GLASSYWING, *Satyrium calanus* BANDED HAIRSTREAK BUTTERFLY, *S caryaevorum* HICKORY HAIRSTREAK BUTTERFLY, *S liparops* STRIPED HAIRSTREAK BUTTERFLY, *Speyeria diana* DIANA FRITILLARY BUTTERFLY, *Thorybes bathyllus* SOUTHERN CLOUDYWING, *Thorybes pylades* NORTHERN CLOUDYWING, *Vanessa atalanta* RED ADMIRAL BUTTERFLY, *V virginiensis* AMERICAN LADY BUTTERFLY. Pollinated by long-tongued bees, other *Hymenoptera, Diptera*, & *Lepidoptera*. Attracts lARGE MILKWEED BUG, COMMON MILKWEED BUG, RED MILKWEED BEETLE, & BLUE MILKWEED BEETLE. In the summer of 2011, the blooms & leaves of Common Milkweed were ravaged by Japanese beetles(?), often reducing the plant to its bare stem. There may have been negative impact on other nectar-feeding insects & foliar feeding larvae. Pod production was also reduced. Attracts hummingbirds. Deer resistant.

ethnobotany: Numerous uses but potentially toxic. Shoots available in late spring & early summer, buds & flowers in early summer, young pods in summer & early autumn. Shoots used by Ojibwa, buds & flowers by Ojibwa who dry them for winter food, & by Menominee, Pottawatomie, Winnebago, Sauk-Fox, & Iroquois (sm32, 23, 33, 28, Radin 1923, Waugh 1916). Used as medicinal plant by Ojibwa & Pottawatomie (sm32, 33). Used for diseases of women (den28). The root is tonic, diuretic, alterative, emmenagogue, purgative, & emetic. Fiber used for sewing thread & fish lines by Menominee & Pottawatomie (sm23, 33). Used as hunting charm by Ojibwa (sm32). Used as a hunting charm to attract deer. Fibers identified in a Sauk-Fox bag, Kickapoo string, & Ohio rock shelter fish net, Ash & Canter cave in Ohio (Whitford 1941).

VHFS: Known to hybridize with *A speciosa*.

Asclepias syriaca, with beetle damage, 2011.

Asclepias tuberosa Linnaeus *ME, NH, NY, SD, VT, QUE NOX HI BUTTERFLY WEED, aka BUTTERFLY MILKWEED, CHIGGER-FLOWER, ORANGE MILKWEED, PLEURISY-ROOT, (*tuberosus -a -um* (tew-be-RO-sus) tuberous, from the Latin *tuberosus*, for the tuberous, or thickened root, related to the root words of *Typha*, Latin *tumere* to swell.) upl

Habitat: Dry open soil, sand, dry, & mesic prairies, sand savanna, dry prairies, canyons, or dry woods. In our area, a rare plant over all, but rare in mesic soils. distribution/range: Thrives in the sands of Mason Co. Widely distributed. Locally very rare. Local populations are threatened from over-collecting seed & from plant poachers slowly digging most of the known plants.

Culture: Horticultural requirements of this sp vary widely due to the dominance of precultivars in the trade. Dormancy & disease resistance has been bread out of some strains. Some commercial strains may be of low viability. ① "Moist cold treatment or fall sow. Light cover. Watch over watering plants. Good germination " (mfd93). 30 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of cold, moist stratification, or no pre-treatment needed, sowing outdoors in the spring is the easiest method. (he99) ③"10 days moist stratification improves germination, but not necessary for good greenhouse crop" (pnnd). ④No pretreatment needed. Soak seeds in hot water for 36 hours, then sow seeds on soil surface at 70ºF & water. Moderately difficult. (ew11) ⑤Sow at +2 to +4ºC (34-39ºF) for 4 wks in moistened sand, move to 20ºC (68ºF) for germination (tchn). ⑥Field sow fall, spring, early summer (pnnd). ⑦Germinates with no treatment, but improves with 60 days moist cold stratification (sh94). ⑧Dormant seed or cold moist stratify 30±60 days (pots2000). Growth rate slow. Seedling vigor low. Vegetative spread rate none. Slightly self sows.

56,000 (pn02, jfn04, shirley94, aes10), 68,800 (pm02), 70,000 (usda, ecs), 76,181 (gnam06), 77,860 (gna06), 80,00 (ew11), 84,228 (asctubG8489), 101,248 (wns01), 101,805 (gnaap03), 102,390 (gnh02), 102,400 (gran), 130,760 (gna04) seeds per pound. Pure stand plant 4 lb per acre (granite), or 25 lb per acre or 10 oz per 1000 (sh94). Use 0.031-0.25 lbs pls per acre as part of diverse mixes (gni).

"*Asclepias tuberosa* Dry, esp. sandy prairie. Blooms late June to late August; ORANGE. Harvest October. 2'; easy with method #1, often a few plants flowering late the 1st year, all the 2nd. Reliable garden ornamental. Successful by SEEDLING TRANSPLANT." (rs ma)

asexual propagation: Stem cuttings, root cuttings.

cultivation: Space plants 15-18". Do not mulch with wood chips. Moderate water requirement. Will grow best on coarse soils with sharp drainage. Anaerobic tolerance none. $CaCO_3$ tolerance medium. Drought tolerance high. Fertility requirement low. Salinity tolerance none, but AES reports it to have some salt tolerance. Shade tolerant intolerant. pH 4.8-6.8 (usda) or pH 4.5-6.5. Plants in formal beds on constructed soils may be very short lived. Soils need good internal drainage. Older bare root material maybe difficult to transplant. Containerized material easily winterkills & must be planted out 1st year.

bottom line: Genesis test data indicate most lots can be successfully established from spring planting. Nondormant lots are common. Widespread cultivation has masked natural dormancy patterns. A domesticate in progress. Germ 75, 83.5, 87, sd 18.9, r28-98 (70)%. Dorm 9.2, 2.5, 0.0, sd 15.5, r0.0-65 (65)%. Test 23, 23, 14, r12-37 days. (#30:2).**

greenhouse & garden: No treatment works in the greenhouse for many seed lots. Bottom heat may help. Dormant seed or moist cold stratify, temperature sensitive, said to be easy from dry stratified seed.

Description: Native, very showy, perennial forb; deep tap root, minimum depth 16"; stems 1-2', 1.5-2.0(3.0)', multiple stems, with beautiful red-orange to yellow flat-topped cluster of flowers.

Comments: status: Possibly extirpated in Maine. Endangered in New Hampshire. Exploitably vulnerable in New York. Rare & endangered in South Dakota. Threatened in Vermont. Rare in Quebec. Noxious weed in Hawaii. phenology: Blooms 6,7,8. In northern Illinois, collect seeds from mid-September to mid-October. Collect seeds in se Wisconsin in September-October (he99). Attractive cut flowers & dried seed heads. Landscaping, rock gardens, dry gardens, & xeriscaping. Can be short lived, with individual plants appearing sporadically (Bob Horlock personal communication). Best in sharply, internally-drained soils. Seed source nursery production from original stock Lyndon Twp, Whiteside Co, & Will, Kane & DuPage cos (Bob Horlock). It is said to thrive along roadsides but not in Earl Butz country. Also said by some to have weedy tendencies. Haa!

Bob Horlock was Seedsman for The Natural Garden in the 1980s & early 1990s, & a pioneer in this industry. We were fortunate to have a friendly business relationship with Bob during the early years of our nursery. Bob's seeds were collected in DuPage, Kane, & Will Cos. We traded back & forth with him, & several of our production plots originate from his collections. Bob passed away in the early 1990s.

"Abundant in prairies and the thinly-wooded barrens (Short 1845).

"More frequent in the sand areas than elsewhere but also found on dry prairies. It is in demand as a garden plant but is very difficult to transplant. We have the usual color variations." (ewf55)

Associates: Butterfly host & nectar plant. Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera, Diptera*, *Lepidoptera, Coleoptera*, & *Hemiptera*. Attracts hummingbirds & butterflies, & bees. Larval host *Danaus plexippus* MONARCH, QUEENS, & GRAY HAIRSTREAK; nectar source *Callophrys gryneus* JUNIPER HAIRSTREAK, *Euptoieta claudia* VARIEGATED FRITILLARY BUTTERFLY, *Lycaena phlaeas* AMERICAN COPPER, *Satyrium titus*, CORAL HAIRSTREAK BUTTERFLY, *Satyrium acadica* ACADIAN HAIRSTREAK BUTTERFLY, ORANGE SULPHURS, MILKWEED TIGER MOTHS. Highly deer resistant.

ethnobotany: Shoots available in late spring & early summer. Used for food "by some Indians of Canada" (Palmer 1817). Used as medicinal plant by Menominee, one of their most important medicines (sm23). Fibers found in Ohio textile mound (Whitford 1941)

VHFS: According to Fernald, our most variable milkweed, with forma *bicolor* Standley, with yellow corolla & orange hood, or *forma lutea* Clute with hood orange to deep red, or pale yellow & pale petals. A yellowish form grows in Heaton Cemetery, near Morrison.

Illinois has ssp *tuberosa* COMMON BUTTERFLY-WEED, & ssp *interior* Woods MIDWESTERN BUTTERFLY-WEED. Ssp *rolfsii* (Britt ex Vail) Woods, SANDHILL BUTTERFLY-WEED is native to the se USA. *A tuberosa* "Hello Yellow" is available as seed.

The native seed industry was kicked in the groin several years ago by the sale of the seed of an orange-flowered, annual tropical milkweed as *Asclepias tuberosa*. But no one cares, because the native seed industry is only a pimple on the ass of the seed industry.





Asclepias tuberosa

Asclepias verticillata Linnaeus WHORLED MILKWEED, aka DWARF MILKWEED, EASTERN WHORLED MILKWEED, HORSETAIL MILKWEED, (*verticillatus -a -um* verticillate, whorled, from Latin *verticillus*, adjective, the whirl of a spindle, & *–atus*, adjectival suffix for nouns, possessive of or likeness of something with, shaped, made.) upl

Habitat: Hill prairies, sand, dry, & mesic prairies, roadsides, & open soils. Thrives in interstate medians & cloverleaves. "Very common weed on prairies that have been grazed" (ewf55). distribution/range:

Culture: ①30 days cold moist stratification (pm09). ②No pre-treatment needed, sowing outdoors in the spring is the easiest method, or seeds germinate after about 60 days of cold, moist stratification (he99). ③Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn).. ④Fall plant or cold stratify at 40ºF for 2 to 3 months then move to 70ºF. Some seeds may take two seasons to sprout. (ew11) 68,800 (sh94), 160,000 to 164,000 (jfn04), 169,600 (ew11), 176,000 (pm02), 181,745 (gnh11), 224,308 (gna05), 235,294 (gna04) seeds per pound.

"*Asclepias viridiflora* Mesic to dry or sand. Blooms late June to mid July; GREENISH. Harvest early October. 1 1/2'; method #1, seedlings very weak 1st year, delicate first 2 years, begin bloom 3rd year. Shoots come up late each spring; true of most *Asclepias*. SEEDLING TRANSPLANT." (rs ma)

cultivation: Space plants 2.0-3.0'. Dry to mesic soils, full sun to partial shade. Tolerates clay soils.

bottom line: Dormancy varies from year to year. Spring may be reasonably successful 6 out of 10 years, but dormant seed to increase germination & establishment. Flipflop & crossover(?) species. Germ 52.5, 72, 75, sd 37.7, r2.0-97 (95)%. Dorm 35.6, 11, 3.0, sd 38.7, r0.0-94 (94)%. Test 33, 33, 37, r25-47 days (#11)**

Description: Erect, herbaceous, perennial, native forb; stems 1.0-1.5'; flowers white;

Comments: status: phenology: Blooms 6,7,8. In northern Illinois, collect seeds on mid-September to mid-October. Collect seeds in se Wisconsin in October (he99). Attractive dried seed pods, naturalized landscaping, rhizomatous, aggressive, not for small gardens or plantings. Thrives on many IDOT roadsides, some in obviously saline/alkaline areas. Seed source Tampico Twp, Whiteside Co.

Associates: Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera, Diptera*, & *Lepidoptera*. Larval host of Monarch butterflies. Attracts butterflies & songbirds. Reported as deer resistant. Poisonous to livestock.

Asclepias verticillata

Asclepias viridiflora Rafinesque SHORT GREEN MILKWEED, aka GREEN COMET MILKWEED, GREEN-FLOWERED MILKWEED, GREEN MILKWEED, (*viridiflorus -a -um* green flowered, with green flowers) upl.
Habitat: Sand prairie & dry to dry-mesic prairies. Sandy soils of lakeshores & dunes. distribution/range:
Culture: ①30 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of cold, moist stratification, or no pre-treatment needed, sowing outdoors in the spring is the easiest method. (he99) ③Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn). 56,704 to 57,600 (pm02) seeds per pound.

cultivation: Space plants 24-36".
Dormant seed or moist cold stratify.

Description: Erect, herbaceous, perennial, native forb; stems 8.0-18.0"; flowers green;
Comments: status: phenology: Blooms 6,7,8. In northern Illinois, collect seeds mid-August to mid-September. Collect seeds in se Wisconsin in October (he99). "Not uncommon in Sugar River sand area & occasional on dry prairies particularly the sandy ones about Camp Grant" (ewf55).
Associates: Larval host of Monarch butterfly.
VHFS: [*Acerates viridiflora* (Raf) Pursh ex Eaton, *A viridiflora* (Raf) Pursh ex Eaton var *ivesii* Britton, *A viridiflora* (Raf) Pursh ex Eaton var *linearis* Gray, *Asclepias lanceolata* Ives, *A viridiflora* Raf var *lanceolata* (Ives) Torr, *A viridiflora* Raf var *linearis* (Gray) Fern]

Asclepias viridiflora

Asclepias viridis Walter *IN GREEN ANTELOPE-HORN, aka GREEN MILKWEED, SPIDER MILKWEED, (*viridis -is -e* Latin green (general), fresh green, fresh, young, youthful, vigorous, from *viridis*.)
Habitat: Rocky prairies & glades. distribution/range:
Culture: ①Moist cold stratify. 30 days cold moist stratification (pm09). ②Fall plant or cold stratify at 40ºF for 2 to 3 months then move to 70ºF. Some seeds may take two seasons to sprout. (ew11) 68,800 (pm02 & ew11) seeds per pound.
cultivation: Space plants 18-24". Full sun to part shade.
Description: Erect, herbaceous, perennial, native forb; stems 12-18"; key features:
Comments: status: Endangered in Indiana. phenology: Blooms Our plants required 3-4 years to bloom from seed. Great for the very dry garden. Carefree once established. Genetic source Bluestem Prairie Nursery.
Associates: Attracts butterflies. Larval host & nectar source for Monarch. Deer resistant.



Asclepias viridis

CYNANCHUM Linnaeus **SWALLOW-WORT** *Asclepiadaceae* *Cynanchum* dog-strangler, New Latin, from Greek *kynankhon*, dogbane, *Marsdenia erecta*, from κυον, κυνο-, *kyon*, *kyno-,* a dog, & *-ankhon*, from *anchein,* to choke; alternately dog-strangler κυν-αγχω, *kyn-agkho, kyn-anckho*; some are poisonous. Squinancy-wort, *Asperula cynanchica* was used for squinancy, tonsillitis, cognate with quinsy. Formerly in the genus *Ampelamus.*

Cynanchum laeve (Michaux) Persoon BLUE VINE, aka CLIMBING MILKWEED, HONEYVINE, HONEYVINE MILKWEED, SANDVINE, SMOOTH SWALLOW-WORT, (*laevis -is -e* (LIE-vis) smooth (as in not being rough), or beardless & delicate, soft.) fac
Habitat: Wet savannas & wooded floodplains, occasionally wet ditches. distribution/range:
Culture: Dormant seed, root cuttings.
Description: Vining, herbaceous, native forb, lacks a latex sap; roots clustered & fibrous, minimum depth; stems slender, hairless, twining to 10'; leaves opposite, entire, cordate, 3-7" long, 1.5-5.0" wide, hairless, on petioles 1-4"long, leaf surfaces have conspicuous white veins that arise from a common point (palmate venation); flowers small, white, axillary, 5-merous; fruit is a smooth, angled follicle; N. key features:
①Perennial vine with opposite leaves & large follicle. The prominent white veins distinguishes this weed from any of the morning glories. The heart-shaped leaf distinguishes this weed from field bindweed.
Comments: status: Endangered in Pennsylvania. This sp is considered weedy & invasive by some authors (Haragan 1991, Stubbendieck et al 1994, SWSS 1998) phenology: Blooms 7,8. Herbaceous vine. Considered adventive in Chicago, but native in Bureau Co, along the Bureau Creek bottoms, occasional in moist ditches in Center Prairie, & near Green River, at Route 92. Weedy in Macomb & Peoria.
VHFS: [*Ampelamus albidus* (Nutt) Britt, *A laevis* (Michx) Krings] (synonym *Ampelamus*, Greek *ampelos*, a vine, & *albidus* whitish)

Photo Robert H Mohlenbrock USDA-NRCS PLANTS Database.-Not copyrighted image

BALSAMINACEAE A Richard 1822 **TOUCH-ME-NOT FAMILY, JEWEL WEEDS**

IMPATIENS Linnaeus **IMPATIENS, JEWELWEED, TOUCH-ME-NOT, SNAPWEED, BALSAM**
Balsaminaceae Impatiens (im-PAT-ee-enz) Latin for impatient, for the explosive release of seed when a ripe seed capsule is touched. A genus of 850-1000 spp of hardy & tender, annual & perennial herbs & subshrubs, mostly. Fruits are capsular, 5-celled, bursting elastically by 5 valves.

The seeds are said require 140 days winter stratification (Eastman & Hansen 1995). Dormant seed outdoors, germination will occur the second spring (pm07).

Impatiens biflora Walter SPOTTED JEWELWEED,
Habitat: Wet prairies, savannas, & woodlands. distribution/range:
Culture: propagation: ①No pre-treatment needed, sowing outdoors in the spring is the easiest method, or seeds germinate after about 60 days of cold, moist stratification. (he99)
Description: Erect annual; 2-5'; orange flowers; key features:
Comments: status: phenology: Blooms 7-9. Collect seeds in se Wisconsin in October (he99). Synonym of the following.

Impatiens capensis Meerburgh SPOTTED TOUCH-ME-NOT, aka ORANGE JEWELWEED, ORANGE TOUCH-ME-NOT, SPECKLED JEWELS, SPOTTED JEWELWEED, TOUCH-ME NOT, WILD TOUCH-ME-NOT, (*capensis -is -e* of or referring to the Cape of Good Hope region (Table Mountain), in southern Africa, often meaning South Africa in general, or another cape region, the reference is unclear) facw
Habitat: Grows in a range of habitats. Fens, floodplains, wet prairies, mesic woodlands, & upland swamps. distribution/range:
Culture: propagation: ①Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside & allow 2 years for germination. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. Best planted outdoors in the fall. Further germination pretreatments not sure? (pm09) 27,664; 33, 325 (gnhm14), 64,000 (pm20, ew11), 69,013 (gnam06), 69,419 (gnhm11), 82,144 (gnh13) seeds per pound.

cultivation: If plants existed, you could space plants 1.5-2.0'.

bottom line: Field establish by dormant seeding only. Germ 3.5, 3.0, 2.0, sd 2.6, r0.0-8.0 (8.0)%. Dorm 76.2, 82, 82, sd 12.8, r57-90 (33)%. Test 30, 30, na, r22-36 days.**

greenhouse & garden: Dormant seed, alternating temperatures, light.
Description: Annual, 2-5-5.0', flowers orange.
Comments: status: phenology: Blooms 6,7,8,9. Collect seeds in se Wisconsin in August-September (he99). Seed source wet prairie remnants & drainage ditches, Green River Lowland, Lee Co. "Our common jewelweed" (ewf55).
Associates: Attracts Ruby-throated Hummingbirds, butterflies, & bees. Upland game birds eat seeds, including Ruffed Grouse, Ring-Necked Pheasants, Prairie Chickens, & Bobwhite Quail.

ethnobotany: Numerous uses.
VHFS: [*Impatiens biflora* Walter]

Impatiens pallida Nuttall PALE TOUCH-ME-NOT, aka JEWELWEED, PALE JEWELWEED, TOUCH-ME-NOT, YELLOW JEWELWEED, (*pallidus -a -um,* pale, wane, pallid, somewhat pallid, somewhat pale, causing paleness, from Latin *pallidus*, from *pallere* to be pale, from Greek *polios* gray) [fac+]
Habitat: Fens, floodplains, & mesic woodlands. Full sun to woodland, wet to mesic soils. Found more in

deciduous woods than *I capensis*. distribution/range:
Culture: ①Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside & allow 2 years for germination. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. Best planted outdoors in the fall. Further germination pretreatments not sure? (pm09) ②No pre-treatment needed, sowing outdoors in the spring is the easiest method, or seeds germinate after about 60 days of cold, moist stratification. (he99).

25,600 (pm20, ew11), 27,664, 29,147 (gnhm14) seeds per pound.

cultivation: If plants existed, you could space them 2.0-3.0'. Clay soil tolerant.

bottom line: Field establish by dormant seeding only. Germ 7.0%. Dorm 80%. Test 24 days.

greenhouse & garden: Dormant seed, alternating temperatures, light

Description: Native erect annual forb; 3.0-5.0'; flowers yellow;
Comments: status: phenology: Blooms 7,8,9. Collect seeds in se Wisconsin in October (he99). Woodland, savannah, & wetland restoration, woodland gardens, shady hummingbird gardens, & shady rain gardens. Annual, can be invasive in small areas, readily reseeds where competition is scant. Sow in your woodland where there is room to expand. "Definitely less common than the above & found in the same damp usually shady places" (ewf55).
Associates: Attracts hummingbirds. Walnut tolerant.

ethnobotany: Used as medicinal plant by Ojibwa & Pottawatomie (sm32, 33). Used for dye by Ojibwa, Menominee, & Pottawatomie (sm32, 23, 33).

BERBERIDACEAE AL de Jussieu 1789 **Barberry, Berberids, Barberry Family** In the broad sense, a family of about 15 genera & 650 spp of herbs & shrubs, of the temperate Northern hemisphere & Andean South America. Several genera have north temperate relictual distributions, with spp in eastern North America & in eastern Asia, including *Caulophyllum, Diphylleia, Jeffersonia,* & *Podophyllum*. (Weakley 2008) Fruits are berries.

BERBERIS Linnaeus 1753 **BARBERRY** *Berberidaceae Berberis* New Latin, the genus including barberry, alteration of Medieval Latin *barberis* barberry, from Arabic *barbārīs*. A genus of 300-500 spp of shrubs of North America, South America, Europe, North Africa, & Asia.

Berberis thunbergii Augustin de Candolle JAPANESE BARBERRY (*thunbergii* for Carl Peter *Thunberg* (1743-1828), Swedish botanist, plant collector, & student of Linnaeus who sent back plants from Japan to Europe; professor at Uppsala. (Some Internet references place Uppsala in Holland, but many Swedes said otherwise.)
"This commonly planted hedge plant escapes frequently to woods & waste places around cities" (ewf55).

The wood fluoresces bright yellow under ultraviolet lights (Hoadley 1986).

Berberis vulgaris Linnaeus EUROPEAN BARBERRY, aka COMMON BARBERRY, (*vulgaris -is -e* (vul-GHA-ris) common, vulgar, from Latin *vulgāris*, from *vulgus*, the common people.)
"An occasional escape to waste places & the edge of woods near cities" (ewf55).

CAULOPHYLLUM Michaux 1803 **BLUE COHOSH** *Berberidaceae Caulophyllum* stem-leaf, from καυλος-φυλλον, from Latin noun *caulis, caulis* m., from the Greek καυλος, *kaulos,* the stem or stalk of a plant, usual spelling was *colis* or *coles*, or *kaulos*, the shaft, & φυλλον *phyllon*, leaf. A genus of three spp of herbs with a relictual north temperate distribution, eastern North America (2) & eastern Asia (1). *Caulophylli* are spring wildflowers, but are not ephemeral, persisting much of the summer. Seeds are drupe-like. Formerly *Leontice.*

"Remark. To the generic description of p 34, it should be added: that the supposed drupe is but a naked seed elevated on a funicule-like stipe, after having burst its caducous pericarp. See Torrey's Flora, p. 336. Dr Darlington says (M S) he has closely watched this plant three years, & knows this remark of R Brown to be correct. (Eaton 1829).

Caulophyllum thalictroides (Linnaeus) Michaux BLUE COHOSH, aka *CAULOPHYLLE FAUX-PIGAMON,* COMMON BLUE COHOSH, FALSE COHOSH, GREEN VIVIAN, PAPOOSE ROOT, SQUAW ROOT, *Be'cigodji'biguk,* one root (Ojibwa) (*thalictroides* thalictrum-like, resembling *Thalictrum,* from

Thalictrum, the genus name, & *-oides* from Latin *oīdēs,* & ancient Greek οειδής, *oeides,* a suffix indicating having the form or likeness of.) upl
Habitat: Mesic savanna & mesophytic forests. "Common in woods" (ewf55). distribution/range: Mesic woods: occasional to common throughout Illinois (m14).
Culture: ①Seeds are hydrophilic. Fresh seed harvested before turning blue. Remove blue "flesh" by fermenting or using a blender, wash & sow immediately. Seed coat is very hard, scarification may help (via the blender see the closing section for blade directions). Sowing in permanent location may be best, as germination occurs in 2-3 years. Cullina codes C seeds will germinate only after multiple cycles of warm and cold, typically 40º-70º-40º-70º. * seed is hydrophilic, intolerant of dry storage, G chemical inhibitors (I? seeds requires scarification because of an impermeable seed coat). (cu00) ②Best planted outdoors in the fall (pm09). ③Scarify. Sow seeds just below moist soil surface at 70ºF for 1 month. Move to 30ºF for 1 month, then bring back to 50ºF. (ew11)
1,920 (jfn04) seeds per pound.
cultivation: Space plants 1.0-1.25'. Full sun to partial shade, mesic soils. Clay soil tolerant.
greenhouse & garden: Plant outdoors late fall in permanent location, seedling beds, or in a metal flat covered with hardware clothe in an unheated lathe house.
bottom line: Handrake into woodland soil under insitu overstory late fall. Very strongly dormant. Germ 1%. Dorm 90%. Test 31 days. (#2).**
Description: Plant glabrous & glaucous, from a knotted rhizome; flowers yellow (green/brown), followed by blue, berry-like, drupe-like fruits; N 2n = 16.
Comments: status: phenology: Blooms 4,5. Seed matures late summer to early fall. Pericarp bursting at an early period, exposing the finally drupe-like seed raised on its thickened funiculus. See Swink & Wilhelm (1994) for a discussion of the seed development. Landscaping, used as an ornamental in woodland & shade gardens. The emerging spring leaves are purplish. Genetic origin LaSalle Co, LaSalle twp.
Associates: Reported to be deer resistant.
ethnobotany: BLUE COHOSH & other herbal medicines should only be taken with direct professional medical supervision. Root used as medicinal plant by Ojibwa, Menominee, & Pottawatomie (sm23, 32, 33). Ojibwa medicinal plant for lung trouble & cramps, & noted for fever by Omaha (den28) rhizomes & roots said to be sedative, diuretic, & emmenagogue. Used as a uterine tonic, for difficult menstruation, & to induce labor, where it was to be taken only in the ninth month. ☠ Children should not eat the blue fruit. The powdered roots can cause dermatitis & irritation to the mucous membrane. The roasted seeds do not contain caffeine, but have been used as a coffee substitute. The plant has been use medicinally for cancer, internal parasites, smooth muscle function, spasms, diuretic, & to ease menstruation, & childbirth.

JEFFERSONIA W Barton **JEFFERSONIA, TWINLEAF** *Berberidaceae Jeffersonia* New Latin, from Thomas *Jefferson*, 1743-1826, farmer, naturalist, patron of science, & third president of the United States & New Latin *-ia***.** A genus of two spp, relictually distributed in eastern America & east Asian (eastern Russia, Korea, Manchuria) herbs with basal palmately lobed leaves, solitary white flowers, & capsular fruit. Seeds have a lacinate aril, & are hydrophilic.

Jeffersonia diphylla (Linnaeus) Person *GA, IA, NJ, NY, WI TWINLEAF, aka JEFFERSONIA, GROUND SQUIRREL PEA, HELMET POD, RHEUMATISM ROOT, (*diphyllus -a -um* Greek for two-leaved, with two leaves.)
Habitat: Rich moist woods, partial to full shade. Forests. In the se USA, *Jeffersonia* grows in moist & extremely nutrient-rich forests, generally in soils over calcareous or mafic rocks, or very rich alluvium (w08). Rich moist woods to semi open rocky slopes & outcrops, usually in soils over limestone or other calcareous rocks (fna). In Ontario, grows in lowland forests. distribution/range: Mesic woods; scattered throughout Illinois, although rare in the s ½ of the state (m14).
Culture: ①Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside & allow 2 years for germination. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment (pm09).
cultivation: Space plants 0.75-1.0'. pH 6.1-7.8.
Description: Native, erect, herbaceous, perennial forb; roots minimum depth; stems; leaves are unusual, fused at the center; N 2n = 12. key features: ①8 white petals & 4 sepals. "It is somewhat suggestive of *Sanguinaria* in flower & foliage." ②"Flower on leafless stalk, leaves all basal, divided into 2 unequal half-

ovals" (fh).
Comments: status: Endangered in Georgia & New Jersey. Threatened in Iowa & New York. Special Concern in Wisconsin. phenology: Blooms 4-5. Fruiting spring. The attractive foliage is the source of the common mane & one of the key features of this plant. Landscaping, shade gardens.
"The wooded bank of Kishwaukee River at Camp Hillcrest, above New Milford. Also known on Walnut Creek in Ogle Co." (ewf55)
Associates: Pollinator friendly. Walnut tolerant.
ethnobotany: Numerous ethnobotanical uses.
VHFS:

PODOPHYLLUM Linnaeus 1753 **MAY-APPLE** *Berberidaceae Podophyllum* (pod-o-FIL-lum) with stalked leaves, originally *anapodophyllum,* from Latin *anas* a duck, Greek ποῦς, ποδὸς, *pous, podos,* a foot & φύλλον, *phyllon* a leaf, for the leaves of *P peltatum.* In one source as an allusion to the long petioles. Narrowly defined a genus of 2 spp of perennial herbs with a relictual distribution, one in eastern North America, one in eastern Asia. The fruit is a berry. "The obvious morphological kinship of *Podophyllum, Diphylleia*, and *Hydrastis* is corroborated by alkaloid chemistry" (w12).

Podophyllum peltatum Linnaeus ☠ *FL MAY APPLE, aka AMERICAN MANDRAKE, DEVIL'S APPLE, HOG APPLE, INDIAN APPLE, MANDRAKE, MANDRAKE ROOT, MAYFLOWER, *PODOPHYLLE PELT, POMME DE MAI,* UMBRELLA PLANT, WILD LEMON, WILD MANDRAKE, (*peltatus -a -um* (pel-TAH-tus) stalked from the surface, not the edge, peltate, shield-shaped, from Latin *pelta*, a small half-moon-shaped shield, from Greek πελτη, *pelte*; as in the leaves of *Nasturium-Tropoeolum*.) The common name refers the plant blooming in May & the flower's resemblance to an apple blossom; the ripe fruit also vaguely resembles a small apple, though it ripens in mid summer, not May. The other common names are based on the appearance or the reported flavor of the fruit, or the shape of the leaves or roots. facu
Habitat: Mesic & dry savannas, rich low woods & thickets. Mixed deciduous forest, shaded fields, shaded moist road banks, shaded riverbanks. Forests. distribution/range: Woods, very common; in every Illinois county (m14).
Culture: ① Seeds are hydrophilic & ripen early fall. Harvest when the fruits turn yellow. Squeeze seeds from pulp, (macerate) & ferment to remove the rest of the pulp. Plant fresh seed outdoors for germination next spring. (cu00) ②90 days cold moist stratification (pm11). ③Sow seeds just below moist soil surface at 65ºF for 1 month. Move to 35ºF for 1 month, then bring back to 55ºF. (ew11) ④Pour hot water over seeds, let soak 1-2 days until swelling is noticeable. Sow at 18-22ºC (64-71ºF) for 2-4 wks, move to +2 to +4ºC (34-39ºF) for 4-6 wks, move to 5-12ºC (41-53ºF) for germination. Short viable. (tchn).
17,600 (pm11), 19,200 (aes10) seeds per pound.
asexual propagation: The easiest way to propagate is by root division while the plant is dormant. Divide the rhizomes in fall with at least one bud. (lbj) Divisions planted early spring may bloom first year. Late summer division, using all of the rhizome beyond the current leaf as one division (cu00). Division (pm09).
cultivation: Space plants 2.0-3.0'. Does not like competition or disturbance. Do not mix with other plants. Species needs moisture-retaining, humus-rich soil & a partially shaded spot. Dig the planting area deeply & enrich it with leaf mold, peat moss, aged & rotted manure, or good compost. Set the crowns just below the surface of the soil in spring. One source notes it as clay tolerant, perhaps as in timber clays? Certainly not construction site clay subsoils. In favorable sites, this sp can grow far beyond where it was planted. Do not plant near paths or near special plants it may overwhelm. Excellent for naturalizing. Colonies expand slowly in dry, sandy woods.
greenhouse & garden: Seeds are best planted immediately or stored in ziplocks in a refrigerator. Cold moist stratify for 3 months. Plant thickly. Seedlings take several years to mature
Description: Erect perennial, native forb; colonial; stems 1.0-1.5(2.0)'; 2 peltate leaves, palmately veined; 1 flower white (sometimes tinged with pink, rose or purple, drooping downward, followed by a yellow, many-seeded (30-50) berry; N 2n = 12. key features:
Comments: status: Endangered in Florida. phenology: Blooms 4-6. C3. Collect ripe berries in late July-September. Woodland landscaping, emerges as green, pointed spears in spring, quickly forming attractive. short, umbrella-like leaves form an interesting mini-canopy in the woods. The fragrant white flowers are hidden beneath the leaves. A colony is quite interesting when viewed from ground level. Best grown in a naturalized or woodland garden where the plant can naturalize. Will form large circular clones. Old

colonies may persist after all the old overstory trees have been removed. Mowing a colony may kill it. Prairie Moon reports this grows well in dry semi-shade under their pines (Bill Carter, personal communication). "Common in woods & frequently persisting in the open for many years after all the trees are removed" (ewf55).
Associates: Pollinated by bees. Larval host *Euptoieta claudia* VARIEGATED FRITILLARY BUTTERFLY. Plant is avoided by grazing animals, due to its bitterness. Walnut tolerant.

ethnobotany: ☠ Treat the whole plant with respect & caution. Species has edible (?) fruit (reported as lemony tasting or with a strawberry flavor); poisonous rhizomes, cathartic used in medicines; & poisonous leaves & roots. Some consider the whole plant poisonous, even the rind of the berry & seeds! Fruit is available in July to August (September). Some people make jelly from the fruit. The ripe fruit was used as food by Ojibwa, Menominee, Sauk-Fox, Kickapoo, & Iroquois (Gilmore 1933, sm23, 28, Chamberlin 1901, Waugh 1916).

"The ripe fruits are edible; the rest of the plant contains a variety of alkaloids, and is poisonous-medicinal. Compounds from *Podophyllum* are used in wart removal, and show anti-viral and anti-cancer promise." (w12)
VHFS: The pink/rose-flowered plants are sometimes referred to as a separate form of this sp: forma *deamii* Raymond, with fruit & seeds maroon, & flowers, placentae, & plant axes pink-tinged.

BORAGINACEAE AL de Jussieu 1789 **BORAGE FAMILY** Flowers usually in scorpoid cymes, 1-sided uncurling inflorescences. Recalcitrance & double-dormancy extended germination is known from various spp in this family.

BUGLOSSOIDES Moench **CORN-GROMWELL** *Boraginaceae Buglossoides* bugloss-like, from Greek βουγλωσσος-οειδης, *bouglossos-oeides*. Tribe *Lithospermeae.*

Buglossoides arvensis (Linnaeus) I M Johnston BASTARD-ALKANET, aka CORN GROMWELL, STEEN-CROUT, STONE-SEED, WHEAT-THIEF, (*arvensis -is -e* (ar-VEN-sis) growing in fields, of cultivated or planted fields, of farmland, from Latin *arvum*, noun, field, cultivated land, plowed land, & *-ensis*, adjectival suffix for nouns denoting country or place of origin or habitat.)
Description: leaves lance-linear, rather acute, lower ones obtuse, veinless, hairy: calyx nearly as long as the corolla; segments spreading; seeds rugose.
"A weedy annual that is found occasionally in pastures & waste places." (ewf55 as *Lithospermum arvense* L)

CYNOGLOSSUM Linnaeus **COMFREY** *Boraginaceae Cynoglossum* (si-no-GLOS-um, or more appropriately ki-no-GLOS-um) hounds-tongue, from Greek κυνο-, *kyno-*, a dog, & γλωσσα, *glossa*, a tongue, from Dioscorides' name κυνογλωσσον, for the rough leave texture &/or the leaves shape resembling to a dog's tongue. With the root word spelled with a *kappa*, one would assume this was pronounced with a K sound, but not according to some authors. A genus of about 75 spp of temperate regions.

Cynoglossum boreale Fernald NORTHERN WILD COMFREY, (*borealis -is -e* (bo-ree-AH-lis) northern, of the North wind, of the North, Latin *boreas, boreae,* from Greek βορεας.)
Associates: ethnobotany: Used as medicinal plant by Ojibwa (sm32)

Cynoglossum officinale Linnaeus GARDEN COMFREY, aka HOUND'S TONGUE, (*officinalis -is -e* of or pertaining to the shops, sold in (apothecaries') shops, sold as an herb, sold in the marketplace, of practical use to man; used in medicine, medicinal, official, from *officina*, noun, Modern Latin, workshop, laboratory, or herb pharmacy, & *-alis*, of or pertaining to.)
Sow at max 5ºC (41ºF), germination irregular, often several months (thcn).
"Common around farms & in waste places" (ewf55).

ECHIUM Linnaeus **VIPER'S BUGLOSS, BLUEWEED** *Boraginaceae Echium* New Latin, from Greek *echion, echium*, from εχις, *ekhis,* viper, from a name εχιον, *ekhion,* used by Dioscorides for a plant to cure snake bite (vipers bugloss). The common name is pronounced bew-gloss, & is derived from *bous*, cow & *glossus*, tongue, or from *buglossus -a -um*, ox-tongued, from βουγλωσσος, *bouglossos,* the Greek name for

Anchusa, a reference to the rough-textured leaves, bugloss is *Lucopsis arvensis*; nothing to do with bugs. A genus of about 60 spp of herbs, of the Old World.

Echium vulgare Linnaeus VIPER'S BUGLOSS, aka BLUEWEED, (*vulgaris -is -e* (vul-GHA-ris) common, vulgar, from Latin *vulgāris*, from *vulgus*, the common people.)
" A common ill-smelling weed of pastures & waste places" (ewf55).

HACKELIA Opiz **Stickseed** *Boraginaceae Hackelia* possibly from Ernst H *Haeckel* died 1919, German biologist, & English *-ia*. A genus of about 45 spp of north temperate regions, Central America, & South America, with its greatest diversity in western North America.

Hackelia virginiana (Linnaeus) IM Johnston BEGGAR'S LICE, aka VIRGINIA STICKSEED, (*virginianus -a -um* of or from Virginia, USA, Virginian.)
"Common in woods & thickets" (ewf55).

LAPPULA Moench **SHEEPBUR, SHEEP'S BUR, BEGGAR'S LICE** *Boraginaceae Lappula* with small burrs, covered with minute tufts of prickles or burrs, New Latin, from Latin *lappa* burr, & *-ula,* the diminutive of *lappa.* A genus of about 40 spp of herbs of Eurasia & western North America.

Lappula echinata Gilbert BEGGAR'S LICE (*echinatus -a -um* prickly, spiny, set with prickles or spines, from *echinus*, a hedgehog, an edible sea-urchin or a prickle.)
"Common in woods, pastures, & waste places" (ewf55).

LITHOSPERMUM Linnaeus **PUCCOON, GROMWELL, STONESEED, HERB STONE CROP** *Boraginaceae Lithospermum* stone seed, New Latin from Linnaeus, from Greek λιθόσπερμον, *lithospermon,* gromwell, or stonecrop, from λίθος, *lithos,* stone, & σπέρμα, *sperma,* seed. The name *puccoon* is a Native American term for a source of pigment, as in Virginia Algonquian *poughkone,* the plant *Lithospermum vulgare*; compare Unami Delaware *pé·kɔ ·n* bloodroot. A genus of about 45 spp (*sensu lato* ca 60 spp) of herbs or subshrubs, mostly perennials, native to Europe, northern Asia, & North America, with terminal flowers white, yellow, or blue, having a regular tubular corolla, & polished, white, stony nutlets, some species with later cleistogamous axillary flowers. The fruit is a schizocarp consisting of 4 mericarps, the fruits commonly called nuts or nutlets. Can't tell your orange puccoons apart? Hairy, hoary, don't know, don't care? Your in good company, or at least join the crowd. A lot of old timers can't either. Native Americans & early settlers use the roots as a source of red dye. The root is still used in dying weavers' wool. Some spp are grown as ornamentals or medicinal plants.

Chasmogamous & cleistogamous seeds are expelled when ripe. In northern Illinois, collect axillary seeds in October. Plants must be carefully watched as seeds ripen. Plants may be enclosed in cheese cloth to collect the shattering seeds. Alternately the entire plant can be clipped before the seeds are completely ripe and placed loosely in a 5-gallon bucket. This method interferes with the plants carbohydrate reserves and will weaken or possibly kill the plant. Only a small portion of a population should be harvested his way, and only infrequently, ideally in your own restoration or remnant.

The spring seeds are reported to be of low viability, but they may require immediate planting, alternately warm moist then cold moist. There are some old references these seeds being double dormant, or needing multiple cold warm cycles. Species formerly reported as having double dormancy are actually recalcitrant or hydrophilic.

The closely related *Onosmodium* is known to germinate over 8 years in an unheated coldframe. *Onosmodium* is sometimes included in *Lithospermum* (Weakley 2015, BONAP 2016).

In common usage, the name is properly spelled *Lithospermum* or *Lithospermon*.

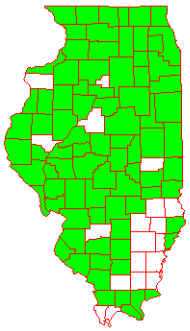
(*L ruderal*, AM Wicklow-Howard 1994)

G Ajilvsgi, 1984, Wildflowers of Texas, Shearer Publishing, Fredericksburg, TX.

D Govoni, 1973, The taxonomy of the genus *Lithospermum* L (*Boraginaceae*) in the western Great Plains. PhD dissertation, Univ of Nebraska, Lincoln.

IM Johnson, 1952, Studies in the *Boraginaceae*, XXIII. A survey of the genus *Lithospermum*. J Arnold Arbor. 33:299-366.

Lithospermum canescens (Michaux) Lehmann HOARY PUCCOON, aka GOLDEN GROMWELL, HOARY GROMWELL, INDIAN PAINT, (*canescens* becoming grayish white or whitish gray, gray (or white) & somewhat hairy, gray-pubescent, generally or rather hoary or whitish, from New Latin *canescens* gray, grayed, or hoary, from, *canescens, canescent*, from *canesco, canescere*, become covered in white; generally for the tiny whitish hairs.) Hoary refers to the whitish colored hairs on the leaf and stem. Native Americans are said to use the flowers as a source of yellow dye ("puccoon" is a word any number of plants yielding dye).



Habitat: Hill, dry, dry mesic, & mesic prairies, sand prairies, open woods.
distribution/range:
Culture: ①Establish from seeds soaked in hot water or scarified. Sow seeds immediately when ripe, or seeds germinate after about 60 days of cold moist stratification (he99). ②Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn). 400,000 (sh94) seeds per pound. ③#1-4; preferably plant seed when fresh; seedlings weak & often die; cutting of young shoots placed in sand in closed coldframes;; seeds need scarification only. (pph)

"*Lithospermum canescens* Mesic to dry prairie. Blooms mid May to mid June; ORANGE. Harvest July. 10"; SEEDLING TRANSPLANT, but seeds should be sown while fresh for emergence next spring; they are hard to get; seedlings grow weak, usually die. Plants grow poorly. Highly desirable ornamental." (rs ma)

asexual propagation: Difficult to transplant; division in summer.

cultivation: dry-moist prairies; neutral to slightly acid soil. Companion plants include: *Carex pensylvanica, Comandra umbellata, Dichanthelium oligosanthes scribnerianum, Heuchera richardsonii, Koeleria cristata, Sporobolus heterolepis, Sisyrinchium campestre.*

Description: Erect, herbaceous, hairy grayish, perennial, native forb; stems (4)8-12", stems & leaves covered with fine soft hairs; leaves 0.5-1.5" (1.3-3.8 cm) long, alternate , narrow, mostly stalkless; flowers terminal, 0.5" (1.3 cm) wide, corolla with 5 flaring lobes. gold, (orange to yellow, yellow-orange, golden-yellow), 5-merous; key features: Dense white pubescence.

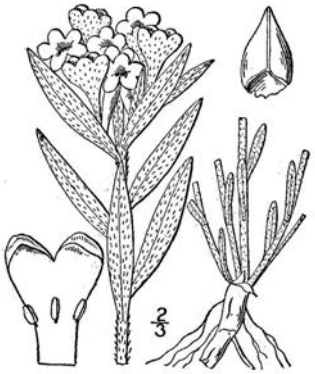
Comments: status: phenology: Blooms (3)4-6, mid-May-mid-June. C3. Collect seeds in se Wisconsin in July (he99). harvest July (seed easily lost) (pph). Highly ornamental. A great plant for borders and rock gardens. The flowers are showy for a small, early plant.

"Common in the sand north of Shirland & on sandy prairies about Camp Grant. It flowers early, the corolla being orange yellow." (ewf55)

Associates: Pollinated by long-tongued bees, *Diptera*, *Lepidoptera*, butterflies, and skippers primarily. Among the bees are Miner bees, Nomadine Cuckoo bees, & Mason bees.

ethnobotany Red dye obtained from roots.

VHFS: [*Batschia canescens* Michx.]



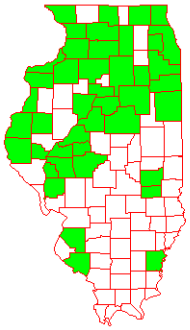
Lithospermum canescens

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Illinois map courtesy of ILPIN. Photo by Jock Ingels

Lithospermum croceum Fernald HAIRY PUCCOON, (*croceus -a -um* Latin adjective, yellow, golden; saffron-colored; of saffron or its oil, saffron-; scarlet in Ecclestical references.)
Habitat: Dry, dry mesic, & mesic prairies. distribution/range:
Culture: ①Sow seeds immediately when ripe, or seeds germinate after about 60 days of cold moist stratification (he99). ② Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn).

Treatment limited experience suggests soaking seed in 136ºF and planting immediately; propagation best propagated from 2" root cuttings; for transplants treat cuttings with Rootone and plant right side up, 2" deep, in fall; for permanent establishment use root cuttings. (tpg)
Description: Erect perennial, 1-2'; flowers gold; similar to *L canescens*.
Comments: status: phenology: Blooms 5-6. Collect seeds in se Wisconsin in July (he99, tpg). "About as common as the above & found in the same places. Its flowering time is later than *L canescens,* the corolla lobes are also entire, but the color is a much lighter yellow." (ewf55)
VHFS: This is a now considered a subsp of the following, *Lithospermum caroliniense* (Walter ex JF Gmel) MacMill subsp *croceum* (Fern) Cusick by most authors. Taxon is maintained as a species by Weakley (2015).

Lithospermum carolinense (Walter ex JF Gmelin) MacMillan PUCCOON, aka CAROLINA PUCCOON, COASTAL PLAIN PUCCOON, HAIRY PUCCOON, HISPID GROMWELL, PLAINS PUCCOON, YELLOW PUCCOON, *Odji'biknamun'* (Ojibwa) (*carolinensis -is -e* of Carolina, Carolinian, of North or South Carolina, USA)


Lithospermum caroliniense

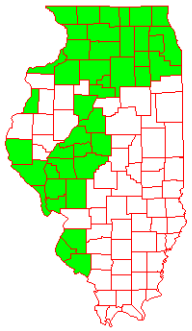
Habitat: Dry sand prairies. Sandy open ground, sandy banks along roadsides and railroads (Ilpin) distribution/range: Occasional to common in northern half of Illinois, less common in south.
Culture: ①Sow seeds just below moist soil surface at 70ºF for 1 month. Move to 30ºF for 1 month, then bring back to 50ºF. (ew11) ② Sow at 18-22ºC (64-71ºF) for 2-4 wks, move to +2 to +4ºC (34-39ºF) for 4-6 wks, move to 5-12ºC (41-53ºF) for germination (tchn). 32,000 (ew11) seeds per pound.

cultivation: Space plants 1.0-1.25'. Full sun to partial shade, dry soils.
Description: Erect, herbaceous, perennial, native forb; 0.5-2.0'; flowers orange to yellow; fruit ivory white nutlet; key features: ①As many as 12 or more stems; flower 0.50-1" wide, throat of tube hairy, petal lips smooth; fruit white; leaves roughly hairy, appearing whorled (fh). "Species has shiny, ivory-white nutlets" (Ilpin)
Comments: status: phenology: Blooms 5-7. Fertile cleistogamous flowers later. Nursery remnants.
Associates: ethnobotany: Purple staining root. Used as dye by Ojibwa (den28).
VHFS: This is considered synonymous with the above in Mohlenbrock (2014).




Lithospermum caroliniense
Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Illinois map courtesy of ILPIN.

Lithospermum incisum Lehmann *IN, MI FRINGED PUCCOON, aka FRINGED GROMWELL, NARROWLEAF GROMWELL, NARROW-LEAVED GROMWELL, NARROW-LEAVED PUCCOON, NARROWLEAF STONESEED, PUCCOON, TRUMPET STONESEED, YELLOW GROMWELL, YELLOW PUCCOON,
(*incisus -a -um* cut, incised, cut deeply into irregular lobes, from Latin verb *incido, incidere, incidi, incisum*, cut into, cut open.)


Lithospermum incisum

Habitat: Dry prairies, sandy soils with minimal competition. distribution/range: Culture:. ①Sow seeds immediately when ripe, or seeds germinate after about 60 days of cold moist stratification (he99). ② Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn). FRINGED PUCCOON also produces axial cleistogamous flowers late in late spring & summer. The spring flowers are more or less infertile (http://www.santafebotanicalgarden.org/HERB%20PAGES/H%20Puccoon.html) , while the cleistogamous flowers are said to be very fertile (GN Diggs Jnr, BL Lipscomb, & RJ O'Kennon, Illustrated Flora of North Central Texas Botanical Research Institute, Texas. 1999 ISBN 1-889878-01-4; Johnson 1952).

"Propagation Material: Seeds Description: Soak seeds in hot (135 degrees) water overnight, & plant immediately. Germination is unreliable. Propagation may be accomplished from 2-inch root cuttings. Treat cuttings with hormones & plant in fall. Mature plants may be divided. Seed Collection: Late in summer, the plant produces smaller, almost invisible flowers which fertilize themselves without opening. It is from these late, hard-to-see flowers – not the showy yellow ones – that produce fertile seed. Inside each of four oblong nutlets is a bony, white seed. Seed Treatment: Some references suggest stratification." From http://www.wildflower.org/plants/result.php?id_plant=LIIN2

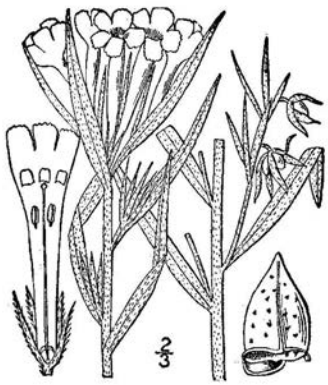
"*Lithospermum incisum* Dry hill or sand prairie. Blooms mid May to early June; YELLOW. Harvest July. 10"; seeds should be planted fresh; seedlings emerge next spring & bloom the following, but plants seem short-lived in cultivation." (rs ma)

greenhouse & garden: Self sows in fire managed remnants & old fields, often into disturbed soils & at some distance from the mother plant

Description: Erect perennial native forb; 8-12"; very narrow leaves; flowers yellow, petal lips fringed; key features: "Showy flowers crowded in the upper axils; nuts lustrous white to buff" (Ilpin)

Comments: status: Endangered in Indiana. Probably Extirpated in Michigan. phenology: Blooms 6-7 (4-6). Collect seeds in se Wisconsin in July (he99), but *vide supra*. Sp produces cleistogamous flowers on lower part of plant (Ilpin). "Our common high prairie yellow puccoon & a good indicator of prairie soil. It grows with *Stipa, Silphium, Liatris cylindracea,* & *Brauneria pallida*." (ewf55 as *L angustifolium* Michx)

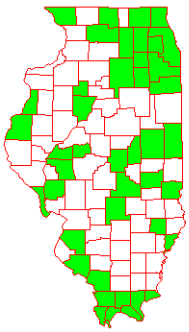
VHFS: [*Batschia linearifolia* (Goldie) Small, *Lithospermum angustifolium* Michx, *L linearifolium* Goldie, *L mandanense* Spreng.]



Lithospermum incisum

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Illinois map courtesy of ILPIN.

Lithospermum latifolium Michaux *MD, PA AMERICAN GROMWELL, aka AMERICAN STONESEED, BROAD-LEAVED GROMWELL, BROAD-LEAVED PUCCOON, (*latifolius -a -um* (la-tee-FO-lee-us) flat-leaved, wide-leaved, broad-leaved, from Latin *latus*, adjective, broad, wide, *-i-*, connective vowel used by botanical Latin, & *folium*, leaf.)


Lithospermum latifolium

Habitat: Mesic to dry mesic savanna, wooded slopes, & narrow, woodland roadsides. distribution/range: Known but not mapped from Bureau County, Wacktown Timber, Greenville Twp.

Culture: ①Code BC: Hot water treatment. Seeds germinate after a period of cold, moist stratification, 90 days, or dormant seeding in an outdoor location. (Wade various years, pm16) ②Species has 'double dormant' seeds requiring alternating moist cold & warm periods, sow outside & allow 2 years for germination, or sow seeds immediately when ripe (he99).

20,800 (pm02) seeds per pound.

Seed was available 10-15 years ago, and recently became available at Prairie Moon online (winter 2015-16).

Description: Erect, herbaceous, perennial; 1-3', white flowers. "Species has shiny, white fruits; leaves are scattered" (Ilpin)

Comments: status: Endangered in Maryland & Pennsylvania. phenology: Blooms May-June (4-6). C3. VHFS:

Lithospermum latifolium

Line drawing Britton & Brown (1913) courtesy of Kentucky Native Plant Society. Illinois map courtesy of ILPIN.

MERTENSIA Roth **BLUEBELL, COWSLIP** *Boraginaceae Mertensia* after Franz Karl Mertens 1764-1831, German botanist. A genus of about 45 spp of perennial herbs of north temperate regions.

Seeds ripen late spring to summer & are moderately hydrophilic. Ripe seeds are quickly shed. Seeds should immediately be planted or stored in moist vermiculite @ 40ºF. Seedlings should be transplanted at the cotyledon stage. Transplanting later during warm weather may trigger early dormancy. Code D seed needs a period of warm moist stratification followed by cold stratification and will germinate after shifting back to warm (70º-40º-70º), & * seed is hydrophilic, intolerant of dry storage. Roots can be broken apart during summer dormancy & replanted. (cu00)

Mertensia is a great plant to have in a shaded area you see every day. The blue flowers become visible soon after the plants emerge from the ground, becoming larger each day as they come into full bloom, helping shake off the last doldrums of winter.

Mertensia virginica (Linnaeus) Persoon ex Link VIRGINIA BLUEBELLS, aka EASTERN BLUEBELLS, LUNGWORT, OYSTERLEAF, ROANOKE BELLS, VIRGINIA COWSLIP, (*virginicus -a -um* (vir-JIN-i-kus) of Virginia.) COWSLIP is from Old English *cú-slyppe*, apparently from *cú* cow, & *slyppe* viscous or slimy substance, ie 'cow-slobber' or 'cow-dung' (compare German *kuh-scheisse* as a plant-name in Grimm) (oed). The relevance is uncertain.

Habitat: Wooded floodplains, mesic woods, & Sugar Maple woods. Often in woodlands that are a little wetter than mesic. Rich woods on old, stable, Pleistocene sand dunes. distribution/range:
Culture: ①60 days cold moist stratification. Best planted outdoors in fall. (pm09). ②No pretreatment needed. Sow seeds on the soil surface at 70ºF & water. (ew11) 155,200 (pm02, aes10), 156,450 (gniav02), 156,800 (ew11), 351,938 (gnh13) seeds per pound.

cultivation: Space plants 1.25-1.5'.

bottom line: Plant fresh-picked seed, or dormant seed with seed cool moist stored. Germ 5.0%. Dorm 80%. Test 42 days.**

Description: Erect perennial; 1.0-2.0'; flowers pink buds turning to blue flowers, rarely white, trumpet shaped. key features: ①Flowers trumpet shaped, on a hairless stalk; nutlet often wrinkled; leaves hairless, with rounded tips, stalkless (fh).

Comments: status: phenology: Blooms late March to late May. Spring ephemeral, with the plants go dormant by mid-summer. Will self-sow in fire-managed naturalized wildflower plantings. Best in blue-haze mass plantings. The pink buds are slightly acidic & the blue blossoms slightly basic. Who needs PG hydrangeas????

"Much less common here than it is 100 miles south. Mulford woods near the Forest Preserve, Page Forest on Kent Creek, the "dells" of Hall Creek, &c. Found in only one place in Sugar River sand area, north of Shirland, & there apparently planted." (ewf55)

Associates: Attracts female bumblebees & butterflies. Attracts hummingbirds. Reported to be deer resistant.

MYOSOTIS Linnaeus **FORGET-ME-NOT, SCORPION-GRASS, MOUSE-EAR** *Boraginaceae Myosotis* (mee-os-O-tis) from the Greek name for another plant, from *mus*, a mouse, & *otos,* an ear, referring to the leaves. A genus of about 100 spp of annual, biennial, & perennial herbs of temperate & montane tropical regions.

***Myosotis scorpioides* Linnaeus** WATER SCORPION GRASS,
"Abundant in Hall Creek at the "dells" but not seen elsewhere except sparingly in Kent Creek at Springfield avenue road" (ewf55).

Myosotis verna Nuttall EARLY FORGET-ME-NOT,
"Only in the sand west of Shirland where it grows over a small area" (ewf55).

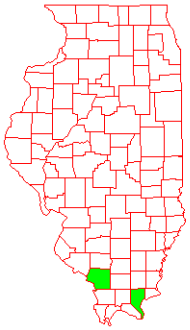
ONOSMODIUM Linnaeus **MARBLESEED, FALSE GROMWELL** *Boraginaceae Onosmodium* having the smell of an ass, or a smell donkeys find appealing, New Latin, irregular from Greek *onosma*, a boraginaceous plant, from ονος, *onos,* ass, & *-osma*, from *osmē* odor, & -ωδης, *-odes*, a reference to the root(?); from a resemblance to *Onosma*. Cf *Lycoperdon*. A genus of 7 spp or 4 spp & 7 total taxa of perennial herbs native to most of the United States & Canada east of the Rockies.

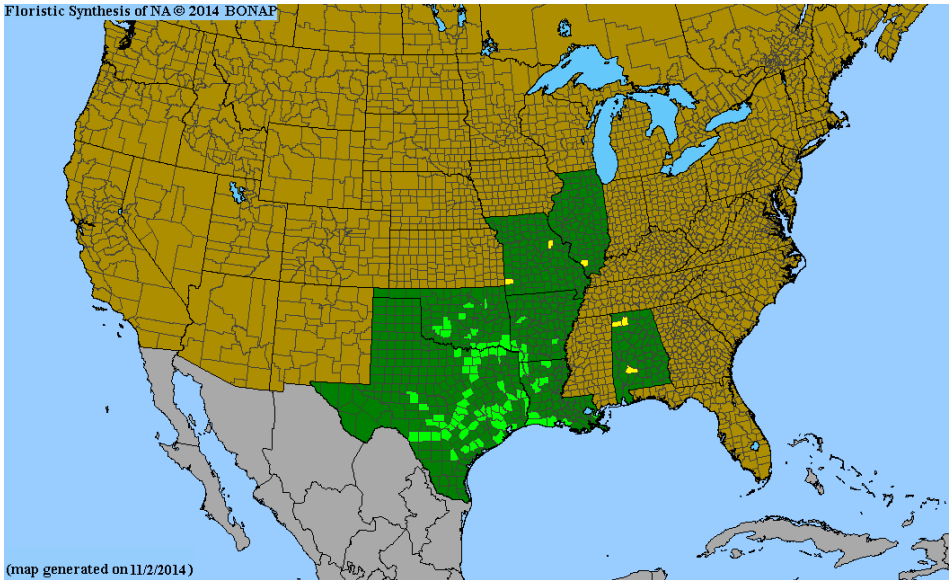
Onosmodium virginianum seed is sown in the fall for germination the following spring.
http://www.horizonherbs.com/group.asp?grp=46

Weakley (2010-15) notes *Onosmodium* may more properly belong in a broader defined *Lithospermum*. The fololowing 3 are in Illinois.

Lithospermum molle (Michaux) Muhlenberg. A southern species in one county.
[= Onosmodium molle Michaux – F, G, Y; = O. molle var. molle – C; = O. molle ssp. molle – K1, X, Z; < O. molle – S; < O. bejariense A.L.P.P. de Candolle ssp. bejariense – K2]

Onosmodium molle Michaux Marbleseed.
Limestone hills, barrens, open areas.
key features: Nutlets dull and pitted without a collar.
blooms 5-9. C3.

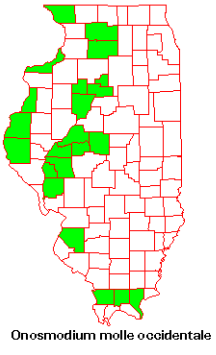


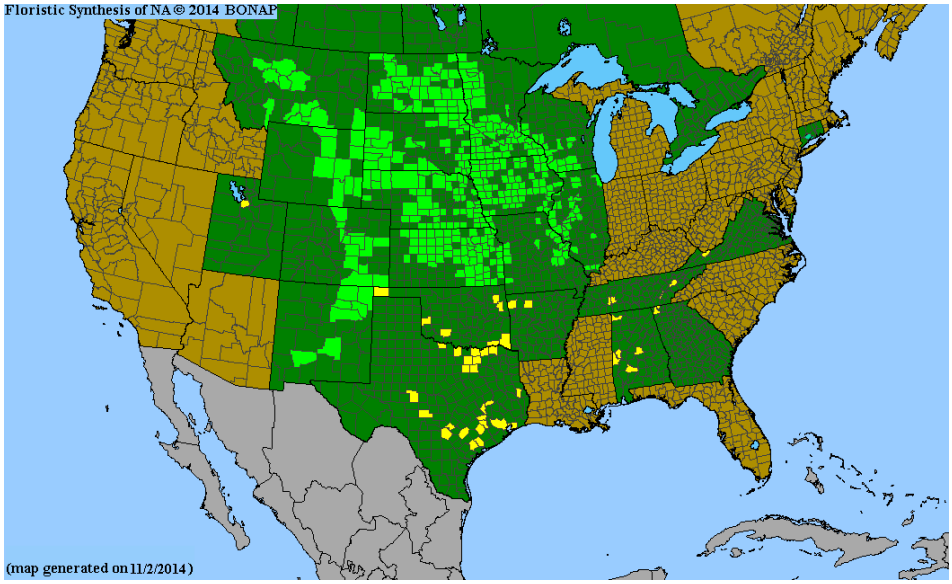


Onosmodium molle

Lithospermum occidentale (Mackenzie) Weakley, Witsell, & D. Estes. A prairie plains species, Illinois at eastern limit, disjuncts into TN &VA.
[= U; = Onosmodium occidentale Mackenzie – F, G, Il; = O. molle Michaux var. occidentale (Mackenzie) I.M. Johnston – C; = O. molle Michaux ssp. occidentale (Mackenzie) T.S. Cochrane – K1, X, Z; < O. molle – S; = O. bejariense A.L.P.P. de Candolle var. occidentale (Mackenzie) B.L. Turner – K2, Y

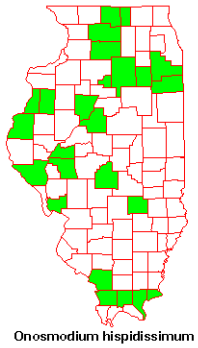
O. molle Michaux var. *occidentale* (Mackenzie)
Sandy, rocky, or gravelly open areas.
key feature: Nutlet is without a collar, smooth and shining.
Blooms 5-7. C3.

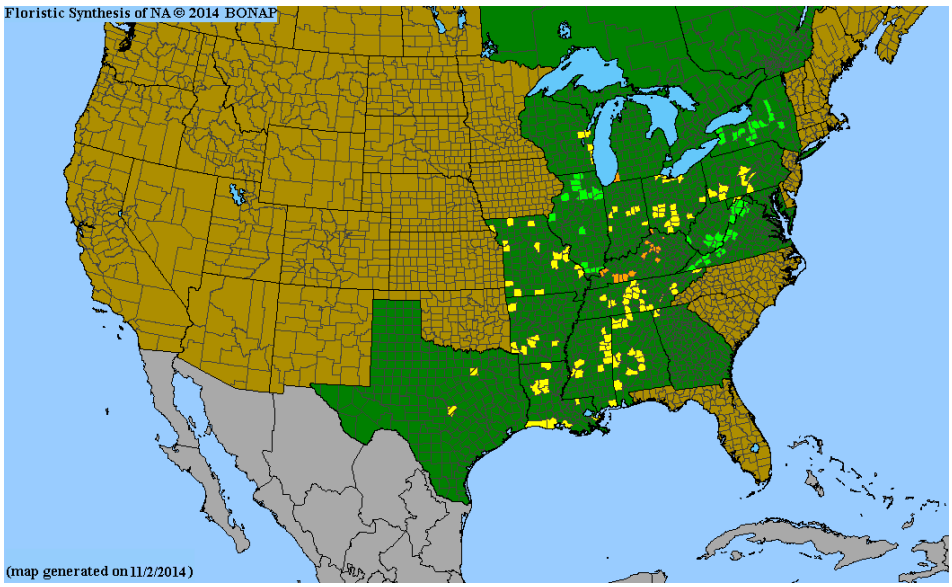




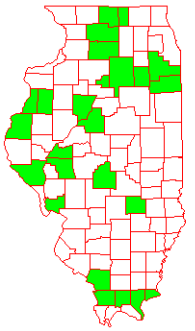
Onosmodium molle occidentale

Lithospermum parviflorum Weakley, Witsell, & D. Estes,
[= U, Va; = Onosmodium hispidissimum Mackenzie – G, S, W, WV; = O. molle Michaux var. hispidissimum (Mackenzie) Cronquist – C, Pa; > O. hispidissimum var. hispidissimum – F; > O. hispidissimum var. macrospermum Mackenzie & Bush – F; < O. molle – Il; = O. molle Michaux ssp. hispidissimum (Mackenzie) Boivin –K1, X, Z; = O. bejariense A.L.P.P. de Candolle ssp. hispidissimum (Mackenzie) B.L. Turner – K2, Y]
Onosmodium hispidissimum Mackenzie
calcareous areas, open areas.
key feature: Nutlets are constricted just above base to form a collar; species is coarsely and conspicuously hairy.
blooms 5-7. C3.





Onosmodium hispidissimum Mackenzie *IN, KY [in new nomenclature this is *Onosmodium bejariense* A DC var *hispidissimum* (Mack) BL Turner or *O. molle* Michaux] MARBLE SEED, aka EASTERN PRAIRIE MARBLESEED, FALSE GROMWELL, HAIRY FALSE-GROMWELL, MARBLEWEED, SHAGGY FALSE-GROMWELL, SHAGGY MARBLESEED, SMOOTH ONOSMODIUM, SOFT FALSE GROMWELL, SOFT-HAIRY FALSE GROMWELL, SOFTHAIR MARBLESEED, WESTERN FALSE GROMWELL, *Mi'gisens'ibug,* little-shell leaf (Ojibwa) (*hispidissimus -a -um* most bristly, very bristly, extra rough or bristly from the Latin superlative of the adjective *hispidus -a -um*, bristly, rough hairy.) (*bejariensis -is -e* of, from or pertaining to Béjar, Spain, or Bejar, Texas, a former name for San Antonio.)


Onosmodium hispidissimum

Habitat: Sand prairies, limestone or gravel prairies, dry savannas, dry to dry mesic prairies, & rarely roadsides with non-native associates. Prairies & savannas, mesic, dry mesic to dry soils. Calcareous soils. In the southeast USA, sp grows calcareous woodlands, barrens, & glades, & nearby in disturbed areas, such as older pasture edges; rare (w10). distribution/range:

Culture: ①Hot water treatment (pm09, 11). ②Pour 180ºF water over seeds, let soak overnight. Sow seeds just below soil surface at 70ºF & water. (ew11) ③Species has 'double dormant' seeds requiring alternating moist cold & warm periods, sow outside & allow 2 years for germination (he99). ④Germination has been known to extend over 8 years on unheated coldframes (bb91).

From Sean Watson, the nursery manager of the Lady Bird Johnson Wildflower Center: "We sow seeds in spring in our greenhouse, using sterile seed germinating mix & intermittent misting (about every hour for 6 seconds). Just cover the seed with media, about 1/8" deep. They do benefit from some shade when trying to germinate them. I have also sown them as late as July with success (again I gave them more shade)." (lbj)

24,000 (pm11, ew11), 27,200 (pm02) (as *O molle*) seeds per pound.

asexual propagation: Divide mature plants in early spring. Cuttings in late summer.

cultivation: Space plants 1.5-3.0'. Full sun to partial shade, mesic to dry soils.

bottom line: Sp is best sown outside and allowed to germinate over a period of years. *vide infra*.

greenhouse & garden: Dormant seed, (double dormant?), germination may extend over many years. Successional restoration works also. Sow in a galvanized metal tray & keep in an unheated cold frame or lathe house, removing seedlings as they appear. Plant out late summer/early fall as plugs do not overwinter well.

Description: Erect perennial, 3.0-4.0'; leaves sessile, grey-green hairy; flowers creamy white (greenish-white) in a leafy cluster, inflorescence a helix-shaped cyme; seeds ivory-colored, hard nutlet; key features: ①"Flowers hairy outside, lobes with pointed tips, style protruding; inflorescence a helix-shaped, branched cluster (cyme); blooms June-July" (fh). ②"Nutlets are constricted just above base to form a collar; sp is coarsely & conspicuously hairy." (Ilpin)

Comments: status: Endangered in Indiana, Kentucky, Maryland, & Pennsylvania. Probably Extirpated in Michigan. Special Concern, Threatened, & Endangered in Tennessee. phenology: Blooms 5,6,7. C3. In northern Illinois, collect seeds in late August through October until spring. Some seeds are retained on the plant into winter, & with patience, many seeds can be picked up off the ground under the mother plant. Collect seeds in se Wisconsin in August-September (he99). The flowers aint nothing to write home about, but its structure & texture are attractive in the landscape. Provides some winter interest.

Species will self-sow, in a fire-maintained landscape, typically at some distance from the mother plant, but MARBLESEED may be somewhat self-allelopathic, with growth inhibitors around the mother plant. I accidentally touched an old large plant in sandy soil in an old bed with Roundup & killed it before it flowered that particular year. The next year, there were about a dozen little plants under the dead mother that were not there the year before. In seed, the plant looks like a giant, steroidal puccoon. The ivory nutlets on the stem are all from chasmogamous flowers and some are retained into the following spring, ≈ March. (Some *Lithospermum* have chasmogamous & cleistogamous flowers in comparison.) A formal grouping (planted 2009) in a bark-mulched bed is impressive in our current home landscape, & seeds pepper the ground each fall, but again, we had no germination near the mother plant until April 2011. These plants are offspring of the first cohort. These seedlings can be potted up as true leaves appear, plants should

be lined out early fall. It seems the seeds are germinating in their second or third spring. The seed forms, in the very least, a mid-term soil seedbank. Ah, but only if it were available as a plug. Plugs should be planted out late summer as they do not overwinter well in coldframes.

Volunteer *Onosmodium* seedlings in formal bed.

"Occasional over the county usually in old pastures or on roads. Infrequently, as in Kishwaukee River Bottom at Perryville road, it is an abundant weed." (ewf55)

Associates: Flowers are a nectar source.

VHFS: Illinois has var *bejariense,* var *hispidissimum* (Mack) BL Turner, & var *occidentale* (Mack) BL Turner. Weakley (2012b) *Lithospermum molle* (Michaux) Muhlenberg.

[*Lithospermum carolinianum* auct non Lam, *Onosmodium hispidissimum* Mack, *O h* Mack var *macrospermum* Mack & Bush, *O h molle, O molle* Michx subsp *hispidissimum* (Mack) Cochrane, *O m* Michx var *hispidissimum* (Mack) Cronquist]

Associates: ethnobotany: Used as an Ojibwa charm (den28).

JM Baskin & CC Baskin. 1983. The historical geographical distribution of *Onosmodium molle* Michx. subsp. *molle* (*Boraginaceae)*. Bulletin of the Torrey Botanical Club 110: 73-76.

JM Baskin & CC Baskin. 1991. An eight-year greenhouse germination study of the cedar glade endemic *Onosmodium molle* subsp. *molle*. Natural Areas Journal 11: 190-192.

http://www.wildflower.org/expert/show.php?id=1769

Onosmodium hispidissimum, with gall

Add O. occidentalis. (m14)

[*Lithospermum occidentale* (Mackenzie) Weakley, Witsell, & D Estes]

BRASSICACEAE Burnett 1835 or *Cruciferae* AL de Jussieu 1789. **CRUCIFERS, MUSTARDS** A family of about 340 genera & 3400 spp, annuals, perennials, shrubs, rarely trees & vines, with the greatest diversity in the temperate Northern Hemisphere; cosmopolitan. Fruits are siliques or silicles, usually 2-celled. The mustard family has several vegetables & condiments, kale, turnip, cabbage, cauliflower, Brussels' sprouts, mustard, radish, & cochlearia, all with an acrid, volatile principle & an essential oil high in sulfur.

ALLIARIA Heister ex Fabricius 1759 GARLIC MUSTARD
Add *Alliaria petiolata* (Bieberstein) Cavara & Grande GARLIC MUSTARD, aka HEDGE GARLIC.

ALYSSUM Linnaeus 1753 **ALYSSUM, MADWORT** *Brassicaceae* or *Cruciferae Alyssum* New Latin, from Latin *alysson*, Pliny, from? Dioscorides, Greek ἄλυσσον, *alysson*, a plant believed to cure rabies, from neuter of ἄλυσσος, *alyssos* curing rabies, curing (canine) madness, from α- *a-* privation, & -λυσσος, *-lyssos*, from λνσσα, *lyssa,* rage, rabies, canine madness; or pacifier, from Greek α-λυσσα, *a-lyssa,* from an ancient Greek name αλυσσα, *alyssa,* without-fury; akin to Greek *leukos*. A genus of 170-190 spp of herbs of Eurasia. Fruits are silicles.

Alyssum alyssoides Linnaeus YELLOW ALYSSUM, "Common on the C & NW Railway row west of Rockford" (ewf55).

ARABIDOPSIS Heynhold **MOUSE-EAR CRESS** *Brassicaceae* or *Cruciferae Arabidopsis* New Latin, from *Arabid-, Arabis* & *-opsis*. A genus about 9 spp of annual/biennial or perennial herbs of north temperate regions, circumboreal, with the greatest diversity in Eurasia, with basal rosettes of petioled leaves, cauline leaves short-petioled or clasping, & flowers having white, purplish, or sometimes yellow petals

Arabidopsis thaliana (Linnaeus) Heynhold. MOUSE-EAR CRESS,
Introduced from Eurasia. "Common along railroads" (ewf55).

ARABIS Linnaeus 1753 **ROCKCRESS** *Brassicaceae* or *Cruciferae Arabis* (AR-a-bis) derivation obscure, possibly from Greek name for *arabid-, arabis*, a brassicaceous plant, probably from *Arab-, Araps* Arab; or from Latin *arabia, arabiae*, in reference to its ability to grow in rocky or sandy soil, or in reference to the native country of some spp. Large genus of herbs with white or purple flowers & flat siliques with nerved valves. Annuals, biennials, perennials. Fruits are siliques.

Arabis has been divided into 4 genera, *Arabidopsis*, *Arabis sensu strictu* (n=8), *Boechera* Löve & Löve, & *Turritis*. Most northeastern North American native *Arabis* are now *Boechera.*

Arabis alpina seeds need no pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11)

Check all the following against Boechera Love & Love
Arabis canadensis Linnaeus SICKLEPOD, aka CANADA ROCKCRESS, "Not uncommon in ravines & on river banks. Kishwaukee River at Camp Hillcrest, south ledges of Kinnikinnick Creek, & Rock river west of Rockton." (ewf55)

Arabis dentata T & G "Grows commonly in low places along streams as Rock River bank in Blackhawk park & in Sugar River bottom north of Yale bridge. Definitely perennial with us having strong basal offshoots." (ewf55)

rewrite as *Turritis glabra* Linnaeus
Arabis glabra (Linnaeus) Bernh. TOWER MUSTARD, upl
Habitat: Moist prairies, mesic prairies, limestone woods, ledges & cliffs. "Common in waste places. (*Turritis glabra* Linnaeus)" (ewf55)

Culture: ①Seeds germinate after a period of cold, moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. Other germination pretreatments not sure? (pm) ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method, or seeds germinate after about 60 days of cold, moist stratification (he99). ③Ken Schaal recommends dormant seeding, Code J. 5,520,000 (pm02), 8,000,000 (gn) seeds per pound.
Description: Biennial (or winter biennial); fruits are slender siliques,
Comments: status: phenology: Blooms 5,6. Collect seeds September. Can be weedy. We have had two populations on our farm, one in a north-facing, recovering, dry-mesic sand prairie, & one in wet to mesic black soil row plantings in old corn field.
Associates: Pollinated by long-tongued bees, short tongued bees, other *Hymenoptera,* & *Diptera*.

Arabis glabra

Arabis hirsuta HAIRY ROCK CRESS,
Habitat: Dry to dry-mesic, rocky, limestone sites. distribution/range:
Culture: ①Cold moist stratify 60 days. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. (pm09) ②Seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99) 4,160,000 (pm02), 5,568,000 (pm) seeds per pound.
Description: white flowers, 1-2',
Comments: status: phenology: Blooms May-June. Collect seed July.

Arabis laevigata (Muhlenberg) Poiret SMOOTH ROCKCRESS, "Rather common in shaded places as woods & ravines." (ewf55)

Arabis lyrata Linnaeus ROCK CRESS, aka LYRATE ROCK-CRESS, SAND CRESS,
Habitat: Dry to dry-mesic sites, dry woods & fields, sandy or rocky soil. distribution/range:
Culture: propagation: ①No pre-treatment needed. Sowing outdoors in the spring is the easiest method (he99). ②Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn).
Description: Perennial or biennial; 4" to 16"; flowers white; key features:
Comments: status: phenology: Blooms April-May. Collect seed June. "Common in sandy, gravelly & rocky places at times densely covering limestone outcrops" (ewf55).
Associates: ethnobotany:
VHFS: Mohlenbrock (2014) *Arabidopsis lyrata* (L) O'Kane & Al-Shebaz.

Arabis pycnocarpa M Hopkins SLENDER ROCKCRESS, aka HAIRY ROCKCRESS, "Not common. Gravel hillsides & on cliffs. Varies much as to size of plants, pubescence, &c (*A hirsuta* (L) Scop)" (ewf55)

ARMORACIA Gaertner, Meyer & Scherbius 1810 **HORSERADISH, LAKE CRESS** *Brassicaceae* or *Cruciferae Armoracia* of uncertain meaning, αρμορακια, *armorakia,* a name used by Columella & Pliny, formerly for a cruciferous plant, possibly the widespread *Raphanus raphanustrum*, rather than *Armoracia rustica* (horse radish), Pliny said that the name in the Pontic language was *armon,* Pliny also used *Aremorica* as a name for the region of Aquitania; alternately from a Celtic name referring to saline, a favorite habitat of a plant of this genus. Possibly related to Gaulish **are-mor-ika*, place by the sea, a name for part of nw France, including Brittany, also Breton *war vor*, on the sea. *Armorica*, now Brittany, France is said to be its native country. Fruits are silicles.

Armoracia rusticana Gaertner HORSERADISH,
Native of Europe, escaping or persisting around old home sites. The smallest piece of root left in the soil will quickly produce a new plant. "A common garden escape" (ewf55).

BARBAREA R Brown 1812 **WINTER-CRESS, CREASY GREENS** *Brassicaceae* or *Cruciferae* *Barbarea Herba Sanctae Barbarae* New Latin, from St. Barbara, who discovered the now unknown medicinal properties of the plants, & New Latin *-ea,* from Lyte's translation of Dodoens' *Herba Sanctae Barbarae*. A 3rd century martyr, she professed a belief in Christ, St Barbara was beheaded by her wealthy heathen father Dioscorus.

Barbarea vulgaris R Brown WINTER CRESS, aka COMMON WINTER-CRESS, YELLOW ROCKET,
Introduced from Eurasia. "Common in damp places. One of the first mustards to bloom." (ewf55)

BERTEROA Augustin de Candolle 1821 **HOARY ALYSSUM** *Brassicaceae* or *Cruciferae*

Berteroa incana (Linnaeus) Augustin de Candolle HOARY ALYSSUM,
Introduced from Europe. "A common roadside weed most frequent in the east & north parts of the county" (ewf55).

BRASSICA Linnaeus 1753 **BOK-CHOY, BROCCOLI, BRUSSELS SPROUTS, CABBAGE, CHINESE CABBAGE, COLLARD GREENS, CAULIFLOWER, KALE, KOHLRABI, MUSTARD, TURNIP, RAPE, RUTABAGA** *Brassicaceae* or *Cruciferae* *Brassica* New Latin, from Latin, cabbage, alternately Celtic *bresic*, cabbage. A genus of about 40 spp of herbs native to the Old World. Fruits are siliques.

Brassica alba (Linnaeus) Rabenhorst WHITE MUSTARD, "Common in fields & gardens. (*B hirta* Moench.) (ewf55)

Brassica arvensis (Linnaeus) Rabenhorst "Common in fields & waste places. (*B kaber* (DC) LC Wheeler) " (ewf55)

Brassica nigra (Linnaeus) WDJ Koch BLACK MUSTARD,
Introduced from Eurasia. "Common in fields, gardens & waste places" (ewf55).

CAKILE Tournefort **SEA ROCKET** *Brassicaceae* or *Cruciferae* *Cakile* New Latin, from Arabic *qāqulla.*
Fruits are silicles.

CAMELINA Crantz 1762 **GOLD-OF-PLEASURE, FALSE-FLAX** *Brassicaceae* or *Cruciferae*

Camelina microcarpa Andrzejowski SMALL-FRUITED FALSE FLAX,
Introduced from Europe. "A very uncommon roadside weed" (ewf55).

CAPSELLA Medikus 1792 **SHEPHERD'S PURSE** *Brassicaceae* or *Cruciferae* *Capsella* New Latin, from Latin *capsa* box, case, chest & New Latin *–ella*, a diminutive suffix meaning small; from *capere* to take, to hold, both in reference to the fruit. A monotypic genus, an annual or biennial herb native to Europe. [*Capsella* Medic] The fruit is a silicle.

Capsella bursa-pastoris (Linnaeus) Medikus COMMON SHEPHERD'S PURSE,
Introduced from Europe.

CARDAMINE Linnaeus 1753 **BITTERCRESS, TOOTHWORT** *Brassicaceae* or *Cruciferae* *Cheiranthus* (kay-RANTH-us) New Latin from Arabic *khiri*, *kheyry,* wallflower, a plant with red, very sweet-scented flowers. Modified from Arabic into the Greek *khier*, hand, & ἄνθος, *anthos,* flower, hand flower for their use in fragrant hand-held bouquets. A genus of about 200 spp of herbs, cosmopolitan. Fruits are siliques.

Cardamine bulbosa (Schreber ex Muhlenberg) Britton, Sterns, & Poggenburg BULBOUS BITTERCRESS, ①Sow at 20ºC (68ºF), if no germination in 3-4 wks, move to +2 to +4ºC (34-39ºF) for 2-4 wks (tchn). "Common in wet places in the open & in woods," (ewf55)

Cardamine douglassii (Torrey) Britton "We have found this only in the maple woods on Newburg road. It is earlier than *C bulbosa*, is a smaller plant & the flowers are purplish." (ewf55)

Cardamine pensylvanica Muhlenberg ex Willdenow QUAKER BITTERCRESS, "Common in marshes & other wet places." (ewf55)

CARDARIA Desvaux **HOARY CRESS** *Brassicaceae* or *Cruciferae* See *Lepidium*.

CHEIRANTHUS (author) **WALL FLOWER** *Brassicaceae* or *Cruciferae* *Chieranthus* (kay-RANTH-us) New Latin from the Greek *chier*, hand, & *anthos,* flower, for their use in bouquets; alternately from Arabic *khiri*, wallflower. Biennial & perennial herbs. This is sometimes placed in *Erysimum.*

Cheiranthus allionii WALL FLOWER, aka SIBERIAN WALLFLOWER (*allionii* (ah-lee-ON-ee-ee) after Carlos *Allioni* (1705-1804), Italian botanist, the origin & identity of plants grown under this name is uncertain.)
cultivation: Low to moderate water requirements, full sun. 350,000 (ecs) seeds per pound.
Description: To 3' tall. Yellow, orange, red to purple flowers spring to summer in well drained or rocky soils. Used for quick color in wildflower mixes.
VHFS: USDA calls this plant *Erysimum* × *marshallii* (Henfr) Bois. [*Cheiranthus allionii* hort ex Bois; *Erysimum* × *allionii* hort, nom illeg [anomalous]]

CONRINGIA Adanson 1763 **HARE'S-EAR MUSTARD** *Brassicaceae* or *Cruciferae* *Conringia* New Latin, from Herman *Conring* died 1681, German scholar, & New Latin *-ia.* A genus of 6 spp of European & Middle Eastern herbs with entire clasping leaves, small yellow flowers in racemes, & long slender pods

Conringia orientalis (Linnaeus) Andrzejowski HARE'S-EAR MUSTARD, aka TREACLE MUSTARD, Introduced from Eurasia. "Common in waste places & along railroads" (ewf55).

DENTARIA *Brassicaceae* or *Cruciferae* **PEPPER-ROOT** *Dentaria* feminine singular of Latin *dentarius*, pertaining to the teeth, from *dens*, a tooth, referring to the tooth-like scales or projections on the roots of the plant. *Cardamine* is sometimes lumped into this genus, as this is sometimes lumped into *Cardamine*. Fruits are siliques.

Seeds are hydrophilic & mature early summer. It is the opinion of Cullina (2000), that many colonies are reproductively isolated, self-sterile clones that set little seed. Best divided in late summer-early fall.

Dentaria diphylla Michaux CRINKLEROOT, aka PEPPERROOT, TOOTHROOT, TOOTHWORT, TRICKLE, (*diphyllus -a -um* Greek for two-leaved, from δὶς, *dis*, twice, & φύλλον, *phyllon*, leaf.) The common name TOOTHWORT may refer to the gash-toothed leaves or the toothed leaves.
Habitat: Damp, rich woods, moist & sandy soil, & low alluvial flats, frequently occurring in large colonies.
Associates: ethnobotany: Tubers available in April to May. Tubers used as food by Iroquois (Waugh 1916).

Dentaria laciniata Muhlenberg TOOTHWORT, aka CROWFOOT, PEPPERROOT, TOOTHPLANT, (including *D. maxima* Nutt.) (*laciniatus -a -um* lacinate, torn, deeply cut, fringed, slashed or lacerated, cut into narrow divisions or lobes, jagged, from Latin *lacinia*, *lacinae,* (1st f), edge, fringe, or hem of garment; strip or rag of cloth; fringe, protuberance, border, flap, & *-atus*, adj suffix for nouns, possessive of or likeness of something, with, -shaped, -made, generally referring to the deeply cut leaves.) The common name element tooth refers to the tooth-like projections on the tubers, & the doctrine of signatures use of the plant for tooth ailments.
Habitat: Rich woods, wooded bottoms, & calcareous rocky banks, preferring moist soil & deep leaf mold, frequently occurring in large colonies. Mesic to wet-mesic woodlands. "Common in large or small patches

in woods" (ewf55).
Culture: ①Seeds germinate after about 60 days of cold moist stratification (he99).
Description: Erect perennial, 0.5-1.0'; from a tuber; 3 leaves in a whorl, deeply lobed, sharply toothed; flowers white to pink, 4-merous, cross-like.
Comments: status: phenology: Blooms April-June. In northern Illinois, collect seeds in May. Collect seeds in se Wisconsin in June-July (he99). This sp may spread rapidly once established in favorable sites.
Associates: ethnobotany: Tubers available April to May. Used as food by Ojibwa, Menominee, & Iroquois (sm23, 32, Waugh 1916). Carbonized tubers found at Juntunen site.

DESCURAINIA Webb & Berthelot 1836 **TANSY-MUSTARD, FLIXWEED** *Brassicaceae* or *Cruciferae* *Descurainia* New Latin, from François *Déscourian* died 1740 French botanist & New Latin *-ia*. A genus of about 40 spp of annual or biennial herbs of America (primarily of North & South America) & Europe differing from members of the genus *Sisymbrium* in having a pubescence of stellate or forked hairs & comprising the tansy mustards

Descurainia brachycarpa (Richard) Schulz. TANSY-MUSTARD, "Common in waste places & particularly so on railroad ballast" (ewf55).

Descurainia sophia (Linnaeus) Webb ex Prantl HERB SOPHIA,
Introduced from Eurasia. "Credited to the county in Jones' Flora but not known to us." (ewf55)

DIPLOTAXIS Augustin de Candolle 1821 **Wall-rocket** *Brassicaceae* or *Cruciferae* *Diplotaxis* New Latin, from Greek *diplous, dipl-*, double, & *-taxis*, *taxis*, "row," in reference of the double row of seeds in the seed pod. A genus of about 30 spp of Eurasian & African weedy herbs with alternate pinnatifid leaves & yellow racemose flowers.

Dilpotaxis muralis (Linnaeus) Augustin de Candolle ANNUAL WALL ROCKET, aka SAND-ROCKET, STINKING WALL-ROCKET,
Introduced from Europe. Plants annual or biennial. "Common along railroad tracks" (ewf55).

DRABA Linnaeus 1753 **DRABA, WHITLOW-GRASS** *Brassicaceae* or *Cruciferae* *Draba* (DRAH-ba) from Greek *drabe*, name for a related plant, from δράβη, *drabe,* acrid, biting, in reference to the taste of the plant. Perennial herbs. Fruits are silicles.

Draba reptans (Lam.) Fernald COMMON WHITLOW GRASS,
Habitat: Dry to dry-mesic prairies. distribution/range:
Culture: propagation: ①No pre-treatment needed. Sowing outdoors in the spring is the easiest method (he99).
Description: 2-10"; flowers white, like diminutive stars; key features:
Comments: status: phenology: Blooms April-May. Collect seeds in se Wisconsin in June-July (he99). "Very early, very common & our only sp" (ewf55).
Associates: ethnobotany:
VHFS:

ERYSIMUM Linnaeus 1753 **WALL FLOWER, TREACLE MUSTARD** *Brassicaceae* or *Cruciferae* *Erysimum* (e-RI-si-mum) from the Greek name *erysimon*, a kind of mustard, from *erysthai* to defend, protect, help, & save; from its use as a medicinal herb; alternately from ἐρύω, *eryo*, to cure, in reference to its salutary medicinal properties. A small genus of Old World annual, biennial, & perennial herbs including several weeds & having alternate leaves, small yellow flowers, & slender terete pods (or 180 spp of the Northern Hemisphere!)(± 150 species: North America, Eurasia, northern Africa.) Fruits are siliques, dehiscent, linear, cylindric, 4-sided, or flat parallel or perpendicular to septum, unsegmented; stigma entire or 2-lobed.

Erysimum capitatum (Douglas ex Hooker) EL Greene WESTERN WALL FLOWER, aka ALPINE WALLFLOWER, COASTAL WALLFLOWER, PRAIRIE ROCKET, SAND DUNE WALLFLOWER, (*capitatus -a -um* kap-I-TAH-tus in a dense head, for the flowers.)

Habitat: Full sun, dry soils. distribution/range:
Culture: ①Moist cold stratify? (Code J Ken Schaal) ②No pretreatment needed. Sow seeds on the soil surface at 70ºF & water. Slow to germinate. (ew11)
864,000 (ew11), 1,312,000 (gn) seeds per pound. Space plants 0.5-1.0'.
Description: Biennial (biennial/perennial); 1.0-2.0'; flowers yellow to orange; key features:
Comments: status: phenology: Blooms
Associates:
VHFS:

Erysimum cheiranthes Linnaeus WORMSEED MUSTARD,
Introduced from Eurasia. "Common in a few places; west of new Milford near Camp Grant, the island in Rock River at the IC RR bridge, in west Rockford, & Pecatonica River at Trask bridge" (ewf55).

Erysimum inconspicuum (S Watson) MacM SHY WALLFLOWER, "Very uncommon; in Killbuck Creek bottom near the Ogle Co line & on he bank of Rock River below the dam in Rockford" (ewf55).

HESPERIS Linnaeus 1753 **DAME'S ROCKET**, **ROCKET, SWEET ROCKET, DAME'S VIOLET**
Brassicaceae or *Cruciferae Hesperis* New Latin, from Latin, dame's violet, from Greek ἕσπερα, *hespera,* evening, from feminine of *hesperios* of the evening, from *hesperos, hespera* evening. The flower is most fragrant in the evening. Similar to Latin *vesper, vespera*, evening, or the evening star & Old High German *westar*, to the west. *Eosphoros or Hesperos* was also name for the planet Venus (did *Eosphoros have an aspirated E?)*. *Hesperos/Hesperus* as the personification of Venus as the evening star. Biennial or perennial Eurasian herbs having large purple or white racemose flowers.

Hesperis matronalis Linnaeus DAME'S ROCKET, aka DAMES VIOLET, GARDEN ROCKET, MOTHER-OF THE EVENING, ROCKET, SWEET ROCKET, (of matrons; of March 1st, from Latin *matronali,* adjective, of a matron; *Matronalia* was a festival for Mars celebrated by matrons on March 1st where gifts were given to matrons & brides.) The literal meaning of the scientific name is matron of the evening. Did Linnaeus have a sense of humor? Yes, Linnaeus is said to have named a useless weed "*Siegesbeckia*" after Johann Siegesbeck, "honoring" one of his critics.
Habitat: Roadsides & old home sites. distribution/range:
Culture: ①No pretreatment needed. Sow seeds just below the soil surface at 75ºF & water. (ew11) ②Sow at 22-24ºC (71-75ºF), germination slow. Cover thin. Needs light. (tchn). Growth rate rapid. Seedling vigor medium. Vegetative spread rate none. Blooms second year. Reseeds. 171,914 (s&snysstl01), 224,000 (usda, ecs), 240,000 (ew11), 245,000 (stock), 288,000 (gran), 296,000 seeds per pound. Seeded alone plant 3.2 oz per 1,000 sq ft (stock). Pure stand plant 8 lb per acre (gran).
cultivation: This plant should not be cultivated. Space plants 1.0-2.0'. Moderate to high moisture requirement, full sun to partial shade, mesic soils. Moderately coarse to moderately fine soils. Neutral soils, some acid tolerance. Anaerobic tolerance none. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermediate. pH 5.0-7.0.
Description: Introduced biennial or short-lived perennial, 12-48", with deep lavender, white, to pink flowers. 12"minimum root depth.
Comments: status: B list noxious weed in Colorado. Invasive & banned in Connecticut. Prohibited in Massachusetts. This plant is considered invasive in many parts of the country (Assorted authors. 200_, State Noxious Weed Lists for 46 States; Stubbendieck et al 1994; SEPPC 1996, Hoffman & Kearns 1997).
phenology: Blooms May to August (May to June, spring to summer). Resembles, & is often mistaken for *Phlox*. Attractive cut flower, in fact, feel free to cut them wherever you see them. Fragrant in the evenings. Seed source is find your own commercial sources for those who wish.
relate use as an accent flower at ATT insert photo
"A garden escape that is found frequently on roadsides" (ewf55).
This sp seems to be rapidly on the increase in our area, with more colonies & larger colonies every year. It will be a colorful alternative to GARLIC MUSTARD. Until recently, this sp was used in a seed mix by the Illinois State Toll Highway Authority.
Associates: Attracts bees, birds, & butterflies. Resistant to deer.
ethnobotany: Species has shown antimicrobial properties, particularly against *Salmonella typhimurium* (Frey & Meyers 2010).

FM Frey & R Meyers, 2010, Antibacterial activity of traditional medicinal plants used by Haudenosaunee peoples of New York State, http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2989932

IODANTHUS Torrey & A Gray 1840 **PURPLE ROCKET** *Brassicaceae* or *Cruciferae* *Iodanthus* violet flowered from Greek ιώδης, *iodes*, violet-colored, & ἄνθος, *anthos*, flower. Fruits are siliques.

Iodanthus pinnatifidatus (Michaux) Steudel PURPLE ROCKET, A purple-flowered native mustard from ne USA. "Uncommon on streambanks. Rock & Kishwaukee Rivers." (ewf55)
I pinnatifidus resembles *Hesperis matronalis*.

I pinnatifidus	*H matronalis*
petals 10-13 mm long	petals 20-25 mm long
siliques 2-4 cm long	siliques 5-10 cm long
pubescence of lower stem of simple trichomes	branched trichomes

LEPIDIUM Linnaeus 1753 **PEPPERWORT, PEPPERGRASS, PEPPERWEED** *Brassicaceae* or *Cruciferae* *Lepidium* New Latin, little scale, from Latin name for a plant, dittander, pepperwort, from Greek *lepidion*, diminutive of *lepid-, lepis* scale, flake, small plate, capsule, a reference to the resemblance of the silicle, also a name for Syrian plant, PEPPERWORT, *Lepidium latifolium*. A genus of about 220 spp of herbs, cosmopolitan, having a rounded fruit with a notch or depression at its summit. The fruits are silicles.
Cardaria is included in *Lepidium* by some authors.

Lepidium campestre (Linnaeus) R Brown FIELD PEPPERWORT, aka COW CRESS, FIELD CRESS, YELLOW-SEED,
Introduced from Europe. "A common weed of pastures & roadsides" (ewf55).

Lepidium densiflorum Schrader PRAIRIE PEPPERWEED, aka GREEN-FLOWERED PEPPERGRASS,
Introduced from further west. "Uncommon except on roadsides near Winnebago" (ewf55).

Lepidium draba Linnaeus HOARY CRESS,
Introduced from Europe. "An uncommon introduced mustard found by us only on roadsides south of Winnebago." (ewf55, as *Cardaria draba* (L) Desv.)

Lepidium perfoliatum Linnaeus PERFOLIATE PEPPERWORT, aka CLASPING PEPPERWEED, SHIELDCRESS,
Introduced from Europe "Found only on the Illinois Central Railroad east of Rockford" (ewf55).

Lepidium virginicum Linnaeus POOR-MAN'S PEPPER, aka COMMON PEPPER-GRASS, TONGUE-GRASS, WILD PEPPERGRASS,
Widespread in eastern & central North America, & introduced in various places around the world. About 8 named varieties.
Associates: ethnobotany: Used as medicinal plant by Menominee (sm23).

NASTURTIUM R Brown 1812 **WATER CRESS** *Brassicaceae* or *Cruciferae* *Nasturtium* (nas-TUR-tee-um) from the Latin *nasus tortus*, a twisted or distorted nose, referring to the pungent smell of the plants. A genus of about 5 spp of aquatic perennial herbs of Eurasia, north Africa, & North America. Fruits are siliques, subterete, generally curved upwards, sometimes shortened so as to resemble a silicle. Seeds are small, lens-shaped, many, in a double row.

Nasturtium officinale R Brown TRUE WATER CRESS, aka ENGLISH WATER CRESS,
Habitat: Shallow springs, spring holes, spring fed streams. Soft mud or sand bottom. Prefers hard water 2'- 10'(?) deep
Description: Aquatic perennial,
"Common, particularly in springs & clear streams" (ewf55).
Associates: Waterfowl eat the plants. Plants provide cover for predator & prey spp (esp. trout)
ethnobotany: Occasionally cultivated for salads & sandwiches.

RORIPPA Scopoli **YELLOW CRESS, MARSHCRESS** *Brassicaceae* or *Cruciferae* *Rorippa* New Latin, from the Anglo-Saxon word *rorippen* whose meaning has been lost. A large genus of about 75 spp of chiefly weedy aquatic or marsh herbs, cosmopolitan, that have pinnate or pinnatifid leaves, yellow flowers, & terete pods with seeds in two rows in each cell & that include some forms used for salad greens or pot herbs.

Rorippa hispida (Desvaux) Britton "The low prairies in Coon Creek bottom where it seems to replace the above (*R palustris*) & probably best considered as a variety of it" (ewf55).

Rorippa islandica (Oeder) Borbás YELLOW CRESS
Wet prairies, early successional; 0.5-2.0'; yellow flowers; blooms May-September;

Rorippa palustris (Linnaeus) Besser AMERICAN MARSHCRESS, "Common in sloughs & other very wet places. (*R islandica* (Oeder) Boras)" (ewf55)

Rorippa sessiflora (Nuttall) Bresser "Common on Riverbanks, particularly Rock River" (ewf55).

SISYMBRIUM Linnaeus **HEDGE MUSTARD, JIM HILL MUSTARD** *Brassicaceae* or *Cruciferae* *Sisymbrium* from Latin, a fragrant herb, perhaps mint, from an ancient Greek name, *sisymbrion,* bergamot, watercress. A genus of annual or biennial herbs having a pubescence of simple unbranched hairs, lyrate pinnatifid leaves, & terete stems & comprising the hedge mustards. Fruits are siliques.

Sisymbrium altissimum Linnaeus TUMBLE MUSTARD, aka JIM HILL MUSTARD,
Native to Eurasia. "A very common pasture weed" (ewf55).

Sisymbrium loeselii Linnaeus "Frequent but less common than the above" (ewf55).

Sisymbrium officinale (Linnaeus) Scopoli HEDGE MUSTARD
A native of Europe. "A common weed." (*Erysimum officinale* L) (ewf55)

THLASPI Linnaeus 1753 **PENNY-CRESS** *Brassicaceae* or *Cruciferae* *Thlaspi* New Latin, from Latin, shepherd's purse, from Greek.

Thlaspi arvensis Linnaeus PENNYCRESS, aka FIELD PENNYCRESS, FRENCHWEED,
Native of Europe. "Uncommon as recently as 1945 but now becoming very plentiful" (ewf55).

CACTACEAE AL Jussieu 1754 **PRICKLY-PEAR CACTUS, INDIAN FIGS** Fruits succulent, seeds numerous, parietal, or in the pulp, exalbuminous. 2 genera in Illinois.

OPUNTIA P Miller 1754 **PRICKLY PEAR, BARBARY FIG, BEAVER'S TAILS, BUNNY EARS, *CHOLLA*, INDIAN FIG, *NOPAL*, RIVERINE PEAR, SPANISH LADY, TIGER PEAR, *TUNA*** *Cactaceae* Opun'tia (oh-PUN-tee-a) Origin uncertain, probably from the Greek name of a cactus-like plant that grew near the town *Opus* (*Opuntis*) in ancient Greece. Alternately, a plant that was naturalized in *Opuntiana*, a country near Phocis. The common name is in reference to the somewhat pear-shaped fruits. Fruits are berries, umbilicate at the apex, tuberculate, cotyledons semiterete. Some spp are grown for their edible pads, called *nopales* or *nopalitos*, or their edible fruit, called *tunas*. The edible pears sold in the supermarket are *Opuntia ficus-indica.* The pads are technically cladodes, & peeled make a delightful salad, reminiscent of green bean salad made with jalapenos. The thorns grow in groups called areoles, with large spines, & small, brown, insidious glochida.

Harvest the fruits when they turn red, being cautious of the small, brown spines. Do not be deceived by the large deadly-looking spines on the pads. Carefully extract & clean the large seeds from the gelatinous fruit & ferment (alternately place seed & gelatinous mas in a clean glass bottle, add sugar 7 yeast, fill with water, add fermentation lock, filter well before drinking). Scarify & dormant seed in a sturdy flat. Germination may occur over several years. Transplant when the 1st pad has expanded. Cullina code B seed will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF or C seeds will germinate only after multiple cycles of warm and cold, typically 40º-70º-40º-70º, G chemical inhibitors, I

seeds requires scarification because of an impermeable seed coat. Easier & quicker from pads. Gather pads from a number of genetic individuals. Allow pads to callous for a week & bury half way in a sandy or cactus soil mix. May also plant in permanent location. (cu00) The fruits are eaten (relished) by small mammals (& upland birds?). Small mammals probably spread the seed through scat. Acid scarification may duplicate a digestive tract, & may help germination. Some spp may be locally aggressive from seed, dominating over-grazed sand prairies & open-soiled sandy roadsides in nw Illinois. Most excellent for xeriscaping & green roofs. CAM CO_2 fixation . X = 11. Aka *Opuntia* Tourn. Woods (1873) lists a single species *O vulgaris* Mill [syn *Cactus opuntia* L] native from Mass to Fla, west to Iowa.

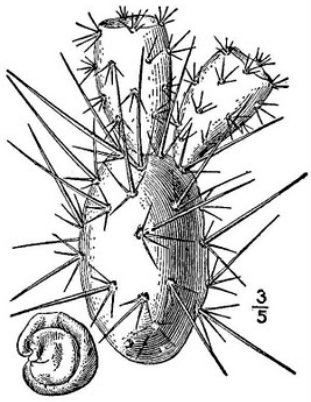
The winter of 2013-14 was very hard on *O humifusa*, killing 90% of the pads. *O fragilis* in the same garden was unscathed.

Opuntia fragilis (Nuttall) Haw. *IL, WI PRICKLY PEAR, aka BRITTLE CACTUS, BRITTLE PRICKLY PEAR, FRAGILE CACTUS, FRAGILE PRICKLY PEAR, JUMPING CACTUS, LITTLE PRICKLY PEAR, LOOSE PRICKLYPEAR, PYGMY PRICKLY PEAR, (fragil'is (properly fra-GIL-is, but often fra-JIL-is) easily broken, fragile, brittle, from Latin *fragilis*, brittle, frail, impermanent, from *frag-* root of *frango, frangĕre* to break (oed), and *-ilis* adj suffix indicating capacity or ability, hence a property or quality.)
Habitat: According to one authority, known from soils drier than a popcorn fart. Dry sandy, open prairies with low fuels. Barren soil areas in grasslands, open woodlands, sandy or gravelly soils, on outcrops of granite, limestone, or quartzite. Observed on quartzite outcrops in sw Minnesota. Known from Jo Daviess Co, Illinois. A similar plant is reported from roadsides in Henderson Co.
Culture: ①No pre-treatment necessary other than cold, dry stratification (pm09, 11). ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) ③Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination , recycle (tchn).

asexual propagation: Easy from pads. Birds or small mammals may steal newly planted pads. Protect newly planted pads with fencing until well rooted.
Description: Prostrate spreading perennial, technically a spiny shrub, forming a low, matted clump, pads with usually more than 2 spines together (3-8), flowers yellow or greenish, showy; N 2n = 66. key features: Dense mats up to 20" wide; pad joints are not very flat, pads easy to detach; flower 1.5-2.0" wide; usually more than 2 spines together (fh).
Comments: status: Endangered in Illinois. Threatened in Wisconsin. phenology: Blooms late June-early July. CAM CO_2 fixation. Collect seeds in se Wisconsin in August (he99). This sp is one of the most cold hardy cacti, growing at 56º (58º) north latitude. "*Opuntia fragilis* is a widespread, though inconspicuous, sp; in many places, it flowers infrequently, if at all. Its easily detached stem segments are dispersed by animals & possibly water." (fna)

The cladodes were probably moved around on the coats of animals, including bison. Every time I examine our patch, there are always several, detached pads laying on the ground. I think they drop off if I look at them wrong.

Our colonies are next to the south & east foundation of our single-story, Prairie-style woodshop which has a 5' roof overhang. They rarely receive significant rain, & they are loving it. They winter better than *O humifusa.*




Opuntia fragilis

Opuntia humifusa (Rafinesque) Rafinesque *CT, MA, NY, PA EASTERN PRICKLY PEAR, aka CREEPING PRICKLYPEAR, CREEPING-PEAR, DEVIL'S TONGUE, *FICO D'INDIA NANA*, INDIAN FIG, LARGE-FLOWER PRICKLY-PEAR, LOW PRICKLY PEAR, *NOPALE DEL ESTE*, PRICKLY PEAR, SMOOTH PRICKLY PEAR, (*humifusus -a -um* (hum-i-FEW-sus) low growing.) upl

Habitat: Sand & sandstone prairies; sandy or rocky soils. Full sun to partial shade, dry sandy soils. "Sandy black oak woods, sand blowouts, old mowed sandy cemeteries, rocky prairies, sandy & gravelly washes of valleys along streams" (Ilpin) distribution/range: In Illinois, EASTERN PRICKLY PEAR occurs in the Green River Lowland, Mason Co, & Kankakee Sands, & many cos along the Mississippi & Illinois rivers. Wide spread in eastern USA.

Description: 'Shrubs' forming clumps, or better a clump-forming cactus, in low, open mounds to 8" tall by up to 3' wide; roots fibrous, sometimes from tuberous rootstocks, green pads with 1, rarely 2 large spines together (0-2 (3)), pads also have minute, reddish brown barbed, bristles (glochids); large waxy yellow flowers with showy stamens from upper edges of pads, singly or in small groups, fruits reddish colored, barrel-like cylinders, also with minute barbs; N 2n = 22, 44. key features: Pad joints are flattened; flowers sometimes with a red center; spines usually single or sometimes paired (fh). "Leaves are scale-like; quickly deciduous, stem strongly flattened" (Ilpin)

Culture: ①No pre-treatment necessary other than cold, dry stratification (pm09). ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) ③Fall plant or cold stratify for up to 2 to 3 months for best results. Sow just below the soil surface at 70ºF & water. (ew11) ④Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination , recycle (tchn). ⑤"Seeds are best sown outdoors immediately after collection. Seedling will appear the next spring. Cuttings can be taken anytime during the growing season by breaking off one or more pads at their joints & sticking in prepared soil. Collect seeds from the mature, reddish-brown fruit. Wear substantial gloves while collecting. Rake the seeds from the berry (removing all pulp is not necessary), air-dry a few hours, & store in sealed, refrigerated containers." (lbj) Discard gloves after picking *tunas*. It is also possible to pick them with clippers & salad tongs. Interns may also pick the fruits & clean the seeds.

seed counts & rates: 16,000 (sh94), 21,504 (jfn04), 22,400 (pm02, aes10), 28,800; 40,000 (ew11) seeds per pound.

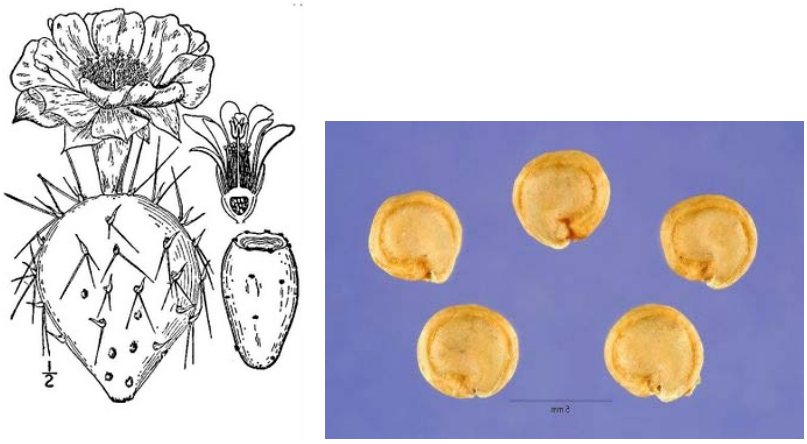
asexual propagation: Division by pads.

cultivation: Space plants 1.5-3.0'.

Comments: status: Special concern in Connecticut. Endangered in Massachusetts. Exploitably vulnerable in New York. Rare in Pennsylvania. phenology: Blooms 6-7. CAM CO_2 fixation. In northern Illinois, collect the ripe, reddish-purple fruits (technically berries) starting in late August into December. Beware the insidious glochida (the tiny brown, numerous spines). Collect seeds in se Wisconsin in August (he99). Attractive, flowers are highly ornamental, drought resistant landscape, & useful in zones of human exclusion. Excellent ground cover. Aggressive in sand. The pads naturally desiccate, discolor, & shrivel during the winter, but recover in spring. The winter of 2013-2014 was very detrimental to this species around our office and home.

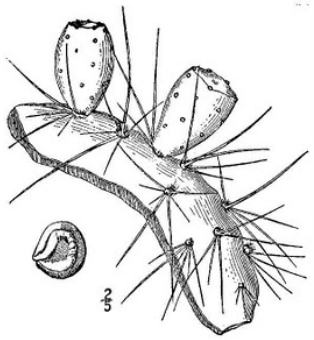
Associates: Attracts butterflies, nectar source for *Hesperia ottoe* OTTOE SKIPPER. Ripe fruits are highly sought after by small mammals. Reported to be deer resistant.

ethnobotany: Fruit is edible, raw or made into jelly, stem is edible peeled raw or after roasting. We strongly recommend Prickly Pear Salad made by a professional. Remove bristles before use with a flame, wiping off with a sturdy glove, wipe with a damp cloth; it is possible to cut out the bristles, but wipe the blade between each cut. Caution, ingested glochids may be very harmful!
VHFS: [*O compressa* (Salisb) Macbr]



Opuntia humifusa

Opuntia macrorhiza (Rafinesque) Rafinesque (or Engelmann) PLAINS PRICKLY PEAR, aka BIGFLOWER PRICKLYPEAR, BIGROOT PRICKLY PEAR, COMMON PRICKLY PEAR, PRICKLY PEAR, TWIST-SPINE PRICKLY-PEAR, WESTERN PRICKLYPEAR,
Habitat: Dry plains & open woods. Rocky or sandy soils; sandy, gravelly or gravelly loam. pH <6.8.
distribution/range: In Illinois known from Jackson, Madison, Pope & Whiteside cos.
Description: Low clump-forming cactus, usually <10" tall, up to 3' wide; sometimes from tuberous rootstocks; flattened bluish-green pads, 2.5" wide & 4" long, with 2 or more large spines together (0-4); flowers yellow, often with a reddish base, papery, 2-3" wide; followed by fleshy, reddish-purple fruit without spines (lbj) N 2n = 44. key features: ① Stem joints very flat & difficult to detach; flower sometimes with a red center; usually several spines together (fh). ②"Leaves are scale-like, soon deciduous; roots are tuberous thickened" (Ilpin)
Comments: status: phenology: Blooms 5-7. CAM CO_2 fixation. Clump forming, a good low ground cover for small areas. Attractive in rock gardens & stonewalls. Attractive yellow flowers followed by red fruit in late summer.
Associates: Fruits are made into jams or candies.



Opuntia macrorhiza

CALLITRICHACEAE WATER-STARWORT FAMILY

CALLITRICHE Linnaeus 1753 **WATER-STARWORT** 20-50 spp of aquatic, wetland, & upland, annual & perennial herbs, nearly cosmopolitan. This family is sometimes included in a broadly defined *Plantaginaceae,* as the tribe *Callitricheae.*

Callitriche heterophylla Pursh LARGE WATER STARWORT, "Known only in an old drainage ditch west of Yale bridge." (ewf55)

Callitriche palustris Linnaeus COMMON WATER STARWORT, "An uncommon water-weed known to us only on Grove Creek at Seward Bluffs & in Kent Creek near Levings' Park." (ewf55)

CAMPANULACEAE AL de Jussieu 1789 **BELLFLOWER FAMILY** A family of about 82 genera & 2000 spp, mostly herbs, worldwide. Sometimes the *Lobelioideae,* the LOBELIA subfamily, is recognized at the family level.

CAMPANULA Linnaeus **BELLFLOWER** *Campanulaceae Campanula* (kam-PAHN-ew-la) the diminutive of Late Latin *campana*, bell, for the bell shaped corolla. Herbaceous biennials & perennials. Some authorities split this genus into *Campanula, Rapunculus, Campanulastrum*, &c. [*Rapunculus* Mill = *Phyteuma* L]

Seeds ripen sequentially, with ripe & green seeds at the same time. Many seeds germinate with no treatment, & may bloom first year. Cullina code A seeds will germinate within 4 weeks sown at 70ºF, or B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, H, seeds require light to germinate. 4-6 node cuttings before buds are formed may root slowly. (cu00)

rewrite as Genus **CAMPANULASTRUM** Small
rewrite as Campanulastrum a

Campanula americana Linnaeus [new nomenclature this will be *Campanulastrum americanum* (L) Small] TALL BELLFLOWER, aka AMERICAN BELLFLOWER, ELEPHANT FLOWER, (*americanus -a -um* (a-me-ri-KAH-nus) of the New World, American.) fac
Habitat: Wet-mesic, mesic, & dry savannas, woodlands, & forests. In Michigan, "Deciduous forests, both upland & floodplain, especially in openings & ± disturbed areas such as trails, edges of fields & railroads; marshy ground, stream banks" (rvw11).
Culture: ①30 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. (pm09) ②Seeds germinate after about 60 days of cold moist stratification, or no pre-treatment needed. Sowing outdoors in the spring is the easiest method. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99) ③30 days moist stratification required for good greenhouse crop. Field sow fall. (pnnd)

1,134,000, 1,136,000 (aes10), 2,702,381 (gnh13), 2,720,000 (pm02), 3,172,027 (gnmh11), 3,811,764 (gnh12), 4,800,000 (ew11), 12,800,000 (jfn04) seeds per pound.

cultivation: Space plants 1.5-2.0'. Mesic soils, full sun to woodland. Tolerates clay soils.

bottom line: Plant dormant or spring. Seed tests indicate 2/3 of lots have little to no dormant seed, & are capable of germination soon after harvesting. 1/3 of lots have 64-87% dormant seed, requiring dormant seeding - light. Flipflop species, esp of late. Crossover species. Germ 58.4, 74.3, 94, sd 32.9, r4.0-94 (90)%. Dorm 31.9, 14.5, 0.0, sd 33.7, r0.0-87 (87)%. Test 26, 25, 25, r20-31 days. (#31).**
Description: Native, erect biennial; sap is milky; stems 2-6'; flowers blue (blue/violet); key features: The 1st year plants resemble the basal foliage of a young aster, but the milky sap is the key.
Comments: status: phenology: Blooms 7,8,9,10. Seed matures late summer to fall (4 weeks after bloom). In northern Illinois, collect seeds in September-October. Collect seeds in se Wisconsin in October-November (he99). Attractive cut flowers, but 'latex' sap may not mix well with other flowers in the vase. Landscaping, shade gardens without a lot of competition, biennial, self-sows in a fire managed landscape. Establishing colonies that bloom every year takes several years, possible helped by seeding in successive years. Seed source nursery plantings, genetic source LaSalle Co. Listed as an annual by Fernald (page 1352), but a biennial or winter annual by our estimation.

"Common in damp places especially in woods & thickets" (ewf55).
Associates: Species is of special value to native bees. Attracts butterflies & hummingbirds. Reported to be deer resistant. Walnut tolerant.

VHFS: The only sp with wide-spreading petals, a petal tube which elongates in age, stamens which reach up & over the petals, pantoporate pollen (pores spread over the surface, possibly in a regular pattern), & a capsule which opens by subapical valves (vplants). Add varieties.

Campanula aparinoides Pursh MARSH BELLFLOWER, aka BEDSTRAW BELLFLOWER, (*aparinoides* resembling bedstraw, *Galium aparine*.)

This plant is not in the native seed trade!

"Common in marshy places" (ewf55).

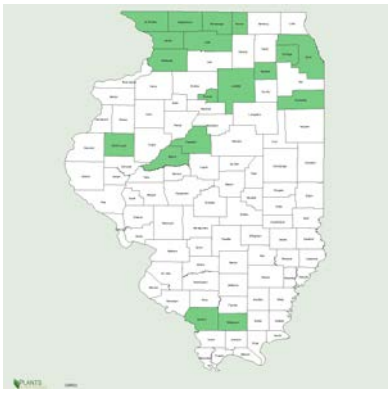
VHFS: *Campanula aparinoides* Pursh var *grandiflora* Holz. "Much like *C aparinoides*, in the same situations but less common. Leaves narrow & flowers blue. Kent Creek at North Central avenue & a bog in Rockton Township." (ewf55 as C *uliginosa* Rydb.)

Campanula rapunculoides Linnaeus CREEPING BELLFLOWER, aka EUROPEAN BELLFLOWER, ROVER BELLFLOWER, (*rapunculoides rapunculus*-like, like a little turnip, resembling Garden Rampion, possibly *Campanula rapunculus*, of the Rapunzel, Rapunzel, let down your hair, fairy tale.)

①Sow at 20ºC (68ºF), if no germination in 3-4 wks, move to +2 to +4ºC (34-39ºF) for 2-4 wks (tchn).

"An old garden plant whose marked tendency to spread & to wander has caused a decrease in popularity. Frequently found on roadsides & little used streets & alleys." (ewf55)

Campanula rotundifolia Linnaeus HAREBELL, aka BELLFLOWER, BLUEBELL, BLUEBELL BELLFLOWER, FAIRY THIMBLES, FLAX BELL-FLOWER, SCOTCH BLUE BELL, SCOTTISH HAREBELL, BLUEBELLS OF SCOTLAND, *Zi'gini'ce* (*zigin* implies pouring) (Ojibwa) (*rotundifolius -a -um* (ro-tund-I-FO-lee-us) round leaf, for the basal foliage.) [upl]



Habitat: Sandy black oak savannas, hill prairies, & rock cliffs. Full to partial sun, dry to moderate moisture, woods, meadows, cliffs, & beaches, in sandy or gravelly soil. Typically in shallow, rocky soils. In the se USA, "Limestone outcrops, high elevation rocky summits (in thin soil over amphibolite) (w12). distribution/range: "A circumboreal sp, widespread & common in n North America & n Eurasia, south to nw NC, TN, MO, TX, NM, AZ, & CA. In our area rare, & generally limited to limestone in its occurrences in the Central Appalachians of WV & VA & to mafic rocks in nw. NC" (w12). Circumboreal, widespread & common in northern North America & northern Eurasia.

Culture: ①30 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. (pm09) ②Seeds germinate after about 60 days of cold moist stratification, or no pre-treatment needed. Sowing outdoors in the spring is the easiest method. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99) ③No pretreatment needed. Sow seeds on the soil surface at 70ºF & water. (ew11) ④ Sow at 20ºC (68ºF), germination slow small seed - do not cover (tchn). 4,500,000 (wns01), 12,800,000 (sh94), 14,400,000 (pm02, ew11) seeds per pound.

asexual propagation: Division of mature plants in spring.

cultivation: Space plants 0.75-1.0'. Dry soils, full sun to part shade. Drought tolerant. Alkaline soil tolerant. "It typically grows in shallow rocky soil, but will flourish in ordinary garden soil if taller, more aggressive plants are kept away. HAREBELL is surprisingly easy to grow, notwithstanding its delicate appearance." (Ninth River)

bottom line: Dormant seed is best. Germ 65%. Dorm 5.0%. Test 75 days.**

greenhouse & garden: Moist cold stratify or no treatment, light. Sow in late fall or stratify 30-60 days & spring plant, light cover, GA3 has been used successfully in professional seed lab germination testing.

Description: Native, erect, herbaceous, perennial forb; roots minimum depth; stems 6-18 (20)", thin, mostly hairless; leaves stalked, the basal leaves broadly oval, toothed, falling off as the plant matures, the upper leaves more linear; inflorescence a branched, drooping cluster of usually many, nodding flowers; flowers blue (blue/violet), 5-merous, bell-shaped, flaring lobes much shorter than the tube; fruit is a nodding capsule opening at the base; N. key features: ①Bell-shaped flowers, lower leaves oval & falling off as the plant matures.

Comments: status: phenology: Blooms 6,7,8,9. Seed matures midsummer to fall (4 weeks after bloom). Collect seeds in se Wisconsin in September (he99). Rock gardens & perennial borders. Original seed source

cliffs near Dubuque, Iowa. This is certainly not a plant for *de novo* restoration of mesic prairies in Chicago; rock gardens perhaps.

"*C intercedens* Witasek. Harebell. It is not uncommon on dry gravel hills & prairies west of Rockton, south of Roscoe, & north of loves Park & on the moist outcrops on Hall Creek & Kishwaukee River. Markedly variable. A pretty plant but it lived only a few years in our garden. (*C rotundifolia* L)" (ewf55)

Associates: Attracts hummingbirds. Reported to be not attractive to deer.

ethnobotany: Root used as medicinal plant by Ojibwa (sm32). Ojibwa medicinal plant for diseases of the ear (den28).

VHFS: [*Campanula alaskana* (A Gray) W Wight ex JP Anderson, *C dubia* A DC, *C heterodoxa* Bong, *C intercedens* Witasek, *C petiolata* A DC, *C rotundifolia* L var *alaskana* Gray, *C rotundifolia* L var *intercedens* (Witasek) Farw, *C rotundifolia* L var *lancifolia* Mert & WDJ Koch, *C rotundifolia* L var *petiolata* (A DC) JK Henry, *C rotundifolia* L var *velutina* A DC, *C sacajaweana* M Peck]

CAMPANULASTRUM Small **BELLFLOWER**

LOBELIA Linnaeus **CARDINAL-FLOWER, INDIAN-TOBACCO, LOBELIA** *Campanulaceae Lobelia* (lo-BEL-ee-a) New Latin, from Matthias de *Lobel* (or de l'Obel, or von Lobel), 1538-1616, Flemish botanist & New Latin *–ia*. A large genus of annual & perennial herbaceous plants of wide distribution that have the corolla tube split. Placed by some in the *Lobeliaceae.* Sometimes the *Lobelioideae*, the Lobelia subfamily, is recognized at the family level.

Seeds mature early fall, about 3-4 weeks after flowering. Most spp need no treatment. Cullina code A seeds will germinate within 4 weeks sown at 70ºF, H seeds require light to germinate. (cu00) Moist cold stratify or dormant seed may help with more uniform or quicker germination. Bottom heat is useful. The seeds need light to germinate. One- to two-node stem cuttings, early enough to encourage rosette formation or division of basal rosettes. Fruits are capsules with small brown seeds.

"Moist cold treatment, or fall sow. Very light to no cover. Tiny seeds. Excellent germination. (mfd93). Easy from transplants or moist stratified seed.

Lobelia hybrid, born in captivity

Lobelia cardinalis Linnaeus *AZ, FL, NY CARDINAL FLOWER, aka INDIAN PINK, (*cardinalis -is -e* (kar-di-NAH-lis) red, cardinal red, deep scarlet. *Cardinalis* became associated with an ecclesiastical meaning, for the color of the raiment of a Catholic cardinal, now referring to the scarlet red color. A very old meaning from Latin *cardo*, *cardinis*, an ancient type of door hinge, a pivot & socket upon which a door was made to swing, & *-alis* adjectival suffix for nouns, hence of, or pertaining to a strong hinge, something pivotal, or important, as the College of Cardinals, the Cardinal Directions, St Louis Cardinals, cf Chicago Cubs.) obl

Habitat: Seasonally inundated areas, wet meadows, wet savannas, swamps, & wet ditches. distribution/range:

Culture: ① 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ②Seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99) ③"30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring." (pnnd).

④No pretreatment needed. Sow seeds on the soil surface at 70ºF & water. (ew11) ⑤Surface sow at 22-24ºC (71-75ºF) in light, germination in less than 2 weeks (tchn). ⑥Sow seed in fall or stratify 30 days & sow in spring (pots). Growth rate moderate. Seedling vigor high. Vegetative spread rate none.

seed counts & rates: 4,345,600 (wns01), 4,800,000; 6,400,000 (pm01), 6,704,000 (ew11), 7,000,000 (jfn04), 8,681,000 (shirley), 9,072,000 (aes10), 9,659,574 (gna04), 10,088,888 (gna06), 10,436,781 (gna06), 11,292,758 (usda), 11,293,000 (ecs), 19,721,739 (gnh12) seeds per pound.

asexual propagation: Basal offsets can be lifted.

cultivation: Space plants 1.25-1.5'. Full sun to partial shade & rich, moist soils (*probably better in partial shade*). Needs constantly moist, rich organic soils, but is said by some to tolerate clay soils. Anaerobic tolerance low. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerant. pH 5.8-7.8. The plant is short-lived in marginal habitats. Its utility can be improved by annually dividing or moving the plant. Species is at its best in forested wetlands or floodplain woodlands with minimal competition.

bottom line: Dormant seeding is significantly to strongly beneficial to 45% of lots. Slight to nondormant lots are common, hence a flipflop species. Germ 50.1, 50.5, 77, sd 26, r1.0-81 (80)%. Dorm 29.4, 22.5, 0.0, sd 29.6, r0.0-79 (79)%. Test 36, 34, 29, r25-55 days. (#20)**

Description: Native, erect, perennial forb; 2.0-4.0(-5.0)'; 12' minimum root depth; inflorescence long terminal racemes of red tubular flowers, occasionally pink or white (much more so in cultivation than the wild).

Comments: status: Threatened in Florida. Exploitably vulnerable in New York. Ssp *graminea* (Lam) McVaugh is salvage restricted in Arizona. phenology: Blooms 7,8,9. In northern Illinois, collect seeds in September-October. Collect seeds in se Wisconsin in October (he99). Attractive cut flowers, landscaping, woodland or meadow gardens, shady rain gardens, & wetland restoration. Life span moderate to short-lived. Species perennates by basal offsets & seeding into open ground. Do not plant with aggressive grassy associates! Seed source drainage ditches, Green River Lowland, & nursery production, Lee & LaSalle cos.

"Frequent on the banks of streams, in sloughs, & other wet places. We have not seen the white form. Planted in our garden in a rather dry prairie situation it showed a decided tendency to spread & persisted for several years." (ewf55)

Associates: Pollinated by hummingbirds, long-tongued bees, & *Lepidoptera*. Often browsed by deer. Attracts hummingbirds & butterflies.

ethnobotany:

Lobelia cardinalis, 1st year from seed, and *al fresco.*

Lobelia inflata Linnaeus ☠ INDIAN TOBACCO, aka ASTHMA WEED, BLADDERPOD, EYEBRIGHT, GAGROOT, PUKEWEED, VOMITWORT, (*inflatus -a -um* Latin adj, inflated, puffed up; bombastic; turgid; swollen up, blown up.) facu-

Habitat: Alluvial, wet & mesic savannas & woodlands. Disturbed areas in woods & forests. Occasionally volunteers from agricultural wetland seed banks. Full sun to woodlands, mesic soils. "Common in dry woods & clearings" (ewf55).

Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break

dormancy & germinate (pm09). ②Seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99)

seed counts & rates: 907,200?; 7,968,000 (ew11), 8,000,000 (pm02), 14,187,500 (gnhm14) seeds per pound.

cultivation: Space plants 0.5-0.75'.

bottom line: Preliminary data indicates dormant seeding is strongly beneficial, with over 60% dormant seed. Small seed effect. Germ 22-30%. Dorm 60-73%. Test 21 days. (#3)**

Description: Erect annual, 0.5-2.0'; leaves mostly stemless, broad, oblong; flowers light blue, seed pods inflated key features: ①Stem usually branched, pods inflated, leaves broad (fh).

Comments: status: phenology: Blooms 6,7,8,9,10. In northern Illinois, collect seeds in late September-October. Collect seeds in se Wisconsin in October-November (he99). Annual.

Lobelia kalmii Linnaeus *NH, PA, WA ☠ KALM'S LOBELIA, aka BOG LOBELIA, BROOK LOBELIA, FEN LOBELIA, ONTARIO LOBELIA, (*kalmii* (KAL-mee-eye) after Pehr *Kalm*, 1715-1779, Finnish student of Linnaeus who traveled in North America, who discovered *Bromus kalmii*.)

Habitat: Bogs, shores, wet meadow, & fens. Calcareous soils.

Culture: ①Seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99)

availability: Sp is not in the native seed trade. Repeat, this is not in the native plant trade. Spec it & be a dufus!

Description: Native, erect perennial forb, 4-16"; flowers blue with white centers (rarely pink-blue), "Common in the shallow bogs & low prairies in Coon Creek bottom but uncommon elsewhere; a boggy place in Seward Bluffs Forest Preserve. Usually a frail plant 6 inches tall but occasionally growing to 18 inches & becoming branched" (ewf55).

Comments: status: Threatened in New Hampshire. Endangered in Pennsylvania & Washington.

phenology: Blooms 7-9. Collect seeds in se Wisconsin in October (he99).

Associates: ethnobotany: All parts are toxic if eaten in quantity. Symptoms include nausea, vomiting, diarrhea, salivation, exhaustion & weakness, dilation of pupils, convulsions, & coma.

Lobelia siphilitica Linnaeus * ME, MA, NY ☠ GREAT BLUE LOBELIA, aka GIANT BLUE LOBELIA, (*siphiliticus -a -um* (si-fi-LI-ti-kus) New Latin, siphilitic, in reference to the plants supposed medicinal properties.) facu+

Habitat: Wet meadows, low woods, mesic savannas, north-facing wooded, springy slopes, swamps, fens, upland swamps, drainage ditches. Full sun to partial shade, wet soils.

Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ②Seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99) ③"30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring." (pnnd). ④(Code C, D Ken Schaal). ⑤No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11) ⑥Surface sow at 22-24ºC (71-75ºF) in light, germination in less than 2 weeks (tchn).

seed counts & rates: 7,520,000 (pn02), 8,000,000 (pm10, sh94, agrelobsip44L72), 8,320,000 (jfn04), 8,960,000 (aes10), 9,072,000, 12,800,000 (ew11), 13,552,238 (gnh03), 14,412,698 (gna06), 15,133,133 (gnh01), 17,600,000 (gn) seeds per pound.

asexual propagation: Division of mature plants in spring.

cultivation: Space plants 1.25-1.5'. Greenhouse plants often bloom 1st year from seed.

bottom line: For field establishment, 55% of lots significantly to strongly require dormant seeding. 40% of lots have less than 10% dormant seed. Flipflop seed. Germ 52.1, 50, na, sd 25.2, r1.0-89 (88)%. Dorm 30.6, 26, 0.0, sd 28.1, r0.0-94 (94)%. Test 34, 34, 34, r22-50 days. (#22)**

greenhouse & garden: Many greenhouse grown plants will bloom from seed the first year.

Description: Erect, herbaceous, perennial, native forb; 1.0-4.0' tall; flowers blue, occasionally white (again, much more so in cultivation.),

Comments: status: Possibly extirpated in Maine. Endangered in Massachusetts. Exploitably vulnerable in New York. phenology: Blooms 7,8,9. Attractive cut flowers. Great in landscaping, good in wet gardens, rain gardens, & swales; wetland restoration. Spectacular in mass *vide infra*. Seed source nursery production, genetic origin DeKalb Co & drainage ditches, Green River Lowland, Hamilton Twp, Lee Co.

"Common along ditches, sloughs, & other very wet places. We have seen plants with rose colored flowers but not white ones." (ewf55)
Associates: Pollinated by long-tongued bees, short-tongued bees, & *Lepidoptera*. Attracts butterflies. Hummingbirds are attracted to the nectar.

ethnobotany: BLUE LOBELIA has numerous ethnobotanical uses, some noted in the specific epithet. The Mesquakie used the ground roots as an anti-divorce remedy, the roots put in food that both husband & wife ate. ☠ Apparently, they reconciled during recovery. ☠ All parts are poisonous. Toxic only if eaten in large quantities. Symptoms include nausea, vomiting, diarrhea, salivation, exhaustion & weakness, dilation of pupils, convulsions, & coma. Toxic principles are alkaloids lobelamine, lobeline, & others, plus a volatile oil.
VHFS: Illinois has the eastern var *siphilitica* & the western var *ludoviciana* A DC [*Lobelia siphilitica* L f *albiflora* Britton]

Lobelia siphilitica, Genesis greenhouse, 2011, 1st year plants from seed, & *au naturel.*

Lobelia spicata Lamarck PALE SPIKED LOBELIA, aka SPIKED LOBELIA, (*spicatus -a -um* (classically spee-KAH-tus) spike-like, spicate, by inference, with flowers disposed on a spike, bearing a spike, from Latin *spicatus*, past participle of *spico*, I furnish with spikes, I provide ears, like wheat or corn (in an Old World corny sense). *Spica* (singular) is the star in the head of wheat in the hand of the constellation Virgo. What's your sign?) fac
Habitat: Dry prairies, hill prairies, mesic old fields, & wet mesic prairies. Springy base of inland dune slopes, with degraded associates.
Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ②Seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99) ③Fall plant or cold stratify for 2 to 3 months for best results. Sow on the soil surface at 70ºF & water. (ew11) ④Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn).

seed counts & rates: 1,440,000 (jfn04, ew11), 8,000,000 (sh94), 14,400,000 (pm02, aes10), 14,632,258 (gnhm11), 18,530,612 (gnam07), 18,916,97 (gnh13), 26,705,832 (gna10) seeds per pound.

cultivation: Space plants 1.0-1.5'. Mesic soils, full sun to partial shade.

bottom line: Dormant seeding is best for field establishment, as 50% of lots are strongly dormant, but the other 50% of lots are nondormant. Germ 35.6, 31, 14, sd 29.5, r2.0-92 (90)%. Dorm 43.6, 55, 0.0, sd 33.9, r0.0-92 (90)%. Test 35, 33, 28, r28-53 days. (#10).**

Description: Erect, herbaceous, perennial, native forb; 1.0-2.5'; inflorescence a wandlike raceme; flowers blue, lavender, or white.

Comments: status: phenology: Blooms 6,7,8. Collect seeds in se Wisconsin in September (he99). Attractive cut flowers if one is truly desperate for cut flowers. Seed source nursery remnants, Whiteside Co. "It is without appendaged calyx & is more common than *L leptostachya* & grows in dry places much as *L inflata* does" (ewf55).

"*Lobelia leptostachya* A DC Uncommon in a low prairie situation in the Searle tract. Calyx lobes with definite appendages. (*L spicata* var *leptostachya* (A DC) Mack & Bush)" (ewf55)

Associates: Attracts butterflies & hummingbirds.

[*Lobelia claytoniana* Mx]

TRIODANIS Rafinesque ex Greene **VENUS' LOOKING-GLASS** *Campanulaceae Triodanis* three teeth, in reference to the seeds. Gledhill notes etymology unclear.

Triodanis perfoliata (Linnaeus) Nieuwland VENUS LOOKING-GLASS, aka CLASPING VENUS' LOOKING-GLASS, CLASPING BELLWORT, COMMON VENUS' LOOKING-GLASS, ROUND-LEAVED TRIODANIS, (*perfoliatus -a -um* literally through the leaves, or perfoliate, with the leaves joined around stem, as though the stem were growing through the leaves, or with a leaf-like appendage through which the stalk passes, from Latin *per-*, a prefix, through, extra, very, & *foliatus*, adjective, provided with or having leaves.)

Habitat: Dry disturbed sandy soils. distribution/range: Not native to Wisconsin.

Culture: ①60 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of cold moist stratification (he99). "Fall plant or cold stratify for 1 to 2 months for best results. Sow seeds on soil surface at 70ºF & water." (ew12) 48,000,000 (ew12, aes10) seeds per pound.

Culture: Space plants 1.0-1.25' centers. Dry soils, full sun to partial shade.

Description: Erect annual; 6-24".

Comments: status: phenology: Blooms 6-8. Collect seeds in se Wisconsin in October (he99). Annual, common.

VHFS: [*Legousia perfoliata* (L) Britton, *Specularia perfoliata* (L) A DC, *Triodanis perfoliata* (L) Nieuwl var *perfoliata*]

CANNABINACEAE Endlicher 1827 **HOP FAMILY**

Celtis Linnaeus is sometimes included in this family.

CANNABIS Linnaeus 1753 **HEMP, MARIJUANA** *Cannabinaceae*

Cannabis sativa Linnaeus HEMP, aka MARIJUANA, *sativus -a -um* (sa-TEE-vus) Latin cultivated, sown, planted; that which is sown or planted for crops. "Locally abundant in town & country & increasing though it is classed as a pernicious weed that should be destroyed" (ewf55). Not a restoration plant, but often sold.

HUMULUS Linnaeus 1753 **HOPS** *Cannabinaceae* or *Moraceae Humulus* (HUM-ew-lus) From the Old German name *humela*. A genus of two spp of herbaceous annual & perennial climbers, of the temperate regions of the Northern Hemisphere.

Humulus lupulus Linnaeus COMMON HOP(S), aka HOP(S), *HOUBLON,* ((LUP-ew-lus) New Latin, from Latin a small wolf, from *lupus, lupi,* (2nd m), wolf, and *-ulus -a -um*, Latin adjectival diminutive suffix meaning (1) little, -tending to, -having somewhat, used with adjectival bases and 1st declension nouns(?); (2) indicating a tendency or an action, used with a verb base.) Facultative

Habitat: Wet savannas, thickets in thickets in alluvium. It may persist around old homesteads where it was planted as an ornamental. distribution/range: North America & Europe.

Culture: ①Sow at max 5ºC (41ºF), germination irregular, often several months (tchn). 90,720 seeds per pound.

asexual propagation: Stem cuttings.

greenhouse & garden: Moist cold stratify or dormant seed. Once established, self sows.

Description: Herbaceous vine; green flowers, aromatic seed heads, & great for hopheads.

Comments: Blooms 8,9. Landscaping, arbors, old fences, & gardens where you can appreciate the fragrance of the maturing fruit. The maturing fruits are aromatic & attractive, & useful in fall flower arrangements. Highly recommended for those that appreciate a nice, hoppy beer. Makes a bold textural statement; a very tactile sp. Plant up close & personal, smell it, touch it, brew it!

"Since the hop vine is not cultivated in the county we have only the one sp which is found infrequently in fence rows, thickets, & the edge of woods." (ewf55 as *H americanus* Nutt)

Associates: A larval host for *Eudryas grata*, BEAUTIFUL WOOD-NYMPH MOTH, that also feeds on *Ampelopsis, Cephalanthus, Vitis*, & *Parthenocissus* (odd bedfellows indeed?).

ethnobotany: Used as medicinal beverage by many tribes as a tonic, stimulant, pain reliever, toothache, rheumatism, sleep aid, nervousness, breast & womb problems, inflamed kidneys, bladder problems, coughs, intestinal pain, pneumonia, earaches, & fever. Also used as protection against witchcraft. (nae, sm32).

Humulus lupulus

CAPPARACEAE CAPER FAMILY formerly *Capparidaceae*

CLEOME *Capparaceae* formerly *Capparidaceae* (klay-O-mee) derivation uncertain, possibly from Greek *kleos*, glory, or from the ancient name of some mustard-like plant. Tender, annual herb. This genus is sometimes placed in the *Cleomaceae* Horaninow 1834, as in Mohlenbrock (2014). Fruit is pod-shaped & dehiscent.

Cleome serrulata Jacquin ROCKY MOUNTAIN BEE PLANT, aka BEE PLANT, STINKING CLOVER, TOOTHED SPIDER-FLOWER, facultative upland-

Habitat: Dry railroad prairies & house-yard seed banks. Full sun, mesic soils. Native to the western foothills & plains. An occasional seed bank sp.

Culture: ①30 days cold moist stratification. Further germination pretreatments not sure? (pm09). ②No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11)

seed counts & rates: 51,200 (ew11), 65,900 (gran), 104,000 (pm02), 112,000 (wns01) seeds per pound. Pure stand plant 9 lb per acre (gran). As an accent flower , think again, or use 0.63-0.125 lb pls per acre (gni).

cultivation: Space plants 1.5-2.0'. Disturbed areas. Low to medium water requirement, full sun. Moderately coarse to fine soils. Neutral soils, base tolerant.

greenhouse & garden: Sow in fall, or soak seed 6-8 hrs in hot water & sow in spring. Needs light to germinate. Very light cover to no cover.

Description: Western USA annual, native forb; 1.0-4.0(-5.0)'; with white to pink to rose to purple (pale pink to purple) fragrant flowers, with long protruding stamens, giving spidery appearance.

Comments: status: Western USA annual. phenology: Blooms 5,6,7,8,9, summer thru fall. Annual, an attractive bedding plant, one of my mother's had-to-have bedding plants, an interesting blend of color & texture. Useful for short-term color in native mixes & soil stabilization. Good flower in masses, meadows, & at the back of annual borders. Occasionally appears as though a seed bank sp. Seed source railroad

remnants, & commercial sources.
Associates: Attracts bees & butterflies.
ethnobotany: Good dye plant. A sacred plant of the Hopi.
VHFS: In new nomenclature, thus is *Peritoma serrulata* (Pursh) DC in the *Cleomaceae* as in Mohlenbrock (2014).

POLANISIA Rafinesque **CLAMMY-WEED** *Capparaceae* formerly *Capparidaceae* *Polanisia* New Latin, from Greek πολύ, *poly-*, much, & ἄνισος, *anisos,* unequal & *-ia*; probably from the large but varying number of stamens. This genus is sometimes placed in the *Cleomaceae* Horaninow 1834, as in Mohlenbrock (2014). Fruit is pod-shaped & dehiscent.

Polanisia trachysperma Torrey & A Gray CLAMMYWEED,
"We have found this in an alley in East Rockford. It differs from the next (*P graveolens*) in having longer petals, the stamens being much exserted & the style being long." (ewf55)

Polanisia graveolens Rafinesque CLAMMYWEED,
"Common in waste places, poor soil, gravel banks, &c" (ewf55)

CAPRIFOLIACEAE AL de Jussieu 1789 **HONEYSUCKLE FAMILY** After *Caprifolium* goat-leaf, with goat-like leaves, from *caprae-folium*, an old generic name. A splitter's delight, by some authors, this family is in part divided into *Adoxaceae, Diervillaceae,* & the *Linnaeaceae.* Lumpers retain all these groups & some add *Dipsacaceae* & *Valerianaceae.* Mostly shrubs, some perennial herbs, often twining; leaves opposite, with no stipules. Flowers tubular funnel- or bell-like, usually with 5 flaring regular or irregular lobes or points. Sepals 5; Petals (5) or (5)z. Fruits are berries, drupes, or capsules; embryo small, in fleshy albumen.

DIERVILLA P Miller **BUSH-HONEYSUCKLE** *Caprifoliaceae* *Diervilla* (dee-er-VIL-la) After Dr N. *Dierville*, a French surgeon who discovered the original sp & introduced the shrub to Europe about 1700. A genus of 3 spp of deciduous shrubs of eastern North America. Shrub; flower yellow, 5-lobed funnel-shaped mostly regular; deciduous, opposite, serrated leaves; fruit is a capsule, 2-celled (apparently 4-celled from the projecting placentae), many seeded. Sometimes placed in *Diervillaceae.*

Diervilla lonicera P Miller BUSH HONEYSUCKLE, aka DWARF BUSH HONEYSUCKLE, GRAVEL WEED?, NORTHERN BUSH-HONEYSUCKLE, (lon-I-se-ra, or LON-i-se-ra, although derived from German or Latinized German, perhaps lon-I-ke-ra) *lonicera* for its similarity to the closely related genus, which was named after Adam *Lonitzer* (1528-1586), German naturalist, physician, & botanist, author of a herbal text that was printed several times from 1557-1783)
Habitat: Dry woods, clearings, & rocky places; sandy or rocky woods, thickets, cliffs. Dry woods, forests, & cliffs, often in rocky soils.
Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. (pm09). 1,600,000 (pm02) seeds per pound.
asexual propagation: Softwood cuttings.
cultivation: Hardy to zone 2. Transplants easily, BR or B&B. Self-incompatible, it takes two to tango. If you plan to grow more plants from seed, be sure to plant more than on genetic individual.
Description: Erect to arching, perennial, deciduous, native shrub, 6"-18(-36)" tall with round stems; roots minimum depth; bark; leaves mostly oblong with a pointed tip, finely toothed, opposite, fall color yellow-red-maroon, or reddish; inflorescence a 3- to 7-flowered, compound, branched cyme; flowers yellowish fading to reddish-orange, 5-merous, small, terminal, 0.5-0.75" long, perfect, funnel-shaped, almost regular, inside hairy, 5 stamens barely longer than the petals; fruits capsule 0.5" long; N. key features: "Corolla is in funnel form, nearly regular; leaves are pointed, petioled, usually ciliate, sometimes hair on lower surface; capsule, septicidal, slender, beaked" (Ilpin). Leaves on short petioles, ped to 3-flowered, capsules attenuate above.
Comments: status: phenology: Blooms June-July. C3. Somewhat useful in erosion control on woodland banks. Forms massive colonies or thickets in sunny sites on generally poor soil.
Associates: Pollinated by insects, mostly bumblebees or *Lepidoptera*. Little wildlife value. Generally pest free.

ethnobotany: Used as medicinal beverage by Menominee (sm23). Used as medicine by Ojibwa & Pottawatomie (sm32, 33). Ojibwa medicine for stomach trouble (den28).
VHFS: [*Diervilla diervilla* (L) MacMill, *D lonicera* Mill var *hypomalaca* Fern, *D lonicera* Mill var *lonicera*, *D trifida* Moench]

Diervilla lonicera

LINNAEA Linnaeus **TWINFLOWER** *Caprifoliaceae Linnaea* (lin-IE-a) New Latin, from *Carolus Linnaeus*, Latinized form of Carl von *Linné* (1707-1778), Swedish botanist who popularized binomial nomenclature. Linnaeus described the plant & it is said that the European form was one of his favorite plants. A monotypic genus of a trailing weak evergreen shrub (subshrub). Fruit is a dry berry, 3-celled, indehiscent, 1-celled (2 cells abortive). Placed by some authors in the *Linnaeaceae.* Also seen as *Linnaea* Gron.

Seed matures late spring to early summer. Tiny hard to find capsules produce one seed per capsule. Requires cold moist stratification. Cullina code B seed will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, H seeds require light to germinate. 3-inch sections of new growth root readily. Stems can be pinned to the ground & layered. (cu00)

Linnaea borealis Linnaeus TWIN FLOWER, (*borealis -is -e* (bo-ree-AH-lis) northern)
Habitat: Dry to moist soils, forests & bogs. distribution/range: From approximately 39º north to the Arctic.
Culture:
Description: Creeping, perennial, herbaceous, evergreen native forb; up to 5' long; roots; minimum root depth; long, creeping, filiform stems, rooting & branching their entire length; with a few leaves on the many short branches, leaves firm, with short stalks, widely oval, opposite; inflorescence a long-stalked, terminal, 2-flowered, nodding cluster; flowers pink (rose) to white, 5-merous, 0.33-0.50" long, funnel-shaped, very fragrant, hairy inside, with flaring, shallow lobes; fruit dry berry, 3-celled, indehiscent, 1-celled (2 cells abortive); N. key features: Stem creeping or trailing; flower two-flowered nodding cluster. " Corolla is campanulate, usually in 2's, hairy inside; evergreen; fruit is dry, 1-seeded enclosed by a persistent calyx." (ilpin)
Comments: status: phenology: Blooms June-August. C3. Creates patches.
Associates: ethnobotany: Used as medicinal plant by Pottawatomie (sm33).
VHFS: [*Linnaea americana* Forbes, *L borealis* L var *americana* (Forbes) Rehder] Add variety notes.

LONICERA Linnaeus 1753 **HONEYSUCKLE, WOODBINE** *Caprifoliaceae Lonicera* (lon-I-se-ra, or LON-i-se-ra, although derived from German or Latinized German, perhaps lon-I-ke-ra) after Adam *Lonitzer*, (or Lonicer, or Latinized *Adamus Lonicerus*) (1528-1586), of Frankfort, a German mathematician, physician, botanist, herbalist, publisher, & author of *Kräuterbuch*, an herbal text that also deals with the noble art of distillation. A genus of about 180 spp of deciduous & evergreen shrubs & climbers, primarily of north temperate areas. Fruit is a few-seeded berry. Nectar source for *Xylophanes tersa,* TERSA SPHINX MOTH.

Lonicera canadensis Bartram (also as Bartram ex Marshall or plain old Marshall) FLY HONEYSUCKLE, aka AMERICAN FLY-HONEYSUCKLE, (*canadensis -is -e* (kan-a-DEN-sis) of Canada or NE USA)
Habitat: Moist woods. distribution/range:
Culture: asexual propagation: Softwood cuttings.
cultivation: Hardy to zone 2.
Description: Deciduous, native shrub of cool shady northern forests; deep green leaves, yellow fall color; flowers pale creamy, opening before leaves in early spring; followed by bright red 0.5" berries early summer. (rrn97).
Associates: ethnobotany: Roots used as medicinal beverage by Pottawatomie (ms33). Menominee used the bark for medicine (sm23). Densmore (1928) lists *Lonicera* sp as Ojibwa lung medicine.

Lonicera dioica Linnaeus RED VINE HONEYSUCKLE, aka HONEYSUCKLE, LIMBER HONEYSUCKLE, MOUNTAIN HONEYSUCKLE, (*dioicus -a -um* (dee-o-EE-kus) of two houses, from Greek δις-οικος, *dis-oikos,* dioecious, indicating that the male & female flowers are found on different plants, having stamens & pistils on separate flowers on different plants.)
Habitat: distribution/range:
Culture: asexual propagation: Softwood cuttings.
cultivation: Hardy to zone 3.
Description: Less vigorous mounding vine with deep blood red flowers in early summer/late spring. (rrn97). key features: " Leaves whitened on the lower surface, uppermost united into a disk; tubular corolla tinged with purple or brick-red." (Ilpin)
Comments: status: phenology: Blooms 5-6. C3.
"With the following characters as the criteria this is not uncommon on shaded limestone & in ravines. The Kinnikinnick Creeks, Hall Creek & Kishwaukee River gorge. The leaves are glaucous beneath & green above; the connate pairs are oblong; the single leaves are not obovate. Also in Cedar Creek gorge in Stephenson Co." (ewf55)
Associates: ethnobotany: Used as medicinal plant by Ojibwa (Gilmore 1923).

Lonicera oblongifolia SWAMP FLY HONEYSUCKLE,
Habitat: distribution/range:
Culture: asexual propagation: Softwood cuttings.
cultivation: Hardy to zone 3. Moist soils.
Description: Low colonial shrub; winter bark yellow tan; flowers white; & red berries;

rename?
Lonicera prolifera (G Kirchner) Rehder (rename *L reticulata* Rafinesque ?) YELLOW HONEYSUCKLE, aka GRAPE HONEYSUCKLE, YELLOW VINE HONEYSUCKLE, upl
Habitat: Savannas, said to be at its best in oak woods. distribution/range:
Culture: ①Further germination pretreatments not sure? (pm)?
asexual propagation: Softwood cuttings.
cultivation: Hardy to zone 3.
greenhouse & garden: Dormant seed? Pretreatment requirements will vary from year to year.
The problem with propagation from seed may be that some *Lonicera* are self-incompatible & much of what is in the plant trade is from a limited number of clonal stocks & sets low viability fruit. Wild colonies may also be of one genetic individual, with limited viable seed. All of which is complicated by double-dormancy and/or multiple warm/cold cycles.
Description: Deciduous, woody, native twining vine; glaucous blue-green leaves with yellow flowers followed by red berries. key features: "Lower leaves are sessile or nearly so, uppermost forming a disk; spike of whorled flowers, two-lipped." (Ilpin)
Comments: status: phenology: Blooms 5,6,7. C3. Forms a sprawling mat to low climbing woody vine. Seed source (such as it is) nursery plantings, northeast Illinois genetic origin. "Our common honeysuckle vine being found in most woods & thickets. It is recommended by Deam as an ornamental but we have found it to winterkill as badly as some of the more showy introduced sp (*L sullivantii* Gray)." (ewf59)
Sp is a beautiful summer screen when trained on a trellis, with glaucous clasping leaves, clusters of yellow flowers, followed by showy red berries. *Vide infra.*
VHFS: "New" name is *L reticulata* Rafinesque.

Lonicera prolifera

Lonicera tartarica Linnaeus TARTARIAN HONEYSUCKLE,
" Very widely escaped, being common on roadsides, in stream bottoms, in woods, &c" (ewf55)

In a Wisconsin pine plantation, water extracts of leaves from *Prunus serotina* BLACK CHERRY, *Rubus idaeus* RED RASPBERRY, *Eurybia macrophylla* BIGLEAF ASTER, *Lonicera tatarica* TATARIAN HONEYSUCKLE, *Solanum dulcamara* CLIMBING NIGHTSHADE, & *Solidago gigantea* GIANT GOLDENROD reduced red pine height growth, number of secondary needle fascicles, weight increments of roots & shoots, & radicle elongation of red pine seedling (Norby & Kozlowski 1980).

SAMBUCUS Linnaeus **ELDERBERRIES** *Caprifoliaceae Sambucus* (sam-BEW-kus) from the classic Latin name, *sambūcĕus,* of elder, elder, the elder tree, from *sambuca*, Latin a triangular stringed instrument made from elder wood, with a very sharp shrill tone, Latin *sambūca -ae*, from a sp of harp, adopted from Greek σαμβύκη, σαμβύκα, *sambuke*, *sambuka,* probably of Eastern origin, cognate with Aramaic *sabb^{e}kā* which it renders, in the Book of Daniel. Deciduous native shrubs. Fruit is a globose berry, pulpy, 3-seeded. Placed by some authors in *Adoxaceae.*

Elderberry ripens from July to September. Germination is difficult due to dormant embryo & hard seed coat. Recommended pretreatments include: 1) 90 days warm moist stratification followed by 90 days cold moist stratification, 2) 10 to 15 minutes acid scarification (as) followed by 60 days cold moist stratification, 3) warm moist stratification at 15-25º C for 21 days followed by cold moist stratification. Gibberellin (GA3) may help. Elder seeds can be cold moist stratified & spring sown or untreated seed sown soon after collection. Germination will not be complete until the second spring after planting. Germination epigeal. (yy92).

60 days warm moist stratification at 68ºF followed by 90-150 days cold moist stratification at 41ºF. 10-20 minutes in sulfuric acid followed by 60 days cold moist stratification at 34-41ºF. In nursery practice , acid scarified seed is fall sown or acid scarified cold moist stratified seed is spring sown. Complete germination in 2 years. (dh87)

Reported to be a 40-70 germinator, but only a single seed germinated in all his trials. (nd91)

Sambucus canadensis Linnaeus [new nomenclature *Sambucus nigra* L ssp *canadensis* (L) R Bolli AMERICAN BLACK ELDERBERRY] ELDERBERRY, aka AMERICAN ELDER, AMERICAN ELDERBERRY, BLACK ELDER, COMMON ELDER, COMMON ELDERBERRY, GOLDEN ELDER (??? from Anon 1981), MEXICAN ELDERBERRY, *TAPIRO, SUACO*, (*canadensis -is -e* (kan-a-DEN-sis) of or from Canada or the north-east USA, of Canadian origin.) (*niger, nigra, nigrum* (NIG-er) from Latin for black, blackness; shiny black, as opposed to *ater*, matt black.) facw-
Habitat: Fence rows, flood plains, woodlands, open woodlands, rich, moist ground, moist soil along stream or lake borders, old fields, fence rows, & following settlements. Roadsides; often in large numbers at a place. Woodlands, along roads, common. Open woods, thickets, along streams, roadsides.
distribution/range:
Culture: ①Best planted outdoors in the fall (pm09).

seed counts & rates: 150,000 (jfn04), 232,000 (lhn01, aes10) seeds per pound. Very seldom field sown.

cultivation: Transplants easily, BR or B&B. Prefers moist ground. Optimum pH 7.0. Hardy to zone 3. Salt tolerance noted by AES (2010).

greenhouse & garden: Macerate, GA3, or dormant sow in permanent location. ②Alternately macerate fruit, blend with sugar, yeast & water, insert fermentation lock, set aside for 6 weeks; decant liquid & reserve, consume at leisure, & wash seeds clean.

Description: Somewhat woody native shrub, 5-12(-15)'; suckering profusely forming small colonies; coarse canes, filled with light & porous pith; coarse compound leaves; with large umbels of creamy white flowers in June, flowers perfect, with a heavy odor; followed by purple-black berry 0.25"; key features: "Species has cymes which are umbel-like; twigs with white pith; fruit is dark purple." (Ilpin) Cymes fastigiate, leaflets 3 to 5 pairs with an odd one, smooth;
Comments: phenology: Blooms 6,7,8. C3. Individual shoots are not long-lived. Borders, naturalizing, edible landscaping, rain gardens, & wildlife plantings.
Associates: Pollinated by long-tongued bees, short-tongued bees, *Diptera, & Coleoptera*. Stems are important nest sites for carpenter bees. Attracts upland game birds, songbirds, & small mammals eat fruit. Terrestrial furbearers eat fruit & bark. Deer eat twigs & foliage. High wildlife value. Subject to borers, cankers, leaf spots, & powdery mildew, all generally not serious. Walnut tolerant.

ethnobotany: ☠ Some authors say all parts of the plant contain hydrocyanic acid.

Berries available in September & October (easily gathered in quantity). Fruit used in jelly, pies, & wine. Used as medicinal beverage by Menominee & Ojibwa (sm23, den28). Ojibwa, Sauk-Fox, & Iroquois used berry for food (Gilmore 1933, sm28, Waugh 1916). STINKING ELDER known from 7 locations in Juntunen site. ELDERBERRIES have been used in place of BLUEBERRIES when baking muffins.

It is reported that ripe elderberries rubbed on your face are said to repel mosquitoes.
VHFS: Reeseville lists *maxima* a large fruited variety? Mohlenbrock includes var *submollis* Rehder.
Reconcile m14.

Sambucus canadensis

Sambucus racemosa L subs **pubens** (Michaux) House var **pubens** (Michaux) Koehne RED-BERRIED ELDER, aka RED ELDER, SCARLET ELDER, (*racemosus -a -um* (ra-kay-MO-sus) with flowers borne in racemes, in the form of a cluster of grapes, for the elongated inflorescence. New Latin from *racemus*, *recemus,* the stalk or a cluster of a bunch of grapes, & *–osus,* plenitude or notable development, with a raceme, a cluster of flowers each on their own stalk & arranged along a single central stem: *pubens* downy, slightly hairy; 'alternately' full grown, juicy, from Latin *pubens, pubentis*, to the prudish, in full growth, luxuriant, an oblique reference to having attained sexual maturity or having pubic hair. From the nature of their nomenclature, keep your children away from plant taxonomists who often define plants by sexual metaphors.)
Habitat: Rocky woods & dry shade, moist woods. s. distribution/range: NE Illinois cos only.
Culture: propagation: 286,000 (gran) seeds per pound.

cultivation: Shade. Moderately coarse to moderately fine soils. Neutral soils, some acid & base tolerance. Hardy to zone 2.
Description: Native, deciduous shrub, 3-6", much like common elder, but more colonial, inflorescence cone shaped cluster; flowers creamy white blooms April to May, followed by red BB sized berries in June & July. key features: "Cymes panicle-like; twigs with brown pith; fruit usually bright red." (Ilpin) Cymes paniculate & pyramidal, leaflets 2 -3 pairs with an odd one, pubescent beneath
Comments: status: phenology: Blooms April to May. Fruits ripen June & July. C3. Very shade tolerant, flowering even in hemlock woods. Graceful, with long arching branches & long thin leaves.

"It starts to grow much earlier than the above, blooms very early, the fruit beginning to ripen about the time *S canadensis* starts flowering. The berries are conspicuously red; the brown pith is very distinctive.

It is found in the county line woods east of Roscoe & in an oak woods 3 miles southeast of South Beloit near Manchester road. We have not seen it in the neighboring cos." (ewf55)
Associates: Pollinator friendly. Walnut tolerant.
ethnobotany: Berries available June to July. Berry used for food by Ojibwa (Reagan 1928), but inedible according to Fernald & Kinsey (1943). ☠ **FRUIT POISONOUS** according to RRN. Bark used as medicinal plant by Ojibwa, Menominee, & Pottawatomie (sm23, 32, 33).
VHFS: [*Sambucus racemosa* L ssp *pubens* (Michx) House, *S racemosa* L var *pubens* (Michx) Koehne]

SYMPHORICARPOS Duhamel **SNOWBERRY, CORALBERRY** *Caprifoliaceae Symphoricarpos* (sim-fo-ree-KAR-pos) New Latin, from Greek *symphora,* act of gathering or collecting, from *sympherein* to bring together, *symphorein*, bear together from *syn-* & *pherein* to bear, carry, New Latin *-i-* & Greek *karpos,* a fruit, referring to the fruit clusters. A genus of about 17 spp of deciduous shrubs of North America & eastern Asia. Fruit is a berry, globose, 4-celled, 2-seeded, (2 opposite cells abortive) (Wood). Placed by some authorities in the *Adoxaceae*.

Fruits are fleshy drupes, 0.5" dia, dull white, becoming blackish, persistent.

Symphoricarpos albus (Linnaeus) SF Blake SNOWBERRY, aka COMMON SNOWBERRY, *Main'gamuna'tig,* wolf wood (Ojibwa) (*albus -a -um* (AL-bus) from Latin white, *albus*, adjective, particularly a dull rather than a glossy white, or dead white; pale; bright; a general white, referring to the fruit)
Habitat: distribution/range: Introduced from western states.
Culture: propagation:

asexual propagation: Softwood cuttings, hardwood cuttings.

cultivation: Moderate to well drained soils. Hardy to zone 4.

Description: Deciduous, rhizomatous, colonial, native shrub, 2-5'; leaves blue green; flowers tiny, pink 4-merous; followed by large white berries (technically drupes) along stem; key features: " Branches glabrous; leaves glabrous beneath; flowers may also be few & axillary; drupe white. May also be 5-merous." (Ilpin)
Comments: status: Native western USA. phenology: Does well in shade.
Associates: Good forage for livestock & wildlife.

ethnobotany: Root used as medicinal plant by Ojibwa (sm32). Ojibwa physic, root is alterative & tonic (den28).

VHFS: Variety *laevigatus* (Fern) Blake, the GARDEN SNOWBERRY, aka WESTERN SNOWBERRY a western native has escaped in Illinois. (lie-vi-GAH-tus smooth for the leaves & shoots.) [*Symphoricarpos rivularis* Suksd])

Symphoricarpos rivularis Suksdorf SNOWBERRY "Much used as an ornamental & by the State Highway Department on cuts & fills but it shows little tendency to go wild." (ewf55 as *Symphoricarpos rivularis* Suksd)

Symphoricarpos occidentalis Hooker WESTERN SNOWBERRY, aka WOLFBERRY, (*occidentalis -is -e* of the west, western, from Latin *occidens*, *occidentis*, noun, the west, towards the setting sun, & *-alis,* adjective suffix of or pertaining to, as opposed to *orientalis* of China) upl
Habitat: Mesic & dry prairie, dry open ground, sand soil, prairies, & old fields. In the se USA, it favors soils over mafic or calcareous rocks. distribution/range: Occasional in north ½ of state; possibly adventive.
Culture: propagation: ①Moist warm stratify (90-120 days), or dormant seed.

asexual propagation:

cultivation: Hardy to zone 3. Transplants easily.

Description: Erect, deciduous, colonial native (western USA) shrub,1.0-2.0(3.0-4.0)', stoloniferous; leaves bluish; flowers fairly showy pink to white (pinkish), flowers perfect; fruits are fleshy drupes, 0.5" dia, dull white, becoming blackish, persistent;
Comments: status: ET, Nox, weedy in part. phenology: Blooms 6,7,8. Stoloniferous erect shrub with horizontal secondary branches. Suckers profusely forming colonies. "It is said to be native in northern Illinois. We have found it in a number of places both here & in Boone & De Kalb cos but it is always closely associated with a railroad track." (ewf55)
Associates: Insect pollinated. Attracts upland gamebirds, songbirds, & small mammals. High wildlife value. Subject to anthracnose leaf spot.

ethnobotany:

Symphoricarpos orbiculatus Moench CORALBERRY, aka BUCK-BRUSH, INDIAN CURRENT, (*orbiculatus - a -um* **(**or-bik-ew-LAH-tus) circular in outline, disc-shaped, orbicular, round, from Latin *orbis, orbis*, for the orbicular fruit)
Habitat: Many kinds of soil. Dry rocky soil, open woods, thickets, & margins of forests, woods, pastures, hill prairies, rocky bluffs, & old fields. distribution/range: United States & Mexico.
Culture: propagation: ①Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside & allow 2 years for germination (pm09).
asexual propagation: Softwood cuttings, hardwood cuttings.
cultivation: Hardy to zone ?
Description: Densely-branched, fine textured, deciduous native shrub, 2-5'; suckers forming thickets; leaves small; flowers pinkish, perfect; fruits are ±fleshy drupes, 0.25" diameter, red-purple persistent;
Comments: status: phenology: Twigs covered with deep red, small berries into winter. Forms colonies "as some of the new branches are prostrate stolons".
"Roughs" along "the margins of 'sloughs,' and along the courses of small streams" *Symphoricarpos orbiculatus* Moench as *Symphorea racemosa sensu* Short (1845), non (Michx) Pursh (as "*Symphorea"*) (Short 1845).
"Known in a wild state on the dry prairie on the bluff of Rock River west of Rockton & in a wooded pasture 2½ miles west of Harrison." (ewf55)
Associates: Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera, Diptera, Lepidoptera, & Coleoptera.* Attracts upland game birds, songbirds, high winter wildlife value. Upland game birds eat fruit & buds. Songbirds (esp robins) eat fruit. Aquatic furbearers eat bark, fruits, & foliage. Deer eat twigs & foliage. Suffers from anthracnose leaf spot.

TRIOSTEUM Linnaeus **TINKER'S-WEED, FEVERWORT, WILD COFFEE** *Caprifoliaceae Triosteum*
New Latin, short for *Triosteospermum*, from *tri-* & *oste-* & *-spermum*, from Greek τρεις, *treis,* three, & ὀστέον, *osteon,* a bone, & σπέρμα, *sperma,* the stem of σπείρειν, *speirein,* to sow, from the usually *three bony nutlets* of the fruit. 6 spp of Asiatic & North American honeysuckles with butt-ugly flowers that only their mother could love, the 3 North American spp having connate or perfoliate entire leaves & purple or yellowish tubular flowers usually sessile in the axils. Somewhat woody herbs, most attractive in fruit. Fruits are drupaceous, crowned with the calyx, 3-celled, 3-seeded; seeds ribbed, bony. *Triosteum* perfoliatum is the only species commercially available and only as seed.
Culture: ①Dormant seed in permanent location. Many other honeysuckle spp require multiple cold & warm cycles. Wait & hope, learn Finnish while you wait.
asexual propagation: Mature clumps can be divided.
bottom line: Genesis seed tests indicate *Triosteum* seeds are strongly dormant. Plant & wait.

Triosteum aurantiacum Bicknell EARLY HORSE GENTIAN, aka ORANGE-FRUIT HORSE-GENTIAN, (*aurantiacus-a -um* sauranti'acus (locally aw-ran-tye-AK-us, aw-ran-TIE-a-kus) colored orange, orange-red or orange-yellow, in reference to *Aurantia*, an old family name for *Citrus,* of which many fruits have an orange-yellow color.) upland
Habitat: Dry savanna, dry, thin woods, & rich woods. distribution/range:
Culture: ①Dormant seed in permanent location. 2,128, 15,744 (jfn04) seeds.
Description: Erect, perennial, native forb, 2.0-3.0'; stems have some glandular pubescens with less than 3 pairs connate leaves; flowers axillary, red, red-purple (brown-purple), or orange; followed by orange-red berries (a rather dry drupe), crowned with the long, leafy spreading calyx segments; key features: ①"Species usually has spreading glandless hairs; leaves are distinct or with only a few united around stem; corolla is barely bilobate; fruit is a dry drupe; flowers are axillary." (Ilpin)
Comments: status: phenology: Blooms 4,5,6. C3.
"Less common than *T perfoliatum* & like it is found mostly in dry woods & thickets." (ewf55)
VHFS: [*T perfoliatum* L var *aurantiacum* (Bickn) Weig]

Triosteum illinoense (Wieg) Rydb.
"Much like the preceding & as about as common." (ewf55)

Triosteum perfoliatum Linnaeus LATE HORSE GENTIAN, aka FEVERWORT, FEVER-ROOT, PERFOLIATE HORSE-GENTIAN, (*perfoliatus -a -um* perfoliate, with the leaves joined around stem, from Latin *per-*, a prefix, through, extra, very, & *foliatus*, adj, provided with or having leaves) upland
Habitat: Sand prairies, mesic savannahs, dry woods, & thickets. distribution/range:
Culture: ①Further germination pretreatments not sure? (pm09)?
seed counts & rates: 8859 (gnhm11), 9257 (gnhm13), 10,000 (gn), 11,529 (gnam06) seeds per pound.
availability: Availability is limited to the extent this sp should not be part of any general seed mix.
bottom line: Genesis seed tests indicate *Triosteum* seeds are strongly dormant. Germ 1.4, 1.0, 1.0, sd 1.0, r0.0-3.0 (3.0)%. Dorm 83, 78, 95, sd10.2, r70-95 (25)%. Test 32, 33, na, 25-39 days.**
greenhouse & garden: Dormant seed in permanent location.
Description: Erect, perennial, native forb,1.5-3.5'; at least 3 or more pairs of connate leaves; flowers axillary, yellow-green to purple flowers; followed by orange-yellow drupes; key features: "Corolla is campanulate, barely bilobate, 3-4 per axil, yellowish, greenish, dull purple; hairy; leaves are united around stem." (Ilpin)
Comments: status: phenology: Blooms May to July. C3. Landscaping, interesting specimen plants adding structure & texture, shade gardens, flowers that only a mother could love. "Perhaps the most common sp. It often grows with *T aurantiacum*. Individuals in this genus are inclined to vary greatly in leaf shape & pubescence." (ewf55)
Associates: ethnobotany: Species is mildly cathartic & in large doses emetic. The dried & roasted berries were used as a coffee substitute.

VIBURNUM Linnaeus 1753 **VIBURNUM** *Caprifoliaceae Viburnum* (vee-BUR-num) from the Latin name for *Viburnum lantana*, WAYFARING TREE; alternately from Latin *viere,* to tie, referring to the pliancy of the twigs. A genus of about 150 spp of deciduous & evergreen shrubs & small trees, mostly temperate, primarily in Asia & North America. White flowers in cymes, at times brilliant. Fruits are 1-seeded drupes. Placed by some authorities in the *Adoxaceae*.

Viburnum lentago & *V trilobum*, NANNYBERRY & AMERICAN CRANBERRY BUSH generally produce fruit every year. Dry seed can be stored for years. *Viburnum* seeds have both embryo dormancy & hard seed coats. Germination standards are 20-30º C & light for 8 hours per day. Seeds are commonly sown in nurseries in the spring for germination the following spring. Germination is epigeal. (yy92).

NANNYBERRY requires 150-270 days of warm moist stratification at 68/86º F. followed by 60-120 days cold moist stratification at 41º F. CRANBERRY bush germinates with 120 days warm moist stratification followed by 90 days cold moist stratification. (dh87) Many *Viburnum* are self-incompatible.

Viburnum acerifolium Linnaeus MAPLELEAF VIBURNUM, aka *ANOB,* ARROW WOOD, DOCKMACKIE, MAPLE-LEAVED ARROW-WOOD, (*acerifolius -a -um* maple-leaved, with leaves like *Acer*, Maple.)
Habitat: Dry or rocky woods, moist woods, wooded slopes. distribution/range: Northeast 1/4 of Illinois.
Culture: propagation:
asexual propagation: Softwood cuttings.
cultivation: Prefers well-drained soil & full sun (Great Lakes Nursery?). Optimum pH 6.2. Hardy to zone 3. Transplants easily, B&B or container grown.
Description: Sprawling, native shrub of deep shade, (4-)6-15', suckers from base forming large colonies, fall colors pastels cream, pink, & red, or rose to red to purple; flowers white (cream-white) perfect; fruit is fleshy blue-black drupe, 0.33" diameter;
Comments: status: phenology: Blooms May to June.
"Uncommon; county line woods east of Roscoe, North Kinnikinnick Creek, & in Kishwaukee River Forest Preserve." (ewf55)
Associates: Probably pollinated by *Hymenoptera* & *Diptera*. Attracts upland gamebirds, songbirds, game mammals & small mammals, high wildlife value. Used by ruffed grouse, cedar waxwing, red squirrel, chipmunk, & deer. Seldom bothered by pests.
ethnobotany: Used as medicinal beverage by Menominee & Ojibwa (sm23, den28). Ojibwa emetic (den28). Bark formerly used as astringent (den28).

Viburnum cassinoides Linnaeus WITHE-ROD, aka NORTHERN WILD RAISIN, SHONNY-HAW, WITHEROD VIBURNUM; (*cassinoides* (ka-si-NOI-deez) cassine-like, like *Ilex cassine.*)
Habitat: Wet to mesic soils, prairies or savannas. distribution/range:

Culture: propagation: ①Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside & allow 2 years for germination (pm09).
asexual propagation: Softwood cuttings.
cultivation: Hardy to zone 3.
Description: Erect, deciduous, native shrub, 6'; leaves deep lustrous green, red fall color; flowers white; fruit bright pink turning blue;

Viburnum dentatum Linnaeus SOUTHERN ARROWWOOD, aka ARROW-WOOD VIBURNUM, (*dentatus -a -um* toothed, toothed like saw teeth.)
Habitat: Low woods. distribution/range: Native to east USA Rare in Illinois, Hardin, Jackson, & Pope cos.
Culture: propagation: ①Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside & allow 2 years for germination (pm09).
asexual propagation: Softwood cuttings.
cultivation: Hardy to zone 3.
Description: Deciduous, native shrub, medium tall; leaves dull to glossy green, fall color yellow to burgundy; flowers creamy white; clusters of blue fruit in late summer.
Associates: ethnobotany: Bark smoked by Ojibwa (sm32).
VHFS: Mohlenbrock lists *V d* var *deamii* (Rehd) Fern. Blooms May to June. Reeseville lists var *pubescens*, DOWNY ARROWWOOD VIBURNUM, denser growing, deep green glossy leaves & later flowers & fruit. Numerous cultivars are available.

Viburnum dentatum lucidum [*Viburnum recognitum*] ARROW WOOD VIBURNUM, (*dentatus -a -um* toothed, toothed like saw teeth. *lucidus -a -um* shining, glistening, reflecting, from Latin *lucid*, bright, shining, clear, transparent.) Facultative Wet (+)
Habitat: distribution/range:
Culture: propagation: ①Seeds reported to need warm moist stratification followed by cold moist stratification.
asexual propagation:
cultivation: Prefers dry to moist soil. Nutrient load tolerance low to moderate, salt tolerance not available, siltation tolerance low to moderate. Partial to full sun. pH not available. Available bare root or B&B.
Description: Deciduous, native shrub, up to 10'; spreads vegetatively; white flowers in May to June;
Comments: status: phenology: Blooms 5-6. Useful for slope stabilization.
Associates: Provides cover & nesting habitat for songbirds.

Viburnum edule (Michaux) Rafinesque SQUASHBERRY, aka MOOSEBERRY, *PIMBINA,* (*edulis -is -e* edible, eatable)
Habitat: Woods & thickets, more boreal. distribution/range:
Associates: ethnobotany: Berries available in August to September & lasting over winter.

Viburnum lentago Linnaeus NANNYBERRY, aka SHEEPBERRY, (*lentago* flexible, pliant, tough but flexible, lasting, from the Latin adjective *lentus -a -um,* with the feminine suffix, a name used by Linnaeus.) Facultative (+)
Habitat: Moist woods, stream banks, fencerows. Forest borders, stream banks, roadsides & woods, moist woods. Moist to saturated soil in mesic woods. distribution/range: Occasional in n ½ of Illinois.
Culture: propagation: ①Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside & allow 2 years for germination (pm09). ②Remove pulp prior to other pretreatments. Double dormant, moist warm stratify (150-180 days), followed by moist cold stratify (60-120 days).
seed counts & rates: 5,600 (aes10), 5,700 (lhn91), 6,000 (jfn04) seeds per pound.
availability: Available as BR, B&B or container grown material
asexual propagation: Softwood cuttings.
cultivation: Said to be tolerant of 1" occasional standing water. pH 6.0-7.5. Nutrient load tolerance moderate, salt tolerance low, siltation tolerance low. Partial shade to full sun, shade tolerant. Hardy to zone 3.. Rapid growth rate, 2-2.5' per year. Can be trained single stemmed & tree-like.

Description: Deciduous native shrub or small tree, tall to 15(-18) (35)', suckering, fine textured; leaves peach-like, fall color red; flowers creamy white; followed by clusters of blue-black, multi-colored fruit; key features: "Species is glabrous; petioles are irregularly wing-margined; cymes are sessile, petioles of leaves subtending the cymes; drupes are blue-black with whitish bloom." (Ilpin)
Comments: status: phenology: Blooms 4,5,6. C3. Spreads vegetatively by suckers. Used in rain gardens, upper shoreline zones, streambank stabilization, & upland slope stabilization. Very adaptable & rugged.

"Leaves large & long acuminate compared with the next (*V prunifolia*). Common on stream banks, fence-rows, the border of woods, &c" (ewf55)
Associates: Attracts birds, provides cover & nesting habitat for gray catbird, common flicker, American robin, eastern bluebird, cedar waxwing, ruffed grouse, & others. Used by red squirrel, & chipmunk. Deer eat the fruit, leaves, & stems.

ethnobotany: Edible fruit. Berry used for food by Ojibwa, Menominee, & Iroquois (sm32, 33; Waugh 1916). Bark used as medicinal plant by Ojibwa (sm32).
VHFS: If you feel you have more discerning taste than Mother Nature, some 'improved' selections are available.


Viburnum lentago fall color

Viburnum pauciflorum Pylaie HIGHLAND CRANBERRY, as Ojibwa food (den28)

Viburnum prunifolium Linnaeus BLACKHAW, aka BLACKHAW VIBURNUM, NANNYBERRY, SMOOTH BLACKHAW, (*prunifolius -a -um* with leaves like *Prunus,* prune-leaved.)
Habitat: "Common on streambanks & in the edges of woods. Likely to be in dried places than the last (*V lentago*). On bluffs it tends to assume tree form & in such places the bark is very dark, quite rough & is broken into short segments & the leaves are thick, shiny on top & are a trifle scurfy. Small trees are found on Kishwaukee River above the Forest Preserve bridge & are suggestive of *V rufidulum* which is a southern shrub." (ewf55) distribution/range:
Culture: propagation: ①Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside & allow 2 years for germination (pm09).

seed counts & rates: 4,960 (aes10), 5,000 (lhn91), 7,504 (jfn04) seeds per pound.

asexual propagation: Softwood cuttings.

cultivation: Some salt tolerance noted by AES (2010). Optimum pH 6.2. Hardy to zone 4.
Description: Small native tree, 12-15(-20)'; leaves thick green, fall color purple; flowers creamy white, followed by blue-black fruit:
Comments: status: phenology: Good for hedges. Medium grower.
Associates: Used by ruffed grouse, cedar waxwing, red squirrel, chipmunk, & deer.

ethnobotany: Fruit used for preserves.
VHFS: 'Early Red' from Reeseville, reddish new leaves, red fall color,

Viburnum rafinesquianum Schultes DOWNY ARROW-WOOD, aka ARROW-WOOD, MISSOURI VIBURNUM, RAFINESQUE VIBURNUM, (*rafinesquianus -a -um* for Constantine Samuel *Rafinesque*, (or Rafinesque-Schmaltz) 1783–1840, of French & German parents, long a resident of Sicily, a naturalist & polymath who

traveled widely in nineteenth-century America. Rafinesque named many American plants, including *Ratibida*. In his time, he was considered a few fries short of a happy meal, & his work was often rejected, but often later proven correct.) upl
Habitat: Fens, wet savannas, wooded slopes, rocky woods. Wooded slopes, rocky woods & bluffs, rocky streambeds. distribution/range: Occasional in n ½ of Illinois, extending s to Clark & Coles cos.
Culture: propagation: ①Seed is double dormant; sow fresh seed in garden bed in late fall for germination in two years.
asexual propagation: Softwood cuttings;
cultivation: Transplants easily, B&B or container.
Description: Deciduous, native shrub, 3.0-6.0', nice full growth, suckers to form thickets; leaves glossy-green, thick, turning rich burgundy in fall, color persisting for weeks; flowers white, perfect; fruit is fleshy, glossy, blue-black drupe, 0.375" diameter, oval; key features: ①"Species has short pubescent petioles, downy when young; lower surface of leaves is softly pubescent; leaves are straight veined ending in teeth; drupe is blue-black." (Ilpin)
Comments: status: phenology: Blooms 5,6. C3.
"The pubescent sp & the more glabrous var *affine* (Bush) House are about equally frequent in the county. They are found on Kishwaukee River & Hall Creek but are most common in the county line woods east of Roscoe." (ewf55)
Associates: Probably pollinated by *Hymenoptera* & *Diptera*. Attracts upland game birds, songbirds, game mammals, & small mammals, high wildlife value. Seeds are dispersed by birds & mammals. The sp is subject to powdery mildew, but KRR says seldom bothered by pests.

Viburnum recognitum Fern SMOOTH ARROWWOOD, aka SOUTHERN ARROW-WOOD, (*recognitus -a -um* restudied, reconsidered**.)** facw-
Habitat: Mesic to dry savannas, woodlands along streams. distribution/range: occasional in s. 1/2 of Illinois, also northeast Illinois.
Habitat: distribution/range:
Culture: propagation: ①Seed is double dormant; sow fresh seed in garden bed in late fall for germination in two years. ②Alternately, warm moist stratify (360-480 days) & moist cold stratify (15-30 days).
asexual propagation: Cuttings.
Description: Deciduous, native shrub, to 10'; flowers white; key features: ①"Branchlets & petioles are glabrous; without stipules; drupe is blue-black." (Ilpin)
Comments: status: phenology: Blooms 6,7. C3.
VHFS: [*V dentatum* L var *indianese* (Rehd) Gl]

Viburnum dentatum lucidum (*V recognitum*) ARROW WOOD VIBURNUM, Facultative Wet(-)
Habitat: Dry to moist soil. distribution/range:
Culture:
Description:

Viburnum trilobum Marshall *IN, OH [new name *Viburnum opulus* L subsp *trilobum* (Marshall) RT Clausen] HIGHBUSH CRANBERRY, aka AMERICAN CRANBERRY VIBURNUM, *PIMBINA,* (*trilobus -a -um* three lobes, from Latin *tri*, prefix from *tres*, three, & Late Latin *lobus*, husk, pod, noun from Greek λοβος, *lobos*, lobe of the ear, the liver, or lung, also a capsule or pod of a legume) facw
Habitat: Mesic woodland, moist woods, rare, low grounds, streambanks, & swamp borders.
distribution/range:
Culture: propagation: ①Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside & allow 2 years for germination (pm09). ②Double dormant, spring plant treated seeds. ③Alternatively, sow fresh seed in garden bed in late fall for germination in two years.
seed counts & rates: 1,296 (jfn04), 13,200 (lhn91) seeds per pound.
asexual propagation: Softwood cuttings.
cultivation: Optimum pH 6.0. Adaptable. Hardy to zone 3.
Description: Deciduous, native shrub 8-12'; deep green foliage, often reddish when new; fall color yellow red to red to purple; white flowers with a few sterile outer flowers, & red edible fruit; key features: "Marginal flowers are neutral & irregular; leaves are long-pointed & entire in the sinuses; drupe is orange to red." (Ilpin)

Comments: status: Endangered in Indiana. Threatened in Ohio. phenology: Blooms 6-7. C3. Does well in upland situations.

"We know of one place in the county where this is unquestionably wild -at the "ledges" of South Kinninnick Creek. It is much used in ornamental planting." (ewf55)

Associates: Used by ruffed grouse, cedar waxwing, fox squirrel, eastern chipmunk, & white-tailed deer.

ethnobotany: Fruits are edible. Berries available in September & lasting through winter. Used for food by Ojibwa, Menominee, & Iroquois (Gilmore 1933, sm23, Waugh 1916). Bark used as medicinal plant by Ojibwa (sm32). Used for bait in snares for snowshoe rabbits.

CARYOPHYLLACEAE AL de Jussieu 1789 **PINK FAMILY** 86 genera & 2200-2300 spp of herbs, shrubs, & trees, nearly worldwide, but mostly Northern Hemisphere.

ARENARIA Linnaeus 1753 **SANDWORT, GROVE SANDWORT** *Caryophyllaceae* *Arenaria* New Latin, sand-dweller, from Late Latin *(h)arenaria,* feminine of *(h)arenarius* of sand, from *(h)arēna, (h)arēnae*, sand, a common habitat for most spp. Widely distributed, chiefly low-tufted herbs with sessile leaves. *Arenaria serpyllifolia*, Eurasian annual sprawling weed with opposite entire leaves & paniculate small white flowers, is naturalized throughout North America. Fruits are 3-valved capsules.

Arenaria lateriflora Linnaeus SANDWORT "Common in upland & lowland woods & on low prairies" (ewf55). Known from Wacktown Timber, ne of Tailholt, Bureau Co. distribution/range:
New nomenclature *Moehringia lateriflora* (L) Fenzi (m14).

Arenaria serpyllifolia Linnaeus THYME-LEAVED SANDWORT
"Not common but abundant when found. Rock River Bluff west of Rockton, C & NW row at Fannan's Crossing west of Rockford." (ewf55) Native to Europe & Asia.
(m14)

Arenaria stricta Michaux STIFF SANDWORT, aka ROCK SANDWORT
Habitat: Dry sandy prairies & savannas. "Locally common in its preferred habitats which are common in this county; gravel hills & stream banks, dry prairie hill-tops, limestone prairies & limestone outcrops" (ewf55). distribution/range
Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. (pm09). ②Seeds germinate after about 60 days of cold, moist stratification (he99). ③Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn).

seed counts & rates: 3,840,000 (pm02) seeds per pound.
Description: Moss-like cushions to 6" diameter; 4-16" tall; flowers white (pink);
Comments: status: phenology: Blooms June-July. Collect seed August-September.
VHFS: New nomenclature *Minuartia michauxii* (Fenzi) Farw (m14). Formerly included in *Alsine*.

Arenaria stricta

CERASTIUM Linnaeus 1753 **MOUSE-EAR CHICKWEED, MOUSE-EAR** *Caryophyllaceae* A genus of about 100 spp of herbs, nearly cosmopolitan, but especially north temperate. *Cerastium* Greek κέρᾶς,

keras, horn, alternately New Latin, from Greek *kerastēs* horned, & New Latin *-ium,* either alluding to horn-like shape of capsule of some spp. Fruits are cylindrical or roundish capsules.

Cerastium brachypodium (Engelmann ex Gray) BL Robinson "Rare; we have found it only on the C & NW row west of Rockford" (ewf55).

Cerastium nutans Rafinesque "Common in damp places in gardens, lawns, on stream banks, &c" (ewf55)

Cerastium vulgatum Linnaeus MOUSE-EAR CHICKWEED, "A common harmless weed of cultivated ground & waste places" (ewf55).

GYPSOPHILA Linnaeus **BABY'S BREATH** *Caryophyllaceae Gypsophila* (gip-SOF-i-la) New Latin, from *gypso-* from Latin *gypsum*, a plaster figurine, *gypsatus*, covered with gypsum, whitened, & Latin – *phila, -philus*, adjective from Greek φιλοσεον, *philoseon*, loved, loving, friendly, fond, in reference to some spp growing on lime. Large genus of Old World annual & perennial herbs having small delicate paniculate flowers with naked gamosepalous calyx & 5-clawed petals. *Gypsophila paniculata* L is a noxious weed, persistent, & invasive.

Gypsophila elegans Bieb. BABY'S BREATH, aka SHOWY BABY'S BREATH, *elegans* (AY-le-gahnz) elegant, from Latin *elegans, elegantis*, choice, fine, neat, tasteful, luxurious, or sometimes in bad sense fastidious, fussy, or too nice.)
Habitat: Native to the Caucasus & West Asia.
Culture: If planted early spring, it will bloom in 60 days. 400,000 (gran) seeds per pound. Pure stand plant 10 lb per acre (gran).
cultivation: Low to moderate moisture requirements. Coarse to moderately fine soils. Neutral to basic soils. Some shade tolerance.
Description: Introduced annual/biennial, 12-18", with fine textured white flowers in early spring (summer), recommended by some for roadsides, & seed mixes. Widely adaptable.
VHFS: *Gypsophila elegans* M Bieb var *elegans* M Bieb [superfluous autonym]

LYCHNIS Linnaeus 1753 **CAMPION** *Caryophyllaceae Lychnis* New Latin, from Latin, a red flower, from Greek; alternately Greek λυχνος, *lykhnos,* lamp, in reference to some cottony sp having been used for lamp wicks, akin to *leukos* bright, white. Fruits are capsules more or less 5-celled at the base.

Lychnis alba Mill EVENING CAMPION,
"A common, introduced sticky weed of fields, roadsides, & waste places" (ewf55).

Lychnis dioica Linnaeus RED CAMPION,
"Well established as an escape in a number of places about Rockford" (ewf55).

PARONYCHIA P Miller 1754 **WHITLOW-WORT, NAILWORT** *Caryophyllaceae Paronychia* New Latin, from Greek *parōnychia*, from Greek παρὰ, *para-*, beside, & ὄνυξ, *onyx,* the nail, or *onychos*, beside the nail or fingernail, i. e. the whitlows, a plant reputed to be a supposed cure for whitlows, from *parōnychia* whitlow, or felon, an inflammation of the tissues adjacent to the nail of a finger or toe usually accompanied by infection & pus. Fruits are 1-seeded utricles. Formerly placed in the *Illecebraceae*, the WHITLOW-WORT family.

Paronychia canadensis (Linnaeus) Wood FORKED CHICKWEED, aka CANADA WHITLOW-WORT, TALL FORKED CHICKWEED,
"Rather common in dry woods especially in sandy soil" (ewf55).

SAPONARIA Linnaeus 1753 **SOAPWORT** *Caryophyllaceae Saponaria* soapy, having soap-like qualities, New Latin, from Medieval Latin, feminine of *saponarius,* of soap, from Latin *sapon-, saponis, sapo,* soap, & *-arius* -ary, pertaining to, in reference to the sap. Fruits are 1-celled capsules.

Saponaria officinalis Linnaeus BOUNCING BET, aka SOAPWORT, "Common throughout" (ewf55).

Saponaria vaccaria Linnaeus COW-HERB, "An uncommon introduced weed that resembles *Silene antirrhina*" (ewf55).

SCLERANTHUS Linnaeus 1753 **KNAWEL** *Caryophyllaceae* Formerly placed in the *Illecebraceae,* the Whitlow-wort family.

Scleranthus annuus Linnaeus KNAWEL, Introduced from Asia. "Found occasionally in waste places" (ewf55).

SILENE Linnaeus 1753 **CATCHFLY, CATS FLY, CAMPION, FIRE-PINK, WILD PINK** *Caryophyllaceae* *Silene* New Latin, probably from Latin *silenus, Silenus*, from Greek *silēnos,* from *Silēnos, Silenus,* the intoxicated foster father & companion of Dionysus (or Bacchus). Silenus had human form but with a horse's ears & tail & occasionally with the legs of a horse or goat & being one of the companions of Dionysus but usually distinguished from a satyr by being always old, frequently bald, & always bearded. He was also described as being covered with foam or slaver. The name may be a reference to viscid secretion (sticky sap) covering the stems of many spp. The sap is sticky enough to trap small insects, hence CATCHFLY. A genus of ca 700 spp of Eurasia & North America. Fruits are 3-celled capsules.

Seeds ripen in early to late summer, 3-4 weeks after flowering. The mature, brown capsules open & allow the seeds to scatter. Harvest when capsules are yellow. Moist cold stratify seed. Transplant seedlings when one inch across. Cullina code B seed will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF. Many spp produce short stolons after flowering, which can be used as cuttings or allowed to self-root & used as divisions. (cu00)

Silene antirrhina Linnaeus SLEEPY CATCHFLY, aka GARTER-PINK, SNAP-DRAGON CATCH-FLY, 160,000 (sh94) seeds per pound.
Comments: "A common weed in fields, gardens, & waste areas preferring sandy soil" (ewf55).

Silene armeria Linnaeus SWEET WILLIAMS CATCHFLY, aka CATCHFLY, GARDEN CATCHFLY, NONE-SO-PRETTY, SWEET-WILLIAM,
Habitat:
Culture: ① "No pre-treatment needed. Sow seeds on soil surface at 70ºF & water." (ew12)
seed counts & rates: 3,547,000, 3,900,000 (gran), 4,000,000 (ew12) seeds per pound. Pure stand plant 1 lb per acre (gran).

cultivation: Space plants 1.25-1.5' centers. Mesic soils, full sun to partial shade. Wide range of soils, low to moderate water requirement, full sun or partial shade. Moderately coarse to moderately fine soils. Neutral soils, some acid & base tolerance
Description: Introduced annual, 2.0-4.0", with pink flowers summer to fall. Used as a component for quick color in meadow mixes. Seed source commercial stock. "Occasional in vacant lots, on street sides & in alleys in Rockford" (ewf55).
Associates: Attracts birds, bees, & butterflies.

ethnobotany:

Silene cserei Baumgarten BALKAN BLADDER-CAMPION, "Similar to but much less common than the preceding (*S cucubalus*). C & NW Ry row at the Kent Creek bridge west of Rockford." (ewf55)

Silene cucubalus Wibel BLADDER CATCHFLY, "Common in fields, & on railroads & roadsides" (ewf55).

Silene dichotoma Ehrhart FORKED CATCHFLY, "An uncommon catchfly which resembles *S noctiflora* & *Lychnis alba*. Killbuck Creek bottom near the Ogle Co line & at the viaduct on Camp Grant "Belt Line" west of New Milford.' (ewf55)

Silene nivea (Nuttall) Muhlenberg ex Otth SNOWY CAMPION, AKA EVENING CAMPION, WHITE CAMPION, Alluvial woods. distribution/range: New Jersey & Pennsylvania, west to Wisconsin, Minnesota, & South Dakota (outliers in Black Hills in BONAP), south to Virginia, Tennessee, Missouri & eastern Nebraska; also Maine & Georgia. Probably introduced in Maine.

①60 days cold moist stratification (pm09). ②"No pre-treatment needed. Sow seeds on soil surface at 70ºF & water." (ew12) 512,000 (ew12) seeds per pound.

cultivation: Space plants 0.25-0.75'. Mesic to moist soils, full sun to partial shade.

N 2n = 48.

"The least common of our catchflys. Found occasionally in thickets, deep woods & ravines. Flowers sparingly & is never in large patches." (ewf55)

Attracts hummingbirds.

Silene noctiflora Linnaeus STICKY COCKLE, aka NIGHT-FLOWERING CATCHFLY, STICKY CAMPION, viscid pubescent

"A common introduced weed" (ewf55).

Silene regia Sims *GA, IL, IN ROYAL CATCHFLY, aka SPLENDID CATCHFLY, WILD PINK, upl

Habitat: Mesic to dry prairies & savannas, rare prairie, mesic to dry mesic railroad prairie. In the se USA, prairies & calcareous woodlands & forests (w07). distribution/range:

Culture: ①Cold moist stratification (Wade 1995). ②"Moist cold treatment has been successful. Light cover. Very good germination. Watch overwatering." (mfd93) ③60 days cold moist stratification (pm09). ④Fall plant or cold stratify at 40ºF for 1 month for best results. Sow seeds on soil surface at 70ºF & water." (ew12) ⑤Sow at 20ºC (68ºF), if no germination in 3-4 wks, move to +2 to +4ºC (34-39ºF) for 2-4 wks (tchn). 368;000 (jfn04,ew12), 448,000 seeds per pound.

cultivation: Space plants 1.0-1.5'. Mesic soils, full sun to partial shade.

asexual propagation: Division of mature plants.

bottom line: Dormant seed only. Seeds have a strong requirement for dormant seeding. Germ 3.0-15%. Dorm 82-95%. Test 14-31 days.(#2)**

Description: 2.0-4.0'; red flowers, N 2n = 48.

Comments: status: Rare in Georgia. Endangered in Illinois. Threatened in Indiana. phenology: Blooms Attractive cut flowers & dried seed heads.

Associates: Attracts hummingbirds. Performs well under black walnuts.

ethnobotany:

Silene stellata (Linnaeus) WT Aiton, *MI, WI STARRY CAMPION, aka WIDOW'S-FRILL, upl

Habitat: Dry & sand prairies, mesic & dry savanna, woods, dry, rather open woodlands, & prairie habitats. In se USA prairies & calcareous woodlands & forests; rare (w07). distribution/range:

Culture: ①Cold moist stratification (Wade95). ②60 days cold moist stratification (pm09). Fall plant or cold stratify at 40ºF for 1 month for best results. Sow seeds on soil surface at 70ºF & water. (ew12). 100,800 (aes10), 480,000 (pm,jfn04,ew12), 516,628 (gnh13), 1,008,000 seeds per pound.

cultivation: Space plants 1.0-1.5'. Mesic soils, full sun to partial shade.

asexual propagation: Division of mature plants. Cuttings.

bottom line: Dormant seed only. Seeds have a strong requirement for dormant seeding. Germ 1.0-12%. Dorm 82-96%. Test 14-42 days. (#3)**

Description: Native, erect, perennial forb; 2.0-4.0'; flowers white;

Comments: status: Threatened in Michigan. Endangered in Wisconsin. phenology: Blooms 7,8,9,10. landscaping Seed source nursery production, genetic source RIRR, Wyanet Twp, Bureau Co, Tampico Twp, Whiteside Co, & Kane Co (Horlock).

Bob Horlock was Seedsman for The Natural Garden in the 1980s & early 1990s, & a pioneer in this industry. We were fortunate to have a friendly business relationship with Bob during the early years of our nursery. Bob's seeds were collected in DuPage, Kane, & Will Cos. We traded back & forth with him, & several of our production plots originate from his collections. Bob passed away in the early 1990s.

"Common in woods & thickets. It is very showy, having numerous flowers, & it grows in large patches. Our most common native catchfly. We have seen none that were not pubescent." (ewf55)

VHFS: [*Silene stellata scabrella* Palmer & Steyermark]

Pink *Silene stellata,* west of Peoria.
Photo courtesy James Marcus Aurelius Alwill.

Silene virginica Linnaeus *FL, MI, WI FIRE PINK UPL
Habitat: Woodlands. "Deciduous woodlands, bluffs, moist wooded slopes; 200-1300 m" (fna).
distribution/range:
Culture: propagation: ①"No pre-treatment needed. Sow seeds on soil surface at 70ºF & water." (ew12) 416,000 (jfn04, ew12) seeds per pound.
cultivation: Space plants 1.0-1.5'. Mesic to dry soils, full sun to partial shade. Zone 4-8.
Description: Perennial, 0.5-1.5(2.5)'0.75-1.5' spread 2n = 48.
Comments: Endangered in Florida & Wisconsin. Threatened in Michigan. phenology: Blooms April-June (August).
Associates: Attracts hummingbirds.
ethnobotany:

STELLARIA Linnaeus 1753 **CHICKWEED, STITCHWORT, STARWORT** *Caryophyllaceae Stellaria* New Latin, from Latin *stella, stellae,* star & New Latin *-aria*, a possible reference to the stellate or star-like shape of the flowers. A genus of about 120-200 spp, cosmopolitan, but centered in Asia. Fruits are ovoid, 1-celled capsules.

Stellaria aquatica (Linnaeus) Scop. WATER CHICKWEED,
"Common on Kishwaukee River bank in this & in DeKalb Co. It continues to grow & bloom until winter is well established." (ewf55)

Stellaria graminea (Linnaeus) COMMON STITCHWORT, aka LESSER STITCHWORT,
Introduced from Europe.
"Not common but occasionally found in a large patch on a moist roadside" (ewf55).

Stellaria longifolia Muhlenberg LONGLEAF STITCHWORT, "Locally frequent in boggy places in Coon & Kent Creek bottoms" (ewf55).

Stellaria media (Linnaeus) Cyril. CHICKWEED, (perhaps *S media* (L) Cirillo)
"A common naturalized annual weed of fields, lawns, & waste ground" (ewf55).
Uses: FOOD(Leaves); ANIMAL FOOD(Aerial Parts); MEDICINES(Skin/Subcutaneous Cellular Tissue Disorders); ENVIRONMENTAL USES(Soil Improvers)
germ info at
http://epic.kew.org/searchepic/detailquery.do;jsessionid=BDBAE176F5E084FA6E18284F145095B6?requiredPage=1&scientificName=Stellaria+medi*&datasources=ipni&datasources=mc&datasources=kr&datasources=ebbd&datasources=libcat&datasources=pmb&datasources=herbcat&datasources=ecbot&datasources=

livcoll&datasources=sid&datasources=sepasal&datasources=efz&categories=names&categories=bibl&categories=colln&categories=taxon&categories=flora&detailDatasource=sid

CERATOPHYLLACEAE SF Gray 1821 **HORNWORT FAMILY** A family of a single genus with about 6 spp of aquatic herbs, cosmopolitan. "A peculiar & apparently very primitive family…the *Ceratophyllaceae* "may have actually arisen from early angiosperms that existed prior to the fundamental divergence of monocots & dicots (Les 1988c, Less in Kubitzki, Rowher, & Bittrich 1993)" (from Weakley 2007). Fossils are known from the Lower Cretaceous, indicating this family is one of the oldest living angiosperm lineages.

Ceratopyhllum Linnaeus 1753 **HORNWORT, CORNIFLE** *Ceratophyllaceae Ceratophyllum* (ke-ra-to-FIL-lum) from Greek *keras*, a horn, & *phyllon*, a leaf, for the resemblance of the leaves to antlers. A genus of six spp of cosmopolitan aquatic herbs. X = 12, 19, 20.

Ceratopyhllum demersum Linnaeus COONTAIL, aka COON'S-TAIL, *CORNIFLE NAGEANTE*, HORNWORT, (*demersus -a -um* (day-MER-sum) growing under water, submerged)
Habitat: Submerged or floating in muck bottomed sloughs, ponds, lakes, or slow streams. This is the most common spp in the New World, & the least likely to be found with fruit. "Rather common in quiet water in all the northern cos" (ewf55). distribution/range:
Culture: Plant at 6 bushels per acre (Anon 1981)
Description: Aquatic herb, 2n = 24, 38, 40, 48.
Associates: Waterfowl eat plants & seeds. Marsh birds & shorebirds eat seeds. Fish eat the plants. Provides cover for predator & prey fish.

CHENOPODIACEAE Ventenat 1799 **GOOSEFOOT FAMILY**

ATRIPLEX Linnaeus 1753 **ORACH** *Chenopodiaceae*

Atriplex hastata Linnaeus "A cosmopolitan weed which is much like the following (*A patula*) & equally as common" (ewf55).

Atriplex patula Linnaeus COMMON ORACH, aka SPEAR ORACH, "Being cosmopolitan we have not classed these as introduced" (ewf55).

CHENOPODIUM Linnaeus 1753 **GOOSEFOOT, LAMB'S-QUARTERS, PIGWEED** *Chenopodiaceae Chenopodium* (kay-no-PO-dee-um) from Greek *chen*, a goose, & *podion,* a foot, for the shape of the leaves. A genus of about 140 spp of annual & perennial herbs, shrubs, & small trees, nearly cosmopolitan.

Chenopodium album Linnaeus LAMB'S QUARTERS, aka PIGWEED, "A common introduced weed" (ewf55).

Chenopodium ambrosioides Linnaeus EPAZOTE, aka MEXICAN TEA, AMERICAN WORMSEED, HIERBA SANTA MARIA,
Culture: No treatment. 1100 seeds per gram.
"An introduced weed that is found occasionally on railroad tracks & in waste places" (ewf55).
Associates: ethnobotany: Added to Mexican bean dishes to prevent gas. Garden annual, used as a vermifuge.
VHFS: [*C anthelminticum*]

Chenopodium berlandieri Moquin-Tandon "A weed of dry waste places" (ewf55).

Chenopodium botrys JERUSALEM OAK, aka FEATHER GERANIUM, OAK-OF JERUSALEM,
Sweet scented

Chenopodium capitatum (Linnaeus) Aschers STRAWBERRY BLIGHT, aka INDIAN PAINT,
Associates: ethnobotany: Used as medicinal plant by Pottawatomie (sm33). Also used for dream dance

paint.

Chenopodium glaucum Linnaeus OAK-LEAVED GOOSEFOOT,
"An occasionally seen introduced weed with a fleshy often prostrate stem" (ewf55).

Chenopodium hybridum Linnaeus MAPLE-LEAF GOOSEFOOT, "A native weed that is found in thickets, ravines, & rocky places. (var *gigantospermum* (Aellen) Rouleau)" (ewf55)

Chenopodium spp GOOSEFOOT, aka LAMBSQUARTERS, PIGWEED, CHENOPOD**,**
Habitat: Cultivated & waste ground.
Associates: ethnobotany: Greens in early summer & seeds in autumn to early winter. Greens used as food by Ojibwa, Pottawatomie, & Iroquois, & seeds by Ojibwa (Stowe 1940, sm33, Waugh 1916). Archaeological occurrences are frequent.

Chenopodium standleyanum Aellen WOODLAND GOOSEFOOT, upl
Culture: No treatment
green flowers
blooms 7,8,9,10.
Associates: ethnobotany: Many native chenopodiums were cultivated by Native Americans.
VHFS: [*C boscianum*]

Chenopodium urbicum Linnaeus CITY GOOSEFOOT, "An introduced weed that is found in cultivated ground & waste places" (ewf55).

CYCLOLOMA Moquin 1840 **WINGED-PIGWEED** *Chenopodiaceae*

Cycloloma atriplicifolia (Sprengel) Coulter WINGED-PIGWEED, "Quite uncommon, being found only occasionally on railroads & about Camp Grant" (ewf55).

SALSOLA Linnaeus 1753 **SALTWORT, RUSSIAN-THISTLE** *Chenopodiaceae*

Salsola pestifer A Nelson RUSSIAN THISTLE,
Introduced from Asia. "Becoming increasingly common in dry prairie & sandy areas & along railroads & in waste places" (ewf55).


Salsola at McCune Sand Prairie, west Bureau Co

CISTACEAE AL de Jussieu 1789 **ROCKROSE FAMILY** About 8 genera & 180 spp of shrubs & herbs of warm temperate & subtropical areas, centered in Mediterranean Europe.

HELIANTHEMUM Mill **FROSTWEED, ROCKROSE, SUN ROSE** *Cistaceae Helianthemum* (hay-lee-ANTH-e-mum) from the Greek ἥλιος, *helios*, the sun, & ἀνθεμον, *anthemon,* a flower, in reference to the

flowers opening only in the sun. A genus of about 20 spp of herbaceous perennials & dwarf evergreen shrubs of eastern North America, California, Mexico, & southern South America. Some authorities place the eastern North American spp in a clade distinct from European *Helianthemum* in the genus *Crocanthemum* Spach.

Our spp have chasmogamous flowers with showy yellow petals & large sepals & apetalous cleistogamous flowers with smaller sepals. The chasmogamous flowers bloom in April to July & the cleistogamous flowers "bloom" in June to September. The fruits are capsules. The seed capsules of the petaliferous flowers are larger & contain more seeds than the cleistogamous flowers.

Of *H canadense*, sw94 state: "On a frosty late November morning, if you are lucky, you may see crystals of ice protruding from cracks in the lower part of the stem, hence another common name, FROSTWEED."

Helianthemum bicknellii Fernald *KY, MD, OH, PA, TN, VT ROCKROSE, aka BICKNELL'S FROSTWEED, BICKNELL'S HOARY ROCKROSE, HOARY FROSTWEED, PLAINS FROSTWEED, Upland
Habitat: Hill prairies & oak openings. Dry to dry-mesic prairies, in sandy soils. "In the same situations as the preceding (*H canadense*) & more common. On gravel hills, in sand & on high prairie roadsides northeast of Rockford." (ewf55)
Culture: ①No pre-treatment needed, sowing outdoors in the spring is the easiest method, or seeds germinate after about 60 days of cold, moist stratification (he99). ②Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germ (tchn).
907,200 seeds per pound.
Description: Erect perennial, 0.5-0.9', 2-3 yellow daisy-like flowers in a terminal corymb.
Comments: status: Threatened in Kentucky, Ohio, & Vermont. Endangered in Maryland & Pennsylvania. Possibly Extirpated & Endangered in Tennessee. phenology: Blooms 6,7. In northern Illinois, collect seeds in September. Collect seeds in se Wisconsin in August (he99). Seed source nursery remnant, southeast Whiteside Co. Blooms 3 weeks later than the following.

Helianthemum bicknellii

Helianthemum canadense (L) Michaux *KY, TN COMMON ROCKROSE, aka CANADA FROSTWEED, FROST PLANT, FROSTWEED, LONGBRANCH FROSTWEED,
Habitat: Sandy soils, dry to dry mesic prairies. "Common on dry prairies & in sandy places" (ewf55).
Culture: ①No pre-treatment needed, sowing outdoors in the spring is the easiest method, or seeds germinate after about 60 days of cold, moist stratification. Easy from seed. (he99) ②Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germ (tchn).
Description: 1-rarely 2, attractive, yellow daisy-like flowers overtopped by the branches. key features: Hoary pubescent; petaliferous flowers solitary, pedicellate, terminal, apetalous ones axillary, small, clustered, subsessile.
Comments: status: Endangered in Kentucky. Possibly Extirpated & Endangered in Tennessee. phenology: Blooms 6. Collect seeds in se Wisconsin in August (he99).

"Other common plants, which presented themselves at different places on our route through the prairies" *Helianthemum canadensis* as *Cissus Canadensis,* in error for *Cistus canadensis* L. (Short 1845).

Helianthemum canadense

Hudsonia BEACH HEATHER, GOLDEN HEATHER *Cistaceae Hudsonia* New Latin, from William *Hudson,* died 1793, English botanist, & author of *Flora Anglica*, & New Latin *-ia.* Fruit is 1-celled, 3-valved capsule with many seeds.

Hudsonia tomentosa Nuttall *CT, IL, IN, IA, NH, OH, VT BEACH HEATHER, AKA FALSE BEACH-HEATHER, FALSE HEATHER, HAIRY HUDSONIA, SAND HEATHER, WOOLLY BEACHHEATHER, WOOLLY HUDSONIA,
Habitat: Sand dunes, sandy pine woods, pine barrens, sand hill clearings, & Atlantic coastal native plant communities. Tolerant of coarse textured soils. Anaerobic tolerance none. CaCO3 tolerance high(?). Drought tolerance high. Fertility requirement low. Fire tolerance medium. Salinity tolerance high. Shade intolerant. pH 5.5-6.9. distribution/range: Known from Lee Co, Illinois.
Culture: propagation: ①60 days cold moist stratification (Skaradek 2001). Growth rate slow. Seedling vigor low. Vegetative spread rate none. Seed spread rate slow. 900,000 seeds per pound (usda) In our experience, unknown in the plant trade in any form.

cultivation: Does not compete well with grassy associates. Plants may be short lived. No notable pest problems. Sensitive to trampling, mechanical disturbances, & shading by woody spp.
Description: Decumbent, low-growing native shrub; 3-8" tall, multiple stems, finely branched; leaves elongated, scale like, less than 0.125" long, & covered with soft, white, woolly hairs; flowers yellow, 5-petaled. key features: ①Hoary tomentose, leaves ovate; flowers subsessile; sepals obtuse.
Comments: status: phenology: Blooms May-July. In New Jersey, seeds ripen August to September. Salt tolerant, but less than plants of the primary foredune. Species has many adaptations for drought tolerance, including prostrate growth, reduced leaf surfaces, & leaf surfaces covered with hair to reduce water loss.
Associates: BEACH HEATHER in Alberta, Canada, has been found growing with nitrogen fixing blue-green algae, & is often associated with ectomycorrhizal symbionts. It is also suspected of producing allelopathic compounds to reduce competition. In the mid-Atlantic area, *H tomentosa* has been observed to preclude other plants from growing near it.
VHFS:

W Skaradek, 2001. Propagation protocol for production of *Hudsonia tomentosa* seeds; USDA NRCS-Cape May Plant Materials Center, Cape May Court House, New Jersey. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 18 July 2011). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.

"Just to the north of the station, the grass turns starveling & thin, & the floor of the border waste becomes a thick carpet of poverty grass, *Hudsonia tomentosa,* variegated with channels & stary openings of whitish sand. All winter long this plant has been kind of rag grey; it has had a clothlike look & feel, but now it wears one of the rarest & loveliest greens in nature. I shall have to use the term "sage green" in telling of it, but the colour is not simply ticketed; it is sage green, yes, but of an unequalled richness & sable depth."

The Outermost House, A Year of Life on the Great Beach of Cape Cod, Henry Beston, 1928


Hudsonia tomentosa

LECHEA Linnaeus 1753 **PINWEED** *Cistaceae Lechea* (LEK-e-a) New Latin, from Johan *Leche* died 1764 Swedish botanist. A genus of about 18 spp of herbs or subshrubs of North America, the West Indies, & Central America having much-branched stems & minute purplish, reddish, yellowish????, or greenish trimerous flowers. Fruits are 3-celled, 3-valved capsules.

Lechea is characterized by the production of numerous evergreen & overwintering basal shoots in late summer & fall. The basal shoots resume growth in spring, producing erect or ascending fertile stems.

Lechea leggettii Britton & Hollick rewrite as L intermedia

"Credited to the county in Jones' Flora & otherwise reported as growing here but we have not found it" (ewf55).

Lechea stricta Leggett BUSHY PINWEED,

"Our common prairie pinweed. Found on all dry prairies & in sandy places, being very common on the sandy prairies about Camp Grant & in Shirland Township." (ewf55)

Lechea tenuifolia Michaux SLENDER-LEAVED PINWEED, aka NARROWLEAF PINWEED,
Habitat: "Common in sandy places & less so on upland prairies" (ewf55). distribution/range:
Culture: propagation: 60 days cold moist stratification (pm09).

Lechea villosa Elliott *IA HAIRY PINWEED, upl
Habitat: Dry & sand prairies.
Culture: propagation: Dormant seed.
Description: 0.5-2.5'; red flowers
Comments: status: phenology: Blooms 7,8,9 "Less common than our other spp & more likely to be in the shade or in damp places" (ewf55).

CONVOLVULACEAE AL Jussieu 1789 **MORNING GLORY FAMILY** *Convolvulus* curling itself together, New Latin, from Latin, bindweed, from *convolvo*, *convolvere,* to twine around, to enfold, enwrap. *Convolvulaceae* is the most advanced plant family that produces seeds with physical dormancy, or a water-impermeable seed coat.

KMG Gehan Jayasuriya, JM Baskin, RL Geneve, & CC Baskin, 2007, Morphology & Anatomy of Physical Dormancy in *Ipomoea lacunosa*: Identification of the Water Gap in Seeds of *Convolvulaceae* (*Solanales*) Ann Bot. Jul 2007; 100(1): 13–22. Published online May 19, 2007.
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2735290/

Add Calystegia.
CONVOLVULUS Linnaeus **FIELD BINDWEED** *Convolvulaceae*

Convolvulus americanus (Sims) Greene BINDWEED,
"Common on fences, railroads, & in fields & waste places. (*C sepium* var *americanus* Sims)" (ewf55)

Convolvulus arvensis Linnaeus FIELD BINDWEED,
"Very common on railroads & in dumps & waste places. The leaves vary in shape & size." (ewf55)

Convolvulus sepium Linnaeus HEDGE BINDWEED,
Habitat: Wet to wet-mesic prairies & savannas. distribution/range:
Culture: propagation: ①Seeds germinate after about 60 days of cold, moist stratification, or no pre-treatment needed, sowing outdoors in the spring is the easiest method. (he99) ②Sow immediately outdoors. Short viability seed will germinate in the spring. Weedy. (tchn).
Description: Twining or trailing vine, to 10'(?). Pink-white flowers. key features:
Comments: status: phenology: Blooms June-September. Collect seeds in se Wisconsin in September-October (he99). Weedy.
Associates: ethnobotany:
VHFS: New nomenclature is *Calystegia sepium* (Linnaeus) R. Brown, (m14, w12). Discuss 4 subsp.

Calystegia sepium

Convolvulus spithameus Linnaeus DWARF BINDWEED, aka ERECT BINDWEED, LOW BINDWEED,
Habitat: Dry to dry-mesic prairies & savannas. distribution/range: Knox, LaSalle cos.
Culture: propagation: Seeds germinate after about 60 days of cold, moist stratification, or no pre-treatment needed, sowing outdoors in the spring is the easiest method. (he99) Sow immediately outdoors. Short viability seed will germinate in the spring. Weedy. (tchn)
Description: Not a twining vine, 3-20" (not feet as in one source); leaves oval or oblong, sub-cordate, pubescent; peduncles one flowered; flowers white; key features:
Comments: status: phenology: Blooms June-July. Collect seeds in se Wisconsin in August (he99).
"Very uncommon, being known only on the sandy bluff of Kishwaukee River on the River road south of Cherry Valley. We have found it in Ogle, Lee, & Jo Daviess cos." (ewf55)
Associates: ethnobotany:
VHFS: New nomenclature is *Calystegia spithamaea* (Linnaeus) Pursh (m14, w12)

Calystegia spithamaea

Photo http://getyourbotanyon.blogspot.com/search/label/Calystegia

CUSCUTA Linnaeus 1753 **DODDER, LOVE-VINE, LOVE DODDER** *Convolvulaceae* New Latin, from Medieval Latin, dodder, from Arabic *alkushuth, kushuth, kashuta, kashutha*. Twining, leafless, weakly-hemiparasitic to totally-parasitic (holoparasitic) herbs that have whitish, yellow, or orange filamentous stems, worldwide except for boreal North America & boreal Eurasia. This genus is for the serious restoration only. They are quite aggressive & should be used with caution in large restorations only, & at the last stage of restoration, or plant next to that neighbor you can't stand. DODDER is a legislated noxious weed by Federal & many state seed laws. Mohlenbrock (2014) places this in the *Cuscutacea;* Weakley 2012 does not.

Cuscuta are noxious weeds & may be of economic impact if they escape from your planting. They are weeds of world-wide economic impact. ☠ There are some sporadic reports of toxicosis in rabbits, horses & cattle.

If you place a piece of the stem of a member of this genus in your Swink & Wilhelm to take home to ID at your leisure, you will have a couple of permanently orange pages.

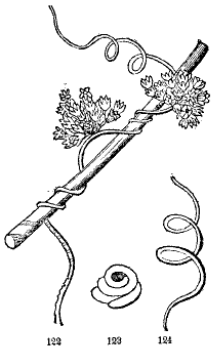
Cuscuta sp
Photo courtesy of Jock Ingels

Some primitive *Cuscuta* have low photosynthetic activity, but even the greenest hemiparasitic spp dependent almost entirely on their host plant for water, nutrients, & organic carbon acquisition. The seeds germinate late in the season after hosts are established. The seedling has 1-2 weeks to find a host & develop haustorial connections. The only food reserves are in the endosperm of the seed, as the seedlings do not have cotyledons. The embryo of the DODDER is a slender thread spirally coiled in the seed, with no vestige of cotyledons (Gray 1853). The seedlings can sense the plant canopy & "smell" volatile cues to find their host. Once attached to the host, the original root-like organ & the base of the stem atrophy.

Once established, *Cuscuta* shoots may grow up to 2 mm per hour. Dodders may grow from 750-7500 meters of vine. As an individual plant continues to grow, it may establish haustorial connections with itself, or become self-parasitic. An individual plant may

plant; whence they can draw little except the ascending, mostly crude sap (79), which they have to assimilate in their own green leaves. The Mistletoe is the most familiar example of this class. It is always completely parasitic, being at no period connected with the earth; but the seed germinates upon the trunk or branch of the tree where it happens to fall, and its nascent root, or rather the woody mass that it produces in place of the root, penetrates the bark of the foster stem, and forms as close a junction, apparently, with its young wood as that of a natural branch. Some species of Mistletoe, or of the same family, however, display no proper green foliage, but are of a yellow or brown hue. On the other hand, imperfect root-parasites with green foliage have recently been detected in more than one tribe of plants; * thus exhibiting intermediate states between the Green and the

135. *Pale or Colored Parasites*, that is, of other colors than green; such as Beech-drops, Orobanche, &c. These strike their roots, or sucker-shaped discs, into the bark, mostly that of the root, of other plants, and thence draw their food from the sap already elaborated (79). They have accordingly no occasion for digestive organs of their own, and are in fact always destitute of green foliage. In some cases of the kind, as in the Dodder (Fig. 122 – 124), the seeds germinate in the earth, from which the primitive root derives its nourishment in the ordinary manner; but when the slender twining stem reaches the surrounding herbage, it gives out aerial roots, which attach themselves firmly to the surface of the supporting plant, penetrate its epidermis, and feed upon its juices; while



122 123 124

* In England a Thesium was discovered by Mr. Mitten to attach its roots

FIG. 122. The common Dodder of the Northern States (Cuscuta Gronovii), of the natural size, parasitic upon the stem of an herb: the uncoiled portion at the lower end shows the mode of its attachment. 123. The coiled embryo taken from the seed, moderately magnified. 124. The same in germination; the lower end elongating into a root; the upper into a thread-like leafless stem.

simultaneously parasitize hundreds of hosts in a community. (Costea 2007+)

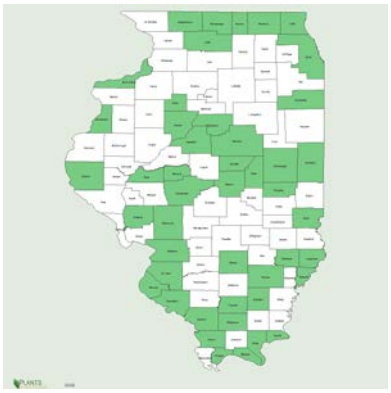
Some spp are specialists with a narrow host range, some specific to a genera or sp. Others are generalists & are capable of parasitizing spp from many families. The widespread generalists are those that cause economic damage, only 15-20 spp out of 200. Ironically, 50% of the *Cuscuta* spp are in need of conservation measures.

Young Pawnee girls used *Cuscuta gronovii* to determine the suitability of a suitor: "A girl having plucked a vine, with the thought of the young man in mind tossed the vine over her shoulder, into the weeds of host sp of this dodder […]. The second day after she would return to see whether the dodder had attached itself & was growing on the host. If so, she went away content with full assurance of her lover's sincerity & faithfulness." (Gilmore 1914).

M Costea, 2007-onwards. Digital Atlas of *Cuscuta* (Convolvulaceae). Wilfrid Laurier University Herbarium, Ontario, Canada. http://www.wlu.ca/page.php?grp_id=2147&p=8968

Cuscuta campestris Yuncker *NJ, NY, also NOX FIELD DODDER, [FACU]
Habitat: Disturbed soil. distribution/range: The most common sp world wide.
Culture: propagation:
Description: plant key features:
Comments: status: phenology: Blooms 4 July to 15 October.
Associates: Consistently growing on *Convolvulus arvensis*: also known from *Brassica kaber, Polygonum arenastrum, Justicia americana, & Xanthium strumarium* (sw94). This sp is considered a generalist & is a problem sp.
ethnobotany:
VHFS: Gleason & Cronquist (1991) include this in *C pentagona*.

Cuscuta cephalanthi Engelmann BUTTONBUSH DODDER, [FACW]
Habitat: Fens & moist prairies (sw94). distribution/range:
Culture: propagation:
Description: plant key features:
Comments: status: Endangered in New Jersey & New York. phenology: Blooms 1 August to 22 September.
Associates: In Indiana, this grows on *Cephalanthus occidentalis* & *Justicia americana* (Deam 1940). Other hosts include *Aster puniceus firmus, Aster simplex, Salix interior;* 2) *Campsis radicans* & *Lycopus asper;* 3) Grows on *Solidago patula* with *Bidens cernua, Campanula aparinoides, Carex comosa, Eupatorium perfoliatum, Rumex orbiculatus, Sagittaria latifolia, & Scirpus validus creber;* 4) *Aster puniceus firmus, Calamagrostis canadensis, Cuscuta glomerata, Elymus virginicus, Eupatorium maculatum, Monarda fistulosa, & Solidago gigantea*; 5) *Acer saccharinum, Aster simplex, Bidens frondosa, Cephalanthus occidentalis, Eragrostis frankii, Eragrostis hypnoides, Polygonum hydropiperoides, & Ulmus americanus.* (sw94).
VHFS: [*Grammica cephalanthi* (Engelm) Hadac & Chrtek]



Cuscuta cephalanthi

Cuscuta compacta Jussieu COMPACT DODDER, [FACW]
Habitat: distribution/range: Kankakee Co.
Culture: propagation:
Description: plant key features:
Comments: status: phenology: Blooms
Associates: In southern Indiana, this grows on *Cephalanthus occidentalis* & *Campsis radicans* (Deam 1940).
VHFS:

Cuscuta coryli Engelmann HAZEL DODDER, [FAC]
Habitat: Lake plain prairies, wet moranic prairie, & low prairies (sw94). distribution/range:
Culture: propagation:
Description: plant key features:
Comments: status: phenology: Blooms 28 July to 7 September.
Associates: Principal hosts in Indiana include *Campsis radicans, Corylus americana, Prunella vulgaris lanceolata & Stachys hyssopifolia* (Deam 1940). Associated plants also include 1) *Panicum verrucosum & Stachys hyssopifolia; 2) Aster praealtus; 3) Ceanothus americanus; 4) Solidago altissima*. (sw94)
VHFS:

Cuscuta cuspidata Engelmann Cusp Dodder,
"Common in Sugar River sloughs" (ewf55).

Cuscuta glomerata Choisy ROPE DODDER, [FACW]
Habitat: Moist prairies. distribution/range:
Culture: propagation:
Description: plant key features: "This sp can be identified at 10 paces by its distinctive appearance as a section of white rope wound several turns around the stem of the host" (sw94).
Comments: status: phenology: Blooms 30 July to 30 September. "Common in wet thickets & other low places west of Yale bridge in Laona Township & in Killbuck Creek bottom near the Forest Preserve" (ewf55).
Associates: Typically found in moist prairies on a composite host, including *Helianthus grosseserratus, Silphium integrifolium deamii, Solidago canadensis, & Solidago gigantea.* 2) *Apios americana, Asclepias syriaca, Aster spp, Helianthus spp, & Solidago spp* (Deam 1940); 3) *Asclepias hirtella, Asclepias syriaca psoraleos onobrychis, Silphium integrifolium deamii, Solidago ohioensis, & Tradescantia ohiensis;* 4) *Aster puniceus firmus, Calamagrostis canadensis, Carex haydenii, Cuscuta cephalantha, Elymus virginicus, Eupatorium maculatum, Monarda fistulosa, & Solidago gigantea*. (sw94)

Cuscuta gronovii Willdenow ex JA Schultes COMMON DODDER, [OBL]
Habitat: Wet meadows. Low ground near streams (Swink & Wilhelm 1994). distribution/range:
Culture: propagation: Total parasite; dormant seed / or scarify for spring planting. Successional restoration near a known host in large plantings only.
Description: Annual herbaceous vine; stems orange; flowers white; key features:
Comments: status: phenology: Blooms 7,8,9; 31 July - 11 October. In northern Illinois, collect seeds in October.
"Common in low places particularly on Rock River & Kent Creek banks near Rockford" (ewf55).
Associates: Parasitic on *Eupatorium maculatum* & *Impatiens capensis*, aggressive. Associated plants also include *Amphicarpaea bracteata comosa, Boehmeria cylindrica. Campsis radicans, Cephalanthus occidentalis, Decodon verticillatus, Justicia americana, Laportea canadensis, Parthenocissus inserta Phytolacca americana, Rudbeckia laciniata, Saururus cernuus, Solidago canadensis, Solidago patula & Typha angustifolia*. (sw94) This sp is considered a generalist & is a problem sp.
VHFS:

Cuscuta gronovii

Cuscuta pentagona Engelmann PRAIRIE DODDER, [UPL]
Habitat: Dry sand prairies. 1) Dry hill prairies & sand prairies, 2) a sandy flat in newton Co, 3) sandy prairies, & 4) dry prairies in our northwest sector (sw94) distribution/range:
Culture: propagation: 60 days cold moist stratification (pm09). Total parasite; dormant seed / or scarify for spring planting. Successional restoration near a known host. 608,000 (pm2002) seeds per pound.

Description: Annual herbaceous vine, flowers white; key features:
Comments: status: phenology: Blooms 7,8,9,10; 12 July to 1 October. In northern Illinois, collect seeds in October.
Associates: Parasitic on a wide variety of hosts, aggressive. Associated plants include 1) *Artemisia caudata, Aster ericoides Erigeron canadensis, Lechea tenuifolia, Liatris cylindracea, & Pycnanthemum virginianum*: 2) *Ambrosia artemisiifolia elatior, Carex muhlenbergii Cyperus filiculmis, Erigeron canadensis, Gnaphalium obtusifolium, Lespedeza capitata, Monarda punctata, Opuntia humifusa, & Plantago patagonica;* 3) *Andropogon scoparius, Asclepias verticillata Cassia fasciculata, Cyperus filiculmis, Hedeoma hispida, Krigia virginica, Lechea tenuifolia, Oenothera clelandii, Panicum villosissimum pseudopubescens, Sporobolus cryptandrus & Vulpia octoflora*; 4) *Andropogon scoparius, Aster ericoides, Bouteloua curtipendula, Carex muhlenbergii, Euphorbia corollata, Helianthus occidentalis, Liatris cylindracea, Panicum perlongum, Petalostemum purpureum, Pycnanthemum virginianum Solidago speciosa, & Sporobolus heterolepis*" (sw94).
VHFS:

Cuscuta polygonorum Engelmann KNOTWEED DODDER, [OBL]
Habitat: Low ground, Kankakee Marsh Co Park, in Lake Co, Indiana, & Chiwaukee Prairie.
distribution/range:
Culture: propagation: Total parasite-dormant seed / or scarify for spring planting. Successional restoration near a known host.
Description: plant key features:
Comments: status: phenology: Blooms 26 July to 26 September. One plant may establish up to 750 meters of stem. (Costea 2007)
Associates: "Its most common associate & host plant is *Polygonum punctatum,* but it grows on most other wetland *Polygonums* as well. Other hosts locally include: *Aster puniceus firmus, Bidens comosa, Cicuta bulbifera, Hypericum majus, Leersia oryzoides, Lycopus uniflorus, Pilea pumila, Scutellaria lateriflora*, & *Sium suave*. … (at Chiwaukee) it grows with the following associates: *Aster ptarmicoides, Aster puniceus, Chelone glabra, Hieracium canadense fasciculatum, Lycopus uniflorus, Parnassia glauca Pedicularis lanceolata Pycnanthemum virginianum Silphium integrifolium deamii, & Solidago ohiensis*." (94)
VHFS: [*Cuscuta obtusiflora*]

IPOMOEA Linnaeus 1753 **MORNING GLORY, SWEET POTATO** *Convolvulaceae Ipomoea* (i-pom-OY-a) from Greek *ips* worm & *homoios* resembling. Tender annual & perennial climbers. *I batatas* is the commercial sweet potato. The seeds of *I violacea* Linnaeus are used in hallucinogenic ceremonies among the Zapotecs, containing d-lysergic acid amine, d-isolysergic acid amine, & chanoclavine (Uphof 1968). Sometimes placed in *Polemoniaceae.* Most or all spp are considered noxious weeds in some states, including Arizona & Arkansas. The genus name may be seen as *Ipomea* in older works.

Ipomoea hederacea Jacquin IVY-LEAVED MORNING-GLORY

Ipomoea hederaceae

Ipomoea leptophylla Torrey BUSH MORNING GLORY
Western prairie sp. Soak seed 6-8 hrs in water & sow in spring (pots 2000). 4,000 (pm02), 5,824 (wns01) seeds per pound

Ipomoea pandurata (Linnaeus) GFW Meyer *MI, NY WILD SWEET POTATO, aka BIGROOT MORNINGGLORY, MAN OF THE EARTH, MAN ROOT, *MECHOACAN,* WILD POTATO-VINE, WILD SWEET-

POTATO-VINE, facu
Habitat: Moderately drained to well drained areas in floodplains, such as the Spoon, Rock, or Illinois Rivers. It may persist at the edge of ag fields.
Culture: ①Steep seed, then dormant seed.

②Storage Behaviour: Orthodox. Storage Conditions*:* Dry seeds (mc not reported) survive overnight in liquid nitrogen (Pence 1991a)

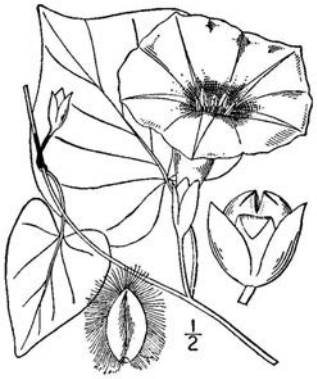
Average 1000 Seed Weight(g): 43.0; Seed; Seed mc not stated, but weight is likely to refer to air-dry seed. Average of Oil Content (%): 7.1; Entire seed/nut; Moisture content not stated. Average of Protein Content (%): 16.2; Entire seed/nut; Moisture content not stated. (Earle & Jones, 1962); RBG Kew, WP.

seed counts & rates: 8,928 seeds per pound.

availability: Sp is not in the native seed trade.

Description: Herbaceous, perennial, native vine; leaves broad, cordate, entire or lobed. flowers white, tubular bell form;
Comments: status: Threatened in Michigan. Endangered in New York. Species is considered weedy or invasive in some areas by some authorities (Assorted authors, 200_, State noxious weed lists for 46 states, Haragan 1991, SWSS 1998.) phenology: Blooms 7,8. Landscaping, specimen planting.
Associates: ethnobotany*:* "A mild cathartic & resembles rhubarb in its effects" (Eaton 1829). Species has shown antimicrobial properties, particularly against *Salmonella typhimurium* (Frey & Meyers 2010).
VHFS: [Basionym *Convolvulus panduratus* Linnaeus 1753*, Ipomoea pandurata* Conz & LC Sm, *I pandurata* (L) G Mey var *hastata* Chapman, *I pandurata* (L) G Mey, *forma leviuscula* Fern, *I pandurata* (L) G Mey var *rubescens* Choisy]

FM Frey & R Meyers, 2010, Antibacterial activity of traditional medicinal plants used by *Haudenosaunee* peoples of New York State, http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2989932



Ipomoea pandurata

Ipomoea purpurea (Linnaeus) Roth COMMON MORNING GLORY,
"A very common escape to fence-rows, dumps, &c" (ewf55)

CORNACEAE Linnaeus 1753 **DOGWOOD, CORNEL FAMILY** A family of 2 genera & about 80 spp of trees, shrubs, lianas, & subshrubs, semi cosmopolitan (but not semi-Vogue). Fruits are a baccate drupe crowned with the calyx. Many spp have bitter & astringent bark, some used as an excellent tonic, similar in action to "Peruvian bark". [*Cornaceae* (Berchtold & J Presl) Dumortier 1829] Some authorities feel that *Nyssa* is best excluded.

CORNUS Linnaeus 1753 **DOGWOOD, CORNEL** *Cornaceae Cornus* (KOR-nus) from the Latin name for *Cornus mas*; from Latin *cornu,* a horn referring to the hardness & durability of the wood of some spp. "An alternative etymology, from *dag* & *wood*, is frequently suggested, but both form & chronology argue very strongly against this. Dogwood had originally no connection with dogs, but was the wood of which dags, goads, & skewers were made... When the etymology was changed by the substitution of 'o' for 'a' in dag, it was also called DOG-TREE, DOG-BERRY, DOG-TIMBER... & HOUNDBERRY, & to explain the name it was

said that the bark made an excellent wash for mangy dogs. E Step Wayside & Woodland Trees, 1907, 116." (oed)

A genus of about 60 spp of deciduous trees & shrubs & an herb, mostly north temperate. The bark bitter, tonic. Fruits are drupes baccate, with a 2 or 3-celled nut.

Cornus spp are larval hosts for SPRING AZURE & SUMMER AZURE BUTTERFLIES, *Aellopos titan* TITAN SPHINX MOTH, *Darapsa versicolor* HYDRANGEA SPHINX MOTH, & *Eudryas grata* BEAUTIFUL WOOD-NYMPH MOTH. Nectar source for *Achalarus lyciades* HOARY EDGE SKIPPER, *Anatryone logan* DELAWARE SKIPPER, *Atalopedes campestris* SACHEM, *Epargyreus clarus* SILVER-SPOTTED SKIPPER, *Erynnis horatius* HORACE'S DUSKYWING SKIPPER, *Euphyes conspicua* BLACK DASH SKIPPER, *Euphyes dion* DION SKIPPER, *Lerema accius* CLOUDED SKIPPER, *Panoquina ocola* OCOLA SKIPPER, *Poanes zabulon* ZABULON SKIPPER, *Vanessa cardui* PAINTED LADY BUTTERFLY.

Genus propagation info is double dormant, fresh seed & dormant seed / macerate or moist cold stratify, alternating temperatures

Cornus amomum (*obliqua*), *C foemina* (*racemosa*), & *C stolonifera*

DOGWOOD fruits ripen in the late summer & early fall. The stones may be sown uncleaned (in the flesh, as it were), but stored seed may be dried berries or cleaned stones. Cleaned, air-dried stones are stored in sealed containers at 3-5º C Germination takes place the first or second spring after fall sowing. Hard seed coats & dormant embryos are present in most *Cornus* spp, requiring warm moist stratification for 60 days followed by cold moist stratification for >60 days. Best nursery results are from fall sowing of freshly harvested seed. Late harvested seed should be stored & cold moist stratified until the following season, & dormant sown. Acid scarification & gibberellin may help. Mulch is recommended.

Specific techniques are :

C amomum: light 8 hr/day, warm moist stratification 8-12 weeks at 25ºC, then cold moist stratification 8 -12 weeks at 1–5ºC, incubate at 20/30ºC, or cold moist stratification 21 days at 3º-5ºC

C stolonifera: cold moist stratification at 3-5ºC for 90 days; or cold moist stratification 120-160 days. (yy92, AOSA 1985, Genebank Handbook 1985, dh87).

C stolonifera: fall plant or 60-90 days cold moist stratification. (dh87)

C amomum germ. Best in outdoor treatment with fresh & dry stored seed. Germination in March & April from September planting. This sp has seeds that float & sink in water. Both sinkers & floaters germinate at approximately 30%. Alternating cycles germ 0-5%. *C foemina* germinates low in the laboratory using alternating cycles, with germination continuing through third cycle. *C stolonifera* ripens seed in both July & October. Early & late seed have similar germination. Laboratory experience 40º sown fresh seed & dry stored seed gave germination extended over 6 cycles. Outdoor treatment may give better results. (nd91)

Cornus alternifolia Linnaeus *FL ALTERNATE-LEAVED DOGWOOD, aka BLUE OR PURPLE DOGWOOD, GREEN OSIER, GREEN OSIER DOGWOOD, PAGODA CORNEL, PAGODA DOGWOOD, *Muj'omij'*, moose plant (Ojibwa). (*alternifolius -a -um* (al-tir-ni-FO-lee-us) with leaves alternating on opposite sides, alternating leaves, *alternus*, by terns, alternate, *-i-* connective vowel used by botanical Latin, & *folium*, leaf.) The common name PAGODA is from the horizontal branches with upward curves at their tips resembling the upswept corners of an Asian pagoda roof. Subgenus *Mesomora*

Habitat: Rich woods, near streams, rocky slopes, & thickets. In Michigan, "Deciduous & mixed forests (rarely in spruce-fir stands), either as an understory shrub or along borders; floodplains & cedar swamps; banks & thickets above lakes & streams" (rvw11).

Culture: ①60 days cold moist stratification. Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside & allow 2 years for germination (pm09).

cultivation: Hardy to zone 3. Ideal in shade, does not like hot dry sun. Clay soil tolerant (timber clay?).

Description: Deciduous, shrub to small tree, to 20 (32)'; good horizontal branch pattern, alternate branching; yellow fall color; flowers creamy white (buff) in early summer; drupes globose, blue-black (purple in mid summer;

Comments: status: Native. Endangered in Florida. The "bush for all seasons". Spring clusters of small white flowers; summer dark blue fruit; autumn red-purple leaves; winter strong horizontal branch pattern adds mid-scale texture to plantings.

Associates: Pollinator friendly. Butterfly host plant. Waterfowl (esp. wood ducks) & songbirds (esp. cardinals, evening grosbeaks, robins, wood thrushes, cedar waxwings) eat fruit. Upland gamebirds eat fruit

& buds. Terrestrial furbearers (esp rabbits, squirrels) eat fruit, wood, foliage. Small mammals (esp eastern chipmunks) eat fruit. Deer eat fruit & twigs. Walnut tolerant.

ethnobotany: Bark used as medicinal plant by Ojibwa, Menominee, & Pottawatomie (sm23, 32, 33) Ojibwa medicine for diseases of eyes (den28). Twigs used as thatch by Ojibwa (sm32). Bark smoked by Ojibwa & Menominee (sm32, 23).

VHFS: [*Svida alternifolia, Swida alternifolia* (Linnaeus f) Small]]

Cornus alternifolia

seed photo by Steve Hurst

Cornus amomum Mill BLUE-FRUITED DOGWOOD, aka PALE DOGWOOD, RED WILLOW, SILKY CORNEL, SILKY DOGWOOD, *Kinnikinnik* (*amomus -a -um* (a-MOM-us) New Latin, an aromatic shrub, from Greek name for an eastern spice plant, cardamom, *Amomum* & the spice obtained from it; this root word is also in cinn*amomum*.) Subgenus *Kraniopsis*

Habitat: In Michigan, "Wet (very rarely upland) sites: marshes, swamps (including cedar-tamarack), bogs & fens; margins of ponds, lakes, & streams & on banks of streams & rivers; often forming dense thickets at the edges of swamps & bodies of water (rvw11).

Culture: ①Fall plant or 90 -120 days cold moist stratification (dh87). ②60 days cold moist stratification (pm09).

seed counts & rates: 8,000 (pm), 11,300 seeds per pound.

cultivation: Clay soil tolerant. Tolerates rich mesic soils that do not become droughty. Medium fast grower. Optimum pH 6.0. Hardy to zone 3.

Description: Native, deciduous, shrub, 8.0-10'; purple stems, dark reddish twigs & older branches; inflorescence flat or slightly convex, white flowers followed by dark porcelain blue fruit (with pale patches) in midsummer;

Comments: status: phenology: Fruit ripens in August. Landscaping, rain gardens; attractive blue berries.

Associates: Pollinator friendly. Butterfly host plant. Used by ruffed grouse, cardinal, evening grosbeak, robin, cedar waxwing, turkey, & cottontail rabbit. Walnut tolerant.

ethnobotany: Used as medicinal plant by Menominee (sm23). Bark smoked by Menominee (sm23).

VHFS: [*Cornus amomum* var *amomum*, *C amomum* P Mill ssp. *amomum*, *Svida amomum*, *Swida amomum* (P Mill) Small]

Cornus canadensis Linnaeus BUNCHBERRY, aka BUNCHBERRY DOGWOOD, DWARF CORNEL, LOW CORNEL, *Caca'gomin* (Ojibwa) (*canadensis -is -e* (kan-a-DEN-sis) of Canada or northeast USA.) Subgenus *Arctocrania*

Habitat: Woods, thickets, & damp openings, cool woods & moist clearings. Acidic woodlands.

Culture: ①Seeds mature late summer. Macerate & sow seeds in a cold frame for outdoor treatment. Cullina code B seed will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, G chemical inhibitors. (cu00) ②Slow germinator - up to a year or more. Store seeds in layers of moist sand in the shade. Check seeds regularly in the spring, and sow them all as soon as radicles appear (tchn)

seed counts & rates: 67,000 (gran) seeds per pound.

cultivation: Medium moisture requirement, full sun to partial shade, moderately coarse to moderately fine soils. Neutral to acidic soils. Hardy to zone 2.

Description: Herbaceous ground cover member of the genus; from rhizomes; leaves all or mostly in one whorl, may produce dense carpets; <1'' white petal-like bracts similar to *C florida*, blooming May to July, spring to summer, followed by bright red drupes late summer early fall.

Comments: status: phenology: Blooming May to July. Fruit ripens late summer to early fall. Species may form dense ground cover.
Associates: Self-incompatible. Pollinated by large insects such as bumblebees & possible partially by wind. The flowers are "spring-loaded" & rapidly open when triggered by a heavy insect. As the petals separate, the stamens spring out with an acceleration of 24,000 meters per second per second. The flowers are not triggered by lighter spp such as ants, but may open on their own. The explosive release of the stamens propels the pollen up to 22 cm (in calm air), which effectively coats any insect visitors, &/or may allow wind pollination. (Edwards et al 2005)

ethnobotany: Berries available in August, remain on plant until October. Used for food by Ojibwa & Pottawatomie (den28, sm33). Used as medicinal plant by Ojibwa (sm32).
VHFS: [*Chamaepericlymenum canadense* (Linnaeus) Ascherson & Graebner]

J Edwards, D Whitaker, S Klionsky, & MJ Laskowski, 2005, A record-breaking pollen catapult. Nature, vol 435, 12, May, 2005, page 164.

Cornus drummondii CA Mey ROUGH-LEAVED DOGWOOD, aka CORNEL DOGWOOD, DRUMMOND'S DOGWOOD, MIDWESTERN ROUGHLEAF DOGWOOD, SMALL-FLOWER DOGWOOD, WHITE CORNEL, (*drummondii* named for the Scottish plant-collecting brothers James Drummond, 1786-1863, & Thomas Drummond, 1793(90)-1835, Thomas like his countryman David Douglas made an ill-fated collecting trip to North America.) fac Subgenus *Kraniopsis*
Habitat: Mesic savanna; rocky woods, prairies, bluffs, low wet ground, sandy or clay soils. In Michigan, "banks & thickets, especially along rivers & borders of forests" (rvw11). In the se USA, "open woodlands & glades over calcareous rocks (limestone, calcareous shale); rare" (w11).
Culture: 15,700 seeds per pound.

cultivation: Hardy to zone 4(3). Alkaline soils. Tolerates full sun to heavy shade, but flowers & fruits better in sun. White fruits are attractive, but are quickly eaten by birds. Transplants easily, BR & B&B. Aggressive, can invade adjacent areas, control suckers.
Description: Deciduous, native shrub (small tree) 6-10(12-16)', spread to 16'; leaves late fall color purple; terminal flower clusters up to 3" diameter; flowers creamy white flowers, perfect; followed by white fruit clusters, fruit is a hard white drupe 0.25" diameter;
Comments: status: phenology: Blooms 5,6. Landscaping, windbreak/shelter-belt shrub, naturalized borders, & wildlife plantings. Suckering habit is beneficial in erosion control & bank stabilization. Tall sp, coarser than *C racemosa*.

Roughs" along "the margins of 'sloughs,' and along the courses of small streams" *Cornus drummondii* as *C asperifolia sensu* Short, &c., non Michx. (1803). (Short 1845).
Associates: Insect pollinated, probably similar to *C obliqua* (*vide infra*). Used by upland gamebirds, songbirds, & small mammals. High wildlife value. Fruits eaten by 40+ spp of birds. Can be bothered by scale insects, borers, cankers, leaf blights, root rot, none usually serious. Has very little problem with septoria leaf spot as found in *C racemosa*.
VHFS: [*Cornus drummondii*, *C priceae* Small, *Svida priceae* (Small) Small, *Svida asperifolia* misapplied, *Swida drummondii* (CA Meyer) Sojak]

Cornus florida Linnaeus FLOWERING DOGWOOD, aka WHITE DOGWOOD, (*floridus -a -um* flowering, flowering abundantly or richly, full of flowers; bright.) Subgenus *Cynoxylon*
Habitat: Rocky woods, wooded slopes, low woods. distribution/range: Southern ½ of Illinois.
Culture:
Description: Small to medium tree, up to 50"; drupes red.
Comments: status: phenology: Blooms 4-5. C3. 4,496 (jfn04) seeds per pound.
Associates: Waterfowl (esp. wood ducks) eat fruit. Upland game birds eat fruit & buds. Songbirds (esp cardinals, evening grosbeaks, robins, wood thrushes, cedar waxwings) eat fruit. Terrestrial furbearers (esp rabbits & squirrels) eat fruit, wood, & foliage. Small mammals (esp eastern chipmunks) eat fruit. Deer eat fruit & twigs. Species has been severely impacted since the 1980s by the dogwood anthracnose fungus *(Discula destructiva*).

ethnobotany: Root bark of *Cornus florida* is feeble astringent tonic.
VHFS: [*Cynoxylon floridum* (L) Raf ex BD Jackson]

Cornus foemina Mill STIFF DOGWOOD, Some horticulturalists & growers maintain this as a separate sp. Wetland sp from southern Illinois, 6-7', narrow leaves for the genus, purple fall color. Hardy to zone 4.

Cornus obliqua Rafinesque SILKY DOGWOOD, aka BLUE-FRUITED DOGWOOD, *KINNIKINNICK*, PALE DOGWOOD, facw+ Subgenus *Kraniopsis*
Habitat: Moist sites; wet meadows & prairies, swamps, low woods, edges of streams & ponds.
Culture: 1,200 (jfn2004) seeds per pound.
cultivation: Hardy to zone 4. Transplants easily, BR or B&B.
Description: Deciduous, native shrub, 3.0-10'+ tall; flowers showy white, perfect, followed by pale blue drupes 0.25" diameter; key features: "Twigs have reddish-brown to grayish bark & tawny pith; pale lower surface of leaves with white, appressed hairs; blue drupes." (Ilpin)
Comments: status: phenology: Blooms 5,6,7. C3.
"Roughs" along "the margins of 'sloughs,' and along the courses of small streams" *Cornus obliqua* as *C. sericeus* L. (Short 1845).
"This is our common dogwood of low wet places, being found in all stream bottoms, & in Coon Creek bottom forming dense jungles. It is the sp from which our Kinnikinnick Creeks were named. Being hardy in dry places it is used in foundation planting. The stems, which are green in summer, become a bright reddish purple in winter. The pith is narrow & brown." (ewf55)
Associates: Flowers attract many insects. Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera, Diptera, Lepidoptera, & Coleoptera*. Subject to scale insects, borers, cankers, leaf blights, root rot, none usually serious.
ethnobotany:
VHFS: [*Cornus amomum, C amomum* P Mill var *schuetzeana* (CA Meyer) Rickett, *Cornus purpusii* Koehne, *Cornus amomum* P Mill ssp *obliqua* (Raf) JS Wilson, *Swida obliqua* (Raf) Moldenke] Said by some to be a southern version of *C amomum*. (RRN 1998 catalog, Clinal variation???) Weakley (2011) notes specimens intermediate between *C amomum* & *C obliqua*.

Cornus racemosa Lamarck [alternate nomenclature *Cornus foemina* Mill ssp *racemosa* (Lam) JS Wilson] GRAY DOGWOOD, aka NORTHERN SWAMP DOGWOOD, PANICLED DOGWOOD, Subgenus *Kraniopsis*
Habitat: Dry prairies mesic & dry savanna. Dry to moist open habitats, hedgerows, fencerows, roadsides, clearings, thickets, streambanks, upland woods, & prairies.
Culture: ①*C foemina*: Fruit ripens in August to September. Collect, clean, & plant immediately. (Dirr & Heusser 1987) ②Plant immediately or cold moist stratification; or warm moist stratification at 20/30º C for 60 days, then cold moist stratification at 5º degrees for 60 days. Said to germinate easily after acid scarification. 12,100; 12,160 (aes10) seeds per pound.
asexual propagation: Easily rooted from stem cuttings.
cultivation: Somewhat shade tolerant, partial to full sun. Optimum pH 6.0; or tolerant of 5.5-8.5; prairies, rocky outcrops, dry to moist woods, margins of lakes & streams. Prefers moist to saturated soils, tolerant of 2-4" inundation for short periods. Nutrient load tolerance moderate to high, Salt tolerance low. Siltation tolerance moderate to high. Hardy to zone 3. Transplants easily, BR or B&B. Fast growth rate, 3-6' per year.
Description: Deciduous, multi-stemmed shrub, colonial shrub, suckers, 5-6', rarely 10-15'; fine texture, gray bark on older stems in winter, red brown bark on younger stems; spreads by underground stems, forming clones 8-12' or more in diameter; leaves have nice purple fall color; showy, creamy white flowers, flowers perfect, pollinators insects, probably similar to *C obliqua*; showy white fruit on red pedicles in August, pedicles remain after fruit eaten or drops. key features: "Species has gray twigs (young reddish) with brown pith; inflorescence is about as broad as high with bright red branches; drupes are white on red pedicels." (Ilpin)
"Common in the open on roadsides & in fence-rows where it does not grow tall as it does at times in woods." (ewf55)
Comments: status: phenology: Blooms 5,6,7. Fruit ripens in August to September. C3. Aggressive, invasive, can invade adjacent areas. Useful in rain gardens & wetland erosion control.
Associates: White flowers attract many insects. Larval host *Celastrina neglecta* Summer Azure Butterfly. Fruits are eaten by birds; waterfowl (esp wood ducks) & songbirds eat fruit. Attracts upland game birds & songbirds. Upland game birds eat fruit & buds. Provides cover for quail. Provides browse & cover for American woodcock & pheasant. Used by turkey, cardinal, evening grosbeak, robin, thrush, & cedar

waxwing. Terrestrial furbearers eat twigs, fruit & foliage. Small mammals eat fruit. Provides browse & cover for deer, beaver, rabbit, raccoon, & squirrel. Deer eat leaves, twigs, stems, & buds. Subject to scale insects, borers, cankers, leaf blights, root rot, none usually serious.

ethnobotany: Bark available anytime. Used by Ojibwa for beverage. Also used for smoking. Bark smoked by Ojibwa (sm32).

VHFS: Some authors maintain this as *Cornus foemina* Mill ssp *racemosa* (Lam) JS Wilson. [*Cornus candidissima* Marshall, non Mill, *C foemina* Mill, *sensu* Drescher (1933), *C foemina* Mill subsp *racemosa* (Lam) JS Wilson, *C paniculata* L'Hér, *Svida femina* (P Mill) Small, *Swida racemosa* (Lam) Moldenke]

Cornus racemosa

Seed photo by Steve Hurst

Cornus rugosa Lamarck ROUND-LEAVED DOGWOOD, Subgenus *Kraniopsis*

Habitat: Happiest on cool soils. Hardy to zone 4.

Description: Deciduous, native shrub, tall colonial, sky blue berries on pink pedicles. key features: "Leaves are woolly on lower surface; greenish twigs with white pith; pale blue drupes." (Ilpin)

Comments: status: phenology: Blooms 5. C3.

"Not common. Though a northern shrub it is inclined to freeze back in severe winters. It is most plentiful on Kishwaukee River above the Forest Preserve but it is on both Kinnikinnick Creeks." (ewf55)

Associates: ethnobotany: Bark smoked by Ojibwa Menominee (den28, 29).

VHFS: [*Swida rugosa* (Lamarck) Rydberg]

Cornus sericea REDTWIG DOGWOOD, aka TARTARIAN DOGWOOD, SIBERIAN DOGWOOD,

Clay soil tolerant.

Medium shrub, creamy white flowers, white fruit, red winter twigs: brightening to fire red in late winter (Reeseville)

key features: Branches spreading, purplish, branchlets woolly; leaves rounded at the base, acuminate, silky pubescent beneath; drupes bright blue.

Landscaping, borders, backdrops, pollinator gardens, rain gardens, wildlife plantings, & erosion control; flower, fruit, & bark adds spring, fall, & winter interest.

Pollinator friendly. Butterfly host plant. Walnut tolerant.

Cornus stolonifera Michaux RED-OSIER DOGWOOD, aka RED-TWIG DOGWOOD, RED OSIER, POISON DOGWOOD, *Mis'kwabi'mic,* reddish (Ojibwa), (stolonifera sto-lo-NI-fe-ra bearing stolons or runners that take root, having suckers or runners.) Subgenus *Kraniopsis* This will be combined with the above.

Habitat: Fens, wet meadows, fencerows, roadsides, clearings, thickets, streambanks, moist woods, swampy ground, riverbanks, & open marshes. Medium to coarse soils along streams & swamps. Marshes, fens, margins of streams, sandy soils.

Culture: 18,704 (jfn04), 18,720 (aes10), 20,800 (pm), 173,000? (gran) seeds per pound. Widely available as B&B & BR material, as well as biotechnical erosion control material.

asexual propagation: Very easy to propagate from cuttings.

cultivation: Moderately coarse to fine soils. Prefers saturated soils. Tolerant of periodic inundation of 0-12" early in growing season; said to tolerate continuous inundation for < 30 days. Nutrient load tolerance moderate to high. Not salt tolerant. Siltation tolerance moderate to high. Partial to full sun. Optimum pH 6.0 or 5.5-8.5, neutral soils, some acid & base tolerance. Transplants easily, BR or B&B, sometimes slow to reestablish after transplanting. Excellent establishment from seedling or rooted cuttings. Fast growth rate, > 2' per year. Cut back every 3rd year to maintain orange-red stems.

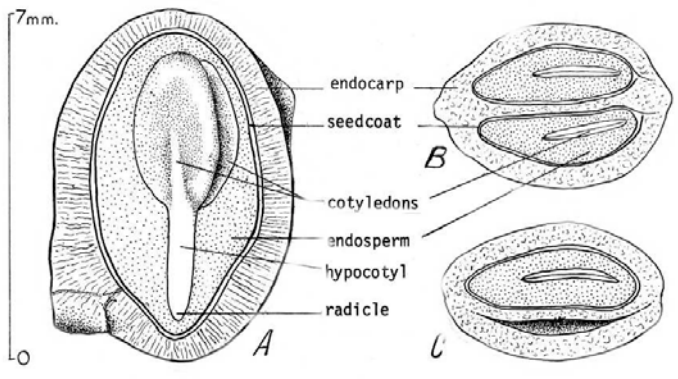
Description: Erect or spreading, native deciduous shrub, 3.0-10+' tall, thicket forming; flowers white, perfect in spring & summer followed by white fruit in fall; fruits are 0.188-0.25" white drupes.
Comments: status: phenology: Blooms 5,6,7,8,9. Calcareous soils. Attractive, ornamental red stems are valuable in winter landscape. Spreads from underground stems. Stoloniferous habit useful for biotechnical erosion control projects. Also used in rain gardens, upper shoreline zone, upland slope buffers, & upland slope buffers. Fast grower. Seed source eastern Iowa.

Roughs" along "the margins of 'sloughs,' and along the courses of small streams" *Cornus stolonifera* as *C. alba sensu* Short (1845) —Non Lam (1786) nec. L (1767) (Short 1845).

"Commonly attributed to the county but we have no dogwood that answers its description. The pith is wide & it is white whereas it is narrow & brown in *C obliqua* a sp of similar appearance & growth habit." (ewf55)
Associates: Insect pollinated, probably similar to *C obliqua* (*vide supra*). Showy white flowers attract many insects. High wildlife value; provides cover & nesting habitat. Excellent habitat for warblers. Berries are valuable food for birds. Waterfowl (esp wood ducks) eat fruit. Upland gamebirds & songbirds eat fruit & buds, including ruffed grouse, turkey, cardinal, evening grosbeak, robin, & cedar waxwing. Fruit attracts small mammals. Terrestrial furbearers eat fruit, twigs, & foliage. Provides food & browse for raccoon, woodchuck, cottontail rabbit, & beaver. Deer eat twigs, buds, & foliage. Some minor problems with scale insects, borers, cankers, leaf blights, & root rot, none usually serious.

ethnobotany: Root & bark used as medicinal plant by Ojibwa (for eyes) & Pottawatomie (den28, sm33). Also used for technology. Used for dye by Ojibwa (den28). Bark smoked by Ojibwa, Menominee, & Pottawatomie (Jones 1861, Hoffman 1896, sm33)
Minutiae: Authors including Gleason & Cronquist (1991), Voss (1985), & AA Reznicek, EG Voss, & BS Walters (2011) call this sp *C sericea* Linnaeus. Voss *ibid* notes this plant may be conspecific with the European *C alba* Linnaeus. Weakley (2007) notes "Attempts to link the name *C sericea* Linnaeus to the red-osier dogwood have focused on the Linnaean description of "*foliis subtus sericeis*" & "*ramis rubicundis*." The reference to the red branches has been emphasized to rule out any other spp, yet *C amomum* & *C obliqua* also have reddish-maroon branches. The description of "*fructo nigro-caerulo*" cannot be dismissed as a reference to individuals of the red-osier dogwood which have pale blue fruit, often considered to be due to hybridization with *C amomum* or *C obliqua*. It seems clear that the description fits *C obliqua* better than it does RED-OSIER DOGWOOD. Although there is a specimen in the Linnaean herbarium which has been identified as the RED-OSIER DOGWOOD, it is neither dated nor is the label of *C sericeus* in Linnaeus' hand. Also, considering the similarity of the RED-OSIER DOGWOOD & *C alba* Linnaeus, it is doubtful Linnaeus would have described the RED-OSIER DOGWOOD without reference to *C alba*. Therefore, we agree with Rickett's rejection of *C sericea* as a *nomen dubium*." Confused? Do you care? Does Weakley have the editorial frog in his pocket?

Variety *flaviramae* with yellow shoots (Reeseville lists *Cornus alba* var *flavoremea* YELLOW TWIG DOGWOOD, to confuse the issue) ((flah-vi-RAHM-ee-a) with yellow shoots.)



Cornus sericea

CRASSULACEAE DC 1825 **STONECROP FAMILY** Fruits are follicles, as many as the ovaries, each opening along the ventral suture, many-seeded.

The photosynthetic path known as Crassulacean acid metabolism photosynthesis was discovered in this family of succulents in 1940. The plants fix carbon at night, storing it as four carbon acid malate, allowing the stomata to remain closed in the day. Essentially, unlike Bill Clinton who didn't inhale, the plants don't exhale all day, conserving water. CAM-type plants are popular choices for green roofs, even though they are succulents & weigh more than dry prairie plants. Go figure. Cacti, quillworts, pineapples, & aloes are CAM plants.

Penthorum See *Penthoraceae*

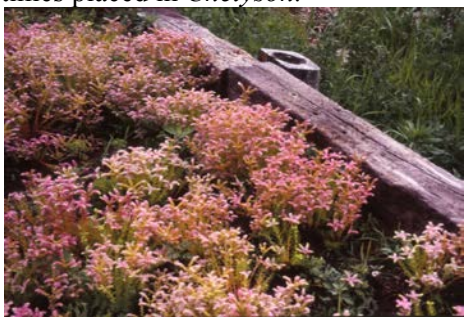
SEDUM Linnaeus 1753 **STONECROP, ORPINE, SEDUM, LIVE-FOREVER, ENGLISH MOSS** *Crassulaceae*
Sedum New Latin, from Latin, houseleek, from Latin *sedēre*, to sit, an allusion to the plants appearance when growing on rocks, seeming to be just sitting there. Date: 1760. A genus of approximately 200 spp, which is sometimes split into 4 or 7 genera. Carpels 4 to 5, distinct, many-seeded, with an entire scale at the base.

The small seeds ripen in summer to fall, 3-4 weeks after flowering. Collect when the seed heads are yellow to brown. Surface sow & stratify. Cullina code A seeds will germinate within 4 weeks sown at 70ºF, or B seed will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, H seeds require light to germinate. Cuttings are by far easier than seed. Late flowering spp should be stuck in spring, with spring flowering spp stuck in summer. Leaf cutting cut at the stem also root in about one month. (cu00)

CAM carbon metabolism.

Sedum pulchellum Michaux WIDOW'S-CROSS, aka LIME STONECROP, STONECROP.
Habitat: In southern Illinois, glades & bluffs. In the SE USA, calcareous rock outcrops.
Culture: ①Moist cold stratify? Ken Schaal. ②"No pre-treatment needed. Sow seeds just below soil surface at 70ºF & water." (ew12) ③Sow at 20ºC (68ºF), germination slow do not cover (tchn). 2,368,000 (ew12) seeds per pound.

cultivation: Space plants 0.5-1.0'. Mesic soils, full sun to partial shade. Marginally hardy in Whiteside Co, gorgeous, but short-lived.
Description: flowers rose pink, central flower 5-merous, those of the branches 4-merous;
Comments: status: phenology: Blooms spring.
VHFS: Sometimes placed in *Chetyson.*



Sedum pulchellum

Sedum telephioides Mx.
Flowers purple, all 5-merous; key features: leaves broadly lanceolate, attenuate at the base, subdentate. "Like the other spp, very tenacious of life, & will grow when pressed & apparently dried in the herbarium" (Woods 1873).

Sedum ternatum Michaux WILD STONECROP, aka MOUNTAIN STONECROP, UPL
Habitat: Limestone bluffs, rich floodplain terraces, & open woodland sites.
Culture: ①Sow at max 5ºC (41ºF), germination irregular, often several months do not cover (tchn). Spreads by seed.

asexual propagation: A real no-brainer from cuttings.

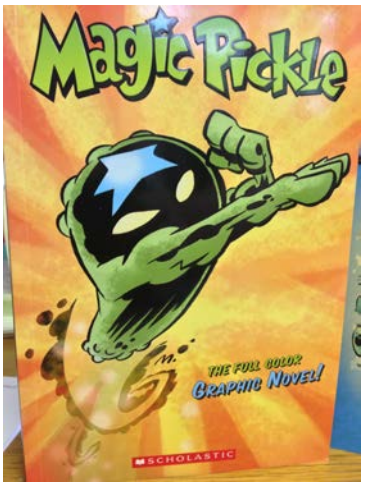
cultivation: Space plants 10.-1.5' on center.
Description: Herbaceous, perennial, native forb; inflorescence cyme, flowers white, central flower 5-merous, those of the branches 4-merous; key features: Leaves ternately verticillate, obovate.

VHFS: Sometimes placed in *Clausenellia.*

Sedum ternatum

Sedum triphyllum (Haw) SF Gray "A frequent escape to roadsides persisting indefinitely" (ewf55).

CUCURBITACEAE AL de Jussieu 1789 **GOURD FAMILY, CUCURBITS, PICKLES** A family of about 120 genera & 775 spp, chiefly tropical & subtropical, with a few spp extending into temperate areas of Europe & America. Flowers are never blue. Fruit a pepo or membranous; seeds flat, with no albumen, often ariled. Many spp have a bitter laxative principle, which is concentrated in a few as to make them medically active. The official *colocynth* is made from the pulp of *Cucumis Colocynthis*, a powerful drastic poison (Woods 1873)



CUCURBITA Linnaeus **SQUASH, PUMPKINS, & GOURDS** *Cucurbitaceae Cucurbita* (kew-KUR-bi-ta) from the Latin name for a gourd; alternately a Latin word for a vessel, referring to the shape of the fruit. Annual & perennial herbaceous vines. Pepo fleshy or ligneous, 3 to 5-celled; seeds thickened at the margin, obovate, compressed, smooth.

Cucurbitacins are bitter, toxic substances (tetracyclic triterpenes) common in the gourd family. Cucurbitacins are feeding stimulants to *Diabrotica undecimpunctata howardii,* SPOTTED CUCUMBER BEETLES. (These bitter chemicals have been breed out of the fruits of our domesticated melons, cucumbers, & squashes. Gourds have a long archaeological record in the lower Illinois River Valley.

Cucurbita foetidissima Humboldt, Bonpland, & Kunth MISSOURI GOURD (*foetidissimus -a -um* most or very fetid, of a very evil smell or stench, from Latin *fētid-us*, from *fētēre* to have an offensive smell, & -*issimus -a -um*, superlative suffix, indicting the most, very, -est.) "This vine has persisted for years on the bank of Kent creek near the IC RR depot on Rockford" (ewf55).

Cucurbita maxima Duchesne SQUASH, *Na'bugogwis'simaün,* flat pumpkin (*maximus -a -um* MAHK-si-mus Latin superlative adjective, largest.)

Cucurbita pepo Linnaeus *Ogwis'simaün,* PUMPKIN (*pepo* PE-po from the Latin name for a large pumpkin or marrow, fruit like a pumpkin or gourd; from classical Latin *pepōn-*, *pepō* (in post-classical Latin also *pepon*, *c*400) a water-melon or other gourd, from ancient Greek πέπων, *pepon*, a kind of gourd or melon eaten when ripe, use as noun (short for πέπων σίκυος, *pepon sikuos,* literally a ripe cucumber) of πέπων, *pepon,* (adjective) ripened, ripe, mellow, from the base of πέσσειν, *pessein,* (Attic πέττειν, *pettein*) to cook, from the same Indo-European base as classical Latin *coquere* to cook (OED)) den28

ECHINOCYSTIS Torrey & A Gray **WILD CUCUMBER, WILD PICKLE OF THE PRAIRIE** *Cucurbitaceae*
A monotypic genus of eastern North America. A climbing herb with branched tendrils; flowers monoecious; fruit roundish, inflated, echinate, 4-seeded.

Echinocystis lobata (Michaux) Torrey & Gray, WILD CORNISHON, aka WILD BALSAM APPLE, WILD CUCUMBER, facw
Habitat: Habitat is limited only by perch selection of jays & other birds which open the fruits, carry the seeds away & drop a few, but typically found in wet or moist environments, along fences, brushpiles, or under shrubs. Blue jays have been known to carry acorns & pine seeds up to 35 miles. "Common in thickets, fence-rows, & weed patches in moist places" (ewf55).
Culture: ①60 days cold moist stratification (pm09). ②Dormant seed only (Deno). The large cotyledoned-seedlings are evident in the cold weather of early spring.
1,248 to 2,880 (pm02, aes10) seeds per pound.
Description: Native, annual, herbaceous vine; flowers white; fruits 1-2" in length, setose-echinate, at length dry & membranous, with 4 large seeds.
Comments: status: phenology: Blooms 7,8,9. Useful in landscaping, arbors, nasty neighbor retribution, wetland restoration. Flowers are fragrant. Can become an agricultural pest.
Associates: Attracts butterflies & song birds. Seeds are relished by Blue Jays.
ethnobotany: Root used as medicinal plant by Ojibwa & Menominee (sm23, 32). Pulverized root used by Meskwaki, Menomini, & others for a poultice for headaches. Decoction used as bitter tonic, used in love potions (Uphof 1968).
VHFS: At one time placed in *Sicyos* Mx, or *Momordica echinata* Muhl.


Echinocystis lobata

SICYOS Linnaeus **SINGLE-SEED CUCUMBER** *Cucurbitaceae Sicyos* New Latin, from Greek σίκυος, *sikyos,* the ancient name for cucumber. A genus of about 50 spp, Australia, Pacific Islands, & tropical America. Fruit ovate, membranous, hispid or echinate, with one large, compressed seed.

Sicyos angulatus Linnaeus # DE, IN, KY BUR CUCUMBER, aka ONESEED BURR CUCUMBER, WALL BUR CUCUMBER, WILD CUCUMBER, facw-
Habitat: Wet savannas, mesic woodlands, fencerows, wooded floodplains, moist soil of fields & woods. "Rock River & Kent Creek banks at the mouth of the latter & on the island at the IC RR bridge, in

Rockford" (ewf55).
Culture: Hull, dormant seed. Seeds germinate after a period of cold, moist stratification (pm09).
Description: Herbaceous annual vine with branching tendrils; roots minimum depth; stems; leaves broad with 3-5 shallow lobes; inflorescence of male flowers in a long-stalked cluster (cyme-like raceme), the female flowers in a shorter-stalked, small, crowded, head-like cluster of 8-10 flowers; flowers white to greenish flowers corolla 5-lobed, 5-merous; fruit 0.5" long, dry, not inflated, ovate, spinous, one seeded. N.
key features: Large leaves, clusters of pistillate flowers, spiny clusters of fruits, fruits not inflated.
Comments: status: Noxious weed in Delaware, Indiana, & Kentucky. phenology: Blooms 8,9 Can become an agricultural pest.
Associates: Female flowers attract long-tongued bees (including honeybees & bumblebees), Sphecid wasps, Vespid wasps, & flies. Wasps & some bees are attracted to the male flowers. Attracts a large number of pests, including flea beetles, Cucumber beetles, Squash beetles, plant bugs, aphids, & moth larvae.

Cuscutacea

Densmore 1928 lists *Dircanum binjeanii* De Not, WOOD MOSS, as Ojibwa utility plant

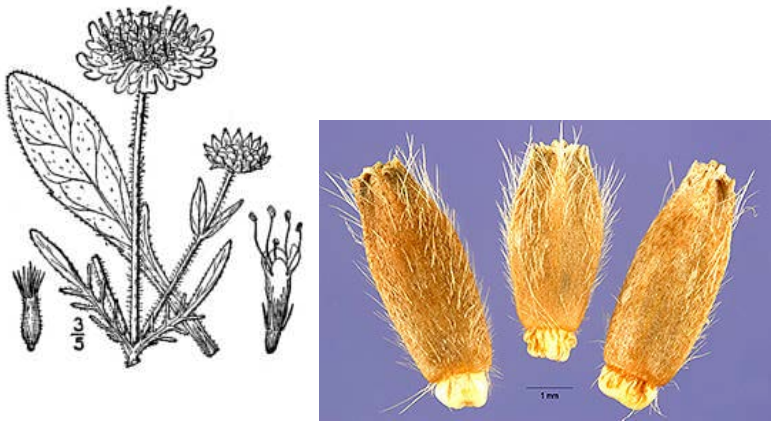
DIPSACACEAE AL de Jussieu 1789 **TEASEL FAMILY, TEASELWORTS** Closely allied to the *Compositae*. Fruits are dry, indehiscent, with a single suspended seed.

DIPSACUS Linnaeus **TEASEL** *Dipsacaceae Dipsacus* New Latin, from Greek *dipsakos,* teasel, diabetes, from διψάω, *dipsao,* to thirst, alluding to the water held in the axils of the leaves. "*Dipsacus* begins flowering about halfway up the head, the flowers then opening sequentially toward both the base & the tip of the inflorescence." (w08) Plants stout, prickly; leaves opposite, connate (sometimes distinct) at base; flowers in heads, heads oblong, the middle zone of florets blooming first; fruit 1-seeded, crowned with the calyx.
http://www.dot.il.gov/oper/Teasel_Poster_101513version2.pdf

Dipsacus sylvestris Hudson WILD TEASEL,
①Sow at 20ºC (68ºF), germination slow (tchn).
Tall thistle-like plant, angled, prickly; flowers bluish in large oval or cylindrical heads, bracts are straight, not hooked; key features: chaff of receptacle pungent(?), not hooked.
"Apparently very uncommon in the county since we have found it only once, in a field south of Pecatonica Corners" (ewf55).

KNAUTIA Linnaeus **BLUE BUTTONS, FIELD SCABIOSA** *Dipsacaceae Knautia* named for Christoph *Knaut*, 1638-1694, German botanist, or dedicated to Christen Knault 1654-1716, Saxon physician & botanist. About 60 spp of herbs of Europe, west Asia, & North Africa.

Knautia arvensis (Linnaeus) Coulter BLUE BUTTONS,
Sow at max 5ºC (41ºF), germination irregular, often several months (tchn).
"Well established on Montague road, 4 miles southwest of Rockford. (*Scabiosa arvensis* L) (ewf55)



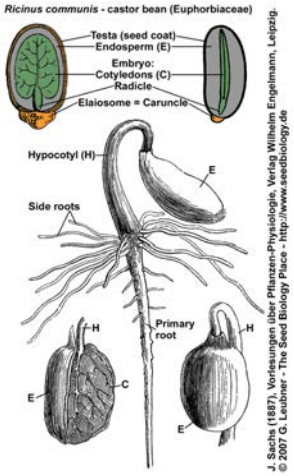
Knautia arvensis

EMPETRACEAE

EMPETRUM CROWBERRY *Empetraceae Empetrum* (EM-pe-trum) from *empetron* Greek from *en* on & *petros* rock, for its growth habit. Evergreen shrub.

Empetrum nigrum Linnaeus CROWBERRY, (*nigrus -a -um* (NIG-rus black, for the fruit)
Habitat: Rocky places & peaty soil, boreal.
Associates: ethnobotany: Berries available in autumn (July-November) & through winter. Used as food by Ojibwa (Reagan 1928)

EUPHORBIACEAE AL de Jussieu 1789 **SPURGE FAMILY**
Many *Euphorbiaceae* spp have seeds with an eliaosome (caruncle).



Ricinus communis Castor Bean
http://www.seedbiology.de/structure.asp

ACALYPHA Linnaeus 1753 **COPPERLEAF, THREE-SEEDED MERCURY** *Euphorbiaceae* New Latin, from Greek *akalyphē*, *acklephes* for nettle, alteration of *akalēphē* , an ancient name for a type of nettle applied by Linnaeus to the genus *Acalypha.*

Acalypha gracilens A Gray subsp **gracilens** SHORT-STALK COPPER-LEAF, aka SLENDER THREE-SEEDED-MERCURY, (*gracilens* thin, slender)
Habitat: Open woods, fields, & meadows, full or partial sun, moist or dry, in sandy soils.
Description: Erect, annual forb; 8" to 20" tall; roots; stem unbranched or with a few branches near base, stems hairy; leaf stalk about 1/4 as long as the linear to oblong leaf blade; inflorescence a cluster from the

leaf axil flowers 4 (male), 3(female)-merous, no petals, only sepals; N. key features:
Comments: status: phenology: Blooms July to October.
Associates:
VHFS: [*Acalypha gracilens* A Gray var *gracilens*]

Acalypha rhomboidea Rafinesque RHOMBIC COPPER-LEAF, aka, THREE-SEEDED-MERCURY,
(rhomboideus -a -um diamond-shaped)
Habitat: Woods, disturbed sites, gardens, full or partial sun, dry to moist.
Description: Erect annual, 8" to 24" tall forb; roots minimum depth; stems with hairs either in lines or all over; leaves lance-shaped to slightly rhombic, stalks about half as long as the leaf blade, alternate; with stipules & coarse teeth; inflorescence a tiny cluster from the leaf axil surrounded by many-lobed bracts; flowers 4 (male), 3(female)-merous, no petals, only sepals; N. key features:
Comments: status: phenology: Blooms
"Common in damp shady places. In this the stem is nearly glabrous & the flower bracts are few lobed." (ewf55)
Associates:
VHFS: [*Acalypha virginica* L var *rhomboidea* (Raf) Cooper]

Acalypha virginica Linnaeus VIRGINIA COPPERLEAF,
"Likely to be in drier places than the above (*A rhomboidea*). The stem has spreading hairs & the pistillate bracts have more lobes." (ewf55)

CHAMAESYCE SF Gray 1821 See *Euphorbia*. Weakley (2007) places many of our *Euphorbia* in *Chamaesyce*.

Chamaesyce supina (Rafinesque) Moldenke "Common on railroads, roadsides, in yards, &c" (ewf55)

Croton capitatus Michaux DOVEWEED, aka GOATWEED, HOGWORT,
overgrazed pastures
Blooms July-October.
Associates: Larval host *Anaea andria,* GOATWEED LEAFWING BUTTERFLY, nectar source *Leroda eufala* EUFALA SKIPPER. Seeds are eaten by quail.

EUPHORBIA Linnaeus 1753 **SPURGE** *Euphorbiaceae Euphorbia* (ew-FOR-bee-a) New Latin, from the classical Latin *euphorbe,-a, euphorbia*, from *Euphorbus*, 1st century Greek physician to Juba II, ob. 23, client-king of Mauretania & Numidia. (*Also seen as king of Numidia. Western Numidia & Mauretania Caesariensis are essentially the same place. The modern country of Mauritania is west & south of ancient Mauretania.*). Juba II was educated in Rome & married the daughter of Anthony & Cleopatra. Occasionally, *Euphorbia* is interpreted as being from Greek *eu*, well, & *phorbê*, pasture, food, although some spp produce a blistering sap. *Euphorbus* is also the name of a Trojan hero of the Trojan War. A very large & wide spread genus of greatly diverse appearing plants, some being fleshy succulents, others like cacti, others leafy & herbaceous, or sub-shrubs, or tender shrubs, but all having milky juice & flowers without a calyx & included in an involucre which surrounds a group of several staminate flowers & a central pistillate flower with 3-lobed pistils. Annual & perennial spp.

Seeds mature in late summer, about 3-4 weeks after flowering. Ripe seeds are quickly shed. Germination is easy by cold moist stratification. The seedlings have fragile taproots that are easily damaged while transplanting. Cullina code B seed will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF. 4-6" tip cuttings with 2,000-ppm liquid dip yield about 50% rooted in 4-6 weeks. (cu00)

Euphorbia commuta Engelmann ex A Gray WOODLAND SPURGE, aka TINTED SPURGE, "Uncommon on shaded banks; Kishwaukee River bluff above Camp Grant & Rock River buff opposite Rockton" (ewf55).

Euphorbia corollata Linnaeus FLOWERING SPURGE, aka APPLE ROOT, MILK IPECAC, PRAIRIE BABY'S BREATH, PURGING ROOT, SNAKE MILK, WHITE PURSLANE, WILD HIPPO, The common name SPURGE is from Latin *expurgare,* to purge. upl

Habitat: Mesic, dry-mesic, dry, hill, & sand prairies, savannas & open woods. Dry to moist prairies & open woods, dry open woods, fields & roadsides, common plant in prairies, glades, & open glades. "A common weed of roadsides & pastures" (ewf55).
Culture: ①"Moist cold treatment, or fall sow. Light cover. Fair to good germination." (mfd93) ②30 days cold moist stratification (pm09). ③Seeds germinate after about 60 days of cold moist stratification (he99). Fall plant or cold stratify at 40ºF for 1 month for best results. Then sow on the soil surface at 70ºF & water. (ew11) ④Sow at max 5ºC (41ºF), germination irregular, often several months (tchn).

seed counts & rates: 128,000 (pm02), 130,235 (gna03), 144,000 (ew11), 157,639 (gnam06), 158,400 (aes10), 160,000 (jfn04, shirley), 181,238 (gnh12) seeds per pound.

"*Euphorbia corollata* Mesic to dry & sand prairie. Blooms mid June to mid September; WHITE. Harvest early September. 2'; method #1. Successful by SEEDLING TRANSPLANT; flowers 2nd year. Seed hard to get because fruit explodes upon ripening." (rs ma)

asexual propagation: Division of mature plants, stem & root cuttings. Easily divided & transplanted, root cuttings (2-3" section of upper root containing a bud), but roots are brittle & difficult to produce uniform transplants, can use 2" root-cutting treated with Rootone planted 2" deep.

cultivation: Space plants 1.5-2.0'. Full sun to partial shade, mesic to dry soils. Drought resistant to tolerant.

bottom line: Dormant seeding is insurance for field establishment. Spring seedings may work 45% of the time. Flipflop & crossover species. Germ 30, 20, 4.0, sd 24.7, r4.0-73 (69)%. Dorm 47.8, 51, na, sd 32.7, r8.0-91 (83)%. Test 31, 31, 29, r20-41 days. (#11).**

greenhouse & garden: Best from moist stratified seed (30-60 days) or dormant seeded.
Description: Native, "warm season", erect, herbaceous, perennial forb; 2-3 feet tall; alternate linear leaves, nearly sessile, hairless, whorled below the flower cluster, leaves turning dark red in fall. Lower leaves are shriveled or shed at time of flowering. Umbellate (flat topped to paniculate cyme) clusters of 5 tiny white flower-like bracts. True flowers in center of bracts, monoecious. Fruit is broad capsule with hard seeds that explodes when ripe. The POINSETTIA is a close relative with red bracts surrounding the true flowers.
Comments: 'Blooms' 6,7,8,9. In northern Illinois, collect seeds in late August-September. Collect seeds in se Wisconsin in September (he99). Landscaping, occasionally aggressive, allergenic sap. Stunning in mass. Our front yard has a small, sloping remnant about 50' by 200' that is solid FLOWERING SPURGE. When it is in 'flower', it is a cloud of white & is visible from 1000 feet away. Inconspicuous white flowers with long lasting white bracts, like the related POINSETTIA. In degraded sand prairies, spurge may form large stands that turn the Green River sand hills snow white in August. Attractive delicate cut flower, when used as filler, very similar to BABY'S BREATH. The latex sap may not mix well with other types of cut flowers. Can be used as a dried flower. The leaves & stems turn a brilliant orange-gold in fall. Seed source prairie remnants Green River Lowlands, Greenville Twp, Bureau Co, Shaw Station, Lee Co, & Tampico Twp, Whiteside Co.

"Other common plants, which presented themselves at different places on our route through the prairies" (Short 1845).
Associates: Pollinated by short-tongued bees, other *Hymenoptera, Diptera, Lepidoptera, & Hemiptera*. Reported as deer resistant. Poisonous to livestock.

ethnobotany: *Euphorbia* is a member of a family of latex, or milky sap producing plants. ☠ The latex sap is acrid & can cause blisters on sensitive skin. SPURGE has been used as a laxative, but overdose is poisonous. Test plots of a *Euphorbia* sp have yielded 10 to 20 barrels of oil per acre per year.
Add varieties.

Euphorbia corollata

Euphorbia cyparissias Linnaeus GRAVEYARD SPURGE, aka CYPRESS SPURGE,
Introduced from Europe. "A common escape to roadsides & pastures often forming dense extensive mats as on Ill. Rt. No. 2 four miles north of Rockford" (ewf55).

Euphorbia dentata Michaux PAINTED LEAF, aka WILD POINSETTIA, TOOTHED SPURGE, "Common in dry open & in thinly wooded places, on railroads & roadsides, also not uncommon in damp places. Moisture & shade do not seem to govern the shape of the leaves since f *cuphosperma* (Engelm) Fern is found not uncommonly growing with the sp. (*Euphorbia dentata* Michx) (ewf55 as *Poinsettia dentata* (Michx) Small)

Euphorbia esula Linnaeus WOLF'S-MILK, aka LEAFY SPURGE,
Introduced from Eurasia. "Grows profusely in an alley in east Rockford, but not seen elsewhere" (ewf55).

Euphorbia glyptosperma Engelmann RIDGE-SEED SPURGE, "In all our sand areas & to a less extent on high prairies & the sandy prairies about Camp Grant. Also in Boone & Stephenson cos." (ewf55 as *Chamaesyce glyptosperma* Engelm.)
[*Chamaesyce glyptosperma* (Engelmann) Small]

Euphorbia heterophylla Linnaeus "Doubtfully native here since the only places we have found it are on railroads & in waste places. The CB & QRR in East Rockford." (ewf55 as *Poinsettia heterophylla* (L) Small)

Euphorbia humistrata Engelmann SPREADING SANDMAT, "Very uncommon. The bank of Kent Creek at North Central avenue, Rockford, & similar damp places. A pale plant that differs from *C supina* by the nearly glabrous lower surface of the leaves, the involucre being split & the seeds nearly smooth." (ewf55 as *Chamaesyce humistrata* (Engelm) Small)

Euphorbia maculata Linnaeus MILK PURSLANE, aka SPOTTED SPURGE, "A common roadside weed. (*E maculata* L) (*E preslii* Gussone) (ewf55 as *Chamaesyce maculata* L)
[*Chamaesyce maculata* (L) Small]

Euphorbia marginata Pursh SNOW-ON-THE-MOUNTAIN, "Railroads, waste places & Rock River bank at Rockford. Questionably native in northern Illinois." (ewf55) Sow at 20ºC (68ºF), germinates in two wks sow in situ outdoors, will not transplant (tchn).

Euphorbia obtusata Pursh WOODLAND SPURGE "Very uncommon. We have found it on Pecatonica & Sugar River slough banks." (ewf55)

POINSETTIA Graham See *Euphorbia* in part. Named in honor of Joel Roberts Poinsette of South Carolina.

FUMARIACEAE Augustin de Candolle 1821 **FUMITORY FAMILY** A family of about 15-20 genera & 500-600 spp of herbs, primarily north temperate.

CORYDALIS Augustin de Candolle 1805 *Fumariaceae Corydalis* (ko-RI-da-lis) New Latin, from Greek name *korydallis* crested lark, for the similarity of the spur of the flower to that of the lark; akin to Latin *cornu* horn; alternately from the Greek name for FUMITORY, from which the genus was taken. Herbs native to north temperate regions & southern Africa & have decompound leaves, racemose irregular flowers, & a several-seeded capsular fruit. Some authors favor merging the *Fumariaceae* into *Papaveraceae.*
[*Corydalis* Medic in m14.]

Corydalis aurea Willdenow GOLDEN CORYDALIS, aka GOLDEN SMOKE,
Habitat: Gravel prairies & mountains from New Mexico to Alaska, & New England.
Culture: ①Sow in fall or cold moist stratify 30 days before sowing in spring.
Description: Biennial (annual?) to 10" with ferny leaves, & yellow flowers. Small black seeds have small white grit (elaiosome?) on one side, & ant dispersed.
Comments: status: phenology: Blooms summer & fall.
"Our only sp answers best the description of *C aurea* var *occidentalis* Engelm or *C montana* Engelm Found only on the crest of a high gravel bank east of Rockton." (ewf55)
Associates: ethnobotany: Root used as medicinal plant by Ojibwa (sm32)

DICENTRA Bernhardi 1833 **BLEEDING HEART, EAR-DROP** *Fumariaceae Dicentra* (di-KEN-tra) modern Latin from Greek δίκεντρος, *dikentros,* from δὶς, δι-, *dis, di,* two or twice, & κέντρον, *kentron*, a sharp point or a spur, for the flower have two spurs, the legs of the breeches, as it were. A genus of about 20 (12) spp of perennial herbs with a relictual north temperate distribution of eastern North America, western North America, & eastern Asia. Flowers are in racemes on scapes. The fruit is a pod-shaped capsule with many seeds. Formerly *Diclytria* DC The ornamental BLEEDING HEARTS is *Dicentra spectabilis* (*Lamprocapnos spectabilis*), from eastern Asia & Japan.

Dicentra seeds are hydrophilic, ant-harvested, & mature late spring to early summer. As soon as seeds are black, harvest green pods & sow seeds immediately in cold frame. Cullina code D seeds need a period of warm moist stratification followed by cold stratification and will germinate after shifting back to warm (70º-40º-70º).* seeds are hydrophilic, intolerant of dry storage. (cu00) Remove & replant bulblets while dormant during summer.

Dicentra canadensis (Goldie) Walpers SQUIRREL CORN, aka *DICENTRE DU CANADA* (*canadensis -is -e* (kan-a-DEN-sis) of Canada or northeast USA) The common name Corn is in reference to the tuber, which is similar to a kernel of corn in size, color, & shape.
"Commonly claimed for the county but we have not found it, though it is common a few miles to the southwest of us in Ogle Co" (ewf55).
Description: key features: Stems subterranean, tubiferous; spurs short, rounded, obtuse, slightly incurved. The flowers are more heart-shaped than pant-like.
Comments: status: phenology: Blooms slightly later than the following sp.
VHFS: [*Bicuculla canadensis* (Goldie) Millspaugh]

Dicentra cucullaria (Linnaeus) Bernhardi DUTCHMAN'S BREECHES, (*cucullarius -a -um* (kuk-ew-LAH-ree-us) hood-like, for the flowers.) The common name is for the resemblance of the flowers to white pantaloons hanging on a clothesline.
Habitat: Full sun to woodland, mesic soils. "Common in woods" (ewf55). distribution/range:
Culture: ①Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment (pm09). ②Sow seeds just below moist soil surface at 70ºF for 1 month. Move to 30ºF for 1 month, then bring back to 50ºF. (ew11). ③Sow at 18-22ºC (64-71ºF) for 2-4 wks, move to +2 to +4ºC (34-39ºF) for 4-6 wks, move to 5-12ºC (41-53ºF) for germination , short viable seed - sow immediately after harvest (tchn). 907,200 (aes10) seeds per pound.
cultivation: Space plants 1.0-1.25'.
Description: Erect, herbaceous, perennial, native forb; 0.25-1.0'; flowers white to yellowish (or pinkish), 4-merous; key features: "White tear-shaped bulblets, both petals spurred, spur heart to triangular shaped, leaves yellow-green, not smooth." (fh) Roots bulbiferous, spurs divergent, elongated, acute, straight.
Comments: status: phenology: Blooms March (early April) -May. Flowers are fragrant. Seeds have elaiosomes & are gathered by ants.
Associates:
VHFS:

GENTIANACEAE AL de Jussieu 1789 **GENTIAN FAMILY** A family of about 87 genera & over 1600 spp of herbs, shrubs, & trees, cosmopolitan. The family is highly dependent on mycorrhizal fungi. This is a also mycoheterotrophic plant family associated with arbuscular mycorrhizal fungus. Species range from apparently photosynthetically normal to completely leafless & dependent on fungal links for nutrition.
"The *Orchidaceae* & *Gentianaceae* have spp with differing levels of dependence on mycorrhizas, extending from fully autotrophic, balanced mycorrhizas to fully–heterotrophic, exploitative associations (Leake 1994). The *Gentianaceae* show an evolutionary series where the hyphal coil interface gradually becomes more important, culminating in cases without any arbuscules (Schmid & Oberwinkler 1994, Imhof 1998, 1999b). Some members of the *Gentianaceae* require companion plants to support their VAM fungi (Jacquelinet-Jeanmougin & Gianinazzi-Pearson 1983, McGee 1985, Warcup 1988)." (Mark C Brundrett, 2002, Coevolution of roots & mycorrhizas of land plants, New Phytologist, (2002) 154: 275-304.)

BARTONIA Muhlenberg ex Willdenow **BARTONIA, SCREWSTEM** *Gentianaceae Bartonia* honoring Prof Benjamin Smith Barton, (1766-1815), botanist, naturalist, & physician, Philadelphia, Pensylvania; in 1803 published *Elements of Botany,* the first American botany textbook, partially illustrated by William Bartram. A genus of three spp of herbs native to eastern North America. The genus lacks root hairs & has coralloid mycorrhizae, & is presumed partially mycotrophic.

Bartonia virginica (Linnaeus) Britton, Sterns, & Poggenburg SCREWSTEM aka VIRGINIA BARTONIA, YELLOW SCREW-STEM,

Special Concern in Wisconsin.

"Rare. In a shallow bog in Rockton Township it grows in deep grass & sedge where it is very hard to find, & to a less extent in more exposed places in the same area." (ewf55)

FRASERA Walter GREEN GENTIAN *Gentianaceae Frasera* after John Fraser, 1750-1811, a Scottish collector of North American plants, especially in Newfoundland & the Appalachians, & nurseryman in London nurseryman.

Frasera caroliniensis Walter *NY, PA AMERICAN COLUMBO, aka GREEN GENTIAN,
"Rich woods, sandy woods; occasional in the s ½ of Illinois; also Cook & DuPage cos" (m14).
Best planted outdoors in the fall (pm09).

"*Frasera verticillata* is not so frequently seen in the more open prairies as in the thinly-wooded barrens." *Frasera caroliniensis* as *F. verticillata* Raf. (Short 1845).

Threatened in New York. Endangered in Pennsylvania.
VHFS: [*Frasera officinalis* W Bartram, *F verticillata* Raf, *F walteri* Michx*, Swertia caroliniensis* (Walter) Kuntze]

GENTIANA Linnaeus 1753 **GENTIANS** *Gentianaceae* (gen-tee-AH-na) New Latin, from Latin *Gentiana* after King Gentius of Illyria, 2nd century BC (or 500 BC), who discovered medicinal properties of *G lutea*, the European YELLOW GENTIAN, aka BITTERWORT, which helped heal his malaria-ridden army. A genus of about 350-400 spp, annual, biennial, or perennial herbs (*sensu stricto*), primarily temperate & arctic, that have smooth opposite leaves & showy solitary or cymose, erect, vase-like flowers with 4-lobed or 5-lobed corolla, flowering late summer & fall. Some spp contain a bitter glycoside often used as a tonic. *Gentianella* Moench & *Gentianopsis* Ma have recently been separated from *Gentiana.*

G andrewsii & *G flavida.* "Moist cold treatment or fall sow. Very light cover. Grit works well. Good germination. Potted plants benefit from light shade. (mfd93).

Seeds mature in fall. Capsules may be infested with weevils (or insect larva) that eat much of the seed. Surface sow & lightly cover with sand for outdoor treatment. Seedlings are slow growing, feeding helps. Cullina code B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, H seeds require light to germinate. (cu00)

Fruit is capsule with tiny seeds. Several spp have "balloon-like" flowers. *Gentiana* is said to be obligate mycorrhizal. This would be in line with Dr Betz's wave method of prairie restoration, the success of successional restoration method with this genus, & Ken Schaal's note that some spp need companions. Gentians are said to resent disturbance. Seeds should be sown in 200 cell trays & plants bumped with little disturbance. Plugs should be planted in their permanent location & not disturbed. Curbstone data suggests that Roundup, applied in the middle of the growing season, to grasses near BOTTLE GENTIAN may translocate through mycorrhizal links & kill the GENTIAN, as it does with NEW JERSEY TEA.

There is an urban legend about the sensitivity of GENTIAN seed. Rumor has it that touching the seed kills it, in one version it is the salt in your sweat, in the other version it is your skin oils. If any one has seen definitive studies, please share them with us. If you have fondled a bag of seed with your dirty, sweaty, oily bare-hands & killed it, we would also like to hear about that too. GENTIANS are said to be an antidote for witchcraft.

Knowing some *Gentianaceae* require companions mycorrhizally, there is a thought one *Gentiana* sp is a partial parasite.

Listing *Gentiana* various species, Short noted: "There are, indeed, comparatively speaking, but few plants, except the grasses, (which are gregarious every where and are intermixed in greater or less degree and variety among all the other plants of the prairie,) which may be considered as indigenes of the prairie region generally. ---Among these we may mention, as occurring most constantly, and under greater diversity of soil and situation that any others, …" (Short 1845).

Gentiana andrewsii Grisebach BOTTLE GENTIAN, aka ANDREW'S GENTIAN, BLIND GENTIAN, CLOISTERED HEART, CLOSED GENTIAN, GALL FLOWER, PRAIRIE CLOSED GENTIAN, SAMPSON'S SNAKEROOT, (*andrewsii* an-DROOZ-ee-ee After HC Andrews.) facw
Habitat: Wet meadows, mesic to wet prairies, & wet-mesic & mesic savannahs.
Culture: ①"Moist cold treatment, or fall sow, or no pretreatment necessary. Light cover. Grit works well.

Good germination. Potted plants benefit from light shade." (mfd93) ②60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. (pm09). ③Sow seeds immediately when ripe, or seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. Easy to introduce if fresh seed is sown in place. (he99) ④Sow seeds on moist soil surface at 70ºF for 1 month. Move to 30ºF for 1 month, then bring back to 50ºF. (ew11) ⑤Sow at 18-22ºC (64-71ºF) for 2-4 wks, move to +2 to +4ºC (34-39ºF) for 4-6 wks, move to 5-12ºC (41-53ºF) for germination, cover thin (tchn).

seed counts & rates: 3,632,000 (jfn04, sh94, aes10), 4,224,000 (ew11), 4,480,000 (pm02), 7,248,739 (gna04), 8,035,398 (gna04), 8,254,545 (gna04), 10,088,889 (gna05), 11,493,670 (gna06), 12,800,000 seeds per pound.

"*Gentiana andrewsii* Moist prairie. Blooms early September to mid October. BLUE. Harvest November. 1 1/2'; method #1, but seedlings spent full year in seed flat; SEEDLING TRANSPLANT; bloom 3rd year; the easiest of the gentians." (rs ma)

asexual propagation: Division (?) in emergencies or with extreme care.

cultivation: Space plants 0.75-1.0'. Full sun to partial shade, mesic soils. Humus soils. Calcareous soils.

bottom line. Seed is significantly to strongly dormant (48-90%); field establish by dormant seeding only, successionally or into previously mycorrhizally inoculated soils. 1 lot in 10 is >20% dormant. Flipflop species. Germ 21.1, 14, 2.0, sd 23.7, r1.0-83 (82)%. Dorm 71.5, 82, 90, sd 23.2, r12-90 (78)%. Test 34, 31, 31, r27-46 days. (#13)**

greenhouse & garden: Dormant seed or moist cold stratify, easy from moist-stratified seed, light. Easy by successional restoration method. Sow in 200 cell trays, & stratify trays.

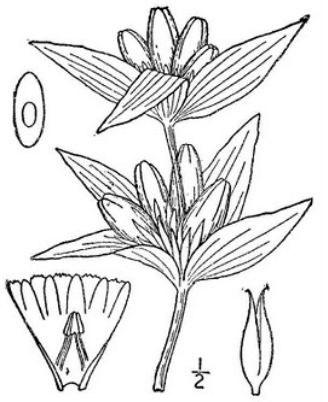
Description: Erect, herbaceous, perennial, native forb, 1-3' tall; flowers deep blue, unusual 'closed' blooms, showy.

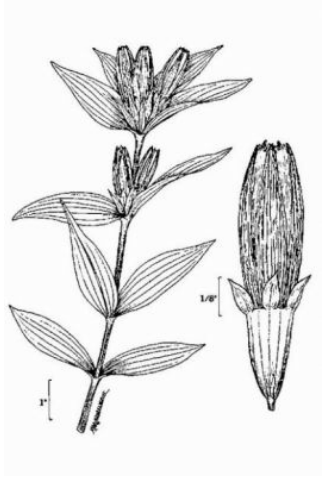
Comments: Blooms 9-10. In northern Illinois, collect seeds in October-November. Collect seeds in se Wisconsin in October-November (he99). Attractive cut flowers & dried flowers, landscaping, rain gardens with clean, rich soils. Noted as obligate mycorrhizal. Retesting of individual lots show viability declines significantly in storage, from 93% to 6% in 10 months, so plant early & plant often. Seed source nursery production; original seed wet prairie remnants, Gold Township, Bureau Co.

"Relatively common & generally distributed in wet places; low prairies in Grove Creek bottom, swampy places on Killbuck Creek, Searle Tract, C & NW Ry east of Winnebago, & boggy places in Coon Creek bottom" (ewf55).

Associates: Pollinated by bumblebees & *Coleoptera*.

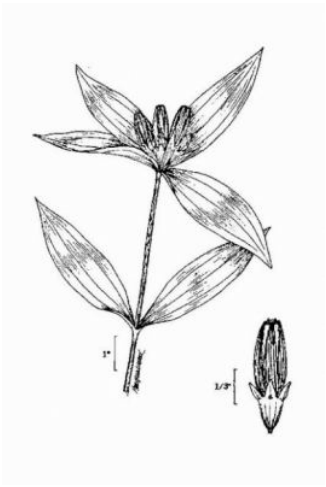
VHFS: Varieties *andrewsii* & *dakotica* A Nelson are known. [*Dasystephana andrewsii* (Grisebach) Small, *Pneumonanthe andrewsii* (Grisebach) WA Weber]






Gentiana andrewsii

Gentiana clausa Raf *NY BOTTLE GENTIAN *clausus -a -um* shut, closed, New Latin from Latin *claustrum*, noun, a means of closing or shutting in; bolt, bar; an enclosure, prison, den; a barricade, dam, fortress.)
Habitat: Moist woods & meadows. distribution/range:
Culture: Growth rate rapid. Seedling vigor low. Vegetative spread rate none. 9,000,000 (ecs) seeds per pound. Anaerobic tolerance low. CaCO3 tolerance low. Drought tolerance medium. Fertility requirement high. Salinity tolerance none. Shade tolerance intermediate. pH 5.8-7.2.
Description: cespitose; roots 6" minimum root depth; stems 1.5'; leaves; N. key features:
Comments: status: Exploitably Vulnerable in New York. phenology: Blooms September to October.
VHFS:



Gentiana clausa

rewrite as Gentianopsis
Gentiana crinita Froelich [New nomenclature *Gentianopsis crinita* (Froel.) Ma] FRINGED GENTIAN, aka GENTIAN ROOT, GREATER FRINGED GENTIAN, (*crinitus -a -um* provided with long haired, covered with long hair, mane-like, hairy, from Latin *crinitus*, from *crinis*, hair, &-*itis*, provided with, adjective, with long hair, for a hairy appearance.) Common name is from the fringed edge of the showy petals. facw+
Habitat: Wetlands & wet prairies. Moist meadows, woods, & streambanks.
Culture: ①Fresh seed, do not dry store seed! 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ②Sow seeds immediately when ripe, or seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. Easy to introduce if fresh seed is sown in place. (he99) ③Sow seeds on moist soil surface at 70ºF for 1 month. Move to 30ºF for 1 month, then bring back to 50ºF. (ew11). ④ Sow at 18-22ºC (64-71ºF) for 2-4 wks, move to +2 to +4ºC (34-39ºF) for 4-6 wks, move to 5-12ºC (41-53ºF) for germination, cover thin (tchn). 2,387,360 to 3,200,000 (pm02, ew11), 7,964,912 (gnhg12) seeds per pound.

cultivation: Space plants 1.0-1.25'. Full sun, wet soils. Said to tolerate clay soils.

bottom line: Seed is significantly to strongly dormant (85%); field establish by dormant seeding only, successionally or into previously mycorrhizally inoculated soils. Germ 6-12%. Dorm 85-91%. Test 26-28 days. (#2)

greenhouse & garden: Moist cold stratify, light, & GA3.

Description: Erect, herbaceous, annual/biennial, native forb; 1.0-1.7'; deep blue flowers, as blue as "the male bluebirds back" (Thoreau).

Comments: status: phenology: Blooms 8,9,10,11. In northern Illinois, collect seeds in October. Collect seeds in se Wisconsin in October-November (he99). Biennial. "This is uncommon & it is irregular in distribution from year to year in the boggy places in Coon Creek bottom & the Searle Tract. Also in Kishwaukee River bottom near Cherry Valley & in a bog near Irene, in Boone Co." (ewf55)

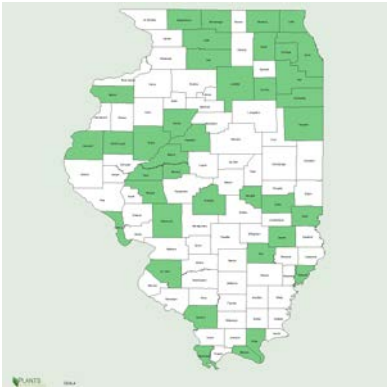
VHFS: [*Gentianopsis crinita* (Froel) Ma]

Gentiana crinita

rewrite as Gentiana alba

Gentiana flavida Gray *IN, KY, MI, OH, PA, WI [new nomenclature *G alba* Muhlenberg ex Nuttall] YELLOWISH GENTIAN, aka CREAM GENTIAN, CREAMY GENTIAN, PALE GENTIAN, PLAIN GENTIAN, WHITE GENTIAN, WHITE PRAIRIE GENTIAN, YELLOW GENTIAN, YELLOWISH WHITE GENTIAN, (yellowish, from Latin adjective *flavus -a -um*, golden yellow, reddish yellow, flaxen, blonde, & *-idus*, adjectival suffix indicating condition or progression.) facu

"*G alba* has nomenclatural priority over *G flavida* as the older name; there is controversy, however, over whether it was validly published & applies clearly to the sp at hand (see Wilbur 1988c for discussion)" (Weakley 2012). "*Gentiana alba* was first published by Muhlenberg in 1818. *Gentiana flavida* was first published by Gray in 1846. The plants are synonymous. Some experts consider *G alba* to be the correct name because it was published first, but other experts consider *G flavida* to be the correct name because of a belief that the Muhlenberg publication was invalid under the International Code of Botanical Nomenclature." (mbg)



Habitat: Mesic & dry prairies, dry savannas, wooded slopes, clay soils; damp woods, prairies, & moist meadows. Damp woods, prairies, & meadows. "In Missouri, it is found in scattered locations throughout much of the State primarily on rocky prairies, wooded slopes, ledges & bluff escarpments, rocky limestone glades & open wooded areas (Steyermark)" (mbg). In Michigan, "Dry or moist prairies & open oak savanna. Now nearly extirpated in Michigan." (rvw11) In Illinois, known from but not mapped from Bureau Co.

Culture: ① "Moist cold treatment, or fall sow, or no pretreatment necessary. Light cover. Good germination. Potted plants benefit from light shade." (mfd93) ②60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ③Sow seeds immediately when ripe, or seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99) ④Fall plant or cold stratify at 40ºF for 1 month for best results. Sow on the soil surface at 70ºF & water. (ew11) ⑤Sow at 20ºC (68ºF), if no germination in 3-4 wks, move to +2 to +4ºC (34-39ºF) for 2-4 wks, cover thin (tchn).

seed counts & rates: 2,240,000 (pm01), 2,560,000 (ew11), 3,400,743 (gnh02), 3,560,784 (gnh02), 3,616,000 (aes10), 3,748,760 (gnh11), 3,840,000; 4,242,991 (gna04), 6,532,374 (gnh03), 6,872,727 (gnh12) seeds per pound.

Kew Storage Behaviour: Orthodox. Long-term storage under IPGRI preferred conditions at RBG Kew, WP. Oldest collection 15 years.

cultivation: Space plants 0.75-1.0'. Full sun to part shade, moist, well-drained soils. Best in moist, humus-rich but gravelly, well-drained soils with some part afternoon shade (mbg). The best flowers are in full sun, but full sun can bleach the leaves. Tolerates mildly acidic to slightly alkaline soils. AES (2010) reports some salt tolerance. Zones 3-7.

This sp is reported to not grow well during hot, humid summers. It may need some help north during the next 80-90 years.

"*Gentiana flavida* Moist to mesic prairie. Blooms early September. Harvest late October. SEEDLING TRANSPLANT; ours flowered abundantly the 3rd year." (rs ma)

bottom line: Seed is strongly dormant (83-92%), field establish by dormant seeding only, successionally or into previously mycorrhizally inoculated soils, or into *in situ*, living soils as part of a diverse mix. Germ 8.1, 7.5, na, sd 5.2, r2.0-18 (16)%. Dorm 87.1, 90, 90, sd 6.3, r73-93 (20)%. Test 28, 28, 28, r20-36 days. (#8)**

greenhouse & garden: Dormant seed or moist cold stratify-light. Some strains are wildly successful by the successional restoration method.

Description: Native, erect to drooping, perennial forb, smooth, usually not branched; stems stout, 2.0'-3.0' tall, 1.0-2.0' spread; leaves mostly stalkless, smooth, yellow-green; inflorescence a dense, many-flowered cluster; flowers cream (cream green, white to yellowish white to greenish white), 5-merous, 1.25"-2.0" long, mostly-closed, tubular-shaped with small opening at the top & irregular folds between the petals; Similar to *G andrewsii.* key features: Leaves are clasping.

Comments: status: Rare in Indiana, Endangered in Kentucky & Michigan. Threatened in Ohio & Wisconsin. Extirpated in Pennsylvania. phenology: Blooms 8,9,10. C3. In northern Illinois, collect seeds in October-November. Collect seeds in se Wisconsin in October-November (he99). Attractive cut flowers & dried seed heads. Landscaping. Seed source old Burlington RR row west of Ohio, Bureau Co.

"Among the œconomical and medicinal plants of the prairies may be mentioned *Gentiana ochroleuca,* the roots of which have somewhat the bitterness of the officinal species, (*G lutea,* of Europe,) …; all these plants have a considerable reputation, which perhaps is but little deserved, against the bites of poisonous serpents, and they are known indifferently by the names of 'snake-root,' 'button snake-root,' 'rattle-snake's masterpiece,'" *Gentiana alba* as *G. ochroleuca sensu* Engelmann (1843) &c., non Froel. (1796) (Short 1845).

"Uncommon, being usually in woods, often dry sandy ones; edge of woods in Rock Cut, sandy oak woods west & north of Shirland. Also in a dry brushy place on Cunningham road west of Rockford. It is the first gentian to bloom. When in flower it has a peculiar way of spreading out flat on the ground with the heads turned up." (ewf55)

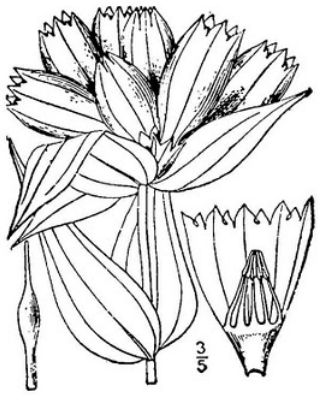
At times in restorations, this sp may behave aggressively from seed. This sp has some "assertive" strains that are thought to be potential hemiparasites (which is a logical step up from obligate mycorrhizal towards the mycoheterotrophic state of some *Gentianaceae*?). Howard Bright (ne Iowa) & Hal Gardner (Macomb) genotypes. These strains may thrive with *Panicum virgatum* and *Solidago canadensis*.

Associates: Species is of special value to & pollinated by bumblebees. Few insect or disease problems.

ethnobotany: Root used as medicinal beverage by Pottawatomie (sm33).

VHFS: [*Dasystephana flavida* (A Gray) Britt, *Gentiana alba* Muhl ex Nutt, *G alba* f *andrewsii* (Griseb) Farw, *G alba* var *pauciflora* Farw, *G albanica* Ják, *G albescens* Favre, *G albescens* Franch ex Kusn, *G albescens* (Franch) Franch ex Kusn, *G albicalyx* Burkill, *G albicalyx* subsp *globosa* (TN Ho) Halda, *G albidocoerulea* Gilg, *G albiflora* Lam, *G albiflora* Schur, *G albomarginata* C Marquand, *G albomarginata* subsp *scytophylla* (TN Ho) Halda, *G alborosea* Gilg, *G flavida* A Gray, *Pneumonanthe flavida* (A Gray) Greene]

RL Wilbur, 1988, The correct scientific name of the pale, yellow, or white gentian of the eastern United States. Sida 13: 161-165.



Gentiana flavida

rewrite as Gentianopsis, possibly as G virgata

Gentiana procera Holm [revised nomenclature *Gentianopsis procera* (Holm) Ma] SMALL FRINGED GENTIAN, aka GREAT PLAINS FRINGED GENTIAN, LESSER FRINGED GENTIAN, (tall, long, from Latin *procerus -a -um*, adjective, tall, large, see *procerius*, further forward.)

Culture: ① 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). 11,568,000 (pm02) seeds per pound.

Comments: status: phenology:

"Uncommon. Coon Creek in Winnebago Co, a bog east of Irene in Boone Co & in a similar situation in Kishwaukee River bottom in DeKalb Co. There is some question whether most of our plants are not of this sp rather than the preceding. (*G crinita*) The only places that we have seen large, much branched plants with broadly ovate leaves & with long fringe on the free edge of the petals are in Coon Creek bottom & the Searle Tract. All others in our neighborhood are suggestive of *G procera* in the size of the plant, the shape of the leaves, & the fringing of the petals." (ewf55)

Gentianopsis procera (Holm) Ma

Smaller Fringed Gentian.

Gentiana procera Holm, Ottawa Nat. 15: 11. 1901.

Annual; similar to the preceding species but smaller; stem simple, or little branched, 3′–18′ high. Basal and lower leaves spatulate, obtuse, the upper linear or linear-lanceolate, 1′–2½′ long, 2″–4″ wide; flowers 1–6, solitary at the ends of elongated erect peduncles, mostly 4-parted, about 1½′ high; calyx-lobes lanceolate, acuminate, their midribs decurrent on the tube; corolla narrowly campanulate, bright blue, its lobes spatulate-oblong, strongly fringed on both sides, entire or somewhat fimbriate or toothed around the apex; capsule short-stipitate; seeds scaly-hispid.

In wet places, New York and Ontario to Minnesota, South Dakota and Manitoba. July–Sept. Previously confused with *G. detonsa* Rottb. and with *G. serrata* Gunner, Old World species. Northwestern and Rocky Mountain plants formerly referred to this species prove to be distinct from it.

Gentiana nesophila Holm, of Anticosti, differs in merely denticulate corolla-lobes.

Gentiana puberulenta J Pringle *MI PRAIRIE GENTIAN, aka BUSH GENTIAN, DOWNY GENTIAN, (*puberulentus -a -um* somewhat(?) pubescent, from Latin verb *pubescere,* to reach physical maturity, to grow body hair, to grow to manhood; to ripen (fruit), mature, & *-ulentus -a -um,* adjectival suffix indicating abundance or full or marked development) upl

Habitat: Mesic, dry, & sand prairies & savannas. distribution/range:

Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ① Sow seeds immediately when ripe, or seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99) ③Sow seeds on moist soil surface at 70ºF for 1 month. Move to 30ºF for 1 month, then bring back to 50ºF. (ew11) ④(Code C, D, needs companions Ken Schaal) ⑤Sow at 18-22ºC (64-71ºF) for 2-4 wks, move to +2 to +4ºC (34-39ºF) for 4-6 wks, move to 5-12ºC (41-53ºF) for germination, cover thin (tchn).

seed counts & rates: 4,536,000, 6,960,000 (pm01, ew11), 10,809,524 (gnh11) seeds per pound.

cultivation: Space plants 1.0-1.25'. Full sun to partial shade, mesic to dry soils. Humus soils. Calcareous soils.

"*Gentiana puberula* Mesic to dry prairie. Blooms mid September to early October; DEEP BLUE. Harvest November. 1'; method #1, SEEDLING TRANSPLANT; but seedlings very delicate, usually die; needs better care in early seedling stage than I gave it; survivors bloom 4th year. Needs short but close competition. Beautiful." (rs ma)

asexual propagation: Careful division of garden plants is noted in one source but we do not recommended.

bottom line: Seed is significantly to strongly dormant (88%); field establish by dormant seeding only, successionally or into previously mycorrhizally inoculated soils. Germ 9.0%. Dorm 88%. Test 20 days.**

greenhouse & garden: Fresh seed dormant seeded or moist cold stratify, light, cool soils, temperature sensitive.

Description: Native, erect, herbaceous, perennial, forb, 0.5-1.0'; flowers blue, showy.

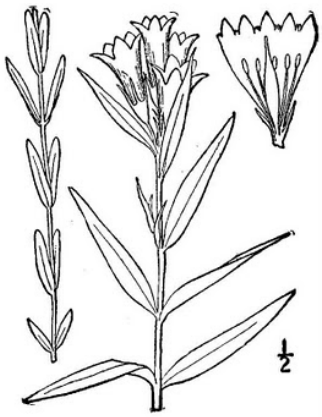
Comments: status: phenology: Blooms 8,9,10. In northern Illinois, collect seeds in October-mid-November. Collect seeds in se Wisconsin in October-November (he99).

"Other common plants, which presented themselves at different places on our route through the prairies. *Gentiana puberulenta as G rubricaulis* sensu Engelmann (1843), non Schw. (1824) (Short 1845).

"Locally common on dry prairies; C & NW RY east & west of Rockford, the Searle Tract, the gravel hills & bluffs that border Rock River. Even more than other gentians this is subject to attack of its seed capsules by insects." (ewf55)

Associates: Pollinated by bumble bees.

VHFS: [*G puberula* Michaux]





Gentiana puberulenta

1st 3 photos courtesy of James Xavier Alwill, Esq.

rewrite as *Gentianella quinquefolia*

Gentiana quinquefolia Linnaeus [new nomenclature *Gentianella quinquefolia* (L) Small] STIFF GENTIAN, aka AGUEWEED,

Habitat: Dry calcareous hill & gravel prairies, dry, calcareous slopes, calcareous woodlands in rocky, shallow soils over dolomite; mesic & dry mesic prairies & savannas. Typically in poor soils with little competition. Wet to wet-mesic prairies & savannas (he99). distribution/range:

Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ②Sow seeds immediately when ripe, or seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99) ③Sow seeds on moist soil surface at 70ºF for 1 month. Move to 30ºF for 1 month, then bring back to 50ºF. (ew11). ④Sow at 18-22ºC (64-71ºF) for 2-4 wks, move to +2 to +4ºC (34-39ºF) for 4-6 wks, move to 5-12ºC (41-53ºF) for germination, cover thin (tchn).

seed counts & rates: 2,880,000 (pm01, ew11), 3,831,224 (gnam11) seeds per pound.

cultivation: Space plants 1.0-1.25'.

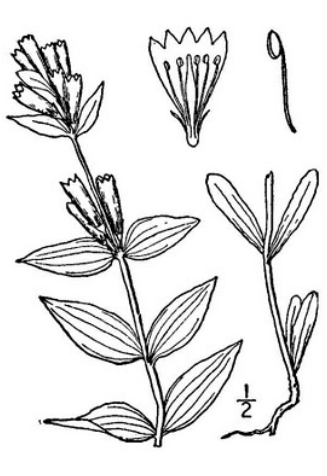
bottom line: Dormant seed successionally. Sow seed as soon as ripe or moist cold stratify as soon as ripe. Very small seed, needs light to germinate. Germ 3.8, 3.0, 3.0, sd 2.6, r1.0-8.0 (7.0)%. Dorm 83.8, 84.5, na, sd 8.9, r71-95 (24)%. Test 33, 34, na, r19-46 days. (#6)**

Description: Biennial (pm01, he99) or annual (IE 2001), 4-16"; blue flowers. Genetic source LaSalle Co.

Comments: status: phenology: Blooms 10-11. Collect seeds in se Wisconsin in October-November (he99).

"Other common plants, which presented themselves at different places on our route through the prairies" *Gentianella quinqueflora* as *Gentiana quinqueflora* (Short 1845).

"Quite uncommon, on dry gravel bluffs, limestone outcrops & high prairies" (ewf55).
VHFS: [*Gentianella quinquefolia* **(**L) Small]



Gentiana quinquefolia

Gentiana saponaria Linnaeus SOAPWORT GENTIAN, aka HARVEST BELLS,
Habitat: Sand & mesic prairies, woods.
1.5-4.0'.
"In low prairies on the C & NW Ry east of Winnebago & on the CB & Q RR south of Killbuck Forest preserve. In Ogle Co we have found it in Camp Lowden south of Oregon & in Boone Co in the shrub border of a wood on Ill. RT No. 173 near Caledonia." (ewf55)

Gentiana saponaria

NYMPHOIDES Hill **FLOATING HEART** *Gentianaceae nymphoides* nymphaea-like.

Nymphoides peltata (SG Gmelin) Kuntze YELLOW FLOATING HEART
Introduced from Europe. "This is in a fish pond in Kent Creek bottom west of Rockford where it was planted & has not spread" (ewf55).

SABATIA Adanson 1763 **SABATIA, ROSE-GENTIAN, MARSH-PINK, SEA-PINK** *Gentianaceae Sabatia*
also *Sabbatia*, New Latin, from Liberatus *Sabbati*, 18th century Italian botanist, & New Latin *–ia.*
The tiny seeds ripen late summer. Surface sow & chill flats. Seedlings grow slowly at first. Cullina code B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, H seeds require light to germinate. Perennial spp can be divided. (cu00)

Sabatia angularis (Linnaeus) Pursh MARSH PINKS, aka BITTER-BLOOM, COMMON MARSH-PINK, ROSE GENTIAN

Habitat: In se US, "Forests, woodlands, marshes, fields, calcareous hammocks (in FL)" (w12).
distribution/range: Moist soil, occasional in the s ⅔ of Illinois, rare or absent elsewhere (m14).
Culture: propagation: ①(Code J, winter annual, Ken Schaal). ②Sow at 20ºC (68ºF), if no germination in 3-4 wks, move to +2 to +4ºC (34-39ºF) for 2-4 wks (tchn).

seed counts & rates: 6,500,000 (jfn04), 20,800,000 (gn) seeds per pound.

Description: Includes f *albiflora* (Raf) House. In Mohlenbrock (2014), this is *S angulatus*.

"Our two most valuable indigenous bitters *Eupatorium perfoliatum* and *Sabbatia angularis* are abundant, and *Aristolochia serpentaria* is seen occasionally in the groves, where various species of dogwoods (*Cornus*) are also of frequent occurrence." (Short 1845).

GERANIACEAE AL de Jussieu **CRANESBILL, STORKSBILL, HERONSBILL GERANIUM FAMILY** 11 genera & about 700 spp of herbs & shrubs, mostly temperate. *Geranium* & *Erodium* are mostly northern temperate & *Pelargonium* south Africa & Australia.

GERANIUM Linnaeus 1753 **GERANIUM, CRANESBILL** *Geraniaceae Geranium* (ge-RA-nee-um) from the Greek name *geranion* from γέρανος, *geranos,* a crane, for the beak like fruits resembling a crane's bill. The domestic geranium genera are *Pelargonium,* from the Greek πελαργὸς, *pelargos*, a stork, referring to the stork's bill-like fruit, & *Erodium*, HERON'S BILL, from Greek ἐρωδιός, *erōdios,* a heron, also referring to the beaked fruit. A genus of about 300-430 spp of perennial herbs, mostly temperate, recognized by palmately-lobed leaves & distinctive seed capsules. Fruits rostrate, separating into 5 long-styled, 1-seeded carpels. Several European spp are naturalized in the USA. Some ornamental selections readily self sow in our flower beds & lawn, which is a bit disturbing.

Seeds are hydrophilic, mature in early summer, & are explosively expelled when ripe. Seeds should be planted immediately in a cold frame or stored in a plastic bag until fall. Seedlings should be encouraged to grow all summer by good container culture, consistent moisture & regular feeding, keeping containers from becoming warm & dry. Cullina code B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, * seeds are hydrophilic, intolerant of dry storage. (cu00)

The western *G caespitosum* sow seed in fall or for spring sowing, scarify seed & soak 6-8 hours in water or hydrogen peroxide, then cold stratify 1-4 months (pots). Some seed technicians note that *G maculatum* has 'hard' seeds, scarification may help.

Geranium maculatum Linnaeus WILD GERANIUM, aka ALUM BLOOM, ALUM ROOT, CRANE'S-BILL, CROW-FOOT GERANIUM, OLD MAID'S NIGHTCAP, SPOTTED CRANESBILL, SPOTTED GERANIUM, WOOD GERANIUM, *Be'cigodji'biguk,* one root (Ojibwa) [upl]
Habitat: Mesic savanna & woodland. Dry or moist woods; woodland edges; dappled meadows. Woods, thickets, & shaded roadsides. Forests. "Common in woods, thickets, & meadows" (ewf55).
distribution/range: Common, in every Illinois county (m14).
Culture: propagation: ①"Sow seed upon ripening & overwinter flats, or fall sow. If not possible try moist cold treatment. Scarification of ...? Variable germination." (mfd93) ②90 days cold moist stratification. Best planted outdoors in the fall (pm09). ③Sow seeds outdoors in fall, or 60 days cold moist stratification (he99). No pretreatment needed. Sow seeds just below the soil surface at 40ºF & water. (ew11) ④Sow at max 5ºC (41ºF), germination irregular, often several months (tchn). ⑤"The fruiting structure begins to darken 3-4 weeks after the bloom period. Collect at this time & place in a paper bag, where they will split open & release small, dark-brown seeds. Store in sealed, refrigerated containers. No treatment necessary. Seeds may be sown outside in late fall or the following spring without any cold treatment." (lbj)

seed counts & rates: 64,000 (aes10), 77,600 (jfn04), 78,400 (ew11), 80,000 (pm02), 80,869 (gna06), 88,802 (gnhg12), 89,396 (gnam04) seeds per pound.

asexual propagation: Easy by root cuttings, often does well in rich soils, full sun (Bill Carter, personal communication). "The spp may also be propagated by rhizome division in either fall or early spring. The rhizomes often form right angles, simplifying division. " (lbj)

cultivation: Space plants 1.5-2.0'. Moderately moisture soil, full sun to shade; woods, in sandy, loamy soil. Prefers moist, well drained, humusy soils. Reported to tolerate clay soils. Zones 3-8. Deadheading will prolong blooming, but is tedious & may not cause repeat blooming. Basal foliage may yellow in dry summers. Suggested companion plants: *Aquilegia canadensis, Carex pensylvanica, Carex rosea, Eurybia macrophylla, Mertensia virginiana, Persicaria virginiana, Taenidia integerrima, Uvularia*

grandiflora, Zizia aptera. Great planted in mass, 50 plants on 1.5' centers, interplanted with *Carex pensylvanica, C radiata, C rosea,* or *Asarum canadense.* A mass planting is strongly recommended outside your kitchen window.

bottom line: Dormant seed only. Seeds have a significant to strong requirement for dormant seeding. Hard seed is noted in some tests. Germ 5.6, 4.0, 4.0, sd 5.0, r 0.0-21 (210%. Dormhard 75.5, 76.5, 71, sd 12.3, r41-92 (51)%. Test 30, 32, 21, r20-40 days. (#20)**

greenhouse & garden: Fresh seed or moist cold stratify (60-90 days), germ is best in cool soils. *Geranium* has hard seed coats, needing scarification. Once established splendidly self sows.

Description: Native erect perennial forb; 1.0-1.5(-3.0)'; stout rhizomes; leaves deeply cut, palmately 5-lobed, dark green; inflorescence corymb, 2-5 flowers; flowers pink-lavender (blue/violet), 5-merous, 1.25" diameter, saucer-shaped; followed by beaked seed capsules. key features: leaves palmately divided into 5-7 lacerated, triangular segments, one pair of short stalked stem leaves (fh). "Leaves are rounded-pentagonal; each carpel is prolonged into a long beak at maturity, dehiscent on the inner suture; largest flowered of our spp." (Ilpin)

Comments: status: phenology: Blooms (4)5,6,7. C3. Seeds mature early summer. In northern Illinois, collect seeds in August. Collect seeds in se Wisconsin in August (he99). Slowly colonial from thick rhizomes, but not aggressively so. Self sows politely, prim & proper, in the open woodland garden with regular burn management. Landscaping, used in shade gardens & borders, naturalized plantings, fern gardens, pollinator gardens, & woodland slopes. Blooms over 6-7 weeks. Basal leaves semi-evergreen. Seed source Kane Co.

Associates: Pollinator friendly. Flowers attract hummingbirds & butterflies, nectar source for *Celastrina nigra* DUSKY AZURE BUTTERFLY. Seeds attract mourning doves, bobwhite quail, & white-tail deer. Also said to be deer resistant. Walnut tolerant.

ethnobotany: Root used as medicinal plant by Ojibwa & Menominee (sm23, 32). Ojibwa medicine for sore mouth (den28). Rhizome is absolute intestinal astringent (den28). Entire plant was boiled to make tea for diarrhea. Roots steeped in water used as a rinse for diarrhea & inflamed gums. Tea used as rinse for sore throat, thrush, & mouth ulcers. Dried, powdered roots applied to bleeding blood vessels to promote coagulation. (Weiner 1990)

Geranium sibericum Linnaeus "A common roadside weed between Seward Bluffs & the village of Seward where it was found by Bebb 70 years ago. It is also a wayside weed in Rockton which is 25 miles from Seward but on a usually traveled early route. Also known in Stephenson Co." (ewf55)

HALORAGACEAE R Brown 1814 **WATER MILFOIL FAMILY** About 9 genera & 145 spp of aquatic & wetland herbs, trees & shrubs, cosmopolitan, but concentrated in Southern Hemisphere. Also spelled as *Haloragidaceae.*

MYRIOPHYLLUM Linnaeus 1753 **WATER MILFOIL** *Haloragaceae Myriophyllum* (mi-ree-o-FIL-lum) from the Greek μυρίος, *myrios*, innumerable, many, & φύλλα, *phylla*, a leaf, for the finely divided leaves. A genus of about 60 spp of aquatic & wetland herbs, worldwide, but centered in Australia. Fruit consisting of 4 nut-like carpels, cohering by their inner angles. Seen as Myriophyllum Vaill. Formerly in the *Onagraceae*.

Myriophyllum spicatum Linnaeus EURASIAN WATER-MILFOIL

"This, the only sp we have found, is common in quiet water. Sugar River Sloughs west of Shirland & west of Yale bridge, & in Kent Creek near its mouth. (*M exalbescens* Fern) Also in Piscasaw Creek in Boone Co." (ewf55)

key features: ①Flowers in terminal, nearly naked spikes; floral leaves or bracts, ovate, entire, shorter than the flowers (w73).

PROSERPINACA Linnaeus **MERMAID-WEED** *Haloragaceae* ***Proserpinaca*** New Latin, from Latin, a plant, probably knotweed, from *Proserpina*, goddess of the subterranean world of the dead, from Greek *Persephonē.* A genus of 2-3 spp of aquatic & wetland herbs of eastern North America & the West Indies. Fruit 3-angled, 3-celled, bony, crowned with the permanent calyx. Formerly in the *Onagraceae*.

Proserpinaca palustris Linnaeus MERMAID WEED,

Introduced from Eurasia.

"We have found this only in Sugar River sand area where it is infrequent; slough west of Shirland, Coon Creek, & in a drainage ditch west of Yale bridge. The leaf cutting & the robustness of the plant very greatly depending on shade & wetness of the soil." (ewf55)

key features: ①Leaves linear-lanceolate, sharply serrate (w73).

HYDROCHARITACEAE AL Jussieu 1789 **FROG'S-BIT FAMILY**

ELODEA Michaux **WATERWEED** *Hydrocharitaceae Elodea* (e-LO-dee-a) from Greek ἑλοδες, ἑλώδης, *helodes*, marshy, growing in marshes, from ἕλος-ωδης, *helos-odes*, referring to the habitat of the plants. Aquatic herbs. Fruit is a 3-celled capsule. Formerly *Anacharis* Rich. At one time included in *Hypericaceae.*

Elodea canadensis Michaux CANADIAN WATERWEED, aka ELODEA, WATERWEED, (canadensis -is -e kan-a-DEN-sis, of Canada or northeast USA)

Habitat: Mud or sandy bottom in 1" to 10" of water, in sloughs or sluggish streams & lakes containing hard, clear, fresh water.

Culture: Planting rate 10 bushels per acre.

Description: Aquatic herb.

Associates: Plants provide food & cover for wildlife. Waterfowl (esp redheads, mallards, widgeons, scaups, & coots) eat seeds & leaves. "Quick growing & carp resistant" (Anon 1981)

As *A canadensis* "Found frequently in ponds, ditches, sloughs & slow streams" (ewf55).

[*Anacharis canadensis* (Michx) Planch]

Elodea nuttallii (Planchon) H St. John SLENDER WATERWEED,

"This has narrower leaves than the preceding. It is found in the same places but is less common." (ewf55)

VHFS: [*Anacharis occidentalis* (Pursh) Victorin]

VALLISNERIA Linnaeus 1753 **EELGRASS** *Hydrocharitaceae* New Latin, from Antonio *Vallisnieri* died 1730 Italian naturalist & New Latin *–ia*. Submerged aquatic plants with ribbon like leaves & pistillate spathes on long finally spiral scapes.

Vallisneria americana Michaux WILD CELERY, aka EEL GRASS, WATER CELERY, TAPE GRASS,

Habitat: Hard, fresh, slightly brackish, fairly clear, "changing" water (not stagnant?), which could contain some lime. Prefers mud, sandy, or coarse silt bottom.

Culture: Tubers: spring plant 1000 tubers/acre at 3' intervals. Plants: spring plant, 1000 plants/acre, 3' intervals. Seeds: dormant seed, seeding rate 30 lbs/acre. (But seeds are unknown.)

Associates: Waterfowl eat foliage, seeds, & rootstocks. Fish eat plants & use cover. Clears & aerates water.

Comments: status: phenology: Blooms "Very uncommon in Killbuck Creek in Winnebago Co & in Ogle Co" (ewf55).

VHFS: [*V spiralis*]

HYDROPHYLLACEAE R Brown 1817 **WATERLEAF FAMILY** A family of about 18 genera & 270 spp of herbs & shrubs, almost cosmopolitan but concentrated in western North America. Some authorities place the WATERLEAF family in the *Boraginaceae*.

ELLISIA Linnaeus **WATERPOD** *Hydrophyllaceae* A monotypic genus, a herb of central & eastern North America.

Ellisia nyctelea (Linnaeus) Linnaeus AUNT LUCY, aka WATERPOD,

"Very common, most often in damp shady places" (ewf55).

HYDROPHYLLUM Linnaeus **WATERLEAF, BURR FLOWER** *Hydrophyllaceae Hydrophyllum* water-leaf, New Latin, from Greek ὑδρο-, *hydro*, & φύλλον, *phyllon,* a leaf. A genus of about 8 spp of herbs of eastern & western North America. Seeds should be refrigerated at 33-38º F until pretreated or planted.

Hydrophyllum canadense, BROAD-LEAVED WATERLEAF, plant of forests, flowers white, walnut tolerant, clay soil tolerant, forms excellent ground cover even under black walnuts.

Hydrophyllum appendciulatum Michaux BIENNIAL WATERLEAF, aka WATER-LEAF,
Culture: ①In order to germinate, seeds need a warm, moist period followed by a cold, moist period. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment (pm09).
Plants biennial from a taproot. "In low damp places in the woods; it is less common than the next. (*H virginianum*)" (ewf55)

Hydrophyllum virginianum Linnaeus VIRGINIA WATERLEAF, aka BURR-FLOWER, JOHN'S CABBAGE, "The flowers have the appearance of a burr several weeks before they expand" (Eaton 1829).
Habitat: Forests.
Culture: ①60 days cold moist stratification (pm09). 16,000 (pm07), 44,800 (pm14), 60,480 (gnhm15), 65,815 (gnm13), 69,007 (gnam07) seeds per pound.
cultivation: Clay soil tolerant (timber clay).
bottom line: Plant fresh seed soon after picking & cleaning, or refrigerate moist, fresh seed in ziplocks & dormant seed later. (The former may be best if warm moist stratification is needed.) Germ 1.7, 2.0, 2.0, sd 0.5, r1.0-2.0 (1.0)%. Dorm 88.3, 86, na, sd 4.8, r84-95 (11)%. Test 31, 31, na, r26-37 days. (#6).**
Description: flowers blue/violet, white; key features:
Comments: status: phenology: Blooms 5,6. Genetic source Kane Co. Landscaping, shady groundcover, woodland & forest naturalizing.
"Very common in damp places, usually in woods but also in the open" (ewf55).
Associates: Said to thrive under black walnuts.
ethnobotany: Available for greens in late spring. Greens used for food by Menominee & Iroquois (sm23, Waugh 1916). Root used as medicinal plant by Ojibwa & Menominee (sm23, 32)

HYPERICACEAE AL de Jussieu 1789 **ST JOHN'SWORT FAMILY** The juice of some spp is considered purgative & febrifugal.

HYPERICUM Linnaeus 1753 **ST JOHN'S-WORT, ST ANDREWS CROSS, ST PETERSWORT** *Hypericaceae,* ***Hypericum*** Hyper'icum (hy-PEER-i-kum, or hi-pe-REE-kum) from Greek, *hyper* above & *ekion* picture. The plant was hung above pictures or an image in the home to ward off evil spirits during the summer festival *Walpurgisnacht* (the eve of May Day), later St John's Day. Or, Latin *hyperīcum*, *hyperīcon*, from Greek ὑπέρεικον (ὑπέρῑκον), *hypereikon* (*hyperikon*), from ὑπέρ, *hyper,* over, & ἐρείκη, *ereike,* heath. Alternately New Latin, from Latin *hypericum, hypericon* a plant, St.-John's-wort, ground pine, from Greek *hyperikon, hypereikos*, a plant, St.-John's-wort, probably from *hypo-* & *ereik*, heath, heather. Common name from some spp blooming on St John's Day, June 24, a sacred day for the Templars; *Walpurgisnacht* was April 30th. A genus of about 370 spp, primarily temperate, of trees, shrubs, & annual & perennial herbs, that are characterized chiefly by their pentamerous & often showy yellow flowers. Flowers are flat & saucer-shaped, with numerous fine stamens, giving each flower a soft, fuzzy appearance. Fruits are capsules. At times placed in *Guttiferae* or *Clusiaceae*, the Mangosteen family.

Hypericum canadense Linnaeus CANADA ST JOHN'S-WORT, aka LESSER CANADIAN ST. JOHN'S-WORT, "Uncommon in moist places in Sugar River sand area & the Coon Creek bottom. Not known elsewhere in the county." (ewf55)

Hypericum gentianoides (Linnaeus) Britton, Sterns, & Poggenburg *IA, MI ORANGE GRASS, aka PINE WEED, facultative upland
Habitat: Disturbed, early successional areas in & adjacent to high quality sand & sandstone prairies.
Culture: No treatment or moist cold stratify, light. Seed count not available. This spp is not in the seed or plant trade.
Description: Erect annual, 0.5-0.9', flowers yellow.
Comments: status: phenology: Blooms 7,8,9. Rock gardens, annual, successional, noncompetitive. Seed source sand prairies, Lee Co, Il. Known from Longenecker's Prairie & Doug's Knob, Nachusa.

"Found only in Coon Creek bottom where it is locally abundant in dry places that have little other vegetation. (*H gentianoides* (L) BSP)" (ewf55 as *Sarothra gentianoides* L)

Hypericum kalmianum KALM'S ST. JOHN'SWORT, aka SHRUBBY ST. JOHN'S WORT, (*kalmianus -a -um* after Pehr *Kalm* (1715-1779), Finnish student of Linnaeus who traveled in North America, discovered *Bromus kalmii*.)
Habitat: Wet meadows, moist dune swales & shores, rocky or sandy soil. Mesic to wet mesic prairies & savannas.
Culture: ①Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). 1,920,000 (pm02) seeds per pound.
asexual propagation: Clone, soft wood cuttings.
cultivation: Zone 3. Low maintenance.
Description: Erect shrub to 30"; cinnamon peeling bark; narrow dense blue green foliage, red fall color; sulfur yellow flowers 0.75" across; dark tan winter seed capsules;
Comments: status: phenology: Blooms 6,7,8,9. Calcareous soils, shrubby sp. Landscaping, stays low, clusters of showy yellow flowers with long bloom season, evergreen leaves; rain gardens.
Associates: Pollinator friendly. Landscape plantings may be damaged by rabbits in winter.
ethnobotany:

Hypericum mutilum Linnaeus DWARF ST JOHN'S-WORT, aka SMALL-FLOWERED ST. JOHN'S-WORT, WEAK ST. JOHN'S-WORT, (*mutilus -a -um* curtailed, docked, pointless, blunt, awnless, from Latin.)
"Particularly common in low prairies & other wet places in Sugar River sand area. Less common in other wet places as the Searle Tract. The obvious difference from the above (*H canadense*), which is similar, is the branching habit of this. When this grows on very wet peat or on dry sand the flowering plants, though numerous, are often quite small." (ewf55)

Hypericum perforatum Linnaeus *NOX COMMON ST. JOHN'SWORT, aka KLAMATHWEED, ST. JOHN'S-WORT,
Habitat: Oldfields & roadsides. Tolerates poor soil. distribution/range: Introduced.
Culture: Not. Nevertheless, this is out there for sale. ①Sow at 20ºC (68ºF), germination slow (tchn).
Description:
Comments: status: C list noxious weed in California & Colorado. Category 1 noxious weed in Montana. Noxious weed in Nevada. "B" designated weed in Oregon. Regulated non-native in South Dakota. Class C noxious weed in Washington. Noxious weed in Wyoming. This sp is considered invasive in parts of the United States (Assorted authors. 200_. State Noxious Weed Lists for 46 States, CEPPC 1999, Stubbendieck et al 1994, SEPPC 1996, SWSS 1998, Hoffman & Kearns 1997, Whitson et al 1996). phenology: Blooms
"Common on roadsides & in dry pastures. The basal shoots are long & numerous & continue growing until very late fall." (ewf55)
VHFS:

Hypericum prolificum Linnaeus [*H spathulatum* (Spach) Steudel] SHRUBBY ST. JOHN'S-WORT,
Habitat: Sandy situations, pastures, thickets, slopes, swamp margins, woods, cliffs, rocky stream banks; rocky stream banks, lake margins, rocky thickets, sandy areas, & pastures. distribution/range: Southern Illinois & near Lake Michigan.
Culture: ①No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ②Sow at 20ºC (68ºF), if no germination in 3-4 wks, move to +2 to +4ºC (34-39ºF) for 2-4 wks (tchn). 2,240,000 (pm02, aes10), 3,844,067 (gnhm12) seeds per pound.
asexual propagation: Softwood cuttings.
cultivation: Zone 3. Easily transplanted from container grown stock.
bottom line: Dormant seeding is best for field establishment. Germ 52%. Dorm 41%. Test 29 days.**
Description: Low, deciduous, native shrub; 1-3.0(-4.0)'+ tall, globe form; exfoliating bark; with narrow green leaves, red fall color, very fine texture all seasons; small yellow flowers, flowers perfect; fruit is small tan seed capsules, 0.38-0.62" long, providing winter show.

Comments: status: phenology: Blooms June-September. Flowers abundant & showy. Slightly taller than *H kalmianum*. Attractive in formal landscape, specimen plantings, & rain gardens. Our one specimen is self-sowing.
Associates: Pollinated by insects, primarily bees. Flowers attract bees, also attracts songbirds, upland game birds, & small mammals, but of little wildlife value. Generally pest free, some leaf spot & powdery mildew.

Hypericum psuedomaculatum Bush. "This sp, or variety, blooms materially earlier than *H punctatum* & is the more common. The flowers are larger, averaging 15mm in length. Ill Rt No 173 north of Forest Hills Country Club & on 20th street road near Camp Grant. (var *pseudomaculatum* (Bush) Fern) (ewf55)

Hypericum punctatum Lamarck SPOTTED ST. JOHN'S-WORT, aka DOTTED ST. JOHN'S WORT, (*punctatus -a -um* spotted, marked with dots, from Latin *punctatus,* spotted, dotted, from Latin *punctum*, noun, something that is pricked; a puncture; a small spot; a small portion, *-atus*, adj suffix for nouns: possessive of or likeness of something, or with, shaped, made.)
Habitat: Mesic to dry prairies & open woods. Dry to dry mesic prairies & savannas.
Culture: ①Cold moist stratify 60 days, & sow seed on top of soil (Wade). ②Seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99) ③No pretreatment needed. Sow seeds on the soil surface at 75ºF & water. (ew11)
seed counts & rates: 3,200,000 (sh94), 4,536,000, 9,280,000 (pm02, ew11), 9,458,333 (gnhm14) seeds per pound.
cultivation: Space plants 1.0-1.25'. Full sun to partial shade, mesic soils.
bottom line: Preliminary datum indicates dormant seeding is strongly beneficial, with 71% dormant seed. Germ 21%. Dorm 71%. Test 21 days.**
Description: Erect perennial, 1-3', flowers yellow streaked with brown.
Comments: status: phenology: Blooms 6,7,8,9. In northern Illinois, collect seeds in September-October. Collect seeds in se Wisconsin in October-November (he99). Can be short lived. Seed sources nursery production, sandy roadsides, Whiteside county, old fields & woodland edges near Wyanet, Bureau Co. "Thickets, borders of woods & damp open places. Not much basal branching." (ewf55)

Hypericum pyramidatum Aiton or **Hypericum ascyron** Linnaeus or **Hypericum ascyron** Linnaeus ssp **pyramidatum** (Aiton) N Robson. *CT, IN, ME, MD, MS, NH, VT GREAT ST. JOHN'S WORT, aka AMERICAN GREAT ST JOHN'S-WORT, GIANT ST. JOHN'S-WORT, (*Ascyrum, ascyron* not hard, soft, from Greek α-σκυρος, *a-skyros* (cf *scyr, scyro-* Greek rough); or more likely, from Greek *askyron* St.-John's-wort *Ascyron* was formerly capitalized as an epithet. *pyramidatus,* from Latin *pyramis, pyramidis*, noun, from Greek πυραμις, πυραμιδος, *pyramis, pyramidos,* (also seen in error as πψραμις) a pyramid, & *-atus*, adjectival suffix for nouns: possessive of or likeness of something, with, shaped, made.) fac+
Habitat: Fens, wet meadows, dry mesic prairies, dry savanna, & thickets. In se US, swamps & bottomlands (w12). distribution/range: "Banks of rivers & streams, calcareous fens; occasional in the n ½ of the state; also Fayette, Macoupin, & St Clair cos (m14).
Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. (pm09). ②Seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99) No pretreatment needed. Sow seeds on the soil surface at 75ºF & water. (ew11) ③Sow at 18-22ºC (64-71ºF) for 2-4 wks, move to +2 to +4ºC (34-39ºF) for 4-6 wks, move to 5-12ºC (41-53ºF) for germination (tchn). Moist cold stratify or dormant seed, light. Growth rate moderate. Seedling vigor medium. Vegetative spread rate none.
seed counts & rates: 1,800,000 (usda, ecs), 3,040,000 (pm02), 3,088,435 (gnh02), 3,163,763 (gna04), 3,208,481 (gna06): 3,242,847 (gna11), 3,280,000 (ew11), 3,350,553 (gnh03), 3,520,000 (jfn04), 4,544,000 (aes10) seeds per pound.
asexual propagation: Cuttings.
cultivation: Space plants 1.5-2.0'. Mesic soils, full sun to partial shade. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance low. Fertility requirement medium. Salinity tolerance none, but some tolerance noted by AES (2010). Shade intolerant. pH 5.7-7.1.

bottom line: Dormant seeding is best for field establishment. Spring works some years, and some lots are non- to slightly dormant. The high seed count gives even mediocre germination illusions of grandeur. Flipflop species. Germ 21.2, 16, 6.0, sd 22.1, r1.5-92(9.5)%. Dorm 56.8, 64.5, 83, sd 26.9, r0.0-88 (88)%. Test 36, 38, 31, r18-46 days. (#18)**

greenhouse & garden: Moist cold stratify 60 days or dormant seed, light.
Description: Erect perennial, 2-5', large showy yellow flowers. 14" minimum root depth.
Comments: status: Threatened in Connecticut, New Hampshire, & Vermont. Endangered in Indiana & Massachusetts. Possibly Extirpated in Maine. Endangered, extirpated in Maryland. phenology: Blooms 6,7,8. In northern Illinois, collect seeds in September-October. Collect seeds in se Wisconsin in September-October (he99). Attractive cut flowers & dried seed heads. Landscaping, specimen plants, herbaceous borders, rain garden. May be an aggressive seeder in some habitats. Seed source Taylor Twp, Ogle Co. This sp forms buds above ground (subshrub?) that are set back by late spring prairie fires

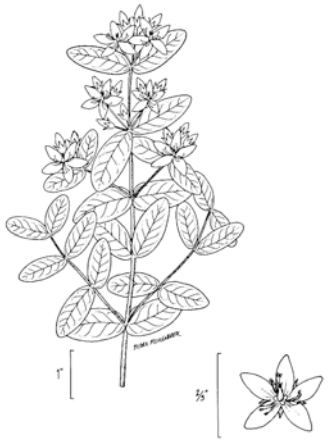
"This we have found only on Kishwaukee River bank in the Forest Preserve. (*H pyramidatum* Ait)" (ewf55 as *H ascyron* L)
Associates: Attracts butterflies & bumble bees. Reported as deer resistant. May cause skin irritation in animals.

ethnobotany: Root used as medicinal plant by Menominee (sm23).
VHFS: This species is commonly referred to as *H ascyron*. Mohlenbrock (2014) maintains this as *H pyramidatum*. Weakley (2012b) takes middle ground with "The species is of e North America and e Asia; the North American ssp *pyramidatum* occurs from QC west to MN, south to s. PA (Rhoads & Klein 1993; Rhoads & Block 2007), MD (Robson 2000), and WV." [*Hypericum ascyron* L, *H ascyron* L ssp *pyramidatum* (Ait) N Robson, *H pyramidatum* Aiton]

Hypericum sphaerocarpum Michaux *MI, WI ROUND-FRUITED ST. JOHN'S WORT, facu
Habitat: Wet meadows-mesic & dry prairies, hill prairies, dry woods. Calcareous soils. "Common in moist places on streambanks, roadsides, &c" (ewf55)
Culture: Moist cold stratify or dormant seed, light. 756,000 seeds per pound.
Description: Erect perennial, native forb; 1.5-2.5'; flowers yellow; fruit is a capsule with small seeds.
Comments: status: phenology: Blooms 6,7,8.
Associates: Pollinated by flying insects, *Diptera.*

Hypericum virginicum (Linnaeus) MARSH ST. JOHN'SWORT,
Habitat: Wet sands, bogs, & swamps.
Culture: ①Surface sow, seeds are very small or need light to naturally break dormancy & germinate. Further germination pretreatments not sure? (pm) 3,680,000 (pm02, jfn04) seeds per pound.
Associates: ethnobotany: Used as medicinal beverage by Pottawatomie (sm33)

"*Triadenum fraseri* (Spach) Gleason. Marsh St, John's-wort. Common in wet grassy places, especially in the shallow bogs in Sugar River sand area. (*H virginicum* L var *fraseri* (Spach) Fern)" (ewf55) Placed in *Triadenum* by Mohlenbrock (2014).



SAROTHRA Linnaeus see *Hypericum* in part.

TRIADENUM Rafinesque **MARSH ST-JOHN'S-WORT** see *Hypericum* in part. A genus of about 6-10 spp of herbs of eastern North America & eastern Asia. Often included in *Hypericum*, several authorities consider *Triadenum* more closely related to the tropical Asian shrub *Cratoxylum* Blume.

LENTIBULARIACEAE Richard 1808 **BLADDERWORT FAMILY**

UTRICULARIA Linnaeus 1753 **BLADDERWORT** *Utricularia* New Latin, from Latin *utriculus* small bag & New Latin *-aria*

Utricularia vulgaris Linnaeus COMMON BLADDERWORT, (*vulgaris -is -e* (vul-GHA-ris) common, vulgar, from Latin *vulgāris*, from *vulgus*, the common people.)

"Our only sp & not common; the sloughs west of Shirland & west of Yale bridge & the north branch of Kent Creek northwest of Rockford. In Piscasaw Creek in Boone Co." (ewf55)

LIMNANTHACEAE R Brown 1838 **FALSE MERMAID, MARSH-FLOWER, or MEADOW-FOAM FAMILY** From *Limnanthes* from Greek λίμνη, *limne*, a lake, marsh, & ἄνθος, *anthos*, flower. About 2 genera & 8 spp of herbs, endemic to North America. Fruits are 2 to 5 achenes, rather fleshy.

FLOERKEA Willdenow 1801 **FALSE-MERMAID** *Limnanthaceae Floerkea* New Latin, after Heinrich G *Floerke* died 1835, German botanist. A monotypic genus of one small, annual, aquatic herb, endemic to North America.

Floerkea proserpinacoides Willdenow FALSE-MERMAID, (*proserpinacoides* New Latin resembling *Proserpinaca*, from *Proserpinaca,* which see, & *-oides*, Greek adjectival suffix indicating resemblance, having the form or nature of.)
Marshes on rivers & lakeshores. Fruits are achenes.
"Though abundant when found it is inconspicuous & short lived so it is not often seen. The maple woods on Newburg road & on a shady street in Rockton." (ewf55)

LINACEAE DC ex Gray 1821 **FLAX FAMILY, FLAXWORTS** About 14 genera & 250-350 spp of trees, vines, shrubs, & herbs, cosmopolitan. The fibrous "bark" of *Linum* is the source of the linen of commerce.

LINUM Linnaeus 1753 **FLAX** *Linaceae Linum* (LEN-um) New Latin, from Latin *linum*, flax, Celtic, *llin,* thread, Greek λίνον, *linon*, flax, *Linum usitatissimum*, used by Theophrastus. Herbaceous annual or perennial herbs, subshrubs, & shrubs that have small sessile leaves, terminal or axillary racemes of flowers with fugacious petals, & capsular fruits. Capsules 5-celled.

Seeds mature in summer. Seeds require cold moist stratification. Cullina code B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF. (cu00)

Linum lewisii Pursh LEWIS FLAX, aka PRAIRIE FLAX, PERENNIAL FLAX, (*lewisii* for Captain Meriwether *Lewis* (1774-1809), American explorer, member of the trans-American expedition, tutored in natural history by Benjamin Smith Barton of the University of Pennsylvania)

Linum perenne Linnaeus BLUE FLAX, introduced from Europe (*perennis -is -e* perennial, lasting more than two years, from Latin *perennis -is -e*, adjective, remaining or lasting throughout the year.)
Habitat: *Linum lewisii* is a perennial from western prairies & plains, well drained acidic to alkaline soils, drought tolerant, full sunlight, dry soils.
Culture: ①No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11) ②Sow at 20ºC (68ºF), germinates in less than two wks (tchn). ③Light aids germination, sow in spring or fall. Difficult to transplant, easy from seed, sow any time (pots 2000), but USDA says fall dormant seedings best. 285,000 (cci), 288,000 (ew11), 288,960 (wns01), 293,000 (stock, gran), 295,000 (appl02) seeds per pound. Broadcast seed 1/4 to 3/4", covering lightly, 3-4 lbs pls per acre. Seeded alone plant 3.2 oz per 1,000 ft sq (stocks). Pure stand plant 5 pls lbs per acre (usda) or 8 lb per acre (gran).

cultivation: Best in dry sunny sites in light, infertile soils. Low moisture requirements. Coarse to moderately fine soils. Best in neutral soils, some base tolerance & weakly acid & weakly saline tolerant. Plants will tolerate semi-shaded areas.

Description: Western native perennial, subshrub, 1.0-2.0', vase shaped structure; leaves & stems are semi-evergreen; with dazzling sky-blue 0.50-1.0" flowers, each flower only lasts a day, opening in the morning & fading by the heat of the day, but the plant blooms from May to September.
Comments: status: phenology: Blooms May to July, flowering is indeterminate, with ripe seed & flowers on the same plant. May bloom 1st year from seed. Commercial sources.

"*Linum perenne* Linnaeus PERENNIAL FLAX A perennial flower garden plant that often escapes & establishes itself on roadsides." (ewf55)
Associates: Attracts butterflies. Birds eat the seed & capsules in fall & winter. Provides a place where the deer & the antelope play & feed. Subject to damage from grasshoppers, rodents, & fungus.
VHFS: BLUE FLAX taxonomy is kinda messy, especially when horticulturally driven. According to the USDA NRCS, the native North American wildflower is PRAIRIE or LEWIS FLAX, *Linum lewisii* Pursh var *lewisii,* synonyms *Adenolinum lewisii* (Pursh) A&D Löve, *Linum perenne* L ssp *lewisii* (Pursh) Hultén, *L perenne* L var *lewisii* (Pursh) Eaton & J Wright. The widely-planted, introduced plant is BLUE FLAX, *L perenne* L, synonym *L lewisii* auct non Pursh [misapplied]. Plants.usda.gov Plant Guide & Plant facts can be confusing, the plant guide lumps the two spp, as I just did. According to Cronquist et al (1997), "the only significant difference between *L lewisii* & the Eurasian *L perenne* appears to be that the former is homostylic, & the latter heterostylic."

'Appar' is an improved selection of *L perenne* with little dormant seed. Native seed lots maintain a percent of dormant seed that does not germinate the first season, & forms soil seed bank.

Linum rubrum SCARLET FLAX, aka CRIMSON-COLORED FLAX, FLOWERING FLAX, RED FLAX, (*ruber, rubra, rubrum* Latin adjective, red, ruddy, painted red.)
Habitat: North Africa & southern Europe, light well-drained soil, full sun or part or half shade, low to moderate moisture requirements. Open rocky soils of western North America.
Culture: ①No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11) Easily established, broadcast 0.13 to 0.50" deep in fall or early spring, 15 lbs pls per acre. Spring plant 6 oz per 1,000 sq ft (stocks). Pure stand plant 15 lbs per acre (gran). Self sows. 122,000 (stock, gran), 123,200 (ew11), 132,000 (apl), 285,000 (cci) seeds per pound.

cultivation: Space plants 1.0-1.5'. Prefers full sun mesic soils, tolerates hot dry conditions & light soils. Coarse to moderately fine soils. Best in neutral soils, some base tolerance.
Description: Introduced annual, 1.0-2.0', very slender gray-green leaves; delicate large red-scarlet flowers, each individual flower lasting only a day.
Comments: status: phenology: Blooms (4-)5-8(-9), with new blossoms each day. Used in mass plantings & roadside plantings. Low maintenance plant. Seed source commercial sources.
VHFS: [*Linum grandiflorum rubrum*] Commercial varieties available.

Linum sulcatum Riddell *CN, IN, MA, NJ, NY, PA, RI GROOVED YELLOW FLAX, aka GROOVED FLAX, YELLOW FLAX, YELLOW PRAIRIE FLAX, YELLOW WILD FLAX, (*sulcatus -a -um* sulcate, furrowed, grooved, or fluted, from Latin *sulcatus,* participle of *sulco,* I furrow, or I plow, for the prominent grooves on the stem)
Habitat: Dry open sand prairies & dry open sandy woods. Inland sands.
Culture: ①Dormant seed or cold moist stratify 60 days. Annual or biennial (Wade) 30 days cold moist stratification (pm09). ②No pre-treatment needed, sowing outdoors in the spring is the easiest method, or seeds germinate after about 60 days of cold, moist stratification. (he99)

seed counts & rates: 672,000 (aes10), 1,504,000 (pm02) seeds per pound.

availability: Availability is limited to the extent this sp should not be part of any general seed mix.
Description: Erect annual, 1-2', stem ribbed from decurrent leaves, stem base purplish; leaves alternate, sessile, linear-oblong, entire, acuminate, to 2 cm long, single midrib, with a pair of opposing blackish glands at the leaf base; flowers yellow, 5-merous; petals fall by noon.
Comments: status: Special concern in Connecticut. Rare in Indiana. Endangered in Maryland, New Jersey, & Pennsylvania. Threatened in New York. Historical in Rhode Island. phenology: Blooms 6-7. In northern Illinois, collect seeds in August. Collect seeds in se Wisconsin in September (he99). Known from the Greenville Township 80.

"Other common plants, which presented themselves at different places on our route through the prairies." *Linum sulcatum* as *L. rigidum sensu* Englemann (1843), &c., non Pursh (1814). (Short 1845).

"Frequent on gravel hills & dry prairies; north of Forest Hills Country Club, west of Broadway near the IC RR, & the bluff west of Rockton" (ewf55).

Linum usitatissimum Linnaeus COMMON FLAX, aka ANNUAL FLAX, (*usitatissimus -a -um* **(**ew-see-tah-TIS-i-mus) Latin superlative adj, most or very useful; alternately most ordinary, the most usual or common.)
Native of Europe. The source of linen & flax oil. Seeds are mucilaginous. 100,000 (gn) seeds per pound. Commercial sources. Availability may be limited, as it is scarcely planted in our part of the Midwest. In the 1940's & 1950's, this plant was an occasional seed crop in northern Illinois. "We do not know of this being cultivated in the county but it is found occasionally on railroad tracks" (ewf55).

LINDERNIACEAE Borsch, K Müller, & EB Fischer 2005 **FALSE-PIMPERNEL FAMILY** See *Scrophulariaceae* in part.

LOASACEAE LOASAD OR BLAZINGSTAR FAMILY A mostly American plant family of the tropical & desert regions, ca 14 genera & 265 species of the dogwood order (Cornales), many with rough, hooked, or painfully stinging hairs, with regular 5-merous flowers with numerous stamens; beautiful & often bizarre flowers in red, orange, yellow, or white.

MENTZELIA Linnaeus *Mentzelia* Mentze'lia (ment-ZEE-lee-a) honoring C. *Mentzel*, physician to the Elector of Brandenburg. Illinois is near the eastern limit of the genus's range, with 3 known species.

Mentzelia oligosperma Nutt CHICKENTHIEF, aka STICK-LEAF,
Dry or rocky places, Pike Co (Mead).
key features: ①Leaves ovate-lanceolate, lobed or incisely dentate; capsules 3-5 seeded.
"Flowers solitary, of a deep, golden yellow, 8 to 10 (" meaning twelfths of an inch) diameter, very fugacious (w73).
Blooms May. Flowers open early morning & close by afternoon.

LOGANIACEAE R Brown ex Mart. 1827 **LOGANIA FAMILY** Plants of the *Logania* tribe, named for James Logan. The *Loganiaceae* family is subject to interpretation. In a narrow sense, approximately 12 genera & 300 spp of herbs, & subshrubs from the old & new World tropics, subtropics, & warm temperate regions.

Spigelia Linnaeus **Pinkroot** *Loganiaceae* A genus of about 50 spp of herbs of tropical & warm temperate America.

Spigelia marilandica (Linnaeus) Linnaeus INDIAN PINK, aka PINKROOT, WORMGRASS, WOODLAND PINKROOT,
Habitat: Shaded woods, open woodlands, woodland edges. In the se USA, circumneutral soils.
distribution/range: Southern ⅕ of Illinois.
Culture: ①There is contradictory information on dry seeds versus hydrophilic seeds (www.wildflower.org, cu00). Seeds ripen over an extended period in the summer 4 weeks after flowering. Cover ripening seeds with netting or pick when clusters are ¼" diameter & medium to light green. Dry stored seed gives mixed results, best sown immediately in flats left outdoors. Blooms second year. Late spring cuttings dipped in 2,000 ppm liquid IBA root slowly but successfully. 2-3 crops of cutting may be taken in succession from plants through the summer. (cu00)
Description: Erect clump-forming perennial; roots; stems; leaves 4-7 pairs of lance-shaped leaves; flowers terminal one-sided spike, with the corolla scarlet on the outer surface, yellow on the inner surface; flowers -merous; N. key features:
Comments: status: phenology: Blooms May-July.
Associates: Pollinated by hummingbirds.
VHFS: This may be seen as placed in the *Strychnaceae*.

LYTHRACEAE J St.-Hilaire 1805 **LOOSESTRIFE FAMILY** About 27 genera & 600 spp, herbs, shrubs, & trees mainly tropical, a few warm temperate. Fruits capsular, membranous, enveloped in the calyx, usually by abortion 1-celled; seeds small, many, attached to a central placenta.

AMMANNIA Linnaeus **REDSTEM, TOOTHCUP** *Lythraceae Ammania* named for Paul *Ammann* (1634-1691), German botanist, alternately John *Amman*, of Siberia, professor of botany at St Petersburg. A genus of about 25 spp of cosmopolitan herbs. Fruit a capsule, globular, 2 to 4-celled, many-seeded.

This genus in northern Illinois is confusing as hell, even with only 2 spp. According to Swink & Wilhelm (1994), *A coccinea* ranges close to the southern boundaries of the Chicago region. According to plants.usda.gov, it occurs in Cook, DuPage, & Will cos. Swink & Wilhelm note all Chicagoland specimens are the sessile flowered & fruited *A robusta*. According to plants.usda.gov, this latter sp is uncommon & ranges about 150 miles southwest of Chicago. *A auriculata* Willdenow is also a native in Alexander Co.

Examining Woods (1873), the taxonomic confusion has a long, historical basis. He lists *A humulis* Mx, with stems branched from the base, ascending; leaves obtuse (& flowers closely sessile), an obscure & humble plant in wet places; & *A latifolia* L, with stems erect, leaves linear-lanceolate, acute, dilated & auruculated at the sessile base, flowers verticillate(& pedunculate). Both species have the synonym *A ramosior* L!

But then of course, the USDA calls it an annual forb/herb, subshrub, so there.

Dormant seeded, *Ammannia* is great for early native cover.

Mature *Ammannia* lending a reddish cast to a wetland mitigation planting, Fermi Lab.

Ammannia coccinea Rottböll * PA VALLEY REDSTEM, aka PURPLE AMMANNIA, SCARLET AMMANNIA, TOOTH-CUP, (*coccineus -a -um* Latin adjective, crimson, scarlet, red, deep red, deep carmine red, from Latin *coccineus -a -um*, died scarlet, scarlet dye; scarlet, of scarlet color, for the dye produced from galls on *Quercus coccifera*.)

Habitat: distribution/range: ? "Wet soil; occasional to common in the s ¾ of Illinois, rare elsewhere (m14).
Culture: Moist cold stratify or dormant seed. Surface sow, small seeds need light to germinate. Growth rate moderate medium. Seedling vigor medium. Vegetative spread rate none. Seed spread rate slow. 600,000 (usda) seeds per pound.

cultivation: Tolerant of medium & fine textured soils. Anaerobic tolerance medium. CaCO3 tolerance medium Drought tolerance medium. Fertility requirement medium. Salinity tolerance low. Shade intolerant. pH 4.0-5.9.

bottom line: Preliminary data indicate this seed has a strong requirement for dormant seeding. Germ 5%. Dorm 83%. Test 26 days.**
Description: Annual; roots 12" minimum depth; flowers purple; key features:
Comments: status: Threatened in Pennsylvania. This plant is considered weedy & invasive by some authors (SWSS 1998). phenology: Blooms 7,8,9. Seed source Deer Grove, Whiteside Co.
Associates:
VHFS:

Ammannia robusta Heer & Regel *WA GRAND REDSTEM, aka SCARLET LOOSESTRIFE, SESSILE TOOTH-CUP, TOOTH-CUP, (*robustus -a -um* robust, stout, strong, big, gigantic, powerful, from Latin *robustus -a -um,* of hard wood, especially of oak, oaken; strong, powerful, firm. *Quercus robor* is a European Oak.) obl
Habitat: Seasonally inundated, alluvial, mudflats, ditches, & agricultural wetlands. Early successional hydric soil seedbank sp. distribution/range: "Wet soil; throughout the state, but mostly in the ne cos (m14). Known from west-central & southern Illinois?
Culture: ①Moist cold stratify or dormant seed. Surface sow, small seeds need light to germinate. 9,072,000; 27,515,151 (gnag09) seeds per pound.
Description: Annual; 0.5-1.0'; flowers scarlet;
Comments: status: Sensitive in Washington. phenology: Blooms 7,8,9. Wetland restoration.
VHFS: [*A coccinea, A coccinea purpurea*] *A coccinea* Rottb ssp *robusta* (Heer & Regel) Koehne, *Ludwigia scabriuscula* Kellogg.

CUPHEA P Browne 1756 **WAX WEED** New Latin, irregular from Greek κυφός, *kyphos* curved or gibbous, hump; from the protuberance on the calyx tube, or in reference to the capsule; akin to Old English *hūfe* hood, Greek *kyptein* to bend forward, stoop, Sanskrit *kakubha* high, eminent. Capsule membranous, 1 to 2-celled, few-seeded.
Cuphea viscosissima Jacq BLUE WAXWEED,
Viscid pubescent, flowers violet, solitary, one per axil. Capsule bursting lengthwise before the seeds ripen (w73).
VHFS: [*Lythrum petiolatum* L]

DECODON JF Gmelin **WATER-OLEANDER, WATER-WILLOW** *Lythraceae* Greek *deca*, ten & *odous,* tooth, for the summit of the calyx. A monotypic genus, a weak shrub, endemic to eastern north America. Capsule, globous, included, many-seeded.
Stems woody at the base, often prostrate, & rooting at the tip
In w73, this is *Nesaea verticillata* Kunth.

Decodon verticillatus (Linnaeus) Elliott *IA SWAMP LOOSESTRIFE, aka GRASS POLEY, PEATWEED, SWAMP WILLOW-HERB, WATER-OLEANDER, WATER-WILLOW, WHORLED LOOSESTRIFE, (whorled) obl
Habitat: Bogs, marshes, wet meadows. Floodplain swamps of the middle Illinois River valley..
distribution/range: Wetlands & marshes along the middle Illinois River valley.
Culture: Growth rate rapid. Seedling vigor medium. Vegetative spread rate rapid. Seed spread rate slow. Moist cold stratify,
seed counts & rates: 640,000 (pm02), 644,000 (jfn04), 907,200 seeds per pound.
availability: Seeds are available at Ion Exchange & JF New. USDA says this is routinely available. Yeah, like where?
asexual propagation: Division, cuttings. The self-rooting tips of branches can be removed and transplanted (lbj).
cultivation: Tolerant of coarse, medium, & fine textured soils. Anaerobic tolerance high. CaCO3 tolerance low. Drought tolerance none. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermedium. pH 5.2-7.2
bottom line: Clone, cuttings. Dormant seeding may work. Germ 3.0%. Dorm 44%. Test 49 days.**
Description: Shrub, subshrub, arching perennial, semi-aquatic, emergent forb; often forms floating mats in muddy areas; roots minimum depth; stems 1-9' stems woody at the base & angled, arching over & re-rooting in the water, lower stems are spongy; leaves short-stalked, lance-shaped, in whorls of 3 or 4 or in opposite pairs; inflorescence a dense cluster (cyme) of stalked flowers from the upper leaf axils; flowers pink or lavender (a fine purple), 5-merous, 0.33-0.50" long, petals obvious, narrowing towards the base, 8-10 protruding stamens of 2 alternating lengths; fruit rounded capsule with many seeds; N key features:
Comments: status: Native. Endangered in Iowa. phenology: Blooms 7,8,9. Aggressive suckers. Good for large bog gardens and pond margins, often arching over the water. Genetic source Deer Park Twp, LaSalle Co.
Associates:
VHFS: Formerly *Nesaea verticillata* (L) Kunth. Basionym *Lythrum verticillatum* Linnaeus 1753. [*Decodon verticillatus* (L) Elliott var *laevigatus* T&G, *D verticillatus* (L) Elliott, var *pubescens* T&G, *D*

verticillatus (L) Elliott var *verticillatus*, *Lythrum verticillatum* L, *Nesaea verticillata* (L) Kunth] Add varieties.

LYTHRUM Linnaeus **LOOSESTRIFE** *Lythraceae* Ly`thrum (LITH-rum) from Greek λύθρον, *lythron*, black blood, referring to the color of some spp flowers. According to Pliny, a garland of spiked loosestrife around the neck of oxen helps them pull together as a team. A genus of about 36 spp of perennial herbs, cosmopolitan. Flowers are heterostylic, with styles of different length in flowers of the same sp. Fruit is a capsule, 2-celled, with many, very tiny seeds.

Lythrum alatum Pursh WINGED LOOSESTRIFE, aka NORTHERN WINGED LOOSESTRIFE, WINGED PURPLE LOOSESTRIFE, WINGED LYTHRUM, (*alatus -a -um* alate, winged (stems with protruding ridges wider than thick), or wing-like (fruits), from Latin *alatus -a -um*, adjective, furnished with wings, winged.) obl
Habitat: Wet meadows, fens, marshes, alkaline seeps, wet-mesic to wet prairies.
Culture: ①"Moist cold treatment, or fall sow. Very light to no cover. Tiny seeds. Excellent germination." (mfd93) ②Clean seed should be stored in an airtight container in cold storage until planting or further treatments. 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm11). ③Seeds germinate after about 60 days of cold moist stratification (he99). ④Fall plant or cold stratify for 2 to 3 months for best results. Sow on the soil surface at 70ºF & water. (ew11) ⑤Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn).

seed counts & rates: 18,916,667 (gnhm11), 21,619,047 (gna06), 23,894,736 (gna06), 27,515,151 (gnhm03), 28,375,000 (gna04), 48,000,000 (pm01, jfn04, ew11), 64,000,000 (aes10), 145,152,000 seeds per pound.

"*Lythrum alatum* Moist prairie & marshes. Blooms late June through August; PURPLE. Harvest September. 1 1/2'; seeds tiny, but germinate well with method #1 if flat sits in water; SEEDLING TRANSPLANT. Bloom 2nd year." (rs ma)

cultivation: Space plants 1.0-1.5'. Wet soils, full sun to light shade. Calcareous soils.

bottom line: Dormant seeding is best, with over 50% of lots with a strong requirement for dormant seeding, but the extreme seed count gives even slight % germination the appearance of a good crop. Flipflop species. Germ 51.2, 46, 46, sd 30.7, r14-98 (84)%. Dorm 34.3, 35.5, 0.0, sd 30.5, r0.0-81 (81)%. Test 38, 37, 39, r27-78 days. (#17).**

greenhouse & garden: Moist cold stratify (30 days) or dormant seed. Surface sow, small seeds need light to germinate. Bottom water.
Description Native, erect, perennial forb, very glabrous; stems winged 1.5-3.0'; leaves opposite & alternate, closely sessile; flowers purple-pink, 6-merous, solitary in upper axils, sessile. key features: ①Stems winged below, leaves lance-ovate, acute (w73).
Comments: status: phenology: Blooms 6,7,8,9. In northern Illinois, collect seeds in late August through October. Collect seeds in se Wisconsin in September (he99). Attractive cut flowers, landscaping, bog gardens, pond edges, rain gardens, floodplain & wet meadow plantings, at times aggressive. Seed source nursery production, genetic sources Spring Slough, Rock Falls, Whiteside Co, restored wetlands, Shaw Station, Lee Co, & CBG, Cook Co.

"Other common plants, which presented themselves at different places on our route through the prairies." Lythrum alatum as *Lythrum hyssopifolium sensu* Short (1845) non L. (1753) (Short 1845).

"Common in wet places as marshes, low prairies, streamsides, &c throughout. In drainage ditches west of Yale Bridge over Sugar River is a form that has small lavender flowers." (ewf55)
Associates: One misguided source reports the seeds provide a 'feast' for waterfowl.

Lythrum salicaria Linnaeus PURPLE LOOSESTRIFE, aka MILK WILLOW-HERB, (*salicarius -a -um* (sal-i-KAH-ree-us) like *Salix* Epithet formerly capitalized.)
Native of Eurasia. "An ornamental plant, native in wet meadows, Canada & New England, rare (w73). "An introduced ornamental with a marked tendency to escape. We have found it on Rock River bank above & below the IC RR bridge in Rockford." (ewf55)
① Sow at 20ºC (68ºF), if no germination in 3-4 wks, move to +2 to +4ºC (34-39ºF) for 2-4 wks can be invasive. Illegal to sell in some states in the US (tchn).

There is a specimen of *Lythrum salicaria* in the Sunflower Valley hot house (Bob the Builder, personal communication, episode 257).

NESAEA Juss. See **DECODON.**

MALVACEAE AL Jussieu 1789 **MALLOW FAMILY** from *Malva* New Latin, from Latin, mallow, *malva*, of non-Indo-European origin; akin to the source of Greek *molochē, malechē* mallow; alternately μαλαχη, *malakhe*, soft, in reference to the soft, mucilaginous properties. Fruits are several-celled capsules, or a collection of 1-seeded, indehiscent carpels. Cotton is obtained from the coma of the seeds of *Gossypium*.

Some members of the Mallow family have hard seeds that may benefit from scarification, cf *Callirhoë*.

ABUTILON P Miller 1754 **INDIAN-MALLOW, INDIAN -HEMP** *Malvaceae* New Latin, from Arabic *awbūtīlūn*, a member of this genus.

Abutilon theophrasti Medikus VELVET LEAF, aka BUTTONTOP, BOTTONWEED, PIEMARKER, BUTTERPRINT, (named after the Greek philosopher & botanist Theophrastos, 371-ca 287 BC.)
Habitat: An introduced, common, agricultural weed. Sunny, dry disturbed sites, soil seed-bank sp.
Description: Erect, annual, introduced forb, softly hairy; roots minimum depth; stems 1-5' tall, stout, branched; leaves large, broadly heart-shaped, velvety, on stalks about as long as the leaves; inflorescence a cluster of stalked flowers from the leaf axils; flowers yellow to orange, 5-merous, 0.50-1.0" wide; N. key features:
Comments: status: phenology: Blooms July-October
VHFS: [*Abutilon abutilon* (L) Rusby, *A avicennae* Gaertn, *A theophrastii* RAB, orthographic variant]

CALLIRHOË Nuttall **POPPY MALLOW** *Malvaceae Callirhoë* (ka-LIR-o-ee or ka-lee-RHO-ee) named for one of several characters & fountains, springs or wells in Greek mythology, including, respectively, the daughter of the river god Achelous & wife of Alcmaeon, the daughter of Hermocrates, the daughter of Lycus, & the daughter of Oceanus; also a woman from Calydonia. Alternately New Latin, from Latin *Callirrhoe*, a water nymph, daughter of the river god Achelous & wife of Alcmaeon, from Greek *Kallirrhoë.* Josephus mentions Herod the Great seeking relief from his terminal illness at the hot springs of Callirhoe or Callirrhoe, said to be east of the Dead Sea. Callirrhoe is also the name of one of Jupiter's outer moons & a hotel in Athens, Greece. Sometimes spelled as *Callirrhoë*. Annual & perennial herbs.

Hardy North American herbaceous annuals & perennials of sunny areas & poor soils, blooming for long periods in the summer. Grown for their showy flowers & attractive foliage. Plant in early spring for germination in 3 weeks (jlh).

Callirhoë has hard seeds, which must be thoroughly scarified then stratified. Cullina code B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, I seeds require scarification because of an impermeable seed coat. Three node stem cuttings taken before well flowering is initiated root well. (cu00).

Callirhoë bushii Fernald BUSH'S POPPY MALLOW, (after its discoverer, Benjamin Franklin *Bush* (1858-1937), American botanist.)
Habitat: Full sun, dry soils. distribution/range: Native south & west of our area.
Culture: propagation: ① Hot water treatment. 30 days cold moist stratification. (pm09) ②Pour 180ºF water over seeds, let soak overnight. Sow seeds just below soil surface at 70ºF & water. (ew11) 33,600 (ew11) seeds per pound.
cultivation: Space plants 15-18".
Description: plant 6-24". key features:
Comments: status: phenology: Blooms 6-8.
Associates: ethnobotany:
VHFS:

Callirhoë involucrata (Torrey & Gray) Gray PURPLE POPPY MALLOW, aka WINECUPS, (*involucratus -a -um* (in-vool-oo-KRAH-tus) with an involucre around the flowers.)
Habitat: Full sun, dry soils. distribution/range: Western perennial.
Culture: propagation: ① Sow seeds in fall or soak 6-8 hrs in water & spring plant. Hot water treatment. 30 days cold moist stratification. (pm09) ②Pour 180ºF water over seeds, let soak overnight. Sow seeds just

below soil surface at 70ºF & water. (ew11) ③Sow at max 5ºC (41ºF), germination irregular, often several months (tchn). 33,600 (pm02, ew11) seeds per pound.

asexual propagation:

cultivation: Space plants 12-15".

Description: plant 6-12". key features:

Comments: status: phenology: Blooms? Cut flowers, groundcover. This sp is gyno-dioecious, so to generally takes two to tango. Plant several for sound seed production.

Associates: ethnobotany:

VHFS:

Callirhoë triangulata (Leavenworth) Gray *IN, IA, WI CLUSTERED POPPY MALLOW, aka POPPY MALLOW, (for the triangular leaves) upl

Habitat: Sand prairies & savannas. Full sun to part shade, dry soils.

Culture: ① Hot water treatment. 60 days cold moist stratification, scarify (pm09). Seeds germinate after about 60 days of cold moist stratification, or sow seeds outdoors in fall (he99). ②"30 days moist stratification required for good greenhouse crop. Scarification required. Field sow fall, early spring." (pnnd). ③Fall plant or cold stratify for up to 2 to 3 months for best results. Sow just below the wet soil surface at 40ºF. (ew11) ④Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn).

seed counts & rates: 86,400 (pm02), 96,000 (pn02) seeds per pound.

cultivation: Space plants 12-15".

greenhouse & garden: Moist cold stratify or dormant seed; cool soils.

Description: Erect perennial, 0.5-1.0', flowers magenta red. key features: Petals square at the tip, inflorescence of several, crowded flowers.

Comments: status: Extirpated in Indiana. Endangered in Iowa. Special Concern in Wisconsin.

phenology: Blooms 7-8. Seeds mature late summer. In northern Illinois, collect seeds in late August-September. Collect seeds in se Wisconsin in October (he99). Attractive cut flowers. Landscaping, hot, dry gardens, & xeriscaping.

Callirhoë triangulata

HIBISCUS Linnaeus 1753 **HIBISCUS, ROSE-MALLOW, SWEAT WEED** *Malvaceae* (hi-BIS-kus) New Latin, from Latin, *hibiscum, hibiscus,* marshmallow. Herbs, shrubs, or small trees with dentate or lobed leaves & large showy flowers. Fruits are a 5-celled capsule, loculicidal, the valves with partitions in the middle, seeds 3 or many in each cell. 3-4 native species in Illinois.

Hibiscus spp have hard seeds (by the AOSA definition). Scarification may help. Seed ripens in fall. Fresh seed germinates well with no treatment (Deno). Seed that has been in storage will benefit from scarification, cold moist stratification, or both. Cullina code B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, I seeds require scarification because of an impermeable seed coat. Summer softwood cuttings. (cu00)

Natural stands of *Hibiscus* in northwest Illinois occur in habitats that experience seasonally high water & seasonally low water or periodic flood or drought cycles. Populations may wax & wane. Their long-term presence in 'normal water level' urban wetlands may be problematic.

Hibiscus laevis Allioni *MI HALBERD-LEAVED ROSE MALLOW, aka HALBERD-LEAVED SWAMP MALLOW, SMOOTH ROSE MALLOW, SOLDIER ROSE MALLOW, Obligate
Habitat: Seasonally inundated areas, muddy shores, shallow water, & marshes. Margins of floodplain woods. Adapted to accretionary mud bars. distribution/range:
Culture: ① Moist cold stratify or dormant seed. 60 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of cold moist stratification (he99). ③No pretreatment needed. Sow seeds just below the soil surface at 75ºF & water. (ew11) Growth rate moderate. Seedling vigor low. Vegetative spread rate none.

seed counts & rates: 35,008 (jfn04), 36,998 (gnhm13), 38,863 (gnam09), 40,539 (gnh11), 42,400; 44,800 (pm01, ew11), 71,680 (wns01) seeds per pound.

asexual propagation: Stem cuttings.

cultivation: Space plants 2.0-3.0'. Full sun to partial shade, wet soil. Anaerobic tolerance high. CaCO3 tolerance low. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermediate. pH 5.5-7.2.

bottom line: Dormant seeding is best for field establishment. Dormancy mechanisms are variable, with much hard seed, spring works some years, nondormant lot known. Flipflop species. Germ 34.3, 28.5, na, sd 28.2, r4.0-95 (91)%. Dorm 46.4, 51.5, na, sd 29.4, r0.0-81 (81)%. Test 28, 27, na, r20-34 days. (#10)**

greenhouse & garden: Bottom heat gives modest results, steeping seeds has not helped.
Description: Erect perennial, 5.0-8.0', flowers showy pink-white.
Comments: status: Special Concern in Michigan? phenology: Blooms 7,8,9. In northern Illinois, collect seeds in October. Collect seeds in se Wisconsin in October-November (he99). Wetland restoration, aggressive. Landscaping, really wet rain gardens, bog gardens, shoreline & shallow water plantings. Seed source nursery plantings, genetic source Rock River backwaters & tributaries, Whiteside Co.
VHFS: [*H militaris* Cav]

Hibiscus laevis
2nd & 3rd photo by James Alfonso Alwill, Esq.

Hibiscus lasiocarpus Cavanilles *IN HAIRY-FRUITED HIBISCUS, aka DELTA HIBISCUS, HAIRY ROSE MALLOW, RIVER MALLOW, SACRAMENTO ROSE-MALLOW, WOOLLY ROSE MALLOW, in one source as CRIMSON-EYED ROSE MALLOW,
Habitat: Full sun to partial shade, wet soil. distribution/range: Native south & east of our area.

Culture: ① 60 days cold moist stratification (pm09). (Code C Ken Schaal). ②No pretreatment needed. Sow seeds just below the soil surface at 75ºF & water. (ew11) 35,200 (pm01), 36,000 (ew11), 96,000 (gn) seeds per pound.
cultivation: Space plants 2.0-3.0'.
Description: Sometimes rhizomatous.
Comments: status: Endangered in Indiana. phenology: Blooms Landscaping, really wet rain gardens, bog gardens, shoreline & shallow water plantings.
Associates: Attracts butterflies.
VHFS: Sp is sometimes considered a subsp of *H moscheutos.* [*Hibiscus moscheutos* L ssp *lasiocarpos* (Cav) OJ Blanch, *H lasiocarpos* Cav var *occidentalis* (Torr) A Gray, *H moscheutos* L var *occidentalis* Torr, *H californicus* Kellogg, *H platanoides* Greene, *H leucophyllus* Shiller]

Hibiscus militaris Cavanilles See *H laevis*.

Hibiscus moscheutos Linnaeus CRIMSONEYED ROSEMALLOW, aka MALLOW-ROSE, MARSH HIBISCUS, MARSH MALLOW, ROSE MALLOW, relate taxonomically & integrate with the next?
Habitat: Riparian prairies, edges of wet woodlands, & brackish woodlands. distribution/range:
Culture: ①Sow at 22-24ºC (71-75ºF), germ in less than 2 weeks (tchn). Growth rate rapid. Seedling vigor high. Vegetative spread rate none. Seed spread rate slow.
200,000 (usda confirmed 9/3/14, ecs) seeds per pound.
cultivation: Anaerobic tolerance high. CaCO3 tolerance medium. Drought tolerance none. Fertility requirement medium. Salinity tolerance low. Shade intolerant. pH 4.0-7.0.
bottom line: Dormant seeding is best for field establishment. Dormancy mechanisms are variable, with much hard seed, spring works well 1 in 6 years. Flipflop species. Germ 38.8, 36, na, sd 25.8, r1.0-82 (81)%. Hard 48.8, 57, na, sd 20.2, r15-74 (59)%. Test 25, 18, na, r12-54 days.**
Description: roots 10" minimum depth; key features:
Comments: status: phenology: Blooms
Associates: Self compatible, pollinated by bees, esp bumble bees & *Ptilithrix bombiformis*, a solitary anthophorid bee. Produces a mix of selfed & outcrossed selfs. The spatial separation of the anthers & stigmas usually prevents within flower selfing, but between flower selfing is possible.
VHFS: Synonyms per USDA [*Hibiscus incanus* Wendl f, *H moscheutos* L ssp. *incanus* (Wendl f) Ahles, *H moscheutos* L ssp *moscheutos* L [superfluous autonym], *H moscheutos* L ssp *palustris* (L) Clausen, *H moscheutos* L var *purpurascens* Sweet, *H oculiroseus* Britt, *H opulifolius* Greene, *H palustris* L, *H pinetorum* Greene] According to Mohlenbrock (2014), the following is a synonym of *H moscheutos*.
Sonja L Reeves, 2008. *Hibiscus moscheutos*. In: Fire Effects Information System, [Online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (Producer). Available: http://www.fs.fed.us/database/feis/ [2014, September 3].

Hibiscus palustris Linnaeus SWAMP ROSE MALLOW, aka MARSH HIBISCUS, in one source as CRIMSONEYED ROSEMALLOW. Obligate
Habitat: Wet meadows, edge of streams, & nearby marshes.
Culture: ① 60 days cold moist stratification (pm09). ②No pretreatment needed. Sow seeds just below the soil surface at 75ºF & water. (ew11) 35,008 (jfn04), 38,400 (ew11), 48,255 (gnhe14), 51,874 (gna07), 54,232 (gna05), 56,821 (gnam09) seeds per pound.
cultivation: Space plants 2.0-3.0. Full sun to partial shade, wet soils.
bottom line: Dormant seeding is best for field establishment. Dormancy mechanisms are variable, with much hard seed, spring works some years for the mediocre. Germ 23.7, 34, na, sd 16, r1.0-34 (33)%. Dorm 57.3, 59, na, sd 14.3, r39-74 (35)%. Test 25, 17, na, r12-54 days.**
greenhouse & garden: Moist cold stratify or dormant seed.
Description: Erect perennial; 4.0-6.0'; flowers pink.
Comments: status: phenology: Blooms 7,8,9. Wetland restoration, aggressive. Useful in landscaping, really wet rain gardens, bog gardens, shoreline & shallow water plantings. Seed source nursery plantings, genetic source Rock River backwaters & tributaries, Rock Falls, Whiteside Co.
Associates: Attracts butterflies.
VHFS: Swink & Wilhelm (1994) & Fernald (1942a) hold this separate from *Hibiscus moscheutos*. Some Chicago area specimens are f *peckii,* with creamy corollas & red-tinged throats.

Hibiscus trionium Linnaeus FLOWER OF AN HOUR, aka BLADDER KETMIA,
Introduced from Europe. A common weed.

ILIAMNA Greene 1906 **GLOBE MALLOW, WILD HOLLYHOCK** *Malvaceae Iliamna* derivation unknown, but there is a volcano by that name northeast of Iliamna Lake in sw Alaska. A genus of about 7 spp of North American perennial herbs. Included by some authorities in *Sphaeralacea*. Add info from Native Plants Journal.

Iliamna remota Greene KANKAKEE MALLOW, aka KANKAKEE GLOBE MALLOW, PETER'S MOUNTAIN MALLOW, STREAMBANK WILD HOLLYHOCK,
Habitat: Full sun to partial shade, mesic soils. distribution/range: One of the few plants endemic in Illinois, native to Altorf Island in the Kankakee River.
Culture: ① Cold moist stratify 60 days (Wade) ②No pretreatment needed. Scarify. Sow seeds just below the soil surface at 70ºF & water. (ew11) ③Sow at max 5ºC (41ºF), germination irregular, often several months, but if you have the patience to nick the small seed, sow at room temperature for germination in about 3 days (tchn).
seed counts & rates: 192,000 (pm02, ew11) seeds per pound.
cultivation: Space plants 1.0-2.0'.
Description: Erect, herbaceous, perennial, native forb; stems 5-7'; leaves shallowly 5-7 lobed; flowers rose-purple, fragrant, key features:
Comments: status: phenology: Blooms Now widely cultivated in wild gardens. Resembles the old fashioned garden HOLLYHOCK.

MALVA Linnaeus **MALLOW** *Malvaceae Malva* New Latin, from Latin, mallow, *malva*, of non-Indo-European origin; akin to the source of Greek *molochē, malechē,* mallow; alternately μαλαχη, *malakhe*, soft, in reference to the soft, mucilaginous properties. Genus of about 40 spp native to temperate Eurasia & montane Africa. Carpels many, 1-celled, 1-seeded, indehiscent, arranged circularly, & when mature separating from the axis.

Malva neglecta Wallroth CHEESES, aka COMMON MALLOW,
Introduced from Europe. "A common dooryard weed" (ewf55).

Malva rotundifolia Linnaeus SMALL MALLOW, aka DWARF MALLOW, CHEESES,
Introduced from Europe. "About as common as the preceding (*M neglecta*) & in the same places; differs in having shorter petals & fewer carpels" (ewf55).

NAPAEA Linnaeus 1753 **GLADE MALLOW** *Malvaceae Napaea* from Greek νάπη, *napa*, a wooded valley between mountains, where Clayton discovered the plant (Wood 1873), from Latin *Năpææ,* nymphs of the woods, from Greek Ναπαϊαι, *Napaiai*. A monotypic genus of temperate central North America. Carpels 1-seeded, indehiscent, beakless, circularly arranged. A Federal Species of Concern.

Napaea dioica Linnaeus *IN, IA, VA, WI GLADE MALLOW, (*dioicus -a -um* (dee-o-EE-kus) of two houses, from Greek δις-οικος, *dis-oikos,* dioecious, indicating that the male & female flowers are found on different plants, having stamens & pistils on separate flowers on different plants.) facw-
Habitat: Wet savannas, & alluvial wet to wet mesic meadows along major rivers. Wet to moist woods & streambanks. Riparian prairies of the Rock River near Lyndon, Erie, & Joslin, wet railroad prairies in the middle Illinois River floodplain, wet outwash/lacustrine plain railroad prairie west of Mineral, Bureau Co (the last now destroyed by IDOT, a curse on thee, Rich Maggi & Cassandra Rogers, apparently someone thought Osama Bin Laden would hide in the cone flowers, so we allowed 2 miles of quality prairie remnant to be destroyed for the sake of a corn ethanol plant that was obsolete before it was complete and helped the conversion of thousands of acres of CRP grasslands into corn).
Culture: ① 60 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of cold moist stratification (he99). ③Fall plant or cold stratify for 2 to 3 months for best results. Sow just below the soil surface at 70ºF & water. (ew11)

seed counts & rates: 49,718 (gnia08), 64,000 (aes10), 66,000 (jfn04), 68,817 (gnnd), 70,203 (gnam06), 73,642 (gna04), 75,200 (ew11), 78,330 (gna11), 84,800 (pm11) seeds per pound.

cultivation: Space plants 1.25-1.5'. Tolerates clay soils.

bottom line: Dormant seed only, significantly to strongly hard seeded (36-90%). Germ 21.6, 12, 24 sd 26.7, r3.0-94 (91)%. Hard 60.2, 70, na, sd 25, r6.0-90 (84)%. Test 33, 32, na r21-46 days.**

greenhouse & garden: Moist cold stratify or dormant seed.

Description: Native, erect, herbaceous, perennial forb, coarse; stems 5-8'; inflorescence large panicle; flowers white, 5-merous, 0.33-0.75"; key features: No bracts below flowers, leaves with 5-9 deep lobes (fh).

Comments: Rare in Indiana & Virginia. Special Concern in Wisconsin. phenology: Blooms 6,7. In northern Illinois, collect seeds in September. Collect seeds in se Wisconsin in September (he99). Landscaping, herbaceous borders, floodplain plantings, provides a bold textural statement with a modicum of color, aggressively large, provide adequate room, not for the meek & timid. Flowers fragrant, dioecious. Seed source riparian prairies, Whiteside Co.

"Irregular in distribution but not uncommon. It is usually near streams, is abundant on Rock River at High bridge in Rockford, in Rock River bottom west of Rockton, in Pecatonica bottom at Harrison, & Killbuck Creek in the Forest Preserve. Occasionally seen in very unexpected places as on a dry roadside in the sand area. Also in Kishwaukee River Bottom in DeKalb Co & in a prairie slough in Stephenson Co" (ewf55).

Associates: Pollinated by several genera of Hymenopterans: *Bombus*, *Lasioglossum,* & *Andreana*; also pollinated by several genera of Dipterans from the *Syrphidae*, hoverflies & *Calliphoridae,* blowflies. Attracts upland gamebirds & songbirds.

Napaea dioica

SPHAERALCEA GLOBE MALLOW *Malvaceae Sphaeralcea* New Latin, Greek σφαιρο-, *sphairo-* combining form of σφαῖρα, *sphaira*, ball, & Latin *alcea*, a mallow, from Greek *alkaia,* vervain mallow.

Sphaeralcea coccinea SCARLET MALLOW, aka GLOBE MALLOW, PRAIRIE MALLOW,
Native west of our area.
① Further germination pretreatments not sure? (pm) ②"No pre-treatment needed. Sow seeds on soil surface at 40ºF & water. Slow to germinate." (ew12) ③Sow at max 5ºC (41ºF), germination irregular, often several months (tchn).
Comments: 96,000 (sh94), 499,200 (ew12) seeds per pound.

MELASTOMACEAE AL Jussieu 1789 **MELASTOME FAMILY** Plants of the *Melastoma*, Malabar Laurel, tribe, from ancient Greek μέλας, *melas,* black & στόμα, *stoma,* mouth. Fruit capsular or baccate.

RHEXIA Linnaeus 1753 **MEADOW BEAUTY, DEER GRASS** *Melastomaceae* Melastome family *Rhexia* New Latin from Linnaeus, from classical Latin, a plant, that was also called *onochilis* (also *Onochiles*, *Alkana?*, *Boraginaceae*); a name used by Pliny for some unknown boraginaceous plant; alternately from Greek ῥεξις, *rhexis*, a rupture, in reference to the vulnerary qualities of some spp (w73). A small genus of

herbs having 3-nerved, opposite, leaves & red or yellow flowers with 4 petals & 8 equal anthers. Capsule 4-celled, nearly free from the investing calyx tube; placentae prominent; seeds numerous.

The tiny seeds ripen in late summer to early fall. Easy by cold moist stratification & surface sowing. Small seedlings grow slowly at first. Cullina code B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, H seeds require light to germinate. (cu00)

Rhexia virginica Linnaeus *IA, MI?, VT MEADOW BEAUTY, aka HANDSOME HARRY, VIRGINIA MEADOW BEAUTY, (virgínicus Epithet formerly capitalized.) obl
Habitat: Wet sands or peats. Grows in wet ground, mass to Ill & La (w73).
Culture: Sow at 20ºC (68ºF), if no germination in 3-4 wks, move to +2 to +4ºC (34-39ºF) for 2-4 wks (tchn).

asexual propagation: Cuttings, division of mature plants,

greenhouse & garden: ①Light, dry storage 70º (180 days), moist cold stratify (90 days). Dormant seed, successional restoration.
Description: Erect, herbaceous, native perennial; 1.0-1.5'; inflorescence corymbous cymes; flowers showy, four-petaled, red, with prominent anthers; key features: ①Leaves sessile, oval-lanceolate, ciliate-serrulate; stem clothed with scattered hairs; calyx hispid. ②Leaves & stem clothed with scattered hairs; calyx hispid (w73).
Comments: status: Threatened in Iowa & Vermont. phenology: Blooms 6,7,8,9. Wet acid sand or peat. Attractive vase-shaped seed capsules.
VHFS: [*Rhexia stricta* Pursh, *R virginica* L var *purshii* (Spreng) CW James, *R virginica* L var *septemnervia* (Walt) Pursh]

MENISPERMACEAE AL Jussieu 1789 **MOONSEED FAMILY**

MENISPERMUM Linnaeus **MOONSEED, MOON-CREEPER** *Menispermaceae Menispermum* New Latin, moon seed, from Greek μήνη, *mene,* moon, & σπέρμα *-spermum*, from Greek *sperma* seed. Fruits are drupes.

Menispermum canadense Linnaeus CANADA MOONSEED, aka MOONSEED VINE, (*canadensis -is -e* of Canada or northeast USA) The common name is from the lunate seeds.
Zone 3. "A common vine of thickets & fencerows" (ewf55).
Culture: Division.
Description: Dense twining vine, with deep-green maple-like leaves; fall color yellow. Clusters of 0.5" dark blue fruit in fall. Fruits are drupes, seeds lunate & compressed.
Climbs quickly in sun or shade.
Associates: ethnobotany: Root used as medicinal plant by Ojibwa (sm32).

MENYANTHACEAE Dumortier 1829 **BUCKBEAN FAMILY**

MENYANTHES BUCKBEAN *Menyanthaceae Menyanthes* (may-nee-ANTH-eez) from the Greek *menanthos*, moonflower, the name for *Nymphoides peltata,* a related plant. Aquatic or bog perennial herb.

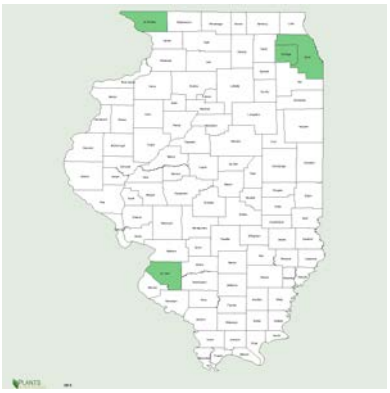
Menyanthes trifoliata Linnaeus BUCKBEAN, aka BOGBEAN, (trifoliatus -a -um (tri-fo-lee-AH-tus) with three leaves).
Associates: ethnobotany: Used as medicinal plant by Menominee (sm23).

NYCTAGINACEAE AL Jussieu 1789 **FOUR-O'CLOCK FAMILY** From *Nyctaginia*, from Greek *nyct*, night, in reference to nocturnal flowering

MIRABILIS Linnaeus 1753 **FOUR-O'CLOCK** *Nyctaginaceae Mirabilis* (mee-RAH-bi-lis) New Latin, from Latin for wonderful, Late Latin *mirabilia,* miracles, marvels, from neuter plural of Latin *mirabilis,* wonderful, marvelous, from *mirari,* to wonder at, & *-abilis,* -able. Annual & perennial herbs. The genus is also spelled *Myrabilis*.

Mirabilis hirsuta (Pursh) Macmillan *IL HAIRY FOUR O'CLOCK, aka PALE UMBRELLAWORT,

Habitat: distribution/range: "Apparently adventive in disturbed soil, including railroad ballast, in Cook, DuPage, St Clair, Tazewell, & Will cos; native in a hill prairie in Jo Daviess Co (m14). Sp also known from the Greenville Township 80, west of New Bedford, Bureau Co, Illinois. Northern Illinois is at the eastern (ne) limit of sp range.



Culture: propagation: 60 days cold moist stratification well. In the garden, plants may be short-lived.

asexual propagation: Unknown.

cultivation: Short lived in the garden.

bottom line:

greenhouse & garden:

Description: plant key features:

Comments: status: Endangered in Illinois. phenology: Blooms

Associates:

ethnobotany:

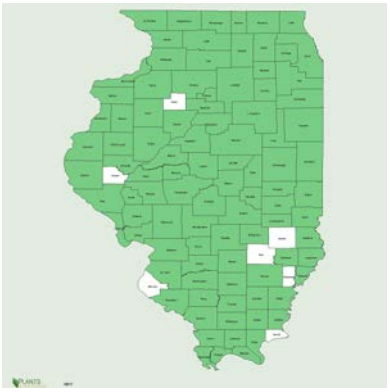
VHFS: In some taxonomies, infidels lump this grand sp into *M albida*. "Plants recognized as *M. hirsuta* are treated as a pubescent form of *M albida* by Spellenberg (2003)" (rvwll). [*Allionia hirsuta* Pursh, *Oxybaphus hirsutus* (Pursh) Sweet]

Some sources suggest this may hybridize with *M nyctaginea*.

Mirabilis hirsuta, cultivated plant, Walnut, ca 1983

Mirabilis multiflora fall sow or stratify 1-2 months & spring plant (pots 2000).

Mirabilis nyctaginea (Michaux) MacMillan FOUR-O'CLOCK, aka HEARTLEAF FOUR O'CLOCK, HEART-LEAVED UMBRELLA-WORT, NIGHTBLOMING FOUR O'CLOCK, UMBRELLA PLANT, UMBRELLAWORT, WILD FOUR-O'CLOCK, *Be'dukadad'igsin* ''it sticks up'' (Ojibwa), possible in reference to the erect seeds, (*nyctagineus -a -um* night-blooming, resembling the four-o'clock-flower.)



Habitat: Dry road edges & dry disturbed ground. Full sun dry soils. In our area this sp has the ecology of a weed & does not grow with conservative associates. "Common in fields, on roadsides, railroads." (ewf55) distribution/range: Adventive in Illinois.

Culture: ① No pre-treatment necessary other than cold, dry stratification (pm09). ②Seeds germinate after about 60 days of cold moist stratification (he99). ③No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11) May flower first year from seed.

seed counts & rates: 56,000 (pm02), 104,000 (sh94) seeds per pound.

cultivation: Space plants (??) 1.25-1.5'.

Comments: status: Pestiferous. phenology: Blooms 5-8. May persist. Flowers fragrant, open in afternoon, hence the common name. This is a virulent weed in our cold frames & around the greenhouses. Self sows like a #!)(^%@?*ºø®.

Associates: ethnobotany: Root used as medicinal plant by Ojibwa (sm32). Medicine for sprains. Also used for fevers (den28).
VHFS: Formerly *Alliona nyctaginea* Michaux, *Oxybaphus nyctagineus* (Michx) Sweet.

Myrabilis See *Mirabilis*

ONAGRACEAE AL de Jussieu 1789 **EVENING-PRIMROSE FAMILY, ONAGRADS** *Onagra* Greek ονάγρα, *onagra,* the oleander *Nerium oleander*. 6th century Latin *onagra,* from Hellenistic Greek ὀνάγρα, *onagra,* feminine derivitive of ὄναγρος, *onagros,* an onager; ὀναγρα, *onagra,* was also translated as ass-trap. *Onagra*, the type genus of the family is an old name for *Oenothera*.

A family of about 18 genera & 650 spp of herbs, shrubs, & rarely trees, cosmopolitan, but especially in temperate & subtropical America. Fruit capsular or baccate, 2 to 4-celled; seeds with little or no albumen. Many are ornamental as *Fuchsia* & *Clarkia*.

insert genus *Chamerion* Rafinesque ex Holub 1972 FIREWEED

CIRCAEA Linnaeus **ENCHANTER'S-NIGHTSHADE** *Onagraceae Circaea* New Latin, from Latin, feminine of *Circaeus,* of Circe, from *Circe*, sorceress deity who transformed men into beasts, from Greek Κίρκη, *Kirkē*, who was supposed to have used the plants in her sorcery. A genus of 7-8 spp of herbs of temperate & boreal regions of the Northern Hemisphere. Fruit is a capsule, obovoid, uncinate-hispid or pubescent, 2-celled, 2-seeded.

Circaea lutetiana Linnaeus ENCHANTER'S NIGHTSHADE, (*lutetianus -a -um* Parisian, from Paris, from the ancient Roman name for Paris, *Lutetia,* or *Lutetia Parisiorum*, from Latin *Lutētia*, an ancient city on the site of Paris, in reference to a certain *je ne sais quois*. Epithet formerly capitalized.)
Damp shade & thickets. ① Sow at 20ºC (68ºF), if no germination in 3-4 wks, move to +2 to +4ºC (34-39ºF) for 2-4 wks (tchn). "*C latifolia* Hill. Common in woods. (*C lutetiana* L)" (ewf55)
key features: ①Stems pubescent, leaves opaque; bracts none

EPILOBIUM WILLOW HERB, ROSE BAY *Onagraceae* Evening Primrose family Epilo`bium (e-pi-LO-bee-um) from Greek ἐπί-, *epi,* on, & λοβός, *lobos* a pod, & New Latin *-ium*; alternately *epilobion,* from Greek ἐπί-, *epi,* on, & λοβός, *lobos* a pod, & ἴον, *ion*, a violet, ie a violet growing upon a pod; the corolla is on the end of the ovary. A large genus of about 200 spp, widely distributed but primarily of boreal latitudes & alpine elevations, perennial herbs with pink, white, or rarely yellow flowers, slender lanceolate leaves, & seeds with a silky coma. Ovary & capsule linear, 4-cornered, 4-celled, 4-valved, seeds many, comous, with a tuft of long, silky hairs. Genus is a larval host for *Hyles gallii* BEDSTRAW HAWKMOTH & *Hyles lineata* WHITE-LINES SPHINX MOTH.

Seeds germinate easily. Cullina code A seeds will germinate within 4 weeks sown at 70ºF, or B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF. Softwood stem cuttings in late spring. (cu00)

Epilobium angustifolium Linnaeus (new nomenclature is *Chamerion angustifolium* (L) Holub, as in m14) FIRE WEED, aka BLACKHEART, BLOOMING SALLY, FIRE FLOWER, GREAT WILLOW HERB, GREAT WILLOW-HERB, ROSEBAY, ROSEBAY WILLOW HERB, *Oja'cidji'bik,* slippery root. (*angustifolius -a -um* angustifòlius narrow-leaved, from Latin *angustus*, adj, drawn together; narrow, *-i-*, connective vowel used by botanical Latin, & *folium,* leaf.) fac
Habitat: North of our area in recently burned areas; full sun, dry mesic to wet mesic soils. Moderate moisture requirements, rich moist soil in open woods, prairies, along streams & disturbed ground.
distribution/range: Comparatively boreal, a rare, marginal native of northern Illinois, which is at the southern edge of its range.
Culture: ① 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ②Seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99) ③"30 days moist stratification necessary for germination. Field sow fall." (pnnd) ④Fall plant or cold

stratify for 2 to 3 months for best results. Sow on the soil surface at 70ºF & water. (ew11) ⑤Surface sow at max 5ºC (41ºF), germination irregular, often several months (tchn).

seed counts & rates: 7,884,800 (wns01), 8,000,000 (pm02, ew11), 8,500,000 (gran), 9,600,000 (aes10), 10,400,000 seeds per pound. Pure stand plant 0.25 lb per acre (gran).

asexual propagation: Division of mature plants in spring.

cultivation: Space plants 1.5-2.0'. Full sun to partial shade, mesic soils. Coarse to moderately fine soils. Neutral soils, some acid tolerance. Needs extra moisture in gardens.

bottom line: Plant spring or dormant. Initial datum shows nondormant seed. Germ 90%. Dorm 0.0%. Test 21 days.**

greenhouse & garden: Moist cold stratify or dormant seed may improve germination. Small seeds need light, Sow in fall or stratify 60 days & sow in spring.

Description: Native rhizomatous perennial, 2.0-4.0(-6.0)', with large, orchid-pink flowers blooming all summer (rarely white).

Comments: status: phenology: Blooms 6,7,8. A rare native in Illinois, &, people, with global warming, we need to keep it that way. Can be aggressive in places, but can't cut the mustard in NW Illinois, & dies out in our nursery. Fire successional, persistent rhizomes allows this sp to dominate an area especially after fires or other disturbances. Seed source southern Wisconsin.

"The one station we know of in the county is in an IC RR cut through limestone west of Rockford near Levings' park. On the damp shaded stone & in the ditch at the base of the cliff it has persisted for several years." (ewf55)

This sp is a circumboreal complex consisting of diploid, tetraploid, & hexaploid taxa.

Associates: Attracts butterflies & hummingbirds.

ethnobotany: Root used as medicinal plant by Ojibwa, Menominee, & Pottawatomie (sm23, 32, 33). Ojibwa medicine for bruises (den28). Plant tonic, astringent, demulcent, & emollient.

VHFS: Some authorities place this sp & its relatives in the genus *Chamerion* (Raf) Raf, cf *Chamerion* Rafinesque ex Holub.

Epilobium angustifolium, Michigan roadside.

Epilobium ciliatum Rafinesque NORTHERN WILLOW HERB, aka AMERICAN WILLOW-HERB, (*ciliatus -a -um* (ki-lee-AH-tus) ciliate, with marginal hairs, fringed with hairs like an eyelash or eyelid.)

"Uncommon, being usually found on moist limestone as at Seward Bluffs & the "dells" of hall Creek. The fall basal rosettes are conspicuous." (ewf55 as *E adenocaulon* Hauss.) 8,000,000 (aes10) seeds per pound.

Epilobium coloratum Biehler CINNAMON WILLOW HERB, aka BRONZE WILLOW-HERB, EASTERN WILLOW-HERB, FIREWEED, (colorȁtum) obl

Habitat: Alluvial areas, fens, wet meadows, agricultural drainage ditches. Disturbed marshy sites. Wet to wet-mesic prairies & savannas. distribution/range:

Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ②Seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99)

seed counts & rates: 880,000 (jfn04, aes10), 4,729,187 (gnh13), 5,274,418 (gnhg12), 5,503,030 (gn07), 8,000,000 (gn) seeds per pound.

bottom line: Genesis seed tests show zero to slight dormancy, field sow dormant or spring. Flipflop species one in five. Germ 74.4, 90, na, sd 33.5, r9.0-98 (89)%. Dorm 14.2, 0.0, 0.0, sd 25.5, r0.0-65 (65)%. Test 26, 29, na, r20-30 days.**

greenhouse & garden: Moist cold stratify for 60 days or dormant seed, light, sow on top of soil, successional restoration.

Description: Native, erect perennial forb; 1.0-3.0'; small pink (rose) flowers; key features: ①Stems subterete, puberulent, leaves?(w73).

Comments: status: phenology: Blooms 6,7,8,9. In northern Illinois, collect seeds in October-early November. Collect seeds in se Wisconsin in October-November (he99). Strongly self sows, wetland restoration. Seed source drainage ditches, Green River Lowland, Lee Co.

"Common in marshes & other wet places often forming dense weedy patches.' (ewf55 as *E coloratum* Muhl)

VHFS: "There are some difficulties in distinguishing this sp & *E ciliatum* in our area." (w07)

Epilobium glandulosum Lehm. NORTHERN WILLOW HERB,

Habitat: Wet prairies. distribution/range:

Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ②Seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99)

seed counts & rates: 960,000 (pm02) seeds per pound.

greenhouse & garden: Moist cold stratify for 60 days or dormant seed, light, sow on top of soil.

Description: Erect perennial, 1-3', pink flowers, variable.

Comments: status: phenology: Blooms 7-9. Collect seeds in se Wisconsin in October-November (he99).

Epilobium leptophyllum Rafinesque FEN WILLOW-HERB, aka NARROWLEAF WILLOW-HERB, AMERICAN MARSH WILLOW-HERB,

"Other common plants, which presented themselves at different places on our route through the prairies" *Epilobium leptophyllum* as *Epilobium lineare* Muhl. (1813) (Short 1845).

"Quite uncommon, we having found it only in shallow bogs on Coon Creek bottom in Rockton Township." (ewf55)

Epilobium strictum Sprengel DOWNY WILLOW-HERB,

"Uncommon in the same wet places as the preceding (*E leptophyllum*)" (ewf55 as *E strictum* Muhl).

GAURA Linnaeus **GAURA** *Onagraceae* Gau`ra New Latin, from Greek *gaurē*, feminine of γαῦρος, *gauros* majestic, splendid, superb, referring to the beautiful flowers of some of the spp. American herbs having alternate leaves & red & white flowers in terminal spikes or racemes. Fruit is a nut, usually by abortion, 1-celled, 1 to 4-seeded. Some authors place *Gaura* in *Oenothera* (w12).

Seeds mature late summer to early fall. Seeds need no treatment. Cullina code A seeds will germinate within 4 weeks sown at 70ºF. Three node stem cuttings taken in spring before flowering root well. (cu00) *Gaura lindheimeri,* sow at 20ºC (68ºF), germination slow (tchn).

Gaura biennis Linnaeus (new nomenclature is *Oenothera gaura* WL Wagner & Hoch) BIENNIAL GAURA, aka BIENNIAL BEE-BLOSSOM, BUTTERFLY WEED, (biénnis) facu-

Habitat: Ubiquitous, an uncommon weed in Illinois in a wide variety of habitats, hill prairies, dry, mesic, & wet prairies, open woods, roadsides & railroad ballast.

Culture: ①60 days cold moist stratification (pm09). ②Easy by seed, germinating after about 60 days of cold moist stratification (he99).

seed counts & rates: 40,789 (gnam11), 43,200 (pm02, ew11, aes10), 51,247 (gnam04), 63,532 (gnhm14), 160,000 (sh94) seeds per pound.

cultivation: Space plants 1.5-2.0'. Mesic to dry soils, full sun to partial shade.

bottom line: Field establishment is best by dormant seeding. Germ 25.5, 26.5, na, sd 12.1, r9.0-43 (340%. Harddorm 65, 69, na, sd 23.4, r32-90 (58)%. Test 24, 23, 18-49 days. (#7)**

greenhouse & garden: Moist cold stratify or dormant plant; light or GA3, easy from seed.

Description: Erect biennial, 3.0-5.0', flowers white turning pink; nut-like seed. key features: ①Leaves lanceolate, oblong, calyx tube as long as the segment (w73).
Comments: status: phenology: Blooms 7,8,9,10. Collect seeds in se Wisconsin in October-November (he99). Seed source Whiteside Co. Sp shows potential for salt tolerance. Significant colonies are growing in the median of I-80 west of Davenport.

"Other common plants, which presented themselves at different places on our route through the prairies." *Gaura biennis* as *G angustifolia sensu* Short (1845), non Michx. (1803) (Short 1845).

"A common & showy roadside weed; mostly in prairie situations" (ewf55). "A beautiful biennial, on the dry banks of streams, … rare (w73).
Associates: Attracts butterflies. Pollinated by long-tongued bees.

Gaura coccinea Nuttall ex Pursh SCARLET GAURA, aka SCARLET BEE-BLOSSOM,
Habitat: Full sun, dry soils. distribution/range: Native west of our area.
Culture: ①60 days cold moist stratification (pm09). ②Fall plant or cold stratify for 2 to 3 months for best results. Sow just below the soil surface at 70ºF & water. (ew11)

cultivation: Space plants 1.0-2.0'.
Description: key features:
Comments: status: phenology: Blooms 22,400 (pm02), 24,000 (ew11) seeds per pound.
Associates:
VHFS:

Gaura longiflora Spach LONG-FLOWER BEE-BLOSSOM,
①Seeds germinate after a period of cold, moist stratification (pm09).

LUDWIGIA Linnaeus **PRIMROSE WILLOW, BASTARD LOOSESTRIFE** *Onagraceae* Sometimes seen as *Ludvigia.* New Latin, from Christian Gottlieb *Ludwig,* (1709-1773), (or CD Ludwig) German botanist & professor of botany at Leipzig ca 1750, & New Latin *-ia*. A genus of about 82 spp of perennial herbs & shrubs, cosmopolitan, mostly of tropical or warm regions, that have 4-parted flowers & a short capsular fruit. Capsule short, often perforated at the top, 4-celled, 4-valved, many-seeded, & crowned with the persistent calyx lobes.

Ludwigia alternifolia Linnaeus *MI? SEEDBOX, aka ALTERNATE-LEAF SEEDBOX, BUSHY WATER PRIMROSE, FALSE-LOOSESTRIFE, RATTLE BOX, SQUARE-POD WATER-PRIMROSE, obl
Habitat: Wet sands, acidic soils. In Michigan, "Marshy ground, borders of swamps, wet thickets, shores, clearings; usually in sandy, acidic soils" (rvw11). In the se USA, ditches, marshes, open wet places, & disturbed wet places (w12).
Culture: ①60 days cold moist stratification (pm09). ②(Code C, D Ken Schaal) ③Fall plant or cold stratify for 1 to 2 months for best results. Sow just below (??) the soil surface at 70ºF & water. (ew11) ④Sow at 4ºC (40ºF) for 6 wks, move to 20ºC (68ºF) for germination (tchn).

seed counts & rates: 4,500,000 (jfn04), 11,350,139 (gnih07), 12,656,000 (ew11), 16,000,000 (gn), 18,916,667 (gnh13), 20,800,000 (ecs) seeds per pound.

asexual propagation: Cuttings.

cultivation: Space plants 1.5-2.0'. Full sun, wet soils.

bottom line: Dormant seeding is best for field establishment, but spring works some years. From year to year, dormancy mechanisms range from nondormant to 88% dormant. Germ 42.9, 28, 21, sd 31.3, r2.0-96 (94)%. Dorm 40.9, 37.5, na, sd 34.2, r0.0-88 (88)%. Test 28, 28, 29, r23-35 days. (#8).**

greenhouse & garden: Moist cold stratify 60 days or dormant seed, light.
Description: Erect perennial, 2.0-2.5', flowers yellow, with persistent pinkish sepals. key features: ①Glabrous; leaves lanceolate, acute; petals scarcely as large as the spreading sepals (w73).
Comments: status: Listed sp in Michigan? phenology: Blooms 7,8. Attractive dried seed clusters, with numerous, small, square seed pods with attractive red fall color. Wetland restoration, rain gardens with no bold grasses. Genetic source Shaw Station, Lee Co.
VHFS: [*Ludwigia alternifolia* L var *linearifolia* Britt, *L alternifolia* L var *pubescens* Palmer & Steyermark, *L alternifolia* L var *typica* Munz]

Ludwigia palustris (Linnaeus) Elliott COMMON WATER PURSLANE, aka MARSH PURSLANE, MARSH SEED-BOX, WATER-PURSLANE,

"Common in quiet water" (ewf55). Creeping in muddy places & floating in water.
key features: ①Prostrate & creeping, smooth; bractlets 0 (w73).
VHFS: Historically placed in *Isnardia* L.

Ludwigia polycarpa Short & Peter *MI FALSE LOOSESTRIFE, aka TOP-POD WATER-PRIMROSE, obl
Habitat: Seasonally inundated areas, muddy shores, farmed wetlands.
Culture: Dormant seed, light. 9,072,000 seeds per pound.
Description: Erect to sagging perennial; 0.5-2.0'; leaves alternate; flowers purple; tetraploid, n = 16. key features: ①Erect leaves lance-linear, capsules 4-angled, truncated (w73).
Comments: status: Special Concern in Michigan. phenology: Blooms 7,8,9,10. Wetland restoration.

OENOTHERA Linnaeus **EVENING PRIMROSE** *Onagraceae Œnothera* Oenother'a, or Oenothe'ra (ee-no-THEER-a, or ee-no-THEE-ruh) New Latin, from Latin *oenothēra, onothēra, onothēras*, a plant of the related genus *Epilobium*, from Greek *oinotheras, onothera, oenotheris* the juice of a plant that is drunk in wine to produce sleep. Alternately, wine-flowering, by inference wine-scented, from *oen*, grape vine, wine, and ανθηρος, *antheros*, flowering, blooming. The plant was thought to to give one a taste for wine, or a better taste to wine, the roots of *Oenothera biennis* are edible and were formally taken after dinner to flavor wine, hence the common name wine-trap; οἰνοθήρας, *oinotheras,* from Theophrastus, may be translated as "wine-trap"; also οἶνος, *oinos,* wine, and θηράω, *therao,* to hunt, referring to the root causing a thirst for wine, or to hunt for wine. 15th century Latin *oenothēra* from classical Latin *onothēra, onothēras,* from Pliny, a name for a toxic plant that was used in small quantities to catch asses and other animals, from Hellenistic Greek ὀνοθήρας, *onotheras*, literally ass-catcher, from ancient Greek ὄνος, *onos*, ass, and θηρᾶν, *theran*, to hunt, pursue, catch, from θήρ, *ther,* (as in *thero-*) wild beast; another name was ὀναγρα, *onagra,* ass-trap. The common name is from the flowers being closed during the day & open in the evening. On dark, cloudy, overcast days, the flowers may remain open. The day flowering spp are known as SUNDROPS. Biennial & perennial herbs.

A genus of about 124 spp of mostly North American (temperate America?) annual or biennial herbs having alternate leaves, usually nocturnal, yellow flowers with erect buds, & terete seeds in two rows in a capsule. The high oil seeds provide valuable food for upland game birds, songbirds & small mammals. Fruit is a capsule, 4-celled, & 4-valved with numerous small seeds without a coma that are rich in oil. Some spp are early successional, part of a persistent upland soil seed bank, & behave as weeds. Although the basal rosettes shade much of the soil in a new planting & may inhibit some germination, the short-lived taproots add much organic matter to the soil, & decay to create large channels for water infiltration, implying this type of spp is important in the long term restoration of disturbed urban or reclamation soils. cf *Beta vulgaris*. Some Midwestern spp are now included in *Calylophus* Spach. Formerly *Onagra.* In some older books, binomials are listed with the dipthong, such as *Œ biennis.*

Seeds ripen in the summer. Plants are mostly self-sterile. Germination is easy from seed with no treatment. Some spp seem to be seed bank spp & probably require light for germination. Cullina code A seeds will germinate within 4 weeks sown at 70ºF. Some are easy by division & all *Oenothera* & *Calylophus* are easily rooted as spring tip cuttings. (cu00)

The genus is a larval host for *Hyles lineata* WHITE-LINED SPHINX MOTH, & nectar source for *Sphinx chersis* GREAT ASH SPHINX MOTH, *Sphinx gordius* APPLE SPHINX MOTH, & *Sphinx poecila* POECILA SPHINX MOTH.

Oenothera biennis Linnaeus COMMON EVENING PRIMROSE, aka BASTARD EVENING PRIMROSE, EVENING PRIMROSE, FEVER PLANT, GERMAN RAMPION, HOARY EVENING PRIMROSE, HOG WEED, KING'S CURE-ALL, NIGHT WILLOW-HERB, SCABISH, TREE PRIMROSE, WEEDY EVENING PRIMROSE, (*biennis -is -e* biénnis (bye-EN-is) biennial, plants which bloom in the second year, from Latin adjective *biennis -is -e,* two years old; lasting two years, in reference to the plant completing its life cycle in two years, usually flowering & fruiting the second year.)
Habitat: Disturbed areas, many soil seed banks, dry to wet mesic soils. Prairies & savannas, wet mesic to dry soils. Open woods, fields, disturbed areas. distribution/range:
Culture: A wildly successful plant. It is unsure why we need to improve the germination of this plant. ①No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need

light to naturally break dormancy & germinate. Seeds germinate most successfully in cool soil. (pm09). ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method. Seeds germinate most successfully in cool soil. Sow in early winter through early spring. (he99) ③"10 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall." (pnnd). ④No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11) ⑤Sow at 20ºC (68ºF), germinates in about two wks (tchn). Growth rate rapid. Seedling vigor high. Vegetative spread rate none.

seed counts & rates: 880,000 (jfn04, aes10), 1,128,000 (ew11), 1,376,000 (usda, ecs), 1,415,000; 1,440,000 (pm02, wns01), 1,589,000 (granite) seeds per pound. Pure stand plant 2 lb per acre.

cultivation: Space plants 1.0-1.5'. Low to moderate moisture requirements. Coarse to medium soils, tolerates clay soil. Neutral to basic soils. Anaerobic tolerance none. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade intolerant, full sunlight. pH 5.0-7.0.

bottom line: Field sow dormant or spring. Some lots benefit significantly from dormant seeding. Flipflop? Photodormant? Germ 56.9, 64, na, sd 27.5, r7.0-87.5 (80.5)%. Dorm 35.3, 26, na, sd 29.4, r2.5-90 (87.5)%. Test 27, 29, 29, r20-30 days. (#6).**

greenhouse & garden: No treatment light or GA3, moist cold stratify or dormant seeding may help, cool soils.

Description: Weedy, erect, biennial, native forb; 10' minimum root depth; stems 36-60"; flowers, yellow, 4-merous, fragrant, night-blooming, each lasting 1-2 days; key features: ①Plant mostly smooth; flower spike stiff; seed capsule thickest near the base, seeds without tufts of hairs; leaves alternate (fh). ②Leaves repand-denticulate; obcordate or obtuse petals; capsules oblong (w73).

Comments: status: This plant may seem weedy or invasive in some areas. phenology: Blooms 6,7,8,9,10. In northern Illinois, collect seeds in October. The flowers open by night, & withering the next day. In the shade or on a cloudy morning, they persist a bit longer. Interesting dried seed heads. Landscaping, moon gardens, wildlife plantings, valuable for erosion control. This can be showy the second year after seeding, but gradually fades from a planting. Vegetative the first growing season, flowering the second growing season. On the one hand, it is aggressive & forms large basal rosettes that shade the ground preventing germination. On the other hand, it is short-lived, successional, the rosettes reduce erosion, & the tap roots place organic matter far into the soil & decompose leaving channels for enhancing water infiltration. Seedbank spp in many soils, probably a light obligate germinator. Seed source roadsides & nursery old fields.

This plant is commercially cultivated in many parts of the world for its oil that contains two essential fatty acids, linoleic acid & gamma linolenic acid (Kemper 1999). The oil is commonly available in health food stores.

"Very common & variable. We have the sp & vars *pycnocarpa* Atkins & Bartl, & *canescens* T & G of Gray's Man Ed 8. *O cruciata* Nutt is in Boone Co so can be expected here." (ewf55)

Associates: Many pale flowered spp are night bloomers & are pollinated by moths, including hawk-moths. Bumblebees work the flowers in the early morning, & occasionally become trapped in the flowers. In 2011, a preferred food of Japanese beetles. Hummingbirds visit the flowers for nectar & insects. Seeds are eaten by gold finches. The high oil seeds provide valuable food for upland game birds, songbirds, & small mammals. Water extracts of *O biennis* are very toxic to germination of *Coronilla varia* CROWN VETCH.

ethnobotany: Greens & roots are edible. Used as medicinal plant by Ojibwa & Pottawatomie (sm32, 33).

VHFS: In the past this sp has been split into subsp & many varieties, about seventeen current & past subsp &/or varieties. [*Oenothera biennis* L ssp *caeciarum* Munz, *O biennis* L ssp *centralis* Munz, *O biennis* L var *pycnocarpa* (Atkinson & Bartlett) Wieg, *O muricata* L, *O pycnocarpa* Atkinson & Bartlett]

KJ Kemper, MD, MPH 1999. The Longwood Herbal Taskforce & the Center for Holistic Pediatric Education & Research. Evening primrose (*Oenethera biennis)*. http://www.mcp.edu/herbal/epo/epo.pdf (accessed13 June 2001).

Oenothera biennis

Oenothera clelandii W Dietrich, PH Raven, & WL Wagner SAND EVENING PRIMROSE, aka CLELAND'S EVENING-PRIMROSE, SAND PRIMROSE, (*clelandii* for Ralph Erskine *Cleland*, 1892-1971, American botanist who studied *Oenothera* genetics.) [upl]
Habitat: Disturbed open sands, dry sand prairies, dry sandy old fields. Seed bank sp in sandy soils.
distribution/range: Disturbed sandy soils, black oak savannas; scattered throughout the state, but more common in the n cos (m14).
Culture: ①Surface sow, seeds are very small or need light to naturally break dormancy & germinate. Further germination pretreatments not sure? (pm09). ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) ③Sow at 20ºC (68ºF), germinates in about two wks (tchn).

seed counts & rates: 1,632,000 (sh94), 2,564,971 (gna04), 4,536,000 seeds per pound. 1,080,952 (gnhm14), 1,600,000 (pm02) for *O rhombipetala.*

bottom line: Field establishment is best by dormant seeding. Germ 14-36%. Dorm 40-75%. Test 25-49 days. (#3:0).**
Description: Erect biennial, 2.0-4.0', terminal spike; flowers yellow, 4-merous; key features: ①Petals elliptical to oval; seed pods linear, usually curving, seeds without tufts of hair; leaves alternate (fh). ②Petals rhombic-elliptical, acute or acuminate (w73).
Comments: status: phenology: Blooms 7,8,9. In northern Illinois, collect seeds in late August-September. Collect seeds in se Wisconsin in October (he99). Attractive dried seed heads. Aggressive. Seed source Hamilton Twp, Lee Co.

"Common in all our sand areas & not infrequent in the sandy prairies around Camp Grant." (ewf55 as *O rhombipetala* Nutt).
Associates: Pollinated by moths.
VHFS: This was formerly referred to as *O rhombipetala* T&G of *O rhombipetala* Nutt. Mohlenbrock (2014) maintains this & *O rhombipetala* in Illinois.

Oenothera hookeri Torrey & A Gray YELLOW EVENING PRIMROSE, aka HOOKER'S EVENING PRIMROSE, TALL EVENING PRIMROSE, (*hookeri* for Sir William *Hooker* (1785-1865), or his son Sir Joseph Dalton Hooker (1817-1911), successive directors of the Royal Botanic Gardens, Kew, London. The younger Sir Hooker collected plants in Asia, Africa, & the Rocky Mountains of North America, & was a friend of Charles Darwin.)
Habitat: Invasive under irrigation. Native west & southwest of our area.
Culture: ①No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11)
Description: Biennial, 2-6', w/ flowers large yellow, 4-merous, fading to red; opening evenings, till mornings, or all day on cloudy days.

Sold as an accent plant.

Revised nomenclature this may be *Oenothera elata* Kunth ssp *hookeri* (T&G) W Dietr & WL Wagner & *O elata* Kunth ssp *hirsutissima* (A Gray ex S Watson) W Dietr.

Oenothera laciniata Hill CUTLEAF EVENING-PRIMROSE, aka RAGGED EVENING PRIMROSE, (*laciniatus -a -um* lacinate, torn, deeply cut, fringed, slashed or lacerated, cut into narrow divisions or lobes, jagged, from Latin *lacinia*, noun, small piece of cloth to be sewn on a garment for lapels, etc, & *-atus*, adjectival suffix for nouns, possessive of or likeness of something, with, shaped, made, generally referring to the deeply for cut leaves.)
Habitat: We have a colony of this little annual in open sterile sand in a *Bouteloua curtipendula* planting. Dry sandy soil with little competition.
①Sow at 20ºC (68ºF), germinates in about two wks (tchn).
Description: Drooping to erect annual, 0.33-0.67'; flowers yellow, 4-merous, key features: Inflorescence not spikelike; seed capsule linear, seeds without tufts of hair; leaves deeply toothed or lobed, alternate (fh).
Comments: status: phenology: Blooms 5-6.

"We have found this but few times, in a dry prairie situation in East Rockford & in a wet prairie in Rockton Township" (ewf55).

Oenothera lamarckiana de Vries [new nomenclature *Oenothera glazioviana* Micheli] EVENING PRIMROSE, aka LARGE FLOWERED EVENING PRIMROSE, MIDWEST EVENING PRIMROSE, RED SEPAL EVENING PRIMROSE, (*lamarckianus -a -um,* for Chevalier Jean-Baptiste de Monte Lamarck (1744-1829), French naturalist. (de Monet Lamarck?) also a synonym of *O erythrosepala*, (e-rith-ro-SE-pa-la), with red sepals. Cult.) (*glazioviana* Auguste Francois Marie Glaziou, 19th century French botanist.)
Habitat: Low to moderate water requirements. Best on moderately coarse to moderately fine soils. Neutral soils, some acid & base tolerance. pH 6.1-6.5. distribution/range: Naturalized on light soils thru North America. Of unknown origin or native in Europe.
Culture: Pure stand plant 2 lb per acre. 864,000 (gran) seeds per pound.
Description: Introduced annual, 36-60", with large, showy yellow flowers opening in early evening, 4-merous.
Comments: status: phenology: Blooms summer. Freely self sows.
VHFS: [*Oenothera erythrosepala* Borbás, *O lamarckiana* de Vries] Also seen as *Oenothera* x *erythrosepala.*

Oenothera macrocarpa Nuttall *TN MISSOURI EVENING PRIMROSE, aka BIGFRUIT EVENING PRIMROSE, FLUTTERMILL,
Habitat: Full sun to partial shade, dry soils. Prairies & savannas, dry mesic to dry soils. distribution/range: Native southwest of our area. Adventive in northern Illinois, rare native downstate.
Culture: ①60 days cold moist stratification (pm11). ②Sow at 20ºC (68ºF), if no germination in 3-4 wks, move to +2 to +4ºC (34-39ºF) for 2-4 wks (tchn). ③Plant seed outside in the fall or early winter. Germination is improved with 4 to 6 weeks of cold moist stratification. (lbj)
Description: Erect perennial, to 1.0', flowers 4-merous; key features:
Comments: status: Threatened in Tennessee. phenology: Blooms 5-8. 75,200 (pm11, aes10) seeds per pound.
Associates: Attracts hummingbirds & butterflies. Nectar source.
VHFS: The following (*O missouriensis*) is a synonym of this sp.

Oenothera missouriensis Sims MISSOURI EVENING PRIMROSE, aka DWARF EVENING PRIMROSE, MISSOURI PRIMROSE, (*missouriensis -is -e* missouriénsis (mi-sur-ree-EN-sis) of or from Missouri or the Missouri River. Epithet formerly capitalized.)
Habitat: Where native, it grows in open prairies, rocky hillsides, dry hills, & along roadsides.
Culture: ①60 days cold moist stratification (pm09). ②No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11) ③Sow at 20ºC (68ºF), if no germination in 3-4 wks, move to +2 to +4ºC (34-39ºF) for 2-4 wks (tchn). ④Sow any time (pots). 75,200 (pm02), 80,000 (stocks), 85,700 (gran), 92,000 (apl), 92,800 (ew11) seeds per pound. In monoculture plant 2 oz per 1,000 sq ft (stock). Pure stand plant 5 lb per acre (gran).

asexual propagation:

cultivation: Space plants 1.0-1.25'. Full sun to partial shade, dry soils. Drought tolerant. Rocky & sandy soils. Low moisture requirements. Coarse to moderately fine soils. Neutral to basic soils. Blooms second year from seed.

bottom line: Field sow dormant or spring. Germ 75-90%. Dorm 0.0-9.0%.**
Description: US native hardy, spreading, perennial, low-growing, 8-10", with, fragrant, large, drooping, 4-merous, canary yellow flowers, to 4 inches, that open in the evening, fading the next day. key features: ①Leaves lanceolate, acute, or short-acuminate, petiolate (w73).
Comments: status: phenology: Blooms May to September. Flowers up to 4", followed by unusual winged seed pods. Remarkable for the magnitude of the flowers & fruits (w73). Ground cover, rock garden, or border. Occasionally used as an accent flower in Illinois native seedings. Seed source commercial sources.

Oenothera perennis Linnaeus *IL, IN, IA, KY SMALL SUNDROPS, aka LITTLE EVENING PRIMROSE, LITTLE SUNDROPS, SMALL EVENING PRIMROSE, (*perennis -is -e* perennial, lasting more than two years, from Latin *perennis*, adjective, remaining or lasting throughout the year.)
Habitat: Moist open ground, prairie, pastures. Dry mesic, mesic to wet mesic prairies. Dry to moist prairies, meadows, & open woods; in sandy soils.
Culture: ①No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) ②Sow at 20ºC (68ºF), germinates in about two wks (tchn).
Description: Erect perennial, 0.33-2.0', flowers yellow, 4-merous, opening singly. key features: Flower petals notched, inflorescence nodding at the tip; seed capsule 4-angled, tapering toward the base, seeds without tufts of hair (fh).
Comments: status: Threatened in Illinois, Indiana, & Iowa. Endangered in Kentucky. phenology: Blooms 6-7. Collect seeds in se Wisconsin in September (he99). Seed not commercially available. "Found rather frequently in wet places in Sugar River sand area but unknown elsewhere in the county. Along a drainage ditch west of Yale bridge & in a low prairie west of Shirland." (ewf55)
VHFS: [*Kneiffia perennis* (L) Pennell, *K pumila* (L) Spach, *Oenothera perennis* L var *rectipilis* (Blake) Blake, *O perennis* L var *typica* Munz]

Oenothera pilosella Rafinesque PRAIRIE SUNDROPS, aka MEADOW EVENING PRIMROSE, MEADOW SUNDROPS, SUNDROPS, (*pilosellus -a -um* a little hairy, from Anglo-Norman & Middle French *piloselle*, from classical Latin *pilōsus*, hairy & *-ellus* diminutive adjective suffix, a little, somewhat, almost.)
Habitat: Mesic to wet mesic prairies Moist to wet meadows, fields, & open woods. Prairies & savannas, wet mesic, mesic, & dry mesic soils. distribution/range: Native south of Wisconsin.
Culture: ①No pre-treatment necessary other than cold, dry stratification (pm11). ②No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) ③Sow at 20ºC (68ºF), germinates in about two wks (tchn). Growth rate moderate. Seedling vigor medium. Vegetative spread rate none. 700,000 (usda), 1,248,000 (sh94) 4,256,000 (pm11) seeds per pound.

asexual propagation: Root cuttings.

"*Oenothera pilosella* Moist prairie. Blooms mid June to early July; YELLOW. Harvest September. 1 1/2'; seed minute, but germinates & grows well by method #1; SEEDLING TRANSPLANT. Seeds small, but grow well, with flowers late 1st year. Forms mat of short stolons. Plants short-lived?" (rs ma)

cultivation: Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermediate. pH 5.8-7.2.

greenhouse & garden: Reportedly easy from dry stratified seed.

Description: Erect or semi-erect, biennial or perennial, (?) stoloniferous in one source? 8"minimum root depth; flowers 4-merous. According to the USDA this has purple flowers. key features: Long hairs toward the top of the plant; flowers not nodding, petals notched at the tip; seed capsule elliptical; leaves alternate (fh).
Comments: status: phenology: Blooms 5-6. Collect seeds in se Wisconsin in October (he99). Adaptable to roadsides.
Associates: Pollinated by moths.

Oenothera rhombipetala Nuttall ex Torrey & Gray WESTERN SAND EVENING PRIMROSE, aka FOUR POINT EVENING-PRIMROSE, LONG-SPIKE EVENING-PRIMROSE, SAND EVENING PRIMROSE, (*rhombipetalus -a -um* rhombipétalus New Latin, with rhomboid-shaped petals)

Many records formerly referred to this sp are *O clelandii*. Some Midwest authorities maintain *O clelandii* as native, & *O rhombipetala* as adventive. Examining a map of the distribution of *O rhombipetala* shows distinct Great Plains element & a separate Midwest element.
Habitat: Prairies & savannas, dry soils. distribution/range: Disturbed sandy soil; occasional in the s ¾ of Il, rare or absent elsewhere (m14).
Culture: ①Surface sow, seeds are very small or need light to naturally break dormancy & germinate. And ? (pm11).) ②Sow at 20ºC (68ºF), germinates in about two wks (tchn).
seed counts & rates: 160,000 (pm11) seeds per pound.
Description: Erect biennial; 1.25-3.25'; flowers yellow, 4-merous; key features:
Comments: status: phenology: Blooms 6-9.
Associates:
VHFS:

Oenothera speciosa Nuttall SHOWY EVENING PRIMROSE, aka MEXICAN EVENING PRIMROSE, PINK LADIES (*speciosus -a -um* (spee-kee-O-sus) beautiful, showy, spectacular, splendid, good-looking, from Latin *speciosus*, adjective, beautiful, handsome, good-looking; attractive, appealing; presentable, respectable, imposing; spectacular, brilliant, impressive.)
Habitat: Full sun to partial shade, mesic to dry soils. distribution/range: Introduced from the south & west. Adventive in Illinois.
Culture: ①No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11)) ②Sow at 20ºC (68ºF), germinates in about two wks (tchn).
seed counts & rates: 304,000 (aes10), 3,024,000 (apl), 3,040,000 (ecs, ew11) seeds per pound.
Description: Perennial subshrub forb/herb, flowers large, delicate, pink to white in the evenings, 4-merous;
Comments: status: phenology: Blooms June to July. Flowers are white with yellow center & purple edges & veining. Where native useful as a groundcover. "*Œ speciosa* of Ark & Tex is a splendid species, with white or roseate flowers, fine in cultivation" (w73).
Associates: Attracts moths.
VHFS: [*Hartmannia speciosa* (Nutt) Small, *Oenothera delessertiana* Steud, *O speciosa* Nutt var *childsii* (Bailey) Munz]

Oenothera tetragona Roth var **longistipata** (or *longistipitata*) GLANDULAR SUNDROPS ((tet-ra-GO-na) four angled.)
Habitat: Northeast Indiana sand prairies. Sow at 20ºC (68ºF), germinates in about two wks (tchn).
[*Oenothera fruticosa glauca*]

OXALIDACEAE R Brown 1818 **WOOD-SORREL FAMILY** 5 to 6 genera of about 500-700 spp of herbs, shrubs, & vines. Many spp contain oxalic acid.

OXALIS Linnaeus 1753 **WOOD SORREL** *Oxalidaceae Oxalis* New Latin from Latin from Greek name for sorrel, from ὀξυς, *oxys,* acid, sharp, sour, referring to the sharp taste of the oxalic acid in the leaves & roots. A genus of about 500-700 spp of hardy & tender herbs, shrubs, & vines. Mainly trifoliate leaves & inversely heart-shaped leaflets. Fruit is a 5-celled, several-seeded capsule.

Oxalis cymosa Small (*cymosus -a -um* with or bearing cymes, with flowers of the centrifugal type, the cyme.)

"A common roadside & garden weed. (*O europaea* Jord f *cymosa* (Small) Wieg) Fruiting pedicles not deflexed." (ewf55)

Oxalis montana Rafinesque COMMON WOOD SORREL, aka WOOD SHAMROCK, (*montanus -a -um* referring to or of mountains, by extension, growing on the mountains, from Latin *mons, montis,* mountain, & *-anus* adjectival suffix indicating position, connection, or possession.)
Habitat: Damp woods.
Associates: ethnobotany: Available for greens in late spring & summer. Used as food by Pottawatomie & Iroquois (sm33, Parker 1910).

Oxalis stricta Linnaeus COMMON YELLOW WOOD-SORREL, (*strictus -a -um* strict, stiff, upright, erect, tight, drawn together, rigid, from Latin *strictus*, drawn tight, bound up.)
"Common in open woods & fields. Fruiting pedicels deflexed." (ewf55)

Oxalis violacea Linnaeus VIOLET WOOD SORREL, aka BULBLET WOOD-SORREL, PURPLE OXALIS, (*violaceus -a -um* referring to the color violet or the genus *Viola,* from Latin *violāceus*, violet-colored, from *viola*.**)** upl
Habitat: Hill, gravel, dry, & mesic prairies, savannas & open woods, bluffs. "Common in open woods, on low prairies & gravel bluffs. White flowers are not uncommon." (ewf55)
Culture: ①Best planted outdoors in the fall, or 60 days cold moist stratification. (pm09). ②Sow seeds outdoors in fall, or 60 days cold moist stratification. Seeds not often formed. (he99)
asexual propagation: Divide & transplant in fall only.
Division, easy from transplants, difficult from seed, dormant seed or moist cold stratify.
Description: Flowers violet to rose-purple. key features:
Comments: status: phenology: Blooms 4,5,6 & remontant 9,10. Collect seeds in se Wisconsin in July (he99). Great in rock gardens & near garden paths. Poor man's shamrock.
Associates: Pollinated by long-tongued bees, short-tongued bees, *Diptera*, *Lepidoptera*. Attracts upland game birds, songbirds, small mammals, & in one source waterfowl. The seeds of *O violacea* are "enclosed in a large transparent appendage that functions in dispersal both in expelling the seed from the capsule & attracting ants." (Cochrane et al 2006)
VHFS: [*Sassia violacea* (L) Holub, *Ionoxalis violacea* (L) Small]

PAPAVERACEAE AL de Jussieu 1789 **POPPY FAMILY**

Argemone L PRICKLY POPPY, *Argemone* a poppy-like herb listed by Pliny, & a name used by Dioscorides for a poppy-like plant used medicinally as a remedy for cataracts, from Greek αργεμα, αργεμωνη, *argema, argemōnē*. Date: 14th century.
Fruit is a prickly capsule.
Associates: ethnobotany: Sap exposed to air becomes gambog yellow & has been used to treat jaundice, cutaneous eruptions, sore eyes, fluxes, & other maladies.

CHELIDONIUM Linnaeus **GREATER-CELANDINE** *Papaveraceae Chelidonium* Greek *cheilidon*, swallow (bird), perhaps from lore reported by Aristotle & others that mother swallows bathe the eyes of their young with the sap; alternately from Latin *chelīdonium*, from Greek χελῑδόνιον, *khelidonion,* for the plant celandine, or Swallow-wort, from χελιδὼν, χελιδίον, *khelidon, khelidion,* swallow. The name for a flower that appeared at the time of the arrival of the swallows & perished with their departure. A monotypic genus, a perennial herb of temperate Eurasia. Plants fragile, pale green, with saffron-yellow sap. Fruit is a silique-form capsule.

Chelidonium majus Linnaeus GREATER-CELANDINE, aka CELANDINE, ROCK-POPPY, SWALLOW-WORT, Introduced from Eurasia. "Near Adeline in Ogle but not known in our county" (ewf55).
Associates: ethnobotany: The bright yellow sap is used to cure itching & to destroy warts.

ESCHSCHOLTZIA *Papaveraceae Eschscholtzia* (esh-SHOLTS-ee-a) after Johan (Johann) Friedrich G von *Eschscholz,* (1793-1831), Russian (or German) botanist, or Estonian physician & biologist who traveled with Chamisso on the Romanzoff (or Kotzebue) Expedition to the Pacific Coast, well known for his

research in California. Annual herbs. Fruit is a pod-shaped capsule. The colorless sap is said to smell of hydrochloric acid.

Eschscholtzia californica CALIFORNIA POPPY, (*californicus -a -um* kal-I-FORN-I-ka, of California)
Habitat: Any moisture regime. Coarse to moderately fine textured soils. Neutral to basic soils.
Culture: ①Sow anytime (pots).
seed counts & rates: 293,000 (gran) seeds per pound. Pure stand plant 8 lb per acre (gran).
bottom line: As an annual accent flower plant dormant or early-mid spring.
Description: Western native annual (short lived perennial usually treated as an annual), 12-18", intense orange flowers, Finely divided blue green foliage.
Blooms spring to summer. Useful in borders, gardens & meadows.

PAPAVER POPPY *Papaveraceae Papaver* (pa-PAH-ver) New Latin from the classic Latin name for poppy, possibly from Greek *papa* (*pap*), referring to the thick, sometimes milky sap. Vulgar Latin *papavum* (whence Old French *pavo,* which gave rise to Old English versions of poppy), alteration of Latin *papaver*; perhaps akin to Latin *papula* papule, or pimple, similar to Latin *papilla*, nipple. Alternately from Celtic *papa*, pap, a soporific food for children, containing poppy seeds. Bristly annual, biennial, & perennial hairy herbs or occasionally subshrubs with lobed or dissected leaves, flowers large & showy, long-peduncled, buds nodding erect in flower & fruit, & a capsular fruit topped by a radiate disk & dehiscent by pores immediately below. Sap is white, abounding in opium. *P somnifera* is the OPIUM POPPY.

The seeds are dispersed by anemoballism, a form of indirect wind dispersal, where the wind does not transport the seed directly but exerts its influence on the fruit. The fruit, a capsule opening by pores under the broad, persistent stigma, is usually exposed on a long flexible stalk that swings in the wind, thereby flinging out the seeds.

Papaver rhoeas Linnaeus FLANDERS POPPY, aka COMMON POPPY, COMMON RED POPPY, CORN POPPY, FLANDERS POPPY, SHIRLEY POPPY, (*rhoeas* Greek ῥοιάς, ῥοιαδ-, *rhoias*, *rhoiad-,* a kind of poppy.)
Habitat: Roadsides & rocky fields.
Culture: ①No pretreatment needed. Sow seeds on the soil surface at 70ºF & water. (ew11) Germ 10-30 days in 60-70ºF soils (ws farms).
seed counts & rates: 2,445,811 live seeds (s&s nysstl01), 3,057,264 (s&s nysstl01), 3,179,000 (appl02), 3,200,000 (gran), 3,400,000 (ecs), 3,401,942 (american meadows), 4,000,000 (ew11) seeds per pound. Pure stand plant 1 lb per acre (gran) alt 2 lbs per acre (wildseed farms).
cultivation: Space plants 1.2-1.5'. Low to moderate water requirement. Full sun to partial shade. Coarse to moderately fine soils. Neutral to basic soils. Zones 4-8.
Description: Introduced annual, 24", with red or mixed flowers.
Comments: status: phenology: Blooms (3)4-6(7). C3. Fast growing sp for wildflower ground cover or mass plantings. Seed source commercial stock.
Self fertile. Pollinated by bees, flies, beetles, selfing. Rarely browsed by sleepy? deer & rabbits.
All plant parts should be considered poisonous. Latex in seed pods is narcotic & slightly sedative.

SANGUINARIA Linnaeus 1753 **BLOODROOT** *Papaveraceae Sanguinaria* from Latin *sanguis,* blood, for the blood red sap in all parts of the plant. A monospecific genus. Fruit is a silique-form capsule.
Seeds are hydrophilic & ripen late spring to early summer. Sow seeds immediately outdoors. Transplant after 1st or 2nd growing season. Cullina code D seeds need a period of warm moist stratification followed by cold stratification and will germinate after shifting back to warm (70º-40º-70º), * seeds are hydrophilic, intolerant of dry storage. Division in early fall. (cu00)

Sanguinaria canadensis Linnaeus BLOOD ROOT, aka COON ROOT, INDIAN PAINT, RED PUCCOON, RED PUCCOON ROOT, RED ROOT, *PAUSON,* SNAKEBITE, SWEET SLUMBER, TETERWORT, TURMERIC, *Mis'kodji'bik,* red root, (Ojibwa), (*canadensis -is -e* (kan-a-DEN-sis) of Canada or northeast USA.)
Several common names are from the red sap that flows from the broken stem or root.
Habitat: Rich woods & forests.
Culture: ①Seeds need a cold, moist period followed by a warm, moist period followed by a 2nd cold, moist period, or sow outside & allow 2 years for germination. Plant fresh seed or keep moist. Refrigerate clean

seed in a ziplock bag until planting or starting other treatment. (pm09) ②"Fall plant or cold stratify at 40ºF for 1 month, then move to 70ºF. Some seeds may take two seasons to sprout." (ew12)

seed counts & rates: 27,200 (ew12), 51,200 (aes10), 55,501 (gnh13), 88,111 (gnh14) seeds per pound.

cultivation: Space plants 0.50-1.0'. Rich, mesic soils, partial shade to full canopy.

bottom line: Field sow fresh seed or store briefly dried, fresh seed in ziplock in fridge & dormant sow. Germ 4.0-11%. Dorm 76-84%. Test 29-42 days.**

Description: Acaulescent, one large, sheath-like, basal, multi-lobed leaf up to 30 cm across; 8-12 delicate white petals & yellow reproductive parts that appear to be clasped by the leaf; stems to 0.5'; all parts of the plant secrete a orangish-red sap when damaged.

Comments: status: Native. phenology: Blooms March to April. One of the first flowers of spring. Attractive, large, showy, but short-lived blossoms. The flowers are fragile, & are easily damaged by a heavy rain. This is one of a number of ephemerals that require a woodland habitat, yet they complete their growth cycles before the canopy develops.

"Common in moist woods & ravines. Petals often numerous, occasionally pink." (ewf55)

Associates: Pollinator friendly. An important early source of pollen & nectar. *Sanguinaria* seeds have an external appendage rich in lipids called an elaiosome, or caruncle. The ripe seeds are carried to ant nests where the elaiosomes are consumed by ant larvae. The unharmed seeds are discarded in the nest or in nutrient rich middens. Walnut tolerant.

ethnobotany: The sap is emetic & purgative. Used as medicinal plant by Ojibwa, Menominee, & Pottawatomie (sm23, 32, 33). Ojibwa dye & medicine & noted as used as charm (den28). Also used for dye & face paint. The rhizome & roots are irritant & narcotic, expectorant in small doses, nauseant, & emetic in large doses (den28). Also used as an insecticide. ☠ BLOODROOT produces toxic morphine-like alkaloids, so you might think twice before applying BLOODROOT warpaint. All parts are said to be poisonous if ingested.

VHFS: Mohlenbrock lists f *colbyorum* Benke, with pink petals, & var *rotundifolium* (Greene) Fedde with flowers elevated above the leaves. Form *multiplex* 'Plena', a double-flowered cultivar is available.

STYLOPHORUM Nuttall 1818 **CELANDINE POPPY** *Papaveraceae Stylophorum* style-bearing, from Greek στῦλος, *stylos*, column, pillar, or pole, a style, & *pherein*, to bear, *phoros*, bearing, referring to the conspicuous style, which is unusual in the family.

Stylophorum diphyllum Michaux (Nuttall) CELANDINE POPPY, aka POPPYWORT, WOODS-POPPY, YELLOW POPPY, (*diphyllus -a -um* Greek for two-leaved)

①The seeds are hydrophilic & ripen in late spring to early summer. It is not necessary to remove the small elaiosomes. Seeds should be sown immediately. Seedlings are vigorous if kept watered & fertilized. Will bloom 2nd spring. Cullina code D seeds need a period of warm moist stratification followed by cold stratification and will germinate after shifting back to warm (70º-40º-70º), * seeds are hydrophilic, intolerant of dry storage. (cu00) ②Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment (pm09). ③"No pre-treatment needed. Sow seeds just below soil surface at 40ºF & water. Slow to germinate." (ew12) ④Sow at max 5ºC (41ºF), germination irregular, often several months (tchn). Self sows.

seed counts & rates: 198,400 (ew12), 208,000 (pm12) seeds per pound.

cultivation: Space plants on 1.5-2.0' centers. Mesic soils, savanna to woodland.

"Found in a ravine on Rock Run in Stephenson Co but not known in Winnebago Co" (ewf55). Woodland gardens, specimen plantings.

PARNASSIACEAE GRASS-OF-PARNASSUS FAMILY Some authors (m14, w12) segregate *Parnassiaceae* from *Saxifragaceae*.

PARNASSIA Linnaeus 1753 **PARNASSIA** See *Saxifragaceae*

PASSIFLORACEAE AL de Jussieu ex Kunth 1817 **PASSIONFLOWER FAMILY PASSIONWORTS**

PASSIFLORA Linnaeus 1753 **PASSIONFLOWER, PASSIONVINE, MAYPOPS** *Passiflora* from Latin *flos passionis*, a reference to the Passion of Christ, as in medieval Passion plays, from *passio, passionis* f, suffering; passion, especially of Christ, & *flos,* Latin a flower, from *Flora, Florae* f, Flora; goddess of

flowers. The floral parts are said to represent elements of the crucifixion story, the Savior's passion. The ten petal-like structures represent the disciples, less Peter & Judas, the five stamens represent the wounds of Christ, the knob-like stigmas the nails, & the fringe the crown of thorns. The common name MAYPOPS comes from the hollow yellow fruits that pop when crushed.

Fruit is a pulpy berry, many seeded.

Passiflora incarnata Linnaeus *IN, OH PURPLE PASSIONFLOWER, aka APRICOT VINE, LARGE PASSION FLOWER, MAYPOP PASSIONFLOWER, MAYPOPS, PASSIONFLOWER, PASSION VINE,
Habitat: Sandy fields; along roadsides, railroads; waste ground. distribution/range: Native to the southern ¼ of Illinois.
Culture: ①60 days cold moist stratification (pm09, 11). ②Fall plant or cold stratify for up to 2 to 3 months for best results. Sow just below the soil surface at 70ºF & water. (ew11) ③Leathery berries develop during a 2-3 month period after flowering. Check seeds when the berry is soft & yellowish. Mature seeds are brown. Seeds should be cleaned soon (remove the sticky aril from seeds) & stored in moist sphagnum sealed, refrigerated containers. When sown immediately or stored, seed germination is low. Direct sowing outdoors is recommended. Once passion flower is established, numerous suckers will appear. (lbj)

seed counts & rates: 11,200 (pm11, ew11) seeds per pound.

asexual propagation: 6-8 in. stem cuttings should be taken early in the season (lbj).

cultivation: Space plants 2.0-4.0'. Mesic soils, full sun to partial shade. Spreads by root suckers.

Description: Climbing perennial herbaceous vine, to 12'; climbing by tendrils; leaves lanceolate, deeply 3-lobed, serrate, lobes oblong acute, petioles with 2 glands near the summit; flowers pink, blue, or purple, threads of the crown longer than the corolla; berry pale yellow, the size of an apple, edible, involucre S-leaved;. key features: Leaves deeply 3-lobed, petioles with 2 glands.
Comments: status: Rare in Indiana. Threatened in Ohio. This plant can be weedy or invasive according to the some sources. (Haragan 1991, SWSS 1998) phenology: Blooms 5-9. C3. Flowers fragrant.
Associates: Attracts butterflies, larval host & nectar. Larval host of GULF FRITILLARY, ZEBRA LONGWING, CRIMSON-PATCH LONGWING, RED-BANDED HAIRSTREAK, JULIA BUTTERFLY, & MEXICAN BUTTERFLY. Moderately deer resistant.

ethnobotany: Edible, sweet gelatinous aril. Numerous food & medicinal uses.
VHFS:

PENTHORACEAE Rydberg ex Britton 1901 **DITCH-STONECROP FAMILY**

" A family of one genus & 2 spp, herbs, of e North America & e Asia. *Penthorum* has been variously placed in the *Crassulaceae*, *Saxifragaceae*, & the *Penthoraceae*. Haskins & Hayden (1987) concluded that *Penthorum* was best treated in a monogeneric *Penthoraceae*, a conclusion based on extensive anatomical evidence. Among those who do not favor a monotypic family, there is nearly evenly divided opinion between the *Crassulaceae* & the *Saxifragaceae*: this in itself perhaps supports segregation in the *Penthoraceae*. Molecular evidence supports the recognition of the *Penthoraceae*, & suggests closer affinities with the *Haloragaceae* than either the *Crassulaceae* or the *Saxifragaceae* (Morgan & Soltis 1993)." (w07)

PENTHORUM Linnaeus **DITCH-STONECROP FAMILY** *Penthoraceae Penthorum* New Latin, from Greek πεντα-, *penta-,* five, & *-horum*, from Greek *horos* boundary, limit, mark, for the 5-parted flowers, or the prominent 5-parted capsule. A genus of 2 herbs of eastern north America & east & southeast Asia, with thin leaves & greenish pentamerous flowers. The flowers resemble members of the genus *Sedum*, but *Penthorum* does not have succulent foliage. Fruits are capsules of 5 united carpels, 5-angled, 5-celled, 5-beaked, dehiscent by an obliquely terminal valve, seeds many, minute. The other sp is *P chinense* Pursh, of relictual distribution in east Russia, China, Korea, & Japan.

Penthorum sedoides Linnaeus *RI DITCH STONECROP aka AMERICAN PENTHORUM, STAR FRUIT, VIRGINIA STONECROP, VIRGINIAN ORPINE, (*sedoides* from Latin *sed, sedēre* to sit, & Greek *-oides* for likeness) obl
Habitat: Wet & wet mesic prairies & savannas. Shores, drawdown areas, moist forests, moist disturbed areas, common (w07). Shorelines & ditches. Agricultural hydric soil seedbank sp. "Common in wet places" (ewf55). distribution/range: Widespread in eastern North America.
Culture: propagation: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09, 11). ②Seeds germinate after about 60 days of cold, moist

stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99) Moist cold stratify or dormant seed, light. Growth rate slow. Seedling vigor low. Vegetative spread rate moderate.

seed counts & rates: 577,008 (jfn04), 18,144,000; 20,000,000 (ew11), 20,800,000 (pm01, aes10), 43,238,095 (gna07), 45,000,000 (usda, ecs), 47,789,470 (gna05), 69,8946,153 (gnh02), 75,667,0000 (gna04) seeds per pound.

cultivation: Space plants 1.0-1.5'. Anaerobic tolerance low. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance none. Shade tolerance intermediate. pH 5.0-7.0.

bottom line: Most lots have a significant to strong requirement for dormant seeding, but the extreme seed count gives even slight germination the appearance of a good crop. Some lots have significant germination (68-77%) from spring seeding. Often best planted when the wetland is available immediately after construction. Flipflop species. Crossover species. Germ 24.1, 11, na, sd 13.2, r1.5-77 (75.5)%. Dorm 54.1, 66, na, sd 29.9, r0.0-89 (89)%. Test 32, 31, 37, r27-40 days. (#13)**

Description: Erect perennial, 0.5-3.0'; stoloniferous; leaves sharply toothed, pointed at both ends, scattered; inflorescence flattish cyme (or cymous raceme); flowers yellow green, secund; followed by reddish seed head, united carpels, flowers in loose spikes, & key features: Inflorescence flattish cyme, flowers secund; leaves sharply toothed, pointed at both ends (fh).

Comments: status: Special Concert in Rhode Island. phenology: Blooms 6,7,8,9. C3. Collect seeds in se Wisconsin in September-October (he99). Wetland restoration. Seed source restored wetlands Shaw Station, Lee Co, Deer Grove, Whiteside Co, ? Will Co.

Associates: ethnobotany:

PHRYMACAEA Schauer 1847 **LOPSEED FAMILY** Some recent authors place *Mimulus* Linnaeus in this family. See section C13 Snapdragons & Friends.

PHYTOLACCACEAE R Brown 1818 **POKEWEED FAMILY**

PHYTOLACCA Linnaeus 1753 POKEWEED *Phytolaccaceae Phytolacca* Phytolac'ca (fy-toe-LAK-a) New Latin, from ancient Greek φυτο-, *phyto-,* combining form of φυτόν, *phyton,* plant, & *laca, lacca,* a dark-red resinous sap, from Hindustani *lākh*, from Prakrit *lakkha*, from Sanskrit *lākshā*, also *rākshā*; the source of *shell-lac* or shellac, or lacquer; in reference to the pigment in the berries & the color of the stems.

Phytolacca americana Linnaeus POKEWEED "Common in woods, in fence-rows, on low prairies, &c" (ewf55)

Culture: propagation: ①Sow at 18-22ºC (64-71ºF) for 2-4 wks, move to +2 to +4ºC (34-39ºF) for 4-6 wks, move to 5-12ºC (41-53ºF) for germination (tchn).

4-10'; flowers with, fruit purple; blooms May-September; aggressive in nw Illinois. It is very difficult to have just a few POKEWEEDS.

Associates: Quail cover & food. Jim Heim, former IDNR Heritage biologist, loved this in bird plots.

PLANTAGINACEAE AL Jussieu 1789 **PLANTAIN FAMILY**
See section C13 Snapdragons. & Friends.

POLEMONIACEAE AL Jussieu 1789 **JACOB'S-LADDER FAMILY** From *Polemonium* (po-lee-MO-nee-um) New Latin from classical Latin *polemōnia*, an unidentified plant from Pliny, from πολεμώνιον, *polemônion*, Hellenistic Greek name for an unidentified plant, possibly Greek Valerian, or possibly *Hypericum olympicum* or *Mentha longifolia,* from Πολέμων, *Polemon,* a proper name, from πόλεμος, *polemos,* war. From the OED "1836 JC Loudon *Encycl. Plants* 132 *Polemonium*. Pliny relates, that the plant which he called by this name received its appellation from having been the cause of a war between two kings, who could not agree which of them first discovered its virtues... Its name has descended to a flower which ornaments the garden, but which preserves nothing of the virtue of its progenitor." A family of 18 genera & 350-380 spp of herbs, vines, shrubs, rarely trees, mostly of temperate North America, but extending into tropical America & Eurasia.

COLLOMIA Nuttall **COLLOMIA, MOUNTAIN TRUMPET** *Polemoniaceae*

Collomia linearis Nuttall SLENDERLEAF COLLOMIA, aka COLLOMIA, NARROW-LEAVED MOUNTAIN TRUMPET,
Adventive from the western USA. "Sandy roadside on River Road south of Cherry Valley near the IC RR We have also found it in Boone Co on an old railroad row east of Belvidere." (ewf55)

PHLOX Linnaeus 1753 **PHLOX, MOUNTAIN PINK, LICHNIDIA, SWEET WILLIAM, WILD SWEET WILLIAM** *Polemoniaceae Phlox* (floks) New Latin from Classical Latin *phlox,* an unidentified flame-colored flower from Pliny, from ancient Greek φλόξ, *phlox,* flame, from φλέγειν, *phlegein,* to burn; also Hellenistic Greek a wallflower in Theophrastus, & an ancient name of *Lychnis* of the *Caryophyllaceae*. LICHNIDIA was a common name used by Amos Eaton. Annual & perennial herbs, about 70 spp herbs to subshrubs in temperate North America, with one sp in northeast Asia. Fruit is a capsule.

While in bloom, an inflorescence is likely to have ripe seeds, open flowers, & buds, even though *Phlox* have determinate growth. The seeds of *Phlox* have a large basal appendage that helps in dispersal by expelling the seed from the capsule & attracting ants that carry the seed away (Cochrane et al 2006).

Best with fresh seed (do not over dry, refrigerate after ripe seed has fallen from drying stems). Dormant seed or moist cold stratify, stem cuttings, or division. KNO3 may help some spp. At one time, several spp were noted as double-dormant. Many seeds formerly classed as double dormant are now classed as hydrophilic.

Seeds are probably hydrophilic & ripen late spring to early fall. Plants are self-sterile. Best planted immediately outside. Germination may extend for several seasons. Woodland spp will handle some dry storage. If you must, store clean seed in ziplocks to prevent over-drying & loss of viability. Cullina code B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, or C seeds will germinate only after multiple cycles of warm and cold, typically 40º-70º-40º-70º, (*implied seeds are hydrophilic, intolerant of dry storage). Softwood cuttings from non-flowering stems root easily, such as the evergreen basal shoots of *P divaricata*. Dry spp should be rooted in sand to avoid rot. (cu00)

Phlox bifida Beck *IA(?), IN, KY, MI, TN, WI The one, the only, the true SAND PHLOX, aka CLEFT PHLOX, GLADE PHLOX, TEN-POINT PHLOX, (*bifidus -a -um* twice-cleft, split into two parts, divided or cut in two, from Latin *bifidus*, divided into two parts) upl
Habitat: Sand prairies & open sandy savannas and woods. Sandy open ground.
Culture: ①60 days cold moist stratification (pm08,11). ②Seeds germinate after about 60 days of cold moist stratification (he99). ③Fall plant or cold stratify for 1 to 2 months for best results. Sow just below the soil surface at 70ºF & water. (ew11)
seed counts & rates: 192,000 (ew11), 800,000 (pm11) seeds per pound.
asexual propagation: Division of mature plants early spring or fall.
cultivation: Space plants 0.40-1.25'. Full sun to partial shade, dry soils. Self sows in open sandy soils without grassy competition.
Description: Matting perennial subshrub; 0.33-1.0'; flowers white to light blue (purple), 5-merous; N. key features: Flower lobe tip notched one-quarter to one-half of its length, leaves opposite, 0.50-1.05" long,

sharp pointed (fh). "Somewhat shrubby at the base, much branched, forming tussocks; some of the pubescence glandular; corolla cleft." (Ilpin)
Comments: status: Threatened in Kentucky & Michigan. Special Concern in Wisconsin. phenology: Blooms 3,4,5,6. C3. In northern Illinois, collect seeds in mid May-June. Collect seeds in se Wisconsin in June-July (he99). Short lived in rich soils, good in rock gardens.

"Found only in the sand hills north of Shirland where it grows in the open & in the black oak woods. It does well in the flower garden in a dry sunny place." (ewf55)
Associates: Attracts butterflies & hummingbirds.

In northwest Illinois, SAND PHLOX carpets cattle-over-grazed sand hill pastures, to the extent some western Bureau Co sand hills appear to be snow covered when this is in bloom.

Our farm has two fifteen acre degraded remnant prairies; one with a history of cattle grazing, one with a history of horse grazing. *P bifida* appears to survive & increase with cattle grazing & burn management, to the point of blanketing entire slopes, but decreases precipitously with burn management without cattle grazing. In the nearby horse pasture, SAND PHLOX was very sparsely distributed. Cattle-grazed sand hills between Thomas & Mineral are also blanketed with SAND PHLOX in spring.
VHFS: Variety *stellaria* (Gray) Wherry, STARRY CLEFT PHLOX, aka GLADE CLEFT PHLOX, with non-glandular pubescence, is known from southern Illinois; endangered in Indiana, Kentucky, & Tennessee. [*Phlox bifida* Beck var *cedaria* (Brand) Fern]

Phlox bifida on sand hill remnants, 1st ungrazed (Tampico) & 2nd grazed (Mineral), respectively

Phlox divaricata Linnaeus *NJ WOODLAND PHLOX, aka BLUE PHLOX, BLUE WOODLAND PHLOX, EASTERN BLUE PHLOX, FOREST PHLOX, LOUISIANA PHLOX, SWEET WILLIAM, TIMBER PHLOX, WILD BLUE PHLOX, WILD SWEET WILLIAM, WOOD PHLOX, (*divaricatus -a -um* widely divergent, widely spreading apart, spread asunder, straggly, divergent, from the past participle of *divarico, divaricare, divaricavi, divaricatus*, Latin verb, stretch apart, spread out.) facu
Habitat: Dry, mesic, & wet mesic savannas & woods. Rich moist deciduous woods & bluffs.
Culture: ①"Upon ripening in the late spring, sow seeds for germination the following spring. Light cover. Poor to fair germination." (mfd93). ②60 days cold moist stratification (pm09). ③Seeds germinate after

about 60 days of cold moist stratification (he99). ④Cold-moist stratification (lbj). ⑤Fall plant or cold stratify for 1 to 2 months for best results. Sow just below the soil surface at 70ºF & water. (ew11) Growth rate rapid. Seedling vigor medium. Vegetative spread rate slow. Seed spread rate slow.

seed counts & rates: 182,168 (gnhm11), 192,000 (aes10), 196,800 (ew11), 200,000 (pm02), 239,451 (gnam07) seeds per pound.

asexual propagation: Species can also be propagated by root division, layering, or softwood cuttings (rooted stems) taken in late spring (lbj).

cultivation: Space plants 1.0-1.5'. Best grown in high humus, moist but well drained soils in partial to full shade. Tolerant of coarse, medium, & fine textured soils. Anaerobic tolerance low. CaCO3 tolerance medium (or high). Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerant intermediate. pH 5.5-7.2. Acidic soils to calcareous areas.

bottom line: Hand plant fresh seed or dormant seed using material that has been properly dried & cold stored. Genesis best greenhouse crop used summer planted seed for germination the following spring. Germ 2.3, 2.0, na, sd 2.1, r0.0-5.0% (5.0)%. Dorm 63.3, 61, na, sd 12.8, r49-80 (31)%. Test 38, 24, na, r23-68 days.**

Description: Erect (decumbent) perennial; rhizomatous; 0.5-1.5(2.0)'; blue flowers; key features: For variety *laphamii:* Flowers pale purple to blue, lobes not notched; leaves opposite, not divided, with a blunt end (fh). "Corolla lobe is entire" (Ilpin).

Comments: status: Variety *laphamii* is endangered in New Jersey. phenology: Blooms 4,5,6. C3. Seeds mature in late spring. In northern Illinois, collect seeds in June. Collect seeds in se Wisconsin in July (he99). Flowers are slightly fragrant. Flowers are normally blue, lavender, or white, but red, pink, & purple have been noted (lbj). Good shady ground cover, shoots root at the tip. Genetic source Kane Co.

"Common in low woods. Plants with white flowers are seen occasionally; in Boswell Woods in Pecatonica River Bottom east of Shirland it is plentiful & most of the flowers are white." (ewf55)

Associates: Attracts butterflies, including swallowtails, gray hairstreaks, & western pygmy blues. Attracts hummingbirds & long-tongued bees. Roots are eaten by rabbits & voles. Rabbit damage. Spider mites in hot dry weather. Powdery mildew may be a problem.

VHFS: Illinois has the sp & variety *laphamii* (AW Wood) Wherry, WESTERN BLUE PHLOX, aka LAPHAM'S PHLOX, with unnotched petals in our area. Cf m14 ssp *laphamii.* Also noted in Wisconsin is var *canadensis* (Sweet) Wherry), with notched petals (included with typical by Fernald (1950a).

Phlox divaricata

Phlox drummondii Hooker DRUMMOND'S PHLOX, aka ANNUAL PHLOX, PHLOX, (*drummondii* named for the Scottish plant-collecting brothers James Drummond (1786-1863), & Thomas Drummond (1793 (1790)-1835), Thomas like his countryman David Douglas made an ill-fated collecting trip to North America. Thomas collected extensively in Texas for 21 months, & died in Havana, Cuba in 1835. He sent seeds of this sp to England in 1835.)

Habitat: Where native fallow fields, open woods, roadsides, & prairies. distribution/range:

Culture: ①Seeds require no pretreatment, but germination of freshly harvested seeds may be enhanced by the addition of giberillic acid. After distributing the seed evenly, rake into loosened topsoil to ensure good seed/soil contact. (lbj) ②No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. (ew11) ③Sow in early spring in north or in fall in south. Cover well needs dark to germinate? (pots 2000).

seed counts & rates: 234,000 (gran, lbj, 240,000 (ew11), 241,500 seeds per pound. Pure stand plant 10 lb per acre (granite, lbjwc).

availability: Commercial availability of seed is reliable.

cultivation: Low to moderate water requirements. Full sun to partial shade. Moderately coarse to fine soils prefers neutral to acidic sandy soils.

Description: Annual, plant is sticky glandular; 8-20"; with bright rose-red to pastel pink to purple flower clusters atop erect leafy stems;

Comments: status: Southern US native. phenology: Blooms May to October. Prolific bloomer, good in low garden beds or as edging. Most commercial seed is produced in Europe. Attractive cut flower, flowers fragrant. Occasionally used for quick color in seed mixes. Seed source commercial stock. Reduced to an "annual" quick color sp in the Midwest, read the interesting history of this Texan native in http://www.wildflower.org/plants/result.php?id_plant=PHDR

Associates: Attracts butterflies, nectar source. Not deer resistant.

Phlox glaberrima Linnaeus subsp **interior** Wherry *MD, WI MARSH PHLOX, aka SMOOTH PHLOX, (*glaberrimus -a -um* Latin very smooth, smoothest, barest, superlative of *glaber,* lacking hairs, smooth; *interior -or -ius* from Latin *interior*, inner, for an inland provenance.) The common name SMOOTH PHLOX is in reference to the plant's lack of hairs. facw

Habitat: Wet meadows, fens, in rich organic soils. Wet & wet mesic prairies & savannas. distribution/range:

Culture: ①Easy from cold(?) stratified seed (?) (krr). ②60 days cold moist stratification (pm09, 11). Seeds germinate after about 60 days of cold moist stratification (he99). ③Fall plant or cold stratify for 1 to 2 months for best results. Sow just below the soil surface at 70ºF & water. (ew11) ④Sow immediately outdoors. Short viability seed will germinate in the spring (tchn). Growth rate moderate. Seedling vigor medium. Vegetative spread rate none. Seed spread rate slow. 115,200 (pm11, aes10), 120,000 (ew11) seeds per pound.

"*Phlox glaberrima interior* Moist prairie. Blooms late June to early August; MAGENTA. Harvest August. 20"; SEEDLING TRANSPLANT. Seed hard to get because capsules explode; should be sown while fresh; seedlings emerge next spring, bloom next." (rs ma)

cultivation: Space plants 1.0-1.5'. Tolerant of medium & fine textured soils. Anaerobic tolerance high. CaCO3 tolerance low, though some say it grows in calcareous soils. Drought tolerance low. Fertility requirement medium. Fire tolerance high. Salinity tolerance none. Shade tolerance intermediate. pH 5.8-7.0.

bottom line: Sow fresh or dormant seed only. Germ 9%. Dorm 76%. Test 11 days. (#1)

Description: Native, erect, perennial forb, hairless; 1.5-2.5'; flowers pink-violet (fuchsia, reddish-purple to pink) occasionally white. key features: Plant hairless; flower lobes not notched, leaves mostly opposite, linear to lance-like, gradually pointing to a sharp point (fh). "green stems" (Ilpin).

Comments: status: Endangered in Wisconsin. phenology: Blooms 6,7,8,9. C3 In northern Illinois, collect seeds in July. Collect seeds in se Wisconsin in August (he99). Calcareous soils. Flowers are showy & fragrant. Attractive cut flowers, dried seed heads have some interest. Great in the landscape, formal beds with rich soils, rain gardens, & bog gardens. Genetic source Big Rock, Kane Co.

"Found only on low prairies in the southwest corner of the county near the CB & Q RR Common in the south part of Boone Co. It blooms later than *P pilosa*." (ewf55)

Associates: Pollinated by *Lepidoptera* & *Diptera*. Attracts hummingbirds & butterflies. Spider mites in hot dry weather. Excellent powdery mildew resistance for a phlox.

VHFS: Weakley (2007) calls this variety *interior* Wherry. The sp is Endangered, Extirpated in Maryland

Phlox maculata Linnaeus *MI, NY SWEET WILLIAMS PHLOX, aka MEADOW PHLOX, PHLOX, SPOTTED LICHNIDIA, SPOTTED PHLOX, WILD SWEET WILLIAM, (*maculatus -a -um* (mak-ew-LAH-tus) spotted, stained, blotched, blotchy, mottled, New Latin from *macula, maculae,* a spot, mark, stain; sometimes the mesh of a net; a moral stain, blemish; more accurately, from the past participle of *maculo, maculare*, to spot, stain, pollute, defile, referring to the spotted leaves & stem.) facw+

Habitat: Fens, peaty wet prairies, wet meadows, & calcareous springy places. Wet mesic & mesic prairies & savannas.. distribution/range: Not reported from Wisconsin.

Culture: ①60 days cold moist stratification (pm09). ②Fall plant or cold stratify for 1 to 2 months for best results. Sow just below the soil surface at 70ºF & water. (ew11) 176,000 (pm11, ew11), 208,000 (aes10) seeds per pound.

cultivation: Space plants 1.0-1.5'. Full sun to partial shade, moist to mesic, rich soils. Intolerant of drought. Calcareous soils.

Description: Native, erect, perennial forb; flowers pink (fuchsia), key features: "Stems are usually spotted" (Ilpin).

Comments: status: Endangered in New York. Threatened in Michigan. phenology: Blooms 7,8,9. Attractive cut flowers. Spectacular landscape flower, formal beds with rich, moist soil.

Associates: Attracts butterflies & hummingbirds. Powdery mildew resistant. Spider mites in hot dry weather.

VHFS:

Phlox paniculata Linnaeus GARDEN PHLOX, aka FALL PHLOX, PERENNIAL PHLOX, SMOOTH-STEM LICHNIDIA, SUMMER PHLOX, (*paniculatus -a -um* (pa-nik-ew-LAH-tus) with flowers in panicles, having panicles or tufts of flowers.) fac-

Habitat: Wet prairies, hedge rows, open woods. Open woods, thickets, meadows, & moist roadsides. distribution/range:

Culture: ①60 days cold moist stratification (pm09). ②Fall plant or cold stratify for 1 to 2 months for best results. Sow just below the soil surface at 70ºF & water. (ew11) ③Sow at 18-22ºC (64-71ºF) for 2-4 wks, move to +2 to +4ºC (34-39ºF) for 4-6 wks, move to 5-12ºC (41-53ºF) for germination (tchn). Cool soils.

seed counts & rates: 4,300 (pm11, ew11) seeds per pound.

GARDEN PHLOX was formerly listed as having double dormant seeds. Many spp formerly considered double dormant have been proven to have recalcitrant (hydrophilic) seeds, which should not be dry stored.

asexual propagation: GARDEN PHLOX also be increased by division, stem cuttings, or root cuttings.

cultivation: Space plants 1.25-2.0'. Said to need 6 hours of sun per day, but we have a very old colony on the north side of an east to west OSAGE ORANGE hedge row that only ever gets filtered sunlight as dictated by the canopy of the *Maclura.*

Description: Erect perennial, 2.0-3.0', flowers pink to white, most colonies have a range of colors; key features: Many branches, flower lobe tips not notched, leaves mostly opposite, oblong, 3-6" long (Freck.). "Species forms clumps; leaves with conspicuous lateral veins" (Ilpin).

Comments: status: phenology: Blooms 6,7,8,9. C3. Attractive cut flowers, fragrant, landscaping, formal beds. Persistently self sows. Native somewhere, but not northern Illinois. Most populations are escapes from cultivation, but we are within the plants natural range. One population in our area (near Buda) appears 'native', or very thoroughly naturalized in a wet prairie. Populations are persistent under burn management, & slowly, somewhat invasive; in 15 years this has 'jumped' from our hedge row to the back woods, a leap of about 1000 feet, with no plants in between. GARDEN PHLOX has also moved about 1000 feet east along a full-sun road ditch, most likely hitchhiking on a mower. This sp has provided the stock for the many colorful horticultural selections.

"We do not think this is native in this county but it escapes very freely & spreads & persists indefinitely on roads & in old fields" (ewf55).

Associates: Attracts birds, butterflies, skippers, moths (hummingbird & sphinx), & hummingbirds. Nectar source. Powdery mildew.

Phlox pilosa Linnaeus PRAIRIE PHLOX, aka DOWNY PHLOX, DOWNY PRAIRIE PHLOX, OZARK PHLOX, (*pilosus -a -um* shaggy, soft hairy, with soft hairs, with long soft hairs, covered thinly with long soft hairs, from Latin *pilosus -a -um*, hairy, shaggy.) fac-

Habitat: Wet mesic, mesic, hill, & dry prairies & savannas. distribution/range:

Culture: ①"Fall sow or sow fresh seed for germination the following spring, or moist cold treatment. Light cover. variable, poor to good germination." (mfd93) ②60 days cold moist stratification (pm11). ③No pre-treatment needed, sowing outdoors in the spring is the easiest method, or seeds germinate after about 60 days of cold, moist stratification. (he99) ④Fall plant or cold stratify for 1 to 2 months for best results. Sow just below the soil surface at 70ºF & water. (ew11) ⑤Sow immediately outdoors. Short viability seed will germinate in the spring (tchn).

seed counts & rates: 160,000 (???) (sh94), 237,735 (gnhm12), 300,000 (jfn04), 302,400 (ew11), 304,000 (pm01), 323,362 (gna07), 374,124 (gnam03), 411,200 (aes10) seeds per pound.

cultivation: Space plants 1.0-1.5'. Full sun to partial shade, wet mesic to dry soil.

"*Phlox pilosa* Mesic to dry prairie. Blooms mid May to early July; MAGENTA. Harvest July. 1'; SEEDLING TRANSPLANT, seed hard to get; see above. The prairie element is early blooming; late dates are a pale sand element. (N B The prairie element of this plant blooms early; a pale sand ecotype continues much later) (rs ma)

bottom line: Hand plant fresh seed or dormant seed using material that has been briefly dried & stored in ziplocks & refrigerated. Germ 17.4, 6.0, 2.0, sd 28.8, r2.0-87 (850%. Dorm 45.1, 59, na, sd 26, r0.0-78 (78)%. Test 22, 21, na, r14-32 days. (#11)**

greenhouse & garden: Older references to most *Phlox* spp were often as being double dormant, a formerly frequently heard reference, indicating an even greater lack of understanding than today's incomplete understanding of recalcitrant seeds. Easy from moist stratified seed.

Description: Native, erect, perennial forb; 1.0-1.5', very hairy stems; flowers white to pink (pink-lavender), key features: Flower tubes hairy, lobes not notched, leaves mostly opposite, abruptly sharp-pointed (fh). "Leaves pubescent with some of the pubescence glandular" (Ilpin)

Comments: status: phenology: Blooms 5,6,7,8. C3. In northern Illinois, collect seeds in June. Collect seeds in se Wisconsin in July (he99). Seed source railroad prairies, Concord, Mineral, & Wyanet twps, Bureau Co.

Associates: Pollinated by long-tongued bees, *Diptera*, & *Lepidoptera*. Attracts bees, butterflies, including AMERICAN PAINTED LADIES, SULFURS, SWALLOWTAILS, & CLOUDYWINGS, hummingbirds, gamebirds, & small mammals. Can be subject to pests.

VHFS: *Phlox pilosa* L *sangamonensis* Levin & Smith has leaves glabrous or nearly so, Champaign & Piatt cos, central Illinois.

Discuss var fulgida

POLEMONIUM Linnaeus *Polemoniaceae* **Phlox Family** *Polemonium* (po-lee-MO-nee-um) New Latin from classical Latin *polemōnia*, an unidentified plant from Pliny, from πολεμώνιον, *polemônion*, Hellenistic Greek name for an unidentified plant, possibly GREEK VALERIAN, or possibly *Hypericum olympicum* or *Mentha longifolia,* from Πολέμων, *Polemon,* a proper name, from πόλεμος, *polemos,* war. From OED "1836 JC Loudon *Encycl. Plants* 132 *Polemonium*. Pliny relates, that the plant which he called by this name received its appellation from having been the cause of a war between two kings, who could not agree which of them first discovered its virtues... Its name has descended to a flower which ornaments the garden, but which preserves nothing of the virtue of its progenitor." The pinnate leaves are ladder-like, hence the common name. A genus of about 25 spp of perennial herbs of the temperate regions of North America having pinnate leaves & large cymose-paniculate flowers with herbaceous calyx, declinate stamens, & mucilaginous seeds.

Seeds of woodland spp are hydrophilic & should be cold moist stratified & not dry stored. Alpine spp can be dry stored & spring planted. Plants are self-sterile. Cullina code A seeds will germinate within 4 weeks sown at 70ºF, or D seeds need a period of warm moist stratification followed by cold stratification and will germinate after shifting back to warm (70º-40º-70º), * seeds are hydrophilic, intolerant of dry storage. Old crowns can be divided after flowering. (cu00)

Polemonium foliosissimum A Gray TOWERING JACOB'S-LADDER (*foliosissimus -a -um* New Latin very leafy, the most leafy, superlative of *foliosus -a -um,* leafy.) ①Western US native sp; sow anytime (pots). ②Sow at 20ºC (68ºF), germination slow (tchn).

Polemonium reptans Linnaeus *MI JACOB'S LADDER, aka BLUEBELL, GREEK VALERIAN, SKUNKWEED, SPREADING JACOB'S LADDER, (*reptans* the same as *repens,* creeping, having creeping & rooting stems, from Latin *reptans,* from *repto, reptare, reptavi, reptatus*, creep over, crawl along.) The common name is for a resemblance of the pinnate leaves to the ladder Jacob saw ascending into heaven. fac

Habitat: Generally considered a woodland plant but grows in fens, mesic prairies, mesic savannas as well as low moist woodlands. Moist deciduous woods & streambanks. "Common on low prairies & in moist woods" (ewf55).

Culture: ①"Fall sow or moist cold treatment. Light cover. Good to fair germination." (mfd93) ②Prairie Moon (2009) calls for 60 days cold moist stratification. Seeds germinate after about 60 days of cold moist

stratification (he99). ③No pretreatment needed. Sow seeds just below the soil surface at 70ºF & water. Slow to germinate. (ew11) ④"Sow seeds as they ripen or in very early spring." (lbj) ⑤Sow at 20ºC (68ºF), germination slow (tchn).

seed counts & rates: 236,458 9gnhm13), 288,000 (pm01, ecs, ew11), 352,000 (pn02), 361,897 (gnam07), 409,600 (aes10), 444,706 (gnhm11), 756,000 seeds per pound.

asexual propagation: Division of mature plants, root cuttings. "Propagate by rootstock division or seed. Divide clumps in early spring or late summer." (lbj)

cultivation: Space plants 1.0-1.25'. Moist, humus-rich soils. pH circumneutral 6.8-7.2. Companions *Arisaema triphyllum, Geranium maculatum, Mertensia virginica,* & *Sanguinaria canadensis*.

(*We have plants in our front field (a former garbage dump) where, in 1995, we dumped flats of used potting soil & disked in the used soil, which was full of ungerminated seed from many spp. The area was disked deeply several times, with what seemed to be no apparent chance of seed being at a germinable depth, but some seeds grew & several plant of JACOB'S LADDER are there. Not exactly light cover. Definite proof anything works once. See the entry for Melanthium*)

bottom line: Dormant seeding of properly cold moist stored new crop seed is best. Dormant seeding of properly cold moist stored new crop seed is best. One germinable lot, flipflop species. Germ 34.2, 38, na, sd 22.2, r1.0-68 (67)%. Dorm 57.4, 52, 52, sd 25, 18-94 (76)%. Test 28, 28, na, r23-35 days. (#9)**

greenhouse & garden: Germination may be delayed several seasons. Plant fresh seed or moist cold stratify fresh seed, or dormant seed.

Description: Erect perennial, 0.75-1.25', smooth, weak-stemmed, odd pinnate leaves, flowers blue-violet (ranging to pink), bell-shaped. key features: Flowers bell-shaped, lobes about as long as the tube; leaves pinnately divides, main leaves with 7-17 oblong leaflets (fh). "Leaflets are 3-veined" (Ilpin).

Comments: status: Threatened in Michigan. Endangered in New Jersey. phenology: Bloom 4,5,6. C3. In northern Illinois, collect seeds in June. Collect seeds in se Wisconsin in July (he99). Seed source nursery plots, originally from Rock Island RR, west of Wyanet, Bureau Co.

Associates: Reported as deer resistant. Walnut tolerant.

VHFS: Ours is the widespread var *reptans*. Var *villosum* EL Braun grows on the Appalachian Plateau in Ohio & Kentucky.

POLYGALACEAE R Brown 1814 **MILKWORT FAMILY** Many spp are generally bitter, acrid, & astringent, with a milky juice in the roots. Fruits are 2-celled, 2-seeded pods, seeds pendulous, with a caruncle. RHATANY-ROOT, the root of *Kameria* was used medicinally, yields a deep red color, & was used to adulterate port wine. This is a mycoheterotrophic plant family associated with arbuscular mycorrhizal fungus.

POLYGALA Linnaeus **MILKWORT, GAYWINGS** *Polygalaceae Polygala* many milks, much milk, from the classical name Greek *polygalon,* milkwort, from Greek πολὺς, *polys,* many, much, & γάλα, γαλακτ-, *gala, galakt-,* milk. The plants were thought to enhance the flow of mother's milk, perhaps an obtuse reference to the milky juice of the roots. Herbs & shrubs of temperate & warm regions having many-colored often showy flowers with the three sometimes crested petals united below into a tube & an irregular calyx with two petaloid sepals. Our spp are herbaceous annuals, biennials, & perennials. The flowers bear a superficial resemblance to those of papilionaceous legumes. There are often subterranean, apetalous flowers. Many spp may have dropped seeds, ripe seeds, open flowers, & new buds in one inflorescence. Fruits are capsules, obcordate, 2-celled, 2-seeded, loculicidal, with the seed appendaged with a various caruncle at the hilium. North American spp are x = 6, 7, 8, 9, 10, 17, 23. *P senega, P sanguinea,* & *P purpurea* are emetic, purgative, & diuretic.

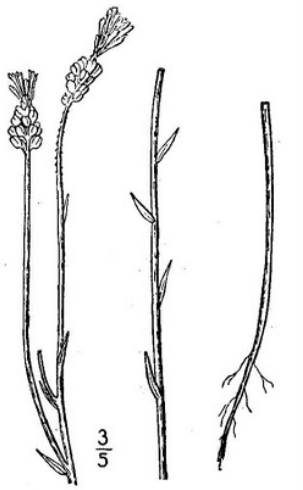
The seeds of *Polygala polygama*, *P sanguinea*, *P senega*, & *P verticillata* have a large appendage arising at the point of attachment known as an aril. (Cochrane et al 2006) The presence of an aril often is an indication of moisture sensitivity & probable recalcitrance. Plant early & often.

Polygala ambigua Nutt. "Other common plants, which presented themselves at different places on our route through the prairies" (Short 1845).

Polygala cruciata Linnaeus DRUMHEADS, aka CANDY ROOT, CROSSLEAF MILKWORT, FIELD MILKWORT, MARSH MILKWORT, (*cruciatus -a -um* cross-like, cross-shaped, crosswise, as the flowers of *Cruciferae*; with leaves of alternate pairs in right angles to the pair below; an instrument of torture, torture, misfortune, from *crucio, cruciare, cruciavi, cruciatum* (fiercely armed with thorns set crosswise).)
Annual, flowers pink, occasionally white.
"Frequent in boggy places & low prairies in Sugar River sand area but not elsewhere in the county" (ewf55).

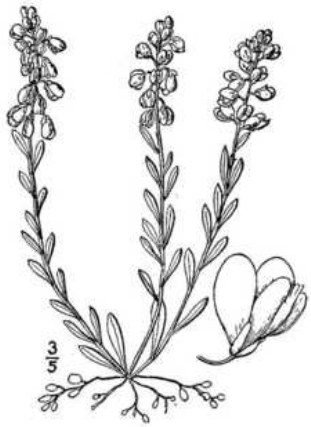
Polygala cruciata

Polygala incarnata *WI PINK MILKWORT, aka PROCESSION FLOWER, (*incarnatus -a -um* (in-kar-NAH-tus) flesh-colored, flesh-pink, from Middle English *incarnat*, from Late Latin *incarnatus*, past participle of *incarnare,* to make flesh, make fleshy, incarnate, from Latin *in-* in- & *carn-, caro* flesh, akin to Greek *keirein* to cut.)
Habitat: Dry mesic, mesic & wet mesic prairies & savannas in areas with little competition.
distribution/range:
Culture: ①Germination method unknown (he99).
Description: Annual, 1-2', pink-rose flowers.
Comments: status: Endangered in Wisconsin. phenology: Blooms 5-6. Very rare. Collect seeds in se Wisconsin in July-August (he99).
"Other common plants, which presented themselves at different places on our route through the prairies." *Polygala incarnata* L. (Short 1845).
Associates:
VHFS:



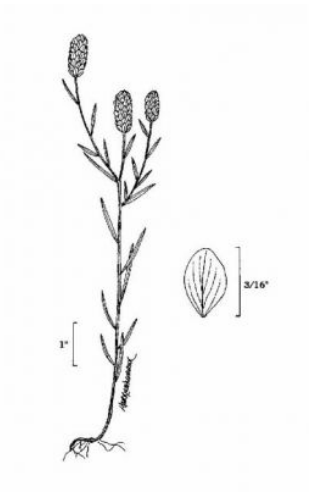
Polygala incarnata

Polygala polygama Walter RACEMED MILKWORT, aka BITTER MILKWORT, PURPLE MILKWORT, SAND MILKWORT, (*polygamus -a -um* literally Greek many married, *polygamus*, with hermaphrodite flowers, with the sexes mixed, meaning, in a botanical sense, that the flowers are of both sexes on a single plant.)
Habitat: Dry & dry mesic prairies. distribution/range:
Culture: ①Germination method unknown (he99).
Description: Biennial, 10", flowers rose-purple, rarely white, subterranean flowers wingless, nearly apetalous (alternately white, complete, cleistogamous flowers underground or just above ground.)
Comments: status: phenology: Blooms 6-7. Collect seeds in se Wisconsin in August-September (he99). "Generally uncommon but frequent in places in Sugar River sand area; very uncommon on the sandy prairies in the Camp Grant area. It is easier to find in late fall when it makes a vigorous growth & has numerous cleistogamous flowers." (ewf55)
Associates:
VHFS:



Polygala polygama

Polygala sanguinea Linnaeus BLOOD MILKWORT, aka FIELD MILKWORT, PURPLE MILKWORT, RED MILKWORT, (*sanguineus -a -um* bloody, blood-red, from Latin *sanguis*, blood.)
Habitat: Dry & dry mesic prairies. Moderately acid soils. "Common in low prairies & other moist places" (ewf55). distribution/range:
Culture: ①Further germination pretreatments not sure? (pm)
Description: Annual, 14-16", rose-purple flowers; crushed roots have a wintergreen odor.
Comments: status: phenology: Blooms 7-9. Collect seeds in se Wisconsin in October-November (he99).
Associates:
VHFS:

Polygala sanguinea

Photo Robert H Mohlenbrock USDA-NRCS PLANTS Database.-Not copyrighted image

Polygala senega Linnaeus SENECA SNAKEROOT aka MILKWORT, *Bi'jikiwuck',* cattle medicine (Ojibwa), (*senega* alteration of Seneca; from the use of *P senega* by the Seneca tribe of the Iroquois Confederation as a remedy against snakebite. The epithet was formerly capitalized.)
Habitat: Dry, rocky, or rocky areas. "Common in two quite different situations, wooded streambanks & low prairies, Kishwaukee River above New Milford & low prairies east of Winnebago & northeast of Shirland" (ewf55). There is a fine colony in an oak opening on the bluff near Sparland. Variety *latifolia* grows in a *Gymnocladus* savanna south of Lacon. distribution/range:
Culture: ①Seeds germinate after about 60 days of cold moist stratification (he99).
Description: Erect, herbaceous, perennial, native forb; 6-18"; root ligneous, branched, contorted, about 0.5" thick, ash-colored; flowers white.
Comments: status: phenology: Blooms 5-6. In northern Illinois, collect seeds of variety *latifolia* in early August. Collect seeds in se Wisconsin in July (he99).
"Abundant in prairies and the thinly-wooded barrens." *Polygala Senega* L. (Short 1845).
Associates: ethnobotany: One source says of no known medicinal value. Large quantities were pressed for transport to larger towns by Menominee (Hoffman 1986). Used as medicinal beverage & tonic by Ojibwa (den28). Menominee & Iroquois used root as food (Hoffman 1896). Also used as charm by Ojibwa & as a tonic (den28). "The root has a sweetish, nauseous taste, soon becoming pungent & hot. … A valuable stimulating expectorant." (Wood 1873)
VHFS: Var *latifolia* T&G leaves ovate, acuminate at each end, leaves 2-3" long, 1" or more broad; stem leafy, more than 1' high.

Polygala sanguinea
Photo by Jock Ingels

Polygala verticillata Linnaeus WHORLED MILKWORT, aka MILKWORT, (*verticillatus -a -um* verticillate, whorled, three or more leaves springing from the same point, from Latin *verticillus*, adjective, the whirl of a spindle, & *–atus*, adjectival suffix for nouns, possessive of or likeness of something.)
Habitat: Dry & dry mesic prairies. "In either moist or dry soil in woods or in the open. Sandy woods north of Shirland & east of Roscoe; abundant on the IC RR east of Rockford where it is of a depauperate type." (ewf55)
distribution/range:
Culture: ①Germination method unknown (he99).
Description: Annual, 41-16", flowers white-green.
Comments: status: phenology: Blooms 7-10. Collect seeds in se Wisconsin in October-November (he99).
"Other common plants, which presented themselves at different places on our route through the prairies." *Polygala verticillata* L. (Short 1845).
Associates:
VHFS:

Polygala verticillata

POLYGONACEAE AL de Jussieu 1789 **SMARTWEED FAMILY** Approximately 43-48 genera & 1100-1200 spp of trees, shrubs, vines, & herbs, cosmopolitan, many in the north temperate regions. Ours are forbs with small flowers in corymbs, racemes, spike-like panicles, or heads; stems are jointed with swollen nodes; leaves simple, usually alternate, often with an *ocreae*, a collar-like sheath enclosing the node.

"A characteristic feature of the family is the *ocrea*, a nodal sheath variously interpreted as an outgrowth of the sheathing base of the petiole, as connate stipules, or as an expanded axillary stipule (SA Graham & CE Wood Jr. 1965)." (fna)

SA Graham & CE Wood Jr, 1965. The genera of *Polygonaceae* in the southeastern United States. J Arnold Arbor 46: 91-113

ANTENORON Rafinesque **KNOTWEED**
Persicaria virginiana is sometimes placed here as *Antenoron virginianum* (L) Roberty & Vautier, as in m14.

FAGOPYRUM P Miller 1754 **BUCKWHEAT, FAGOPYRUM** The Latin & common name refer to the similarity of the seeds to beechnuts; from Latin & Greek for beech wheat, from the beechnut-like, edible fruit. 8-16 sp herbaceous annuals & perennials of Africa & east Asia.

Fagopyrum esculentum Moench BUCKWHEAT, aka GOOSE BUCKWHEAT, INDIA-WHEAT,
Habitat: Poor soils, wastelands, mud, peat, light sandy soils. Fields, roadsides, old fields. Native of Eurasia.
Culture: Available in May, June, early July. Anon (1981) recommends 25 lbs per acre. Needs warm soil to germinate. Sow in late spring or summer cover crop. This is not a nurse crop. This is a cover crop or a smother crop. 1-2 lbs per 1000 (pots). 1 lb per 500 sq ft or 50 lb per acre.
Tolerates poor soil, with minimal nutrient needs.
Description: Annual, sometimes used as a nurse crop or erosion control or commonly as a green manure. To 24" in garden soil. Aggressive plant if well watered. Should be tilled in when flowering begins (5-6 wks after planting). My father warned me about letting buckwheat go to seed. Do not let it go to seed or you will go to restoration hell! Roots are brittle, & easily chopped. Easy cover crop to work in. Helps control weeds, but not in native seedings, & helps make phosphates more available (pots). Dense growth habit said to smother weeds, even thistles. Helps accumulate insoluble phosphorus in soils. (Territorial 2001). Upland game birds, songbirds, terrestrial furbearers (esp squirrels), small mammals & deer eat seeds. Good bee plant, makes a strong dark honey.
VHFS: [*Fagopyrum fagopyrum* (L) H Karst, *F sagittatum* Gilib, *F vulgare* Hill, *Polygonum fagopyrum* L]

FALLOPIA Adanson 1763 **CLIMBING BUCKWHEAT** The genus name is honoring Gabriello *Fallopio* (Gabriel *Fallopius*), 1532-1562, Italian anatomist who invented Fallopian tubes. A genus of 9-10 species of woody & herbaceous vines of temperate regions of the Northern Hemisphere. "If accepted (as here) as a genus distinct from *Polygonum,* this group takes the name *Fallopia* Adanson (1763), which has priority over *Tiniaria* (1832) and *Bilderdykia* (1827). *Reynoutria* is sometimes included." (w12)

PERSICARIA P Miller 1754 **SMARTWEED, TEARTHUMB, JUMPSEED** *Polygonaceae Persicaria* post-classical Latin *persicaria* redshank, or *Persicaria maculosa* (a1250, 1635 in British sources), from the resemblance of the leaves to those of the peach tree, from classical Latin *persicum, persica,* peach, from Pliny *Persicum mālum,* Persian apple, & *-aria*, pertaining to, referring to resemblance of leaves of some spp. A genus of about 150 spp of mostly temperate Northern hemisphere herbs. "Several components of this genus may belong elsewhere" (w10). Formerly part of a broadly defined *Polygonum*.

segregate Tracaulon arifolium pubescens & T sagittatum

Persicaria amphibia (Linnaeus) SF Gray WATER SMARTWEED, aka WATER KNOT WEED, (*amphibius -a -um* (am-FI-bee-us) growing in water or on land; *stipulaceus -a -um* with stipules, small appendages to the base of the leaf stalk.) Obligate
Habitat: Wide tolerance for inundation, 20" water to moist soil. pH 5.4-8.8. Nutrient load tolerance moderate, salt tolerance low, siltation tolerance moderate to high. Partial to full sun.
Culture: Can be established from seeds (*if you can find them)*, cuttings, or rhizomes. Seeds can be stored in freshwater, 32-34°F for 3-6 months to stratify. One source says seeds germinate best when stored dry at 40°F followed by light at 70°F. Can be field sown on wet soils in spring. Seed production is enhanced by shallow flooding during summer. 50,000 (jfn04) seeds per pound. On that magical day in the future, when as much seed as every body wants is available, in mixes sow 0.5-1.5 lb pls per acre (us97). Until you receive my memo, do not list this in seed mixes.

Plants & rootstocks limited availability. 2-6" stem cuttings can be directly stuck in moist soil in field. Spring drawdown increases plant production. (us97)

bottom line: Best from dormant seeding. This species forms part of the long term wetland soil seed bank. Photodormant? Germ 11%. Dorm 81%. Test 31 days.**
Description: Perennial emergent herb, up to 3'; red to pink flowers blooming in June to August. Seed of this sp is seen for sale as about often as fern seed.
Comments: status: phenology: Blooms June to August. Seeds mature July to September.
Associates: Waterfowl eats seeds. Major food source for PURPLISH COPPER BUTTERFLY (nectar or larval???). Provides cover for waterfowl & fish.
VHFS: [*Polygonum amphibium* L*, P amphibium stipulaceum*]

Persicaria careyi (Olney) Greene PERSICARIA, aka CAREY'S SMARTWEED,
Habitat: Sandy soil. In se USA, moist soils, disturbed areas; rare (w10).
Medicinal uses: Used as medicinal plant by Pottawatomie (sm33).
VHFS: [*Polygonum careyi* Olney]

Persicaria hydropiper (Linnaeus) Opiz COMMON SMARTWEED, aka WATERPEPPER, MARSHPEPPER SMARTWEED, (*hydropiper* water pepper, from Greek Ὑδροπέπερι, ὕδροπέπερι, *Hydropéperi, hydropéperi*, WATER PEPPER or WATER-WORT, *Elatine.*)
"Common in damp places." (ewf55)
VHFS: [*Polygonum hydropiper* L]

Persicaria hydropiperoides (Michaux) Small MILD WATER PEPPER, aka WATERPEPPER, (*hydropiperoides* resembling water pepper, from Greek Ὑδροπέπερι, *Hydropéperi,* ὕδροπέπερι, *hydropéperi*, Water pepper or Water-wort, *Elatine*, & ancient Greek -οειδής, *-oeides,* adjectival suffix indicating having the form or likeness of, like unto, like something else, or resemble.)
In se USA swamp forests, streams, ditches; common (w10). "A common smartweed" (ewf55)
144,000 (aes10) seeds per pound. Leaves have a peppery taste.
VHFS: [*Polygonum hydropiperoides* Michx]

Persicaria lapathifolia (Linnaeus) SF Gray HEARTEASE, aka CURLTOP LADYSTHUMB, CURLY-TOP KNOTWEED, CURLYTOP SMARTWEED, DOCK-LEAVED SMARTWEED, HEART'S EASE, PALE SMARTWEED, WILLOW-WEED, (from Greek *lapathon, lapathos*, a name for Monk's Rhubarb, *Rumex Patientia*, & dock, *Rumex conglomeratus*, & Latin *folium*, a leaf.) In one source, the common name has been spell checked to Heart Cease. facw+

Habitat: Agricultural wetlands, ditches, stream banks swampy thickets, shores, damp clearings, & cultivated fields. In the se USA, bottomlands, bottomland fields, disturbed areas; common" (Weakley 2010) "A common smartweed" (ewf55)
Culture: 220,360 (gnh06), 237,137 (gnh02), 243,497 (gnawf03), 320,000 (gn) seeds per pound.
bottom line: No treatment, but seeding is best from dormant or early spring seeding. Dormancy mechanisms vary widely. This sp forms part of the long term wetland soil seed bank. Germ 48.9, 50, na, sd 21.4, r5.0-72 (67)%. Dorm 24, 19, na, sd 21.9, r0.0-87 (87)%. Test 26, 26, 23, r23-30 days.**
Description: Annual native, 1-3.0(6.0)', pink to greenish-white flowers
Comments: status: This plant is considered invasive (Stubbendieck et al 1994, SWSS 1998, Whitson et al 1996). phenology: Blooms 6,7,8,9,10. Seed source farmed wetlands, Lee & Whiteside cos.
Associates: Attracts upland game birds & waterfowl.
ethnobotany: Used as medicinal beverage by Pottawatomie.
VHFS: [*Polygonum lapathifolium* L] This sp has about sixteen synonyms, including six varieties (plants.usda.gov).

Persicaria orientalis (Linnaeus) Spach PRINCE'S FEATHER, aka KISS-ME-OVER-THE-GARDEN-GATE, PRINCE'S-PLUME. Native of Eurasia.
"An infrequent escape" (ewf55).
VHFS: [*Polygonum orientale* L]

Persicaria pensylvanica (Linnaeus) M Gómez, GIANT SMARTWEED aka COMMON SMARTWEED, HEART SEED, PENNSYLVANIA SMARTWEED OR KNOTWEED, PINKWEED, PINWEED, (the last a typo perhaps?) facw+
Habitat: Farmed wetlands, fens, wet prairies, damp shores, thickets, clearings, & disturbed or cultivated soil, fresh moist margins, banks, muddy spots, shallow water areas. Fresh, moderately brackish, or alkaline water. Thickets, clearings, old fields. "A common smartweed" (ewf55). distribution/range:
Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09) (*Seeds are not small & appear to have a hard coat & assumed physiological dormancy, but photodormancy is probable also*). No treatment is traditional, but some lots may be highly dormant. Throw it out & let nature handle it. Anon (1981) says plant spring or fall. Growth rate moderate. Seedling vigor medium. Vegetative spread rate none.
seed counts & rates: 64,000 (aes10), 65,008 (jfn04), 103,040 (wns01), 113,614 (gnih06), 125,276 (gnan03), 126,111 (usda), 267,000 (gn) seeds per pound. 20 lbs. per acre broadcast. USDA 10-15 lbs per acre broadcast.
availability: The old, single sp seeding rates do not reflect current availability. Availability may swing wildly from year to year, abundant to non-existent, a feast & famine species. 2010-2011 availability is a low as the economy & prices are high. 2013-14 availability better, prices a bit lower.
Anaerobic tolerance medium. CaCO3 tolerance medium. Drought tolerance medium. Fertility requirement medium. Salinity tolerance low. Shade intolerant. pH 4.0-8.0
bottom line: Best from dormant seeding. This sp forms part of the long term wetland soil seed bank. Germ 10.6, 9.0, 12, sd 11.5, r1.0-40 (39)%. Dorm 68.6, 75, na, sd 17.2, r44-88 (44)%. Test 34, 31, 30, r24-46 days.**
Description: Annual, to 3.9'; 14" minimum root depth; red flowers;
Comments: status: This sp is considered invasive in many areas (Haragan 1991, Uva et al 1997, Stubbendieck et al 1994, SWSS 1998). phenology: Blooms 6,7,8,9,10. Often used as a cover crop in wetland seedings. Seed source farmed wetlands, Van Petten, Lee Co, & Deer Grove, Whiteside Co.
Associates: Said to attract upland game birds & waterfowl. Waterfowl (20 spp of ducks), geese, marsh birds, shorebirds, upland game birds (bobwhites, mourning doves, pheasants, four spp of rails, songbirds (30 non-game spp), & small mammals (white-footed mice) eat seeds. Aquatic & terrestrial furbearers (muskrats, raccoons, & fox squirrels) eat plants & seeds. Everitt et al (1999) note that this sp is of low food value & of no cover value for any wildlife. Texan critters must have discerning palates.
ethnobotany: Used as medicinal beverage by Menominee & Ojibwa (sm23, Gilmore 1933).
VHFS: [*Polygonum pensylvanicum* L] This sp has about sixteen synonyms, including five varieties (plants.usda.gov)

Persicaria punctata (Elliott) Small WATER SMARTWEED, aka DOTTED SMARTWEED, DUCKWEED, MARSH SMARTWEED, REDTOP, *Ojig'imin* fisher berry (Ojibwa),

Habitat: Marshy soil or shallow water. Fresh or mildly alkaline water, 6"-18" deep, with mud, clay, or sandy bottoms. Swamps. "A common smartweed" (ewf55)
Culture: ①Further germination pretreatments not sure? (pm)? Anon 1981 again says plant spring or fall. Recommends 1000 roots (per what?) on 1.5' interval. 89,901 (gnh13), 124,800 (pm11), 374,379 (gna11) seeds per pound. The availability of this sp' seed is very limited to a few pounds total in the Midwest.
bottom line: Dormant seeding is best, seed is significantly to strongly dormant (or hard seeded). Germ 2.0-34%. Dorm 29-85%. Test 28-42 days. (#3)**
Description: Perennial. Annual?
Associates: Waterfowl, marsh birds, shorebirds, upland game birds, songbirds, & small mammals eat seeds. Aquatic furbearers eat plants & seeds.
ethnobotany: Used as medicinal plant by Ojibwa for pain in stomach (den28).
VHFS: [*Polygonum punctatum* Ell, *P muhlenbergii*]

Persicaria sagittata (Linnaeus) Gross ex Nakai ARROW-LEAVED TEAR-THUMB, aka ARROW-VINE, LADY'S TEAR-THUMB, SCRATCH VINE, TEARTHUMB, obl
Habitat: Wet meadows, swamps, marshes, & wet thickets. In the se USA, marshes, bogs, beaver impondments, wet thickets; common" (w10). distribution/range: "Very common in Sugar River sloughs, uncommon elsewhere" (ewf55).
Culture: Moist cold stratify (90 days) or dormant seed. Growth rate rapid. Seedling vigor medium. Vegetative spread rate none. 125,000 (usda, ecs) seeds per pound.
cultivation: Anaerobic tolerance low. CaCO3 tolerance medium. Drought tolerance low. Fertility requirement medium. Salinity tolerance medium. Shade intolerant. pH 4.0-8.5.
Description: Erect annual; 6" minimum root depth; 2.0-4.0', flowers white, pink, or red in close clusters;
Comments: status: phenology: Blooms 7,8,9. Wetland restoration. Sharp, barbed stems!!!!
Associates: Low food value for waterfowl (Yarrow & Yarrow 1999). Deer resistant.
VHFS: [*Persicaria sagittata* (L) Gross, *Polygonum sagittatum* L, *P sagittatum* L var *gracilentum* Fern, *Tracaulon sagittatum* (L) Small, *T sagittatum* (L) Small var *gracilentum* (Fern) CF Reed, *Truellum sagittatum* (L) Soják]

Persicaria virginiana (Linnaeus) Gaertn JUMPSEED, aka WOODLAND KNOTWEED, fac The common name is from the spring-loaded seeds that may fly 9 to 10 feet when touched.
Habitat: Wooded floodplain terraces, woodland edges, & mesic savannas. "Rich deciduous forests, floodplain forests, dry woodlands, thickets; 0-500 m" (fna). In se USA, floodplains, moist forests; common" (w11). distribution/range: Quebec, Ontario, New Hampshire to Minnesota, south to Florida & Texas.
Culture: ①60 days cold moist stratification (pm09). Dormant seed or moist cold stratify. Seeds have physiological dormancy, germinate after cold moist stratification at 30º/15º C. Germination best in light. (bb02) 69,653 (gna05), 71,716 (gna06), 103,088 seeds per pound.
bottom line: Dormant seeding is best, seed is significantly to strongly dormant (or hard seeded). Germ 7.6, 3.0, 1.0, sd 8.5, r1.0-24 (34)%. Dorm 76.3, 85, 95, sd 18.8, r45-95 (50)%. Test 29, 28, na, r18-42 days. (#7).**
Description: Annual or perennial (perennial fna); rhizomatous; stems 1.0-2.0'; leaves alternate, simple, entire; inflorescence a raceme; flowers white; 4-merous, followed by white seeds; N 2n = 44. key features: Very slender racemes.
Comments: status: phenology: Blooms 7, 8, 9. Excellent shady groundcover. "Tension in the articulation of the pedicels is sufficient to throw mature achenes 3-4 m when the inflorescence is bumped, & the persistent, hooked styles aid in the dispersal of achenes in the fur of animals (HS Reed & I Smoot 1906)." (fna)
"Irregularly distributed. When found it is usually in large patches on damp roadsides or in woods. It is best known from "shooting" its seed in the fall when the dry capsules are touched." (ewf55) Genetic source Concord Twp, Bureau Co & Kane Co from Bob Horlock/the Natural Garden genetic material.
Associates: ethnobotany: Possible cause of hay fever & dermatitis in humans. Cherokee mixed the leaves with the bark of honey locust to treat whooping cough (Moerman 1998)
VHFS: "Section *Tovara* consists of 3-5 spp of e North America & e Asia (Mun & Park 1995); if the section is recognized as a genus (as it often has been), the correct name for this sp is *Antenoron virginianum*." (w10) Mohlenbrock (2014) maintains this as *A virginianum.*

This is now known as *Persicaria virginiana* (L) Gaertn, or sometimes maintained in its own genus as *Antenoron virginianum* (L) Roberty & Vautier. [*Antenoron virginianum* (L) Roberty & Vautier, *Persicaria virginiana* (L) Gaertn, *Polygonum virginianum* L var *glaberrimum* (Fern) Steyermark, *Tovara virginiana* (L) Raf, *T virginiana* (L) Raf var *glaberrima* Fern]

CC Baskin & JM Baskin, 2002. Propagation protocol for production of container *Polygonum virginianum* L plants; University of Kentucky, Lexington, Kentucky. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 11 March 2008). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.

MICHIGAN FLORA ONLINE. AA Reznicek, EG Voss, & BS Walters. February 2011. University of Michigan. Web. May 9, 2012. http://michiganflora.net/species.aspx?id=2292.

Persicaria virginiana

POLYGONELLA Michaux 1803 **JOINTWEED, WIREWEED, *POLYGONELLE*** *Polygonaceae* x = 11.

Polygonella articulata (Linnaeus) Meisner JOINTWEED, aka COASTAL JOINT-WEED, NORTHERN JOINTWEED, NORTHERN WIREWEED, "Locally abundant in Rockton & Shirland Townships. Not known elsewhere." (ewf55) Longenecker's Prairie near Nelson. In the se USA, sandhills, dunes, and other dry, sandy habitats (w12b).
Annual.
W12b as *Polygonum articulatum* Linnaeus.

POLYGONUM Linnaeus 1753 **SMARTWEED, KNOTGRASS, FLEECE-FLOWER** *Polygonaceae* **Buckwheat family** *Polygonum* (po-LI-go-num) New Latin, from Greek *polygonon,* knotgrass, *Polygonum aviculare,* from Greek *polys* many & *gony* a knee for the jointed stems. Annual & perennial herbs & climbers having prominent *ocreae* (tubular sheathing stipules), thickened nodes, & flowers that are solitary & axillary or in spiked racemes. Seeds are achenes. *Polygonum* x = 10. *Persicaria* x = 10, 11, 12. *Fallopia* x = 10, 11. The weedy, invasive ornamentals are placed in the genus *Reynoutria* Houttuyn 1777.

Several spp are planted as wetland nurse crops. They should be included as a source of food & cover for wildlife, but wide-leaved, ground shading dicots are not particularly good nurse crops. Smartweeds are part of many long-term wetland seed banks. SMARTWEED seed supplies vary widely from year to year, from feast to famine.
move Fallopia??

Polygonum aviculare Linnaeus COMMON KNOTWEED,
Introduced from Europe. "Very common in waste ground & in dooryards" (ewf55).

Polygonum coccineum Muhlenburg SMARTWEED, aka SWAMP PERSICARIA,
Habitat: Shores & margins of ponds or streams, wet prairies. "Common in wet soil" (ewf55).
Associates: ethnobotany: Used as medicinal beverage by Ojibwa (sm32). Dried flowers included hunting medicine smoked in pipes to attract buck deer by Ojibwa (sm32)

Fallopia convolvulus (Linnaeus) Á Löve BLACK BINDWEED, aka BINDWEED, CLIMBING BUCKWHEAT, Introduced from Europe. "Common in waste ground, on railroad tracks, etc" (ewf55).
The new name is *Fallopia convolvulus* (L) Á Löve. [*Polygonum convolvulus* Linnaeus]

Fallopia dumetorum (Linnaeus) Holub "Similar to *P scandans*, (sic) less common & possibly only a variety of it" (ewf55).
[*Bilderdykia dumetorum* (L) Dumort, *Polygonum dumetorum* L, *P scandens* L var *dumetorum* (L) Gleason, *Reynoutria scandens* (L) Shinners var *dumetorum* (L) Shinners, *Tiniaria dumetorum* (L) Opiz]

Polygonum erectum Linnaeus ERECT KNOTWEED, "A common native weed of roadsides & waste places" (ewf55).

Polygonum exsertum Small "Uncommon. The low prairie west of Shirland." (ewf55)

Polygonum fluitans A Eaton WATER SMARTWEED, "Common in shallow water & bogs" (ewf55).
Polygonum fluitans f **hartwrightii** (A Gray) GN Jones "Likely to be found in drier situations than the above. Ocreae frequently have a marked horizontal flange." (*P hartwrightii* A Gray)" (ewf55)

Polygonum persicaria Linnaeus LADY'S THUMB, as Ojibwa medicine for pain in stomach (den28).

Polygonum ramossissimum Michaux TALL KNOTWEED, aka LONGFRUIT KNOTWEED, BUSHY KNOTWEED, PROLIFIC KNOTWEED, "Uncommon on dry prairies & in sandy places. Sandy prairie near Camp Grant." (ewf55)

Fallopia scandens (Linnaeus) Holub FALSE BUCKWHEAT, aka COMMON CLIMBING BUCKWHEAT, CLIMBING FALSE BUCKWHEAT,
Habitat: distribution/range:
Culture: propagation:
Description: Perennial or annual, not rhizomatous; 2n = 20. key features:
Comments: status: phenology: Blooms August to November. In northern Illinois, pick seed in October to early November. "Common in thickets, fence-rows, & weed patches" (ewf55).
Associates: ethnobotany:
VHFS: New nomenclature this is *Fallopia scandens* (Linnaeus) Holub. The genus name is honoring Gabriello *Fallopio* (Gabriel *Fallopius*), 1532-1562, Italian anatomist who invented Fallopian tubes.
[*Bilderdykia cristata* (Engelm & Gray) Greene, *B scandens* (L) Greene, *B scandens* (L) Greene var *cristata* (Engelm & Gray) CF Reed, *Polygonum cristatum* Engelm & Gray, *P dumetorum* L var *scandens* (L) Gray, *P scandens* L, *P scandens* L var *cristatum* (Engelm & Gray) Gleason, *P scandens* L var. *scandens, Reynoutria scandens* (L) Shinners, *R scandens* (L) Shinners var *cristata* (Engelm & Gray) Shinners, *Tiniaria cristata* (Engelm & A Gray) Small, *T scandens* (L) Small]

Polygonum tenue Michaux KNOTWEED, aka SLENDER KNOTWEED, "Common on most dry prairies & in sandy areas" (ewf55).

RUMEX Linnaeus 1753 **DOCK** *Polygonaceae Rumex* New Latin, from classical Latin name for sorrel used by Pliny, also a name for a missile weapon, similar to the *sparum* of the Gauls. About 200 spp of perennial & annual herbs & shrubs that are mainly native to north temperate regions & have small flowers in axillary clusters often aggregated in a large panicle & 3-angled wingless fruit enclosed in a persistent perianth whose inner segments often bear conspicuous tubercles. x = 7,8,9,10 (polyploidy common)

Rumex acetosella Linnaeus SHEEP SORREL, aka BITTER DOCK, COMMON FIELD SORREL, COMMON SHEEP SORREL, COMMON SORREL, COW SORREL, FIELD SORREL, RED DOCK, SOUR DOCK, SOURGRASS, "A common weed of fields, pastures, & roadsides" (ewf55). ①Sow at 20ºC (68ºF), germinates in less than two wks (tchn). N 2n = 14, 28, 42.
[*Acetosella acetosella* (L) Small, *A tenuifolia* (Wallr) A Löve, *A vulgaris* (Koch) Fourr, *Rumex acetosella* L ssp *angiocarpus* (Murb) Murb, *R acetosella* L var *pyrenaeus* (Pourret) Timbal-Lagrave, *R acetosella* L var *tenuifolius* Wallr, *R acetosellus*, *R angiocarpus* Murb, *R tenuifolius* (Wallr) A Löve]

Rumex altimissus A Wood PALE DOCK, aka PEACHLEAF DOCK, TALL DOCK, SMOOTH DOCK, WATER DOCK, facw-
Habitat: Low ground along streams & drainage ditches.
Culture: ①No pre-treatment necessary other than cold, dry stratification (pm09). 220,656 (gna06), 230,926 (gnh13), 240,000 (jfn04) seeds per pound.
bottom line: Field plant spring or dormant. 80% of lots have little or no dormancy (0-1%), but 27% dorm is known. Germ 86.6, 92, na, sd 11.8, r64-96 (32)%. Dorm 5.6, 0.0, 0.0, sd 10.7, r0.0-27 (27)%. Test 27, 28, 24, r24-31 days.**
Moist soil, light, no treatment or dormant seed, cool soils.
Description: 3.0-7', green flowers; N 2n = 20.
Comments: Blooms 5,6,7. Wetland restoration. "A common weed of fields & roadsides preferring rich soil" (ewf55). Seed source wet ditches Whiteside Co.
Associates: Wind pollinated, possibly allergenic. Non-mycorrhizal.

Rumex aquaticus Linnaeus *MI WESTERN DOCK,
Habitat: distribution/range: Not known from Illinois or Wisconsin.
Culture:
Description: Erect, herbaceous, perennial, native forb; roots minimum depth; stems; leaves; flowers -merous; N 2n = 120 key features:
Comments: status: Endangered in Michigan. This sp is considered invasive in some areas (Assorted authors. 200_. State noxious weed lists for 46 states). phenology: Blooms
Associates:
VHFS: [*Rumex occidentalis* S Wats.]

Rumex brittanica Linnaeus GREAT WATER DOCK, aka WATER DOCK, "Most common in boggy places in Sugar River sand area but less commonly in wet places throughout the county" (ewf55).
Weakley (2007) & Mohlenbrock (2014) uses this name in preference to *R orbiculatus* A Gray.

Rumex crispus Linnaeus CURLY DOCK, aka YELLOW DOCK, *As Ginoje'wukun*, pike plant,
"A common naturalized weed" (ewf55).
Associates: ethnobotany: Ojibwa medicine for eruptions; also called *Oza'widji'bik,* YELLOW ROOT, root is astringent, slightly tonic, & supposedly alterative (den28)

Rumex obtusifolius Linnaeus BITTERDOCK, aka *Oza'widji'bik,* yellow root,
"A common introduced weed" (ewf55).
Associates: ethnobotany: Densmore (1928) lists Ojibwa medicine for cuts & ulcers.

Rumex maritimus L subs **fueginus** (Phil) Hultén *CT, NY GOLDEN DOCK, aka MARITIME DOCK, *RUMEX MARITIME*, SEA-SIDE DOCK, (*maritim-, maritimus* coastal, growing by or found by the seashore, confined to the coast, from Latin of the sea, marine, maritime; *fueginus* dying, fleeting, present participle of *fugio, fugere, fugi, fugitum*.) Or *Rumex fueginus* Philipp, AMERICAN GOLDEN DOCK or TIERRA DEL FUEGO DOCK. (The last common name is from a bad translation of the specific epithet, see *fuegianus*)
Habitat: Shorelines, streambanks, wet ground. Tolerant of coarse, medium, & fine textured soils. Anaerobic tolerance high. CaCO3 tolerance low. Drought tolerance none. Fertility requirement low. Salinity tolerance medium. Shade tolerance intermediate. pH 5.0-8.2, in non acidic soils.
distribution/range: Considered native in Wisconsin & nw Illinois, adventive in ne Illinois.
Culture: ①Cold moist stratification not required (usda). Growth rate rapid. Seedling vigor medium. Vegetative spread rate moderate. Seed spread rate moderate. 300,000 seeds per pound.(usda).
Description: Native? Introduced? Annual/biennial forb; roots minimum depth, rhizomatous(?); stems to 32" tall, many branches, brushy; leaves narrowly lance-like, edges often curl; flowers 6-merous, stalk jointed near the base; inflorescence large, many-branched clusters with small leaves below the flower whorl; N 2n = 40. key features: Brushy, flower stalk jointed near the base, leaf edges often curly. "Thick, fleshy leaves crisped on margins; flower clusters extend nearly to plant base, frequently interrupted with leaves; mature fruiting masses are a red-brown or copper color." (Ilpin)
Comments: status: Special concern in Connecticut. Endangered in New York. It is also considered

invasive or a noxious weed in parts of the US (Assorted authors. 200_. State Noxious Weed Lists for 46 States) phenology: Blooms 7-10. C3.

"This Eurasian sp is known as a casual alien from several localities in North America. Its distribution is poorly known due to confusion with native American spp of this aggregate. Plants from Alaska & Yukon reported by E Hultén (1968) as *Rumex maritimus* need additional study; they may be conspecific with some eastern Asian races of the *R maritimus* aggregate. It is rare or almost absent in eastern Asia, where it is replaced by closely related taxa." (fna as *R maritimus*) Confused? I am. Read on!

"*Rumex fueginus*, in spite of its similarities to *R maritimus*, is more closely related to *R persicarioides*. Specimens of *R fueginus* often are misidentified as *R maritimus*, & the name *R persicarioides* has been applied to *R fueginus*. This confusion obscures distribution patterns among members of the aggregate." (fna as *R fueginus*)

References to *Rumex fueginus* Phil, *R maritimus* L subs *fueginus* (Phil) Hultén, & *R maritimus* L unclear & confusing. The treatment in Flora of North America is clear, but literature & web references are partly to mostly cloudy.

Associates:

VHFS: [*Rumex fueginus* Phil, *R maritimus* L var *athrix* H St John, *R maritimus* L var *fueginus* (Phil) Dusén]

Rumex orbiculatus Gray GREAT WATER DOCK, obl

Habitat: Wet meadows, fens, swamps, clean, headwater drainage ditches.

Culture: ①60 days cold moist stratification (pm09). 145,008 (jfn04), 212,946 (gna06), 238,736; 240,000 (aes10), 242,263 (gnh13), 278,238 (gna11) seeds per pound.

bottom line: Field plant spring works most years. 85% of lots tested have little or no dormancy (0-1%), while 15% are significantly dormant, at 40%. Flipflop species perhaps? Germ 79.4, 85, 85, sd 16.1, r41-93 (52)%. Dorm 6.1, 1.0, 0.0, sd 13.8, r0.0-40 (40)%. Test 25, 24, na r20-31 days.**

Light, dormant seed or cold moist stratification, cool soils.

Description: Native, erect, perennial forb; 4.0-7', flowers yellow (green/brown);

Comments: Blooms 6,7,8. Useful in wet landscapes, wet rain gardens, bog gardens, wetland & shoreline restoration. calcareous soils. Seed source remnant wetlands & drainage ditches, Whiteside Co.

Rumex patienta Linnaeus PATIENCE DOCK, aka MONK'S RHUBARB, "A common roadside weed that is usually found in wet places" (ewf55).

Rumex verticillatus Linnaeus *MD, MA SWAMP DOCK, (whorled, from Latin *verticillus*, adjective, the whirl of a spindle, & *–atus*, adjectival suffix for nouns, possessive of or likeness of something with, shaped, made.)

Habitat: Drainage ditches. "Swamps, bogs, marshes, wet meadows, irrigation ditches, wet alluvial woods; 0-800 m" (fna).

Culture: ①No pre-treatment necessary other than cold, dry stratification (pm09). 126,000; 155,008 (jfn04), 160,000 (pm, ecs), 160,000 (gn), 384,000 (aes10) seeds per pound.

Description: Native, erect, perennial forb glabrous or nearly so; stems 2.0-3.0(4.5)'; flowers green;

Comments: status: Endangered in Maryland. Threatened in Massachusetts. It is also considered invasive in parts of the US (Assorted authors. 200_. State Noxious Weed Lists for 46 States). phenology: Blooms June to September. Flowering spring to early summer (fna). Seed source Whiteside Co.

"Very common in Sugar River & Pecatonica River sloughs & less common in similar situations throughout" (ewf55).

Associates: Provides food for ruffed grouse, cottontail rabbits, & deer.

VHFS: [*Rumex fascicularis* Small, *R floridanus* Meisn]

TOVARA see *Persicaria*

ADD TRACAULON Rafinesque

PORTULACACEAE AL de Jussieu 1789 **PURSLANE FAMILY** The fruit is a pyxis, dehiscing by a circular, horizontal line, the top usually coming off as a lid.

CLAYTONIA Linnaeus **SPRING BEAUTY** *Portulacaceae Claytonia* (klay-ton-ee-AH-na) New Latin, from John *Clayton* (1686-1773) one of the earliest Virginia botanists & a physician & New Latin *-ia.* Mainly North American succulent herbs having corm-like or thickened roots & a single pair of leaves. Fruit is a capsule, 3-valved, 2-5 seeded.

Claytonia virginica Linnaeus SPRING BEAUTY, aka VIRGINIA SPRING BEAUTY,
Habitat: Mesic prairies, savannas, & woods. "Common in mesophytic woods but rare in the sand area" (ewf55).
Culture: ①Seeds are hydrophilic, dry for a few days & plant immediately. Slow from seed. Will self sow. Cullina code D seeds need a period of warm moist stratification followed by cold stratification and will germinate after shifting back to warm (70º-40º-70º), * seeds are hydrophilic, intolerant of dry storage. (cu00) ②Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment (pm09). Easy by seed, spreads by rhizomes (?). 480,000 (aes10) seeds per pound.
May spread rapidly in favorable environments.
Description: Native, perennial forb, spring ephemeral; flowers many, pink & white candy-striped; fruit is a capsule with small black seeds.
Comments: status: phenology: Blooms Seed matures early summer. Each tuber produces 2 thin, strap-like leaves & up to 15 flowers
Associates: Pollinated by long-tongued bees, short tongued bees, *Diptera*, *Lepidoptera.* Attracts small mammals. Walnut tolerant.

PHEMERANTHUS Rafinesque 1814 **ROCK-PINK, FAMEFLOWER** *Phemeranthus* apparently from Greek *ephemeros*, living for one day, and *anthos*, flower. Most North American *Talinum* are placed in *Phemeranthus* by current authors.

PORTULACA Linnaeus 1753 **PURSLANE, PORTULACA** *Portulaceae Portulaca* New Latin, from Latin, purslane, from *portula, portulae*, little door, the diminutive of *porta,* gate; in reference to the lid of its capsule that opens like a gate. Low, herbaceous, fleshy plants. Flowers only open in sunlight. Fruit is a pyxis, subglobous, dehiscing near the middle, many-seeded.

Portulaca oleracea Linnaeus PURSLEY
"A common weed in cultivated fields" (ewf55). Considered introduced, but it was cropped by Native Americans & the pollen has been found in pre-Columbian context.

TALINUM Adanson 1763 **FAME FLOWER, JEWELS-OF-OPAR** *Portulaceae Talinum* New Latin, possibly from African vernacular name of one sp in Senegal; alternately from θαλια, *thalia*, a green branch, for its verdure. Fruits are capsules, subglobose, 3-valved, many seeded. Sometimes placed in the *Talinaceae*. x = 12.
The tiny seeds ripen in summer as the capsules yellow. Germinates easily after moist cold stratification. Seedlings bloom 1st year. Cullina code B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, H seeds require light to germinate. (cu00).

Talinum calycinum Engelmann ROCK PINK, aka FAME FLOWER, LARGEFLOWER FAMEFLOWER (*calycinus -a -um* calyx-like, with a prominent or lasting calyx, in the nature or form of a calyx.)
Native south of our area.
Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ②No pre-treatment needed. Sow seeds just below soil surface at 40ºF & water. Slow to germinate." (ew12) 1,072,000 (ew12) seeds per pound.
cultivation: Space plants on 0.75-1.0' centers. Dry soils, full sun to partial shade.
Description:
flowers opening at noon & closing by evenings; seed capsules explode when ripe.
Reported as deer resistant.
VHFS: New nomenclature this is *Phemeranthus calycinus* (Engelmann) Kiger. [*Talinum calycinum* Engelmann, *Claytonia calycina* (Engelmann) Kuntze]

Talinum rugospermum Holzinger PRAIRIE TALINUM, aka FAME FLOWER, FLAME FLOWER, OKANAG FAMEFLOWER, PRAIRIE FAMEFLOWER, (*rugospermus -a -um* wrinkled seed or spore, from Latin adjective *rugosus -a -um*, rough, & Greek σπέρμα, *sperma,* seed, semen, male reproductive cells, from the stem of σπείρειν, *speirein,* to sow.)
Habitat: Dry sandy or sandstone derived soils. distribution/range: Discontinuous with several disjunct areas.
Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ② "No pre-treatment needed. Sow seeds just below soil surface at 40ºF & water. Slow to germinate." (ew12) ③Sow at max 5ºC (41ºF), germination irregular, often several months (tchn).
seed counts & rates: 1,280,000 (ew12) seeds per pound.
cultivation: Space plants on 0.5-0.75' centers. Dry soils, full sun to partial shade.
Description: Erect perennial, 0.25-0.67", flowers pink,
Comments: status: Rare native. phenology: Blooms 7-8. Collect seeds in se Wisconsin in September (he99). Flowers open late afternoon. "Rare. Known only in the Sugar River dune area; north of Yale bridge, below Sugar River Forest preserve & on the brim of the sand pit near Winslow bridge west of Shirland. More common at Castle Rock in Ogle Co." (ewf55)
[*Phemeranthus rugospermus* (Holzinger) Kiger]

PRIMULACEAE Ventenat 1799 **PRIMROSE FAMILY** See discussion in w12b.

ANDROSACE Linnaeus *Primulaceae Androsace* man shield, from Greek ανδρο-σακος, *andro-sakos,* for the exposed stamens of heterostyled spp; or New Latin, alteration of Latin *androsaces*, a plant or zoophyte, from Greek *androsakes*, a sea plant (probably a sp of *Acetabularia*).

Androsace occidentalis Pursh ROCK JASMINE,
"Locally abundant in dry sterile soil, sandy places, high prairies, gravel hills, &c" (ewf55)

rewrite as Primula????
DODECATHEON Linnaeus 1753 **SHOOTING STAR, AMERICAN COWSLIP, BIRD BILLS** *Primulaceae* ***Dodecatheon*** Dodecátheon, Dodecath'eon (do-deh-KATH-ee-on, or do-dek-a-THEE-on) New Latin, from Greek *dōdekatheon* primrose, from neuter of *dōdekatheos* of twelve gods, from *dōdeka-* dodeca-, twelve, & *theos, thios* god. "Fanciful name, from δώδεκα, *dodeka,* & θεοί, *theoi,* twelve gods: the specific name of the original &, as we suppose, the only sp commemorates Dr Richard Mead, & was given as generic by Catesby." (Gray 1888) The genus name is also spelled *Dodekatheon.* A genus of 13-15 spp of relictually distributed North American & northeast Asian herbs having basal leaves & scapose nodding flowers with reflexed corolla & monadelphous stamens. Mast et al (2004) have shown that *Dodecatheon* is part of *Primula*, & is derived from & closely related to *Primula* subgenus *Auriculastrum,* evidently from a fairly simple alteration of the corolla for buzz pollination. Gray (1888) recognized a single sp with numerous varieties ranging from the Atlantic to California to the Behring Straits. Formerly *Meadia* Catesby.
Seeds mature in early summer & need brief cold moist stratification. Seedlings are slow growing, producing only on true leaf the first year, & going dormant in hot dry weather. Cullina (2000) recommends carefully keeping the seedlings growing as long as possibly through frequent light fertilizing & consistent moisture. Mature clumps can be carefully separated. Root cuttings taken before growth starts in the spring are said to work well.

Dodecatheon amethystinum (Fassett) Fassett *WI AMETHYST SHOOTING STAR, aka JEWELED SHOOTING-STAR,
Habitat: Moist shade, cliffs, streambanks; in limy soil. distribution/range:
Culture: ①Cold moist stratify for 60 days & sow on top of soil (Wade). ②60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. Seeds germinate most successfully in cool soil. Best planted outdoors in the fall. (pm09). ③Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. Seeds germinate most successfully in cool soil. Sow in early winter through early spring. Seeds germinate after about 60 days of cold moist stratification. Difficult to propagate from seed (he99). ④Sow at max 5ºC (41ºF), germination irregular, often several months moist (tchn).

seed counts & rates: 1,440,000 (pm02, ew11) seeds per pound.
cultivation: Space plants 1.0-1.25'.
Description: Erect perennial, 0.67-2.0', flowers magenta (violet) key features: "Flowers magenta, petals facing backwards & upward, capsule thin-walled, 3 times as long as wide, splitting at the base, leaves basal, grows in shade." (fh)
Comments: status: Special concern in Wisconsin. phenology: Blooms April-May(June). Collect seeds in se Wisconsin in July-August (he99). Differs from *D media* in habitat & capsules. Reported as a vigorous grower from seed in one source. Flowers fragrant.
Associates: Reported as deer resistant.

Dodecatheon meadia Linnaeus *MI SHOOTING STAR, aka AMERICAN COWSLIP, BIRD'S BILL'S, EASTERN SHOOTING STAR, FALSE COWSLIP, INDIAN CHIEF, PRAIRIE POINTER, PRIDE-OF-OHIO, (meadia (MEE-dee-A) *meadia* for Richard Mead (1673-1754) English physician & botanical patron; epithet was formerly capitalized.) facu
Habitat: Mesic, dry, & sand prairies, mesic & dry savanna, woods, also in calcareous fens. "Common on railroads, in thin woods & on high & low prairies" (ewf55). distribution/range:
Culture: ①"Cold moist treatment or fall sow. Germination best in cool soils. Sow early spring or late fall. Very light cover. Grit works well. Best sown in individual pots to avoid transplanting. The slow growing seedlings are better for outplanting the second year, having been over wintered in cold frames. Plants go dormant in mid-late summer. Avoid over watering." (mfd93) ②21 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. Seeds germinate most successfully in cool soil. (pm09). ③"30 days moist stratification necessary for germination. Field sow fall." (pnnd) Fall plant or cold stratify at 40ºF for 1 month for best results. Then sow on the soil surface at 50ºF & water. (ew11) ④Sow at max 5ºC (41ºF), germination irregular, often several months moist (tchn).
seed counts & rates: 960,000 (pm01), 1,080,000 (ew11), 1,200,000 (pn02, jfn04, sh94), 1,678,373 (gna04), 1,783,398 (gna10), 1,936,304 (gna04), 3,000,000, 4,628,571 (gnhg12) seeds per pound.
Our 1995 crop germinated 41% at 20-30ºC & 78% at 20ºC (Hulsey Seed Laboratory Inc, lab number 01-2233). Plant early & often.
"*Dodecatheon meadia* General prairies; also woods. Blooms early May to early June; PINK. Harvest August to October. 1'; method #1, but cotyledons only 1st year; SEEDLING TRANSPLANT, but early growth very slow; flowers 3rd or 4th year. Sensitive to spring fires. A gratifying garden plant." (rs ma)
asexual propagation: Division.
cultivation: AES (2010) reports some salt tolerance.
bottom line: Field establishment is best as dormant seeding up thru late winter. Flipflops are known with >75% germ. Germ 25.5, 19, 10, sd 23.3, r2.0-78 (76)%. Dorm 58.6, 66, 90, sd 30.3, r0.0-90 (90)%. Test 35, 35, 35, r28-46 days. (#17)**
greenhouse & garden: Sow in fall or cold moist stratify 30 days. Dormant seed or cold moist stratify (20 days), light, successional restoration, temperature sensitive, cool soils, easy from fresh (?) or stratified seed.
Description: Erect perennial, 1.0-1.5', with showy spring flowers, white to lavender to pink, fruit is capsule with small seeds; key features: ①"Petals facing backward & upward, capsule thick-walled, less than 3 times long as wide, not splitting at the base, leaves basal grows in full to partial sun." (fh)
Comments: status: Endangered in Michigan. phenology: Blooms 4,5,6. Seeds mature in early summer. In northern Illinois, collect seeds in late June-September (October). Collect seeds in se Wisconsin in July-August (he99). Attractive cut flowers & dried seed pods. Landscaping, rock gardens, woodland & savanna gardens. The plant is ephemeral, & dormant by mid summer. Flowers are fragrant. Differs from *D amethystinum* in habitat & capsules. Seed source nursery production, & genetic source cemetery prairies, Rock River Hills & east Bureau Co, & DeKalb Co.
Associates: Pollinated by long-tongued bees, *Lepidoptera*. Attracts small mammals & songbirds. Reported to be deer resistant & to be browsed by deer.
VHFS: Sooner or later, like it or not, you will *now* call this plant *Primula meadia* (Linnaeus) AR Mast & Reveal. Add varieties.

SHOOTING STARS respond to accelerated production schedules in green house culture. Seedlings may be artificially stratified & put through several growth cycles per year. The following schedule is from Dr Paul Sørenson, Northern Illinois University. Used without permission.

Sørensen 1997 A PROPOSED TIME-LINE FOR 1997-1999 SHOOTINGSTAR SEEDLINGS

19 August 1997 - collect seeds, 21 days of cold moist*
10 October 1997 - out of cold 10-20 Oct: germination & planting
>begin 1st 90-day growth period<
18 January 1998 -complete 1st "Year"
>into cold* for 75 days<
3 April 1998 - out of cold
>begin 2nd 90-day growth period<
3 July 1998 -complete 2nd "Year"
>into cold for 75 days<
16 October 1998 -out of cold
>begin 3rd 90-day growth period<
(Note: about 10% of the seedlings may reach flowering during the third growth period)
14 January 1999 -complete 3rd "year"
>into cold for 75 days<
1 April 1999 -out of cold
>begin 4th 90-day growth period<

Planting outdoors, especially in a garden location, is entirely feasible at this point. On **Mother's Day** in the year **AD. 2000** one should have well-developed, mature flowering plants.

Good Luck!

*Cold treatments are at 4º C.

Dodecatheon yosimite-sammyi D Ingels ex Mel Blanc ROOTING TOOTING SHOOTING STAR,
Habitat: Known only to some native seed company estimators who have seen far too many badly-written seed mixes. Cf *Physostegia halitosis*.

LYSIMACHIA Linnaeus 1753 **LOOSESTRIFE** *Primulaceae Lysimachia* (li-si-MAK-ee-a or loo-si-MAK-ee-a) New Latin, from Latin, a plant, from Greek *lysimacheios,* loosestrife, from *Lysimachos,* Lysimachus *fl* 5th or 4th century BC Greek doctor; or after King Lysimachos, of Thrace (c 360-281BC) whose name means ending strife, is said to have pacified a bull with a piece of loosestrife. A cosmopolitan genus of about 150 spp of perennial herbs, rarely shrubs with leafy stems, leaves opposite or whorled, & yellow flowers. x = 8-15. Formerly *Glaux* Linnaeus, *Naumburgia* Moench, *Steironema* Rafinesque. Placed by some authors in the *Myrsinaceae.*

Lysimachia ciliata Linnaeus FRINGED LOOSESTRIFE, aka *LYSIMAQUE CILIÉE,* (*ciliatus -a -um* (ki-lee-AH-tus) fringed with hairs, for the petals [Coombes 1985], but the petioles are fringed.) facw
Habitat: Wet meadows, mesic prairies, wooded floodplains, & upland swamps.
Culture: ①60 days cold moist stratification (pm09). ②Seeds germinate after about 60 days of cold moist stratification (he99). ③Sow at Max. 5ºC (41ºF), germination irregular, often several months *tchn).
seed counts & rates: 336,000 (aes10), 624,000 (pm11), 1,254,144 (gnh15), 1,275,281 (gnhm13) seeds per pound.
bottom line: Genesis seed test data indicates a strong requirement for dormant seeding. Germ 7.0-12%. Dorm 82-88%. Test 27-32 days. (#3).**
greenhouse & garden: Moist cold stratify or dormant seed, light-cuttings.
Description: Erect perennial; 1.0-3.0'; rhizomatous; leaf stalks with white hairs; yellow flowers;
Comments: status: phenology: Blooms 6,7,8. In northern Illinois, collect seeds in late September-October. Collect seeds in se Wisconsin in September (he99). "The most common sp. Frequent in damp places." (ewf55) Genetic source Whiteside Co.
VHFS: Alternate nomenclature is *Steironema ciliatum* (Linnaeus) Baudo, as in m14.

Lysimachia hybrida RIVER LOOSESTRIFE, aka HYBRID LOOSESTRIFE, (*hybridus -a -um* hybrid, mixed, of mixed parentage, mongrel, between two spp, sharing characteristics of both, from Latin *hybrida*, hybrid,

noun, from *hibrida*, a mongrel or hybrid, & *–us*, adjectival Latinizing suffix.) obl
Habitat: Marshes.
Culture: ① No pre-treatment necessary other than cold, dry stratification (pm09). 1,040,000 (pm02), 1,123,723 (gnhm06), 3,781,000 (gnh11) seeds per pound.

bottom line: Genesis seed test data indicates a strong requirement for dormant seeding. Germ 10.2, 12, 12, sd 5.4, r1.0-18 (17)%. Dorm 82.7, 83.5, na, sd 6.8, r70-92 (22)%. Test 34, 34, 42, r25-42 days. (#6).**
Description: Erect perennial; stems 2-3'; flowers yellow;
Comments: status: phenology: Blooms July, August.
VHFS: Alternate nomenclature is *Steironema hybridum* (Michaux) Rafinesque ex BD Jackson, as in m14.

Lysimachia hybrida

Lysimachia lanceolata Walter LANCELEAF LOOSESTRIFE, (*lanceolatus -a -um* (lan-kee-o-LAH-tus) lanceolate, spear-shaped, lancelet-like in form, New Latin from *lancea,* lance or spear, *-olus- a- um-,* diminutive, & *-atus*, possessive of or likeness of, for the lanceolate leaves.)
Habitat: Mesic prairies & savannas. distribution/range: Not native in Wisconsin.
Culture: ①Seeds germinate after about 60 days of cold moist stratification (he99). ②Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germ (tchn).
Description: Erect perennial, 1.0', very glabrous; colonial, flowers yellow.
Comments: status: phenology: Blooms 7. In northern Illinois, collect seeds in October. Collect seeds in se Wisconsin in August (he99). Known from the base of a dune's north slope, LeBahn's Sand Prairie, Bureau Co & Genesis' cow pasture, Whiteside Co.

"Frequent in marshy places & on prairies high & low. Very stoloniferous, often forming large patches on low prairies & on rather dry ones as well. It is quite variable as to size of plant, leaf width, &c." (ewf55)
VHFS: Alternate nomenclature is *Steironema lanceolatum* (Walter) Gray, as in m14. [*Steironema heterophyllum* **(**Michaux) Baudo]

Lysimachia nummularia Linnaeus MONEYWORT, aka CREEPING CHARLIE, CREEPING JENNY, (*nummularius -a -um* money-like, round & flat like a coin, from Latin *nummus*)
Introduced from Europe. Invasive, still commonly sold as an ornamental, several selections available, as seen on HGTV. The leaves have numerous tiny maroon dots.

"Common in stream bottoms near towns especially in Rock River bottom at Rockton" (ewf55).

Lysimachia quadriflora Sims NARROW-LEAVED LOOSESTRIFE, aka FOUR-FLOWERED LOOSESTRIFE, PRAIRIE LOOSESTRIFE, SMOOTH LOOSESTRIFE, (*quadriflorus -a -um* four-flowered) obl
Habitat: Wet savannas, mesic to wet prairies, calcareous soils. distribution/range:
Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ②Seeds germinate after about 60 days of cold moist stratification (he99). ③Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germ (tchn). 1,201,058 (gnh15), 1,240,437 (gnh13), 1,351,190 (gnhm11) 1,408,000, 1,440,000 (pm02, aes10) seeds per pound.

bottom line: Dormant seeding is strongly required. Germ 14.3, 7.0, na, sd 16.3, r1.0-42 (41)%. Dorm 78.5, 86, na, sd 16.7, r50-92 (42)%. Test 33, 32, na, r27-40 days. (#6).**
Description: Erect, herbaceous perennial, native forb; 1.0-2.0'; leaves very narrow; flowers yellow, dark streaked or spotted; similar to *L lanceolata*.
Comments: status: phenology: Blooms 6,7,8. In northern Illinois, collect seeds in October-early November. Collect seeds in se Wisconsin in September (he99). Attractive cut flowers. Seed sources production from genetic sources in Kane, DuPage & Will Cos.

Other common plants, which presented themselves at different places on our route through the prairies." *Lysimachia quadriflora as L. revoluta* Nutt. (Short 1845).

"Perhaps more common than *L lanceolata*. Almost always in low prairies." (ewf55)
VHFS: Alternate nomenclature is *Steironema quadriflora* (Sims) Hitchcock, as in m14.

Lysimachia quadrifolia Linnaeus WHORLED LOOSESTRIFE, (*quadrifolius -a -um* four-leaved, with four leaves or leaflets, with four leaves diverging from one point.) upl
Habitat: Wet meadows, essentially a wetland plant with us. distribution/range: Known from Gold Town Wetland, Bureau Co.
Culture:
Description: Erect perennial, 1.0-2.0'
Comments: status: phenology: Blooms 6,7,8. In northern Illinois, collect seeds in October. Tolerates acidic soils. Weakley (2012b) notes that the sp normally has whorled leaves, but small & immature plants may have opposite leaves only.

Lysimachia terrestris (Linnaeus) Britton, Sterns, & Poggenburg SWAMP CANDLES, aka BOG-CANDLES, (*terrestris -is -e* of the earth, terrestrial, growing in the ground; growing along the ground, growing lying on the ground.)
Culture: ① Further germination pretreatments not sure? (pm)?

"Locally plentiful in wet places in Sugar River sand area; the slough marsh west of Shirland, the old drainage ditch west of Yale bridge in Laona Township, low prairies in Shirland Township & occasional in the bottoms of the north & south branches of Kent Creek" (ewf55).

Lysimachia thrysiflora Linnaeus TUFTED LOOSESTRIFE, (*thrysiflorus -a -um* (thrys-i-FLO-rus) with flowers in a thryse, a type of inflorescence, from Latin *thrysus*, a staff.)
Habitat: Marshes, bogs, shallow shaded stagnant pools. distribution/range: Europe, Asia, North America.
Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09).

seed counts & rates: 1,312,000 (pm07), 1,520,938 (gnam07) seeds per pound.

bottom line: Dormant seeding is significantly to strongly required. Germ 45.4, 52, na, sd 26.8, r6.0-81 (750%. Dorm 43.2, 33, na, sd 25.9, r15-90 (75)%. Test 33, 35, 35, r26-37 days. (#5).**
Description: stem simple, smooth; leaves sessile, lanceolate, opposite, acute, paler beneath; racemes lateral, long peduncled; key features:

"A peculiar looking plant because of its simple succulent stem & much reduced lower leaves. It grows in shallow water & very marshy places in Coon Creek bottom. Also known in the boggy places in Boone Co north of Capron." (ewf55)
Comments: status: phenology: Blooms 5,6. Seed source Lake Co, Illinois.
Associates:
VHFS: Alternate nomenclature is *Naumburgia thyrsiflora* (Linnaeus) Duby, as in m14.

Lysimachia vulgaris Linnaeus GARDEN LOOSESTRIFE, (*vulgaris -is -e* (volga'ris or vul-GHA-ris) common, ordinary, usual, vulgar, from Latin *vulgāris*, from *vulgus*, the common people.)
Native of Europe, introduced & naturalized.

"We have found this escape persisting on the muddy bank of Rock River near the IC RR bridge in Rockford" (ewf55).

NAUMBERGIA Moench **TUFTED LOOSESTRIFE.**
m14

STEIRONEMA Rafinesque **LOOSESTRIFE**
m14. Grammatically neuter.

TRIENTALIS Linnaeus 1753 **STARFLOWER** *Primulaceae Trientalis* New Latin, probably from Latin *triantalis* vessel, receptacle, from *trientalis* having a third of a foot, from *triens, trientis,* third part, & *-alis*. Alternately *tri,* three & *anthos*, three part flower. A small genus of 2 spp of delicate Eurasian & North American herbs having a whorl of entire leaves & several white stellate flowers on slender peduncles followed by 5-valved capsules. Placed by some authors in the *Myrsinaceae.*

The hydrophilic seeds ripen in midsummer. Seeds are difficult to spot so flag plants when in bloom. Sow immediately after picking. Cullina code B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, * seeds are hydrophilic, intolerant of dry storage. Rhizomes can be divided in summer as the plants yellow. (cu00)

Trientalis borealis Rafinesque *GA, IL, KY, TN STARFLOWER, aka NORTHERN STARFLOWER,
Habitat: Moist woods. distribution/range: Rare, northern cos.
Description: Star-shaped pentamerous (or 7+-merous) flowers; key features: Flowers 7 or more parted; leaves clustered in a whorl at the top of the stem. "*Trientalis* can be recognized by its terminal whorl of leaves (4-10 cm long), the one to several flowers born on terminal, slender pedicles, each flower typically with 7 petals, (inconspicuously united at the base), each petal acuminate. The plant is reminiscent of a white-flowered *Lysimachia* with only one whorl of leaves." (w07)
"Found growing with *Lycopodium lucidulum* in a damp place in the sandy mixed woods east of Roscoe. The nearest station is in a ravine west of Oregon in Ogle Co where it grows with *Dryopteris disjuncta* & *Cornus canadensis* under *Pinus strobus*." (ewf55) "The attractive white corollas, usually with 7 petals united only at the very base, are open in the late spring & they drop intact – like fallen stars" (Voss 1996).
Comments: status: Endangered in Georgia & Kentucky. Threatened in Illinois & Tennessee. phenology: Blooms June July.
Associates: ethnobotany: Roots included in hunting medicine smoked to attract deer by Ojibwa (sm32)

PYROLACEAE SHINLEAF FAMILY

CHIMAPHILA Pursh 1814 **PRINCE'S PINE** *Pyrolaceae Chimaphila* New Latin, from Greek *cheima* winter & New Latin *-phila*; akin to Greek *cheimōn* winter, Old Slavic *zima*, Sanskrit *himā*. Small herbaceous genus of 4-5 spp of subshrubs of temperate & tropical America & Eurasia, having long creeping subterranean shoots, thick shining leaves, & white or pinkish flowers in terminal clusters. Sometimes placed in the *Ericaceae.*

"The *Chimaphila* was long united to the *Pyrola.* Though they possess strong botanical affinities, they differ quite as much in habit, & sensible, as well as medicinal properties, as other genera of the natural order *Ericae*. Such divisions of the Linnaean genera, where the " natural genus gives the characters," ought to be adopted. But divisions founded on any artificial character, however constant & decisive, injure the science. (Eaton 1829)

Chimaphila umbellata (Linnaeus) WPC Barton, **C umbellata** (Linnaeus) Nuttall WINTERGREEN, aka BITTER WINTERGREEN, LOVE-IN-WINTER, PIPSISSEA, PIPSISEWA, PIPSISSEWA, PRINCE'S PINE, *Ga'gige'bug,* everlasting leaf (Ojibwa), Common name from Cree *pipisisikweu*, literally, it (its juice) breaks it (ie, a stone in the bladder) into small pieces.
Habitat: Woods & clearings.
Culture: Midsummer cuttings from non-flowering stems, or rhizome cuttings. Plants may self-sow.

"This grows sparingly in sandy oak woods east of Roscoe & also north of Shirland. Over a period of years it has seldom been seen to flower." (ewf55 as *C corymbosa* Pursh)
Comments: status: phenology: Blooms Seed matures early fall.
Associates: ethnobotany: Used as medicinal beverage by Ojibwa (sm32). Ojibwa medicine for disease of eyes (den28). Den28 lists *Chiogenes hispidula* (L) T&G, CREEPING SNOWBERRY, *Wabos'obugons',* small rabbit leaf, as Ojibwa food.

PYROLA Linnaeus 1753 **SHINLEAF, PYROLA** *Pyrolaceae Pyrola* (PI-ro-la) pear-like (compare the leaves), New Latin, probably from Latin *pyrum, pirum* pear, & *-ola* –ole; the diminutive of *Pyrus* which has

similar leaves. Turner Anglicized the German name *Wintergrün* as WINTERGREEN. A genus of 30-35 spp of subshrubs, perennial herbs, circumboreal, but also in Sumatra & Guatemala. Usually placed in the *Ericaceae,* but placed by some authors in *Pyrolaceae.* Its inclusion in *Ericaceae* or *Pyrolaceae* is controversial.

Pyrola elliptica Nuttall WINTERGREEN, aka SHINLEAF, (*ellipticus -a -um* (e-LIP-ti-kus) elliptic, shaped like an ellipse, for the elliptic leaves)
Associates: ethnobotany: Used as medicinal plant by Ojibwa (Gilmore 1933)

Pyrola rotundifolia Linnaeus SHINLEAF, (*rotundifolius -a -um* (ro-tund-I-FO-lee-us) round-leaved, with round leaves.)
Habitat: Woods & clearings, moist woods. distribution/range: Very rare, Ogle Co.
Associates: ethnobotany: Dried leaves used by Ojibwa for tea drunk for good luck in hunting (sm23, 430). Leaves used for tea for hunting success by Ojibwa (sm32)
VHFS: [*P rotundifolia* var *americana* (Sweet) Fern]

Pyrola americana Sweet ROUNDED SHINLEAF,
"Found in a sandstone ravine west of Oregon but not seen elsewhere (*P rotundifolia* Michaux)." (ewf55)

Pyrola elliptica Nuttall ELLIPTIC SHINLEAF
"Not uncommon in oak woods usually in dry places; woods east of Roscoe, Mulford woods, Kishwaukee River gorge & the upland woods in the sand area" (ewf55).

Pyrola secunda Linnaeus ONE-SIDED SHINLEAF
"In January 1946 we found a very small patch of this in the sandy woods east of Roscoe growing with shinleaf, prince's pine, lycopodium, rattlesnake plantain & trientalis. We watched it for several years but it did not bloom." (ewf55) Weakley (2007) uses *Orthilia secunda* (L) House.

RHAMNACEAE AL de Jussieu 1789 **BUCKTHORN FAMILY** A family of about 50-52 genera & 900-925 spp, mostly trees, shrubs, & lianas, cosmopolitan. Fruit is a capsule or berry with one albuminous seed in each cell.

CEANOTHUS Linnaeus 1753 **NEW JERSEY TEA, REDROOT** *Rhamnaceae Ceanothus* (kee-a-NO-thus, commonly see-a-NO-thus) from the Greek κεάνωθος, *keanothos*, from Theophrastus, a name for a spiny shrub or a kind of thistle, the name for the corn thistle, *Carduus arvensis*. A genus of about 55 spp of deciduous, evergreen, & semi-evergreen shrubs, some becoming tree-like, mostly in California. Two species grow east of the Mississippi, both grow in Illinois, one rare, one more common. Fruits are capsules, obtusely triangular, 3-celled, 3-seeded, surrounded at the base by the persistent tube of the calyx.

In spite of some childish cheddarhead's nonsense in seed lists, these are not legumes!!!!!!! *Ceanothus* has a symbiotic relationship with nitrogen-fixing actinorhizal *Frankia.* Inocula not available. AM mycorrhizal inoculant may help. Seeds of *C velutinus* are capable germination after remaining dormant in the soil for several hundred years (Conard et al 1985).

Fruits ripen late summer to early fall. *C herbaceous* ripens 2-4 weeks before *C americanus*. Ripe seeds are forcefully thrown from ripe pods, so harvest brown to black fruits when the first empty pods are noted. Place fruits in closed paper bags, or in a clean area where the ejected seeds can be swept up. Sandpaper scarification with stratification gives some results. Midwestern species are best grown by the hot water method followed by dormant seeding (90 days cold moist stratification). Poor lightly boiling water over the seeds and allow to steep overnight. Plant immediately and place in an unheated coldframe. Pot seedlings individually in a well drained mix. Inoculate container plants with *Frankia* bacteria using a slurry of a cup of soil from around wild plants mixed with a gallon of water, and water the plants. 1st year growth is slow, 2nd year rapid, blooming 2-3 years. (after cu02)

Softwood cuttings from vigorous new wood in early summer treated with 1000 ppm IBA in 1:3 peat perlite mix.

Ceanothus americanus Linnaeus NEW JERSEY TEA, aka JERSEY TEA, JERSEY TEA CEANOTHUS,

MOUNTAIN-SWEET, MOUNTAIN SWEET, MOUNTAIN-TEA BOHEA, REDSHANK, REDROOT, SPRANGLES, WALPOLE TEA, WILD PEPPER, WILD SNOWBALL, upl

Habitat: Dry open woods, roadsides, & gravelly shores, prairies & open savannas, mesic, dry, & sand prairies; mesic & dry savannas; prairies, rocky wooded bluffs. distribution/range:

Culture: ①"In fall scarify seed then sow, or scarify seed then moist cold treat. Hot water treatment then moist cold treatment recommended by some. Light to medium cover. Unreliable germination." (mfd 1993). ②Hot water treatment, or seeds need scarification. 70 days cold moist stratification (pm09). ③Seeds need scarification. Hot water treatment. Bring water to boil, add seed, boil for 1½ minutes. Then cold moist stratify (70). (he99) ④Fall plant or cold stratify for up to 2 to 3 months for best results. Sow just below the soil surface at 70ºF & water. (ew11) ⑤Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn). ⑥Somewhat difficult to transplant. Scarification followed by hot water treatment. (pnnd).

104,176 (gna05), 110,234 (gna04), 112,000 (pn02, jfn04, shirley), 112,600 (pm02), 112,795 (gna06), 116,800 (ew11), 129,548 (gn03), 131,200 (aes10), 135,320 (gnh02), 156,768 (gnh02), 158,769 (gna04) seeds per pound.

"*Ceanothus americanus* Mesic to dry, sand prairie. Blooms late June to late July; WHITE. Harvest September. 2'; method #1, but germination low. SEEDLING TRANSPLANT. Desirable shrub blooming on new wood, but in cultivation plants die unpredictably. Fruits explode, so time of seed collection short." (rs ma)

asexual propagation: Cuttings.

cultivation: Space plants 2.0-3.0'. Full sun, mesic to dry soils. Hardy to zone 4, possibly 3.

bottom line: Dormant seed for field establishment, scarification may be necessary. Data is unusual due to inter-seedlab use of dorm vs hard seed. Seed hard & or strongly dormant. Germ 12.6, 6.5, 2.0, sd 16.1, r2.0-66 (64)%. Dorm 73.6, 78, na, sd 17.7, r29-88 (59)%)%. Hard 43.2, 35, 30, sd 18.9, r25-69 (44)%. Dorm+hard sd 22.6%. Test 34, 33, 28, r21-49 days.**

greenhouse & garden: GA3 gives best results in greenhouse (gni). Hull, float seed, boil seed, dormant seed or moist cold stratify (90 days). Temperature sensitive.

Description: Shrub (sub-shrub), 3-4', compact, rounded; prolific white flowers in June to July, flowers perfect; flat clusters of 3-parted seed pods, fruit is a 3-lobed, ± dry drupe, 1/5" wide, splitting into 3 nutlets.

Comments Blooms 6,7,8. In northern Illinois, collect seeds in August-September. Collect seeds in se Wisconsin in September-October (he99). Cut flowers, attractive dried seedheads, landscaping. Non-leguminous, nitrogen-fixing shrub, when burned performing like a forb. Some stands self-sow with prescribed burning. Seed source nursery production genetic source railroad remnants, Greenville Township, Bureau Co, & West Brooklyn, Lee Co. Contrary to some wingnut nursery lists, *Ceanothus* is not a legume. *Ceanothus* does not like disturbance. Plant in its permanent location. Curbstone data suggests that Roundup® applied to grasses near NEW JERSEY TEA during the growing season may translocate through mycorrhizal links & kill the NEW JERSEY TEA. Roundup® applied to weeds near NEW JERSEY TEA while it is dormant are killed.

Ceanothus americanus and *C intermedius* were recognized by Short (1847). "There are, indeed, comparatively speaking, but few plants, except the grasses, (which are gregarious every where and are intermixed in greater or less degree and variety among all the other plants of the prairie,) which may be considered as indigenes of the prairie region generally. ---Among these we may mention, as occurring most constantly, and under greater diversity of soil and situation that any others, … *Ceanothus intermedius,* (which here takes the place of *C. Americanus* in the Barrens of Kentucky,)" *Ceanothus americanus* L as *C intermedia* Pursh *& C americanus* L, (Short 1845)

"Common in woods, sandy places, roadsides & railroads, flowering about July 1st." (ewf55)

Associates: *Ceanothus americanus* has a symbiotic relationship with nitrogen-fixing actinorhizal *Frankia* & arbuscular mycorrhizal fungi

Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera, Diptera, Lepidoptera, Coleoptera*, & *Hemiptera*. Attracts butterflies & many other insects. Host & nectar source for *Celastrina ladon* SPRING AZURE BUTTERFLY. Larval host of *Celastrina neglecta* SUMMER AZURE BUTTERFLY, *Erynnis martialis* MOTTLED DUSKYWING, & *E martialis* MOTTLED DUSKYWING SKIPPER. Nectar source for *Achalarus lyciades* HOARY EDGE SKIPPER, *Calycopis cecrops* RED-BANDED HAIRSTREAKS, *Erynnis icelus* DREAMY DUSKYWING SKIPPER, *Euphyes vestris* DUN SKIPPER, *Nastra lherminier* SWARTHY SKIPPER, *Polites origines* CROSSLINE SKIPPER, *Polites peckius* PECK'S SKIPPER, *Satyrium acadica* ACADIAN HAIRSTREAK BUTTERFLY, *Satyrium calanus* BANDED HAIRSTREAK BUTTERFLY, *Satyrium*

edwardsii EDWARDS' HAIRSTREAK BUTTERFLY, *Satyrium caryaevorum* HICKORY HAIRSTREAK BUTTERFLY, *Satyrium liparops* STRIPED HAIRSTREAK BUTTERFLY, *Satyrium titus* CORAL HAIRSTREAK BUTTERFLY, & *Wallengrenia egeremet* NORTHERN BROKEN-DASH SKIPPER. Also attracts small mammals, hummingbirds, songbirds, & upland game birds; of intermediate wildlife value. Occasionally heavily browsed by wildlife, including deer & rabbit. Also said to be deer resistant.

ethnobotany: Flowers are saponaceous. Tea can be made from the leaves. Used as medicinal beverage by Menominee & Ojibwa (sm23, Gilmore 1933)

VHFS: Cf varieties in m14 & w12, 3 total.

Ceanothus herbaceus Rafinesque *IL, IN RED ROOT, aka INLAND NEW JERSEY TEA, NEW JERSEY TEA, PRAIRIE REDROOT, SMALLER RED-ROOT, *Odiga'dimanido',* no translation (Ojibwa), (*herbaceus -a -um* herbaceous, herb-like, not woody; with a succulent stem; grassy green.) upl

Habitat: Dry to dry-mesic prairies, jack pine savannas, & pine barrens. Sandy soils. distribution/range: "Low dunes, sandy soil, rare; Carroll, Cook, Jo Daviess, Lake, Ogle, Whiteside, & Winnebago cos (m14).

Culture: ①Hot water treatment, or seeds need scarification. 60 days cold moist stratification (pm09). ②Seeds need scarification. Hot water treatment. Bring water to boil, add seed, boil for 1 ½ minutes. Then cold moist stratify. (he99)

seed counts & rates: 133,408 to 160,000 (pm2002) seeds per pound.

asexual propagation: Stem cuttings.

greenhouse & garden: Hull, float seed, boil seed, then dormant seed or moist cold stratify (90).

Description: Small shrub with white flowers, 1.5-2.5'

Comments: Blooms 5,6. In northern Illinois, collect seeds in July. Collect seeds in se Wisconsin in July-August (he99). Attractive cut flowers, dried seed heads, landscaping. In spite of the specific epithet, a more woody sp than *C americanus,* flowers about a month earlier than *C americanus*. Zone 3.

"A high prairie shrub that is rare with us. On a gravel hill-top south of Broadway on the C & NW Ry row is a single plant that has persisted for years; on North Rockton avenue road near Harrison - Rockton road (Ill Rt No 75) in a high prairie area are several well developed plants. Not found in Sugar River sand area. Its flowering time is late May." (ewf55)

Associates: Attracts butterflies. Rabbits eat small plants to the ground in winter.

ethnobotany: Used as medicinal plant by Ojibwa for lung trouble & emetic (den28).

VHFS: [*Ceanothus herbaceus* Raf var *herbaceus, C herbaceus* Raf var *pubescens* (T&G ex S Watson) Shinners, *C ovatus* auct non Desf, *C ovatus* Desf f *pubescens* (T&G ex S Watson) Soper, *C ovatus* Desf var *pubescens* T&G ex S Watson, *C pubescens* (T&G ex S Watson) Rydb ex Small] Also *Ceanothus ovalis* Bigelow. Some older floras have both *C herbaceus* & *C ovalis*.

RHAMNUS Linnaeus 1753 **BUCKTHORN** *Rhamnaceae Rhamnus* (RAM-nus) New Latin or Late Latin, from Greek ῥάμνος, *rhamnos,* the name of a shrub, buckthorn. Deciduous & evergreen trees & shrubs. Fruits are drupes with 2-4 cartilaginous nuts. 2nd century Greek physician Galen recorded the virtues of this genus, including protection from witchcraft, demons, poisons, & headaches. Bark was popular as a laxative after 1300's. The 'berries' of many spp are a violent purgative.

Some species are segregated into *Frangula* P Miller 1754. A genus of about 50 species, shrubs & small trees of the northern hemisphere. "The distinctions between *Frangula* and *Rhamnus* are many and meaningful; their separation at the generic level seems warranted based on morphological and molecular analyses (Richardson et al 2000a, Bolmgren & Oxelman 2004)" (w12).

Rhamnus alnifolia L'Héritier ALDER BUCKTHORN, aka AMERICAN ALDER BUCKTHORN, DWARF ALDER,

Description: Dense, deep green, colonial shrub. Fullest in good sun. In the se USA it grows in mafic or calcareous (dolomitic) seeps (w07). Foliage similar to *R frangula*, but only grows to 2.5'. Yellow green fall color. Zone 2.

Associates: ethnobotany: Bark used as medicinal plant by Pottawatomie (sm33). *R frangula* bark used as laxative, wood used for shoe lasts, nails, veneer, charcoal used for gunpowder, bark for yellow dye, berries green dye. ☠ The berries are mildly poisonous. Maybe they just mildly kill you?

Rhamnus cathartica Linnaeus COMMON BUCKTHORN,

"An introduced small tree that stands pruning & was formerly used for hedges. It is now a common escape in wet & dry places, swamps, woods, fencerows, &c. The largest tree seen is 15 inches in diameter 4 feet from the ground where it divides." (ewf55)

Leaves out before many native tree spp, which is problematic for many woodland ephemerals that complete all or most of their annual cycle before the woodland canopy naturally developed. Buckthorn leaves have high nitrogen levels (2.2%), their litter decomposes faster than the litter from oaks, increasing the nitrogen levels in woodland soils, & eliminates the leaf litter layer. Buckthorn also alters the soil chemistry in a manner that prevents native plants from colonizing the area. Lowers pH.

Associated with invasive European earthworms, *Lumbricus* sp, which also help the removal of the leaf litter layer.

Heneghan et al (2006). "The invasive shrub European buckthorn (*Rhamnus cathartica* L) alters soil properties in Midwestern US woodlands." *Applied Soil Ecology* 32:142–148.

KS Knight, JS Kurylo, AG Endress, JR Stewart & PB Reich, 2007, Ecology & ecosystem impacts of common buckthorn (*Rhamnus cathartica*): a review, Biological Invasions, 2007, Volume 9, Number 8, Pages 925-937.

Rhamnus frangula Linnaeus EUROPEAN ALDER-BUCKTHORN,
Introduced from Europe. "Extensively planted about Camp Grant. An occasional escape is found, as in Coon Creek bottom." (ewf55)
This sp is sometimes called *Frangula alnus* P Miller (m14).

Rhamnus lanceolata Pursh LANCE-LEAVED BUCKTHORN,
"The only native sp & not common. Edge of woods & wooded river banks; Tullock woods northwest of Rockford, Page Forest Tract & Kishwaukee River gorge." (ewf55)

RUBIACEAE AL Jussieu 1789 **MADDER OR COFFEE FAMILY** From *Rubia*, red, from *ruber*, a name used by Pliny for *madder*, the name of the dye obtained from *Rubia tinctoria*. Whatsamaddau? or Whatsamadder U, Bullwinkle's *alma mater.* An important family yielding dyes, quinine, ipecac, & coffee. Fruits are various, seeds one, few, or many in each cell.

CEPHALANTHUS Linnaeus **BUTTONBUSH** *Rubiaceae Cephalanthus* with flowers in a head from Greek κεφαλή, *kephale*, head, & ἄνθος, *anthos*, flower, for the flowers in a headlike spike. A genus of about 6 spp of tropical & temperate America. Shrubs with opposite leaves & flowers in globose heads without an involucre.

Cephalanthus occidentalis Linnaeus BUTTON BUSH, aka COMMON BUTTON BUSH, (*occidentalis -is -e* of the west, western, from Latin *occidens*, *occidentis*, noun, the west, the direction of the setting sun, & *-alis,* adjective suffix of or pertaining to, as opposed to *orientalis* of China.) The common name is from the distinguishing characteristic of white, spherical, flower heads, 1" diameter, resembling the globular inflorescence of SYCAMORE. Obligate
Habitat: Wet meadows, upland swamps, streams, lake shores, swamps, ponds, sloughs, backwaters of rivers; wet ground, margins of swamps, ponds, & marshes, backwaters of rivers. distribution/range:
Culture: COMMON BUTTONBUSH ripens in September & October. Some say seed should be stored in fresh water at 34°F, but we do not see this as necessary. ①Germination is prompt with no pretreatment. Germination epigeal. (yy92) ②No pre-treatment necessary other than cold, dry stratification (pm09). ③Collect fruits when red-brown, dry & store in airtight containers or sow immediately. No pretreatment needed. Seeds will germinate in 10-14 days. (dh87) ④BUTTONBUSH has an absolute requirement for light. Fresh seed, cold stored seed, & warm stored seed germinate equally well. (nd91) ⑤Sow at 20ºC (68ºF), germinates in less than two wks (tchn).

⑥Code A seeds will germinate within 4 weeks sown at 70ºF, and H seeds require light to germinate. Seeds will germinate if handled like Rhododendron. Semihardwood cuttings taken in summer dipped in 1000 ppm IBA root in water or peat-perlite mix. (cu02)

seed counts & rates: 96,000 (pm02), 116,304, 116,800 (aes10), 122,902 (gnh02), 134,000 (yy92), 139,951 (gnhe06), 200,000 (jfn04) seeds per pound. Seed & transplants may have seasonally limited availability.

asexual propagation: Easy by cuttings in greenhouse, fresh cut or calloused (a real no brainer, put stick in soil, stick grows, sometimes even when planted upside-down). Can also be established in the field from dormant cuttings in moist soils early in the season. Rooted cuttings survive well, but cuttings need time to root before flooding.

cultivation: Zone 3. Transplants easily, BR & B&B. Growth rate medium, 1-2' per year. Plant with caution, may form monocultures. Performs well in *in situ,* living, rich, mesic soils. Reported to tolerate water depths of 2-3'. Tolerant of permanently to semi-permanently flooded conditions. 10" seedlings have been known to survive complete submergence for up to 45 days, but don't bank on this. Nutrient load tolerance moderate. Salt tolerance moderate to high. Siltation tolerance moderate. Partial to full sun, tolerant of some shade, but may decline. pH 6.0-8.5.

bottom line: Spring seeding works most years, but 1/3rd of lots are significantly to strongly dormant. Flipflop, typically strong germ. Germ 62.6, 79, na, sd 32.8, r2.0-93 (91)%. Dorm 21.1, 1.0, 0.0, sd 32.7, r0.0-92 (92)%. Test 31, 31, 24, r21-42 days.**

greenhouse & garden: Can be direct seeded on wet mudflats & shorelines. Small seed grown plugs may be planted directly on site on as close as 5' centers. One-third of lots need cold moist treatment, plus good seed soil contact, & light;

Description: Native, "tropical-appearing", large, wetland, deciduous shrub, almost a small tree, 3-15'; simple, deciduous, "tropical" leaves, one of the last plants to leaf out in spring, needing temps near 80˚F; globes or round clusters of white, perfect flowers in June to August, slightly fragrant; fruits are round, ball-like clusters of cone-shaped nutlets (or small capsules in one source), 1" diameter; occasional plants have red seed heads;

Comments: status: phenology: Blooms 6,7,8. Great in landscaping, moist rain gardens, wetland restoration, useful in lower & upper shoreline zones, & for wetland erosion control & stream bank stabilization, but potentially aggressive. Seed source nursery production, genetic origin Rock River backwaters, & wet ditches north of Jack Ass Corners, Bureau Co.

"Roughs" along "the margins of 'sloughs,' and along the courses of small streams" *Cephalanthus occidentalis* L (Short 1845).

"It is common on streambanks, sloughs, & other wet places often forming dense thickets in shallow water but is never more than a sprawling shrub. Sloughs of Sugar & Pecatonica Rivers & Killbuck Creek." (ewf55).

Associates: Attracts bees & butterflies. Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera*, *Diptera*, *Lepidoptera.* Larval host for *Aellopos titan*, TITAN SPHINX MOTH *Darapsa versicolor,* HYDRANGEA SPHINX MOTH *Eudryas grata,* BEAUTIFUL WOOD-NYMPH MOTH. Nectar source for *Achalarus lyciades* HOARY EDGE SKIPPER, *Anatryone logan* DELAWARE SKIPPER, *Atalopedes campestris* SACHEM, *Epargyreus clarus* SILVER-SPOTTED SKIPPER, *Erynnis horatius* HORACE'S DUSKYWING SKIPPER, *Euphyes conspicua* BLACK DASH SKIPPER, *Euphyes dion* DION SKIPPER, *Lerema accius* CLOUDED SKIPPER, *Panoquina ocola* OCOLA SKIPPER, *Poanes zabulon* ZABULON SKIPPER, & *Vanessa cardui* PAINTED LADY BUTTERFLY. Seeds provide food for insects. Plants provide nectar & habitat for insects. Good nesting habitat for birds. Attracts marsh birds & shorebirds, of low wildlife value. Waterfowl, marshbirds, & shorebirds eat the seeds. Aquatic furbearers (esp beavers & muskrats) eat the seeds, twigs & foliage. Deer eat the twigs & foliage. No serious insect or pest problems.

http://www.fs.fed.us/database/feis/plants/shrub/cepocc/all.html

DIODIA Linnaeus 1753 New Latin, from Greek *diodos* thoroughfare, from *dia-* & *hodos,* way, & New Latin *-ia*; from the frequent growth of these plants by the wayside; alternately Greek δις, *dis,* twice, & ὀδούς, *odous*, tooth, referring to the two calyx teeth crowing the ovary. American herbs, chiefly tropical, flowers small, white axillary, sessile, solitary or few; fruit as in *Spermacoce*, except that the (2 or 3) 1-seeded, separable carpels are both indehiscent; seeds oval, peltate. (*Spermacoce* fruit dry, 2-celled, crowned with the calyx, separating into 1 open & 1 indehiscent carpel; seeds 2, peltate, furrowed on the face.)

Diodia teres Walter POORJOE (*teres* terete, circular in cross section, cylindrical, cylindrical & usually tapering.)

"Dunes, sandy roadsides, glades, & other dry habitats" (w12). Species is known from the disturbed, sandy/field prairie edge of Greg Wahl's prairie adjacent to Deer Valley Country Club. Erect or ascending, hairy or scabrous, corolla funnel-form, with a wide tube, twice longer than the calyx.

Blooms August-September.

GALIUM Linnaeus 1753 **BEDSTRAW, CLEAVERS, WOODRUFF** *Rubiaceae Galium* (GA-lee-um) New Latin, from Greek *galion*, bedstraw, from Greek γάλα, *gala,* milk, referring to the flowers of *G verum*, Lady's Bedstraw, formerly used to curdle milk. 300 spp of annual & perennial herbs, cosmopolitan. Fruits are nutlets; carpels 2, united, separating into 2, 1-seeded, indehiscent nutlets. BEDSTRAW filled the manger in Bethlehem. BEDSTRAW spp were used as a mattress stuffing because the clinging stems hook together & do not easily matt.

Galium aparine Linnaeus CLEAVERS, aka ANNUAL BEDSTRAW, GOOSEGRASS, SPRING CLEAVERS, STICKY-WILLY , (*aparine* bedstraw, from Greek απαριη, *aparia (*η?), or απαρινη, *aparine*(η?), a name used by Theophrastus for the plant CLEAVERS (GOOSEGRASS), meaning seizing, clinging, holding on, scratching.)
Habitat: Rich woods, thickets, seashores, & waste ground. distribution/range: A weedy sp, of nearly cosmopolitan distribution with native & introduced genotypes.
Comments: status: Native in part. phenology: Blooms May-June.
"A common annual weedy sp found in most low woods & thickets" (ewf55).
Associates: ethnobotany: Used as medicinal beverage by Ojibwa.

Galium boreale Linnaeus NORTHERN BEDSTRAW, (*borealis -is -e* (bo-ree-AH-lis) northern, of the North Wind, of the North, from Greek βορεας, *boreas, boreae*.) fac
Habitat: Wet meadows, dry-mesic to wet mesic prairies, shores, & woodland borders. distribution/range: Circumboreal.
Culture: ①"Moist cold treatment, or fall sow, or no pretreatment necessary. Light cover. Very good germination." (mfd93) ②No pre-treatment necessary other than cold, dry stratification (pm09). No pre-treatment needed. Sowing outdoors in the spring is the easiest method (he99). ③Fall plant or cold stratify for 2 to 3 months for best results. Sow just below the soil surface at 70ºF & water. (ew11) ④Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn).
seed counts & rates: 114,688 (wns01), 831,502 (gnh13), 920,892 (gnam11), 1,008,000 (aes10), 1,120,000 (pm02, ew11), 1,227,027 (gnam04), 1,280,677 (gna07) seeds per pound.
availability: Availability is limited to the extent this sp should never be part of any general seed mix. Seed is perpetually in very short supply & of limited provenance. If you have prop stock, you are fortunate.
"*Galium boreale* Mesic prairie. Blooms late June, early July. harvest August. SEEDLING TRANSPLANT; spreads rapidly by long rhizomes, but is not weedy." (rs ma)
asexual propagation: Division in spring.
cultivation: Space plants 1.5-2.0'. Full sun to partial shade, mesic soils. Aggressively rhizomatous, spreading readily. Do not plant near your special plants, or in small gardens.
bottom line: Limited test data indicate significant to strong dormancy rates (39-70%); field establishment by dormant seeding is necessary. Germ 21, 24.5, 25, sd 8.9, r3.0-31 (28)%. Dorm 58.5, 61, na, sd 9.8, r39-70 (31)%. Test 31, 32, na, r25-38 days. (#9)**
Description: Erect perennial, 1.5-2.4', flowers white, colonial.
Comments: status: phenology: Blooms 5,6,7,8. In northern Illinois, collect seeds in August. Collect seeds in se Wisconsin in September (he99). Attractive cut flowers, a native alternative to fresh floral filler like BABY'S BREATH. Good in the landscape, ground cover for rich sunny soils or in partial shade. Seed source nursery plantings, genetic source Kane Co & May Twp, Lee Co.
"Common & the most showy sp, growing on low prairies & in low places on railroads, &c" (ewf55).
Associates: Pollinated by *Diptera, Lepidoptera*, & sawflies.
ethnobotany:

Galium circaezans Michaux WILD LICORICE, aka FOREST BEDSTRAW, LICORICE BEDSTRAW, (*circaezans* enchanting, having the property of the enchantress Κίρκη, *Kirkē, Circe*; alternately, resembling *Circaea*, Enchanter's Nightshade, in some fashion (the latter is typical sloppy etymology, more properly a translation of *circaeoides* (Gledhill 1985)).
The leaves taste sweet like licorice.
"Not common, usually in oak woods. Not likely to be mistaken for another sp because of its erect pubescent stem, large leaves, & hairy flowers." (ewf55)

Galium circaezans, Daisy Hill Prairie, Tiskilwa, Bureau Co

Galium concinnum Torrey & A Gray SHINING BEDSTRAW, aka PRETTY BEDSTRAW, (*concinnus -a -um* well made, well put together, well arranged, pleasing, pretty, elegant, neat, especially of style.)
Culture: ①60 days cold moist stratification (pm09). 831,502 (gnhm13) seeds per pound.
bottom line: Limited test data indicate a strong dormancy rate (50%); field establishment by dormant seeding is best. Germ 42%. Dorm 50%. Test 25 days.**
Genetic source Buda, Concord Twp, Bureau Co.
"Much branched, leaves in 6's, linear & often cuspidate. Common in dry woods & thickets; Rock Cut, woods south of Argyle & in oak woods west of Shirland." (ewf55)

Galium obtusum Bigelow BLUNTLEAF BEDSTRAW, aka WILD MADDER, (*obtusus -a -um* obtuse, blunt, rounded at the apex, from *obtusus*, blunt, obtuse, from *obtundo*, to beat upon, to make blunt, dull.)
Habitat: Wet to wet-mesic prairies. Humus soils. distribution/range: Common in s. Wisconsin.
Erect perennial, 8-30", white flowers.
①No pre-treatment needed. Sowing outdoors in the spring is the easiest method (he99). ②Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn).
Blooms 6-7. Collect seeds in se Wisconsin in September (he99). "Erect, not much branched, leaves mostly in 4's & blunt. Common in marshes & low prairies." (ewf55)

Galium odoratum **(**Linnaeus) Scopoli SWEETSCENTED BEDSTRAW, aka OUR LADY'S LACE, SWEET WOODRUFF, WOODRUFF, *WALDMEISTER* (G),
"In English Woodrooffe, Woodrowe, & Woodrowell." J Gerard, 1597, Herball ii. 966. The common name from Old English *wudurofe*, *wudu* wood, & **rofe, *rife,* of unknown meaning (*rofe*, possibly related to Latin *rapum, rapa,* turnip or rape, akin to Middle Dutch *roeve* turnip, rape, Middle Low German *röve,* Old High German *rāba, ruoba, ruoppa,* turnip, rape, Old Norse *rōfa,* hard part of a tail, Greek *rhapys, rhaphys* turnip, & Lithuanian *rope*.)
Habitat: distribution/range: Native of Europe, northern Africa, & northern Asia.
Culture: propagation: ①34ºF for 30 days then 60ºF for 35 days; average germination time 30-65 days; light required; planting depth 0.25"; sowing rate 4-5 seeds per plant; keep seed moist until germination (Outsidepride.com). ②Sow at 20ºC (68ºF), germinates in about two wks (tchn).
asexual propagation: Division of mature clumps.
cultivation: Space plants 0.75-1.0'. Partial shade to full shade, in average, medium to wet, well drained soils. Requires consistently moist soils, may go dormant during dry weather. Tolerates dense shade. Spreads by creeping roots & by seed. Zones 4-8.
bottom line:
greenhouse & garden:
Description: Introduced, herbaceous, perennial forb; 0.5-1.0' tall key features:
Comments: status: phenology: Blooms April-May. Flowers showy & fragrant, leaves fragrant.
This alien is sometimes specified in Midwest plantings for reasons known only to the landscape architect or the homeowner. It is aggressive & at times invasive; forming a dense mass of roots that chokes out nearby plants. Very difficult to control.

Associates: Walnut tolerant.
ethnobotany: Plant is used to flavor *Maiwein* (May Wine).
VHFS: [*Asperula odorata* Linnaeus]
"Murder will out, though the Almighty should lend hearing to the ears of the willow, & speech to the seven tongues of the woodriff." Hogg, 1824, Private Mem Justified Sinner 136.

Galium tinctorium (Linnaeus) Scopoli var **tinctorium** (also seen as *Galium tinctorium* Linnaeus) SOUTHERN THREE-LOBED BEDSTRAW, aka STIFF BEDSTRAW, SMALL CLEAVER, (*tinctorius -a -um* tink-TO-ree-us belonging to dyers, used in dyes, of dyes, New Latin, used in dyeing, from *tinctus, tingo*, to wet; to dye, & *-orius,* capability, functionality or resulting action, as in tincture. Often refers to a plant that exudes some kind of stain when broken.)
Habitat: Swamps & damp places, wet to wet-mesic prairies. Humus soils. distribution/range:
"Unusual but much less so than the next from which it is distinguished by being rather stiff, having leaves in 5's or 6's, the peduncles stiff & straight with several pedicles. Corolla 3 or 4 parted. Found only in boggy places in Sugar River sand area." (ewf55)
Culture: ①No pre-treatment needed. Sowing outdoors in the spring is the easiest method (he99). ②Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn).
Erect perennial, 1-2', white flowers.
Comments: status: phenology: Blooms 6-7. Collect seeds in se Wisconsin in September (he99).
Associates: ethnobotany: The roots were used by Indians to produce a red dye. Used as medicinal beverage by Ojibwa (sm32).

Galium trifidum Linnaeus SMALL BEDSTRAW, aka DYER'S CLEAVERS, GOOSE-GRASS, NORTHERN THREE-LOBED BEDSTRAW, (*trifidus -a -um* divided or cleft into three; with three parts, the division extending at least half way.)
Habitat: Moist areas. distribution/range:
Comments: status: phenology: Blooms 6-7. Collect seeds in se Wisconsin in September (he99).
"Much less common than the preceding. Weak & reclining, growing in the grasses & sedges in the boggy places in Coon Creek bottom. Distinguished from the above by the leaves being in 4's, the petals always in 3's & the flowers solitary on arching pedicels." (ewf55)
Associates: ethnobotany: Used as medicinal plant by Ojibwa (sm32).

Galium triflorum Michaux FRAGRANT BEDSTRAW, aka SWEET SCENTED BEDSTRAW, (*triflorus -a -um* three-flowered.)
Habitat: Woods & thickets, moist woodland, wooded gentle slopes adjacent to bogs, margin of bogs, Calcareous springy places. Moist to dry woods & forests. distribution/range: Circumboreal.
Description:
"Common in damp woods & thickets. It resembles *G aparine* but differs in being a perennial with lanceolate leaves & a smooth stem." (ewf55)
Associates: ethnobotany: Used as medicinal beverage by Menominee (sm23). Ojibwa also used it for medicine (Gilmore 1933). Ojibwa also used it for smoking material (Gilmore 1933)

HOUSTONIA Linnaeus 1753 **BLUETS** *Rubiaceae Houstonia* New Latin, honoring Dr William *Houston* died 1733 Scottish (English) botanist who collected in tropical America, friend & correspondent of Miller, & New Latin *-ia.* North American herbs with entire leaves & small blue, lilac, or white tubular lobed flowers. Fruit is a capsule, 2-lobed, the upper half free, cells few (8 to 20)-seeded. "The generic limits of *Houstonia, Hedyotis, Oldenlandia*, & *Stenaria* remain unclear." (w12) Some authors include *Houstonia* in *Heydyotis* Linnaeus.
The very small seed ripens in summer. Cold moist stratification & surface sow. Cullina code B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, H seeds require light to germinate. (cu00)

Houstonia caerulea Linnaeus BLUETS, aka AZURE BLUETS, BLUETS, DWARF PINK, FORGET-ME-NOT, INNOCENCE, QUAKER-LADIES, VENUS' PRIDE, (*caeruleus -a -um* cerulean, dark blue, deep sky blue, bright, deep blue, true blue, from Latin *caeruleus*, dark-colored, dark blue, cerulean, azure, sea-colored, sea-green.)

Habitat: Mesic to wet mesic prairies & savannas. Prefers moist acid soils. distribution/range:
Culture: ①No pre-treatment needed. Sowing outdoors in the spring is the easiest method. (he99) ②Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn).
Description: Erect, herbaceous, perennial, native forb; stems 3-10"; leaves a basal rosette; flowers blue-white with a yellow center, 4-merous, one per stalk;
Comments: status: phenology: Blooms 5-6. Collect seeds in se Wisconsin in July (he99). Profuse bloomer, once established, self sows.

Houstonia longifolia Gaetner LONGLEAF BLUETS, (*longifolius -a -um* with long leaves.)
Habitat: Dry prairies & dry savannas, sandy soils. distribution/range:
Culture: ①No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). 4,800,000 (pm02) seeds per pound.
Description: Erect perennial, 3-10", flowers lavender white, numerous stems with slender cauline leaves.
Comments: status: phenology: Blooms 6-8. Collect seeds in se Wisconsin in September (he99).

"Our only sp & rare. The gravel bluffs south of Roscoe. Also reported in a similar situation north of Rockford Country Club but we have not found it there. SE of Cherry Valley in Boone Co." (ewf55 as *H lanceolata* (Poir) Britt)

Houstonia purpurea Linnaeus BROADLEAF BLUETS, aka SUMMER BLUETS, VENUS PRIDE, (*purpureus -a -um* pur-PEWR-ree-us purple, reddish-purple, from Latin *purpureus*, adjective, purple colored, dark red, dark brown, clad in purple, gleaming, bright, beautiful, for the purple flowers; alternately from Greek for purple.)
Habitat: Mesic prairies. distribution/range:
Culture: Somewhat reluctant from seed, but self-sows once established.
Description: Fruit capsule with tiny seeds.
Associates: Pollinated by long-tongued bees, short-tongued bees, *Diptera*, *Lepidoptera*, & *Coleoptera*.

MITCHELLA Linnaeus **PARTRIDGE BERRY** *Rubiaceae Mitchella* honoring the English born, Virginia botanist & physician, Dr John *Mitchell,*1711-1768), early correspondent of Linnaeus. 2 spp of dwarf evergreen shrubs, one in eastern North America, one in eastern Asia. Fruit is a berry composed of 2 united ovaries.

Seeds are hydrophilic & ripen in fall or spring. Seeds should be cleaned from berries & planted. Some germination occurs 1st spring, most 2nd. Cullina code B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, & C seeds will germinate only after multiple cycles of warm and cold, typically 40º-70º-40º-70, * seeds are hydrophilic, intolerant of dry storage, G chemical inhibitors. Two inch fall softwood stem cuttings are easy to root. (cu00)

Mitchella repens Linnaeus PARTRIDGE BERRY, aka TWO-EYED BERRY, RUNNING BOX, *repens* Latin creeping, creeping & rooting, from Latin, *repens*, participle of *repo*, to crawl, or creep, referring to creeping & rooting stems.)
Habitat: Dry or moist knolls in woods, shaded, acid soil, moderately moist, rich in humus. Rocky woods, swampy woods, sandstone ledges. Hardy to Zone 3. distribution/range: Northern Illinois is on the southern edge of the sp range.
Description: Prostrate evergreen ground cover in light to deep shade; stems prostrate; leaves evergreen, flat, coriaceous, shiny dark green; 0.75" white bell flowers above leaves in May followed by red berries in fall.

"On the wooded crest of a limestone outcrop east of Roscoe a patch 6 feet in diameter has persisted for a number of years booming profusely & bearing some fruit. We have not seen it elsewhere in the northern tier of cos." (ewf55)
Comments: status: phenology: Blooms May. Fruit ripen in fall & may persist through the winter.
Associates: Provides fruit & cover of upland game birds. Songbirds & small mammals eat fruit. Terrestrial furbearers (esp red foxes, skunks, & raccoons) eat fruit.

ethnobotany: Fruits well flavored but dry & full of stony seeds (Woods 1873). Used as medicinal beverage by Menominee (sm23). Berries used for food by Iroquois (Waugh 1916). Ojibwa also used it for medicine (Gilmore 1933). Ojibwa also used it for smoking material (Gilmore 1933). Much used for smoking by Bois Fort Chippewa (Reagan 1928).

SALICACEAE de Mirbel 1815 **WILLOW FAMILY** The remainder of the Willow family is in the Woodies section.

SALIX Linnaeus 1753 *Salicaceae Salix* (SA-liks) New Latin from the classical Latin name *salix, salicis* f, a willow-tree, willow; or from Latin *Salix*, a reference to "to leap or spring" alluding to its rapid growth, from *saltus, saltus* m., a spring, leap, bound. Others note *salicis* is properly from *selix*, from Greek ελικὴ, *elika*, meaning black, & *salix* is abridged from *salicis,* or from ἕλιξ, *helix,* the same as *salix*. Alternately from Saxon *Salh, sal*, black, or Celtic *saileog*, Hebrew *tsala.*

Salix humilis Marsh PRAIRIE WILLOW, aka SMALL PUSSY WILLOW, UPLAND WILLOW, (*humilis -is -e* low growing, of low growth, dwarf, from Latin *humilis*, humble; submissive; on or near the ground, low, shallow.)
Habitat: Prairies, savannahs, open woods, & rocky slopes. Zone 3. distribution/range:
Culture: ①Sow seeds immediately when ripe (he99).

"*Salix humilis* General prairie. Blooms mid Apr to early May; (catkins). Harvest May. 2'; seed must be sown immediately, but even then seedlings rarely survive. Poor luck with cuttings too. A shrub, flowering on old wood. Seeds must be sown fresh, but my results poor even then; poor results with hardwood cuttings." (rs ma)

asexual propagation: Soft-wood cuttings.

cultivation: Transplants easily, BR From seed press fresh seed into moist soil.

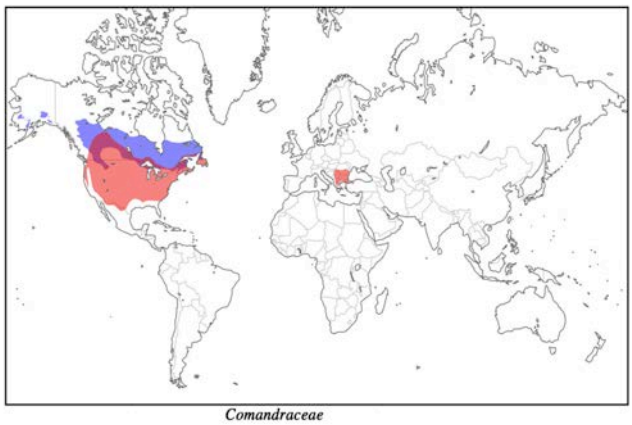
Description: Shrub 4-12' (?krr). Flowers yellow-green, dioecious. Fruit are capsules 0.25-0.38" long, releasing many plumed seeds.
Comments: status: phenology: Blooms March to May. Collect seeds in se Wisconsin in June-July (he99). Plants are of both sexes. One of many good native willows for planting
Associates: Early flowers attract native bees. Pollinated by long-tongued bees, short-tongued bees, *Diptera*, Coleoptera. Attracts upland game birds, songbirds, game mammals, & small mammals. Many bacterial, fungal diseases, & insect pests.

ethnobotany: Root used as medicinal plant by Menominee & Pottawatomie (sm33)
VHFS: Mohlenbrock lists 2 varieties as well as the sp. Reeseville lists *S humulis* as BARRENS WILLOW, native to the pine barrens, as being larger than PRAIRIE WILLOW, var *microphyllus*. 3-7" gray green leaved shrub, very dense form, wet or dry soils, good display of 0.5" male catkins in spring.

SANTALACEAE R Brown 1820 **SANDALWOOD FAMILY** A family of about 34 genera & 540 spp of trees, trees, shrubs, & herbs of tropical & warm temperate regions of the Old World & New World. All members of the SANDALWOOD FAMILY are hemiparasitic.

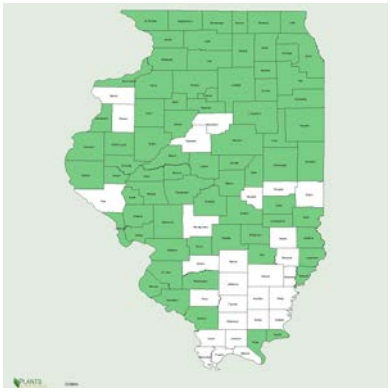
COMANDRA Nuttall **BASTARD-TOADFLAX** *Santalaceae* New Latin, from Latin *coma* hair, or Greek *kome*, hair, & New Latin *–andra* from Greek *ander*, man; from the hairy calyx lobes that are attached to the anthers, or the hairy attachment of the stamens. One or two spp, depending on the author, one North American herb with 3 subspp, one European, that are usually partial parasites attaching to other plants by underground holdfasts & that have creeping stems, whitish flowers in terminal clusters, & a dry nut as fruit. *Comandra umbellata* is the alternate host for *COMANDRA* STEM RUST (COMANDRA BLISTER RUST), *Cronartium comandrae* Peck, of pines.

Comandra & the closely related *Geocaulon* are sometimes placed in the *Comandraceae* Nickrent & Der. *Geocaulon lividum* (Richardson) Fernald was formerly *Comandra lividum* Richardson.



Pink *Comandra,* Blue *Geocaulon,* Fushia, both genera. From http://www.parasiticplants.siu.edu/

Seed is periodically for sale, only in small quantities, packets or fractional ounces, sells out early, & may not be available every year. Prairie Moon is working to increase their production. Seed is seldom seen in the wild, possibly suggesting many remnant colonies are self-incompatible clones or they have locally lost their pollinator.



Comandra umbellata (Linnaeus) Nuttall BASTARD TOADFLAX, aka DUMB BASTARD TOADFLAX, FALSE TOADFLAX, STAR TOADFLAX, TOADFLAX, (*umbellatus -a -um* (um-bel-AH-tus) in umbells, umbrella-like flower heads, umbelliferous, from Latin *umbella, umbell-*, umbrella, "a little shadow", & *-atus*, possessive of or likeness of something, for the flowers appearing to be in umbels, in reference to the inflorescence, which is actually a corymb) FACU

Habitat: 1) Sandy Black Oak savannas, 2) high dunes, 3) most characteristically in prairies often with a history of abuse, & 4) prairie fens (sw94). Hill & sand prairies. Mesic to dry prairies & open woodlands. Calcareous soils. distribution/range: Known from most of the lower 48 states & southern Canada. A subsp (or the second sp) is also mapped from the Balkan peninsula & a small area in Turkey. One website lists this sp from Siberia & China, only because some dipstick mistook west longitude for east longitude. D'oh! And we lost the Space Race because…

Culture: Propagation is difficult from seed due to sp hemiparasitic nature, exact methods are unknown. Cold moist stratify 60 days. For greenhouse work, we suggest inserting stratified seed into a slit in base of a plug of a host plant, & placing the "seeded" plug in a restoration. Germ may not occur until 2nd spring. Use mycorrhizal inoculated soil in the plug mix & do not use fungicides! One may wish to "borrow" a little soil from a remnant where this grows to inoculate your planting site. Alternately, in late fall, insert 1-2 seeds in a slit at the base of a host plug or quart and overwinter in an unheated cold frame or lathe house. ①60 days cold moist stratification. Parasitic sp which needs a host plant. (pm09) ②Germination method unknown (he99). 11,200 (pm01), 26,628 (gnhm14) seeds per pound. Seeds are of limited availability, & may sell out early in the season.

In a experiment conducted by Dr EP Meiecke of the Office of Forest pathology, with seed planted in 1913 & germinating in 1915, 3 seedlings were grown host free, reaching 5" tall by July, 17, 1915 , suggesting *Comandra* is facultatively hemiparasitic. There is no data on how long these plants grew or if they fruited. (Hedgcock 1915)

"Seed - stratify for 3 months at 5°C & then sow in the greenhouse in a pot with a suitable host. Plant out when it is well established close to a mature host plant" (A Huxley 1992, The New RHS Dictionary of Gardening)

"*Comandra richardsiana* General prairie. Blooms late May, early June. Harvest August? Have raised a few by sowing stratified seeds in flat with banded grasses. Spreads from salvaged sods." (rs ma)

Said to tolerate acidic soils. Not shade tolerant. Well-drained soils, full sun. If the occasion arises where a population of *Comandra* should be salvaged, dig the *Comandra* & host together with the root connections intact. Hedgcock (1915) noted *Comandra* transplanted after being severed from its host did not reattach to a new host, exhibited little or no growth, & died. Hedgcock suggests fall planting seeds in flats of known host sp & leaving the flats outdoors all winter or transplanting sods of the sp with intact connections to the host.

bottom line: Until proven otherwise, we consider these seeds recalcitrant, and store them in ziplocks under refrigeration.

In the late fall or early winter, in a remnant or restoration, make a shallow knife slit at the base of a known host plant or known associate, & place 1-2 properly stored seeds into the slit with approximately 0.25" soil over the seeds. Close the slit & firm the soil. *Comandra* seeds are rare & large, & they should be handled with care & precision. The mycorrhizal network and the host should be established, the host's roots damaged. When in doubt, add some endomycorrhizal inoculant to the slit. Germ 2.5, 2.5, na, sd 1.5, r1.0-4.0 (3.0)%. Dorm 61, 61, na, sd 29, r32-90 (58)%. Test 20 days. (#2).**

Alternately, we may not know the true nature of the seed. The seeds mature & are shed mid to late summer. Many species with this early season phenology produce seeds that require a warm moist period followed by a cold moist period. We suggest minimally drying (4-7 days) & cleaning, then immediately planting seeds in a slit beside a host in late summer, either in a restoration or in a potted plant in a lathe or shade house. A large nut for a prairie forb, we consider it recalcitrant (hydrophilic), & store it in ziplocks under refrigeration. You may also try properly storing the seed until late fall and planting it with a host for germination a year and a half later. Dot Wade, the *grande dame* of Midwest restoration, always said that a seed that matures in spring & summer should be planted in spring & summer.

Description: Native, erect, herbaceous, perennial forb, subshrub; rhizomatous, horizontal underground rootstock with slender parasitizing suckers; stems 4-12", simple or with some branches; leaves alternate or scattered, 0.75 to 2.0", lance-like to oval; inflorescence of many flowers in a tight, terminal cluster; flowers white, sometimes pinkish, 5-merous, 0.25" wide; fruit is a small nut (or a dry, single-seeded berry or drupe, or dry to fleshy), brown to purplish, with the persistent calyx; N. key features: Flowers in a tight terminal cluster, fruit dry.

Comments: status: phenology: Blooms late April to early July; 22 April to 3 July. Fruits in July. Collect seeds in se Wisconsin in August (he99). Spreads by rhizomes & may often form dense stands.

"We have only this sp which is common in open woods & thickets & low & dry prairies" (ewf55).

Associates: *Comandra* spp are summer hosts of a blister rust, *Cronartium comandrae*, formerly called *Peridermium pyroforme,* which infects several spp of *Pinus* in the western USA. The negative economic impact of this rust lead early 20th century government researchers to investigate the ecology & germination of the *Comandra.*

BASTARD TOADFLAX is a facultative, hemiparasitic generalist. Adventitious roots, working with fungi, form button-like *haustoria*, which wrap around the root or rhizome of a host plant, & penetrate it to absorb nutrients. Henderson (2002) suggests that TOADFLAX is a keystone sp in reducing the dominance of aggressive grasses & promoting high diversity in remnants. TOADFLAX parasitizes many spp, including trees & shrubs, at varying levels of impact. In North Dakota, FRINGED SAGE & NORTHERN WHEATGRASS are known hosts. Other hosts include *Acer, Betula, Aster, Antennaria, Carex, Fragaria, Populus, Rosa, Rubus, Solidago, Vaccinium,* & various grasses (EH Moss, 1926, "Parasitism in the genus *Comandra*". *New Phytologist* 25: 264–276). *Comandra* is known to parasitize over 200 spp of hosts (Piehl 1965).

Midwestern restorations trying to establish this sp should consult the following plant associates listed in Swink & Wilhelm (1994). Associated spp in the Chicago region include 1) *Andropogon scoparium, Aster azureus, Euphorbia corollata, Lespedeza capitata, Liatris aspera, Phlox pilosa, Quercus velutina, & Tradescantia ohiensis*; 2) *Amelanchier arborea, Arabis lyrata, Arctostaphylos uva-ursi coactillis, Hamamelis virginiana, Quercus velutina, Smilacina stellata, & Viola pedata linearilobа*; 3) *Achillea millefolium, Amorpha canescens, Aster ericoides Aster laevis, Fragaria virginiana, Heuchera richardsonii, Lithospermum canescens, Oxypolis rigidior, Pedicularis canadensis, Phlox pilosa fulgida, Poa compressa, Poa pratensis, Ratibida pinnata, Rudbeckia hirta, Silphium integrifolium deamii, Silphium terebinthinaceum, Sisyrinchium albidum, Solidago rigida, Sporobolus heterolepis, & Zizia aurea*; 4) *Allium cernuum, Andropogon gerardii, Asclepias incarnata, Aster novae-angliae, Aster praealtus, Aster puniceus,*

Aster umbellatus, Bromus ciliatus, Cacalia plantaginea, Carex buxbaumii, Chelone glabra Cirsium muticum, Coreopsis tripteris, Cornus racemosa, Dryopteris thelypteris pubescens, Galium tinctorium, Helianthus giganteus, Liatris pycnostachya, Lysimachia quadriflora, Muhlenbergia glomerata, Onoclea sensibilis, Oxypolis rigidior, Pedicularis lanceolata, Prenanthes racemosa, Rhus vernix, Rudbeckia hirta Silphium integrifolium, Smilacina stellata, Solidago ohioensis, Solidago patula, Solidago riddellii Sorghastrum nutans, Spiranthes cernua, Viburnum lentago, & Zizia aurea (Swink & Wilhelm 1994).

Hedgcock (1915) listed the following hosts that he found in the Eastern States with the plant he was calling *C umbellata*. (Taxonomy is original not updated 12/21/13.) *Acer rubrum* L, *Achillea millefolium* L, *Andropogon virginicus* L, *Angelica villosa* (Walt) BSP, *Antennaria plantaginifolia* (L) Richards, *Aster ericoides* L, *Aster macrocarpa* L, *Aster patens* Ait, *Aster undulatus* L, *Baptisia tinctoria* (L) Br, *Betula nigra* L, *Betula populifolia* Marsh, *Carex* sp, *Castanea dentata* (Marsh) Borkh, *Chimaphila umbellata (L) Nutt, Chrysopsis mariana* (L) Nutt, *Comptonia peregrina* (L) Coulter, *Danthonia compressa* Austin, *Fragaria americana* (Porter) Britton, *Fragaria virginiana* Duchesne, *Gaylussacia frondosa* (L) T&G, *Hieracium venosum* L, *Ionactis linariifolius* (L) Greene, *Lespedeza capitata* (L) Pers, *Lysimachia quadrifolia* L, *Meibomia paniculata* (L) Kuntze, *Panicum* sp, *Poa compressa* L, *Poa pratensis* L, *Populus tremuloides Michx, Potentilla monspeliensis* L, *Quercus coccinea* Muenchh, *Quercus digitata* (Marsh) Sudw, *Quercus marilandica* Muenchh, *Quercus nana* (Wood) Britton, *Rhus copallina* L, *Rosa blanda* Ait, *Rosa canina* L, *Rubus canadensis* L, *Rubus procumbens* Muhl, *Rubus villosus* Ait, *Solidago bicolor* L, *Solidago caesia* L, *Solidago juncea* Ait, *Solidago nemoralis* Ait, *Solidago speciosa* Nutt, *Spiraea salicifolia* L, *Vaccinium atrococcum* (A Gray) Heller, *Vaccinium nigrum* (Wood) Britton, *Vaccinium vacillans* Kahn, & at least 3 unidentified spp of grass.

Pollinated by long-tongued bees, short-tongued bees, *Diptera*, *Lepidoptera*, & *Coleoptera*. Larval host of *Junonia coenia*, COMMON BUCKEYE. Small mammals eat the seeds.

ethnobotany: The fruits are said to have a sweet taste. Species was used in several ways by various tribes. The seeds were eaten as food & children sucked the flowers for the sweet nectar. Part of the root was used to produce a blue dye. Medical uses include treating cuts & sores, kidney aid, lung pains & labored breathing, a footbath for corns, eye medicine, mouthwash, narcotic, & headaches. Where selenium naturally occurs in the soil, the plant may be a facultative accumulator of selenium.

VHFS: Ours is subsp *umbellata*, which ranges from the Great Plains to the Atlantic. Subsp *pallida* grows from the Great Plains west & subsp *california* grows in the far west.

In the early 20th century, 4 spp were recognized, *Comandra livida* Richards, *C pallida* A DC, *C richardsiana* Fern, & *C umbellata* (L) Nutt.

[*Comandra richardsiana* Fern, *C umbellata* (L) Nutt *decumbens* EV Hill, *C umbellata* (L) Nutt subsp *richardsiana* (Fern) A&D Löve, *C umbellata* (L) Nutt var *umbellata*, *Thesium umbellatum* L]

GG Hedgcock, 1915, Parasitism of *Comandra umbellata*. Journal of Agricultural Research, Department of Agriculture, Vol V, No 3, October 18, 1915. pp 133-135. http://ia700307.us.archive.org/10/items/parasitismofcoma00hedgrich/parasitismofcoma00hedgrich.pdf

RA Henderson, 2002, Are there keystone plant spp driving diversity in Midwest prairies? in Stephanie Foré, Editor, 2002, Proceedings of the 18th North American Prairie Conference: Promoting Prairie, Truman State University Press, Kirksville, Missouri.

JL Mielke, RG Krebill, & RH Powers Jr, 1968, Comandra Blister Rust of Hard Pines, USDA Forest Pest Leaflet 62, Revised August 1968.

MA Piehl, 1965, The Natural History & Taxonomy of *Comandra* (*Santalaceae*) Mem Torrey Bot. Club 22:1-97.


Comandra umbellata

Seed photo courtesy of Bend Seed Extractory, Seeds of Success, http://seedsofsuccess.smugmug.com. Fruit photo Comandra umbellata subsp. pallida, with persistent calyx teeth on nut, photo Russ Kleinman & Karen Blisard, Burro Mtns., Rte 828, May 28, 2007, http://www.wnmu.edu/academic/nspages/gilaflora/comandra_umbellata.html

SARRACENIACEAE Dumortier 1829 **PITCHERPLANT FAMILY**

SARRACENIA Linnaeus **PITCHER PLANT** *Sarraceniaceae Sarracenia* French botanist & physician Michael *Sarrasin* (*Sarrazen*) (Latinized as *Sarracenus*), of Quebec (1659-1734).

Seeds ripen early summer & are chalky brown with a waxy coating that can be partially removed by soaking in soapy water. Surface sow seed in a 50-50 mix of peat moss & sand. The germinating seedlings should be kept evenly moist & undisturbed for the 1st summer or until 1 or 2" tall. They may be kept sealed in a plastic bag under grow lights. Seedlings cannot dry out. Cullina code B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, H seeds require light to germinate. Older clumps may be cut apart after flowering. (cu00)

Sarracenia purpurea Linnaeus PITCHER PLANT, *O'mukiki'wida'sun,* frog leggings (Ojibwa) (Purpurea the purple pitchers)
Habitat:
Associates: ethnobotany: Root used as medicinal plant by Ojibwa, Menominee, & Pottawatomie (sm23, 32, 33). Ojibwa amusement (den28)

SAXIFRAGACEAE AL de Jussieu 1789 **SAXIFRAGE FAMILY** Fruits generally capsular, 1 to 2-celled; seeds small, many, albuminous.

HEUCHERA Linnaeus 1753 **ALUMROOT, CORALBELLS** *Saxifragaceae Heuchera* (HOY-ka-ra) after 18th century botanist, botanic author, physician, & professor Johann Hienrich von *Heucher* (1677-1747), of Wittenberg, Germany. The common name is from the astringent root. About 37 sp of North American perennial herbs having basal cordate or orbicular leaves & small panicled flowers with petals entire or lacking. Fruits capsules, 1-celled, 2-beaked, dehiscent between the beaks; seeds many, with a rough, close testa. Planted for the texture of the foliage.

Cold moist stratification gives quick & consistent germination. Cullina code A seed will germinate within 4 weeks sown at 70ºF, or B seed will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, H seeds require light to germinate. (cu00)

Heuchera americana Linnaeus AMERICAN ALUMROOT, aka CORAL BELLS,
Habitat: Somewhat dryish locations in rocky open woodlands and along ledges and crevices of bluffs (mbg). In the se USA, Rocky forests, rock outcrops, particularly where soils are subacidic to circumneutral" (w12b). distribution/range: This is the most widespread sp in the genus. Illinois is at the northern limit of the species range.

Culture: propagation: ①Surface sow at 20ºC (68ºF) in light, germination slow (tchn). ②Seed from Shenandoah National Park was not pretreated. Greenhouse temps daytime 70-85ºF during the winter months depending on natural solar; night temperatures averaged around 65-68ºF. No supplemental heat. Seedlings were transplanted 30 days after sowing. Mature foliage is a mottled gray green and may look nutrient deficient when it is not. *H. americana* does not seem to be bothered much by whiteflies, aphids, mites, thrips or powdery mildew. Periodic cutbacks allow new growth to emerge from crown and prevent fungal die-back in the center of the plug tray that may otherwise occur during wet, rainy periods. (Kujawski & Davis 2001) ③"Check for mature seeds in dark-brown capsules 3-4 weeks after the plant has flowered. The seeds are black when mature and are smaller than grains of black pepper. Dried seeds may be stored, uncleaned, in sealed, refrigerated containers. Sow seed in spring." (lbj)

asexual propagation: Divide mature plants every 3-4 years, spring or fall.

cultivation: Full sun to part shade. Organically rich, humusy, medium moisture, well-drained soils. Full sun plantings must be kept moist. Remove spent blooms to encourage more. Plants are shallow rooted, mulch in early winter after ground freezes. Low maintenance, medium H2O usage, Zone 4-9.

1.0-2.0' tall, 1.0-1.5' wide. viscid-pubescent, petals spatulate, about as long as the calyx

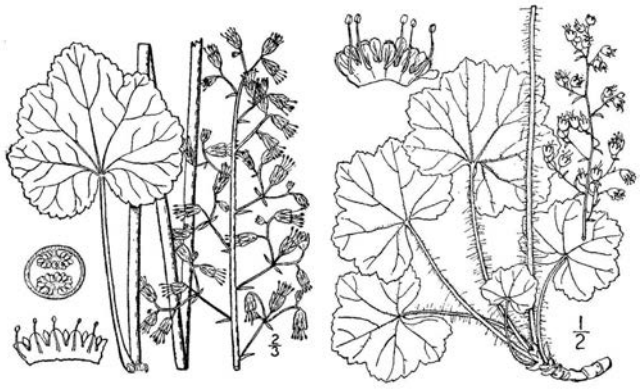
Comments: status: phenology: Blooms June - August. Flowers small but showy, great in mass. Colorful foliage. Useful in rock gardens, perennial borders, native plant gardens, open woodland or shade garden. Good edging plant or massed as a ground cover. In sunny plantings, the leaves may assume a bronze cast several months into the growing season.

Associates: No serious insect or disease problems.

ethnobotany: Native Americans used as a tonic & astringent, treating diarrhea, ulcers, hemorrhoids, piles, sore mouth, eye wash, & stomach pain (nae).

VHFS: Synonyms for var *americana* [*Heuchera americana* L var *heteradenia* Fern, *H lancipetala* Rydb, *H americana* L var *subtruncata* Fern, *H calycosa* Small, *H curtisii* Torr & A Gray ex A Gray, *H curtisii* Torr & A Gray ex A Gray var *crenata* Rydb, *H americana* L var *calycosa* (Small) Rosend, Butters & Lakela, *H americana* L var *brevipetala* Rosend, Butters & Lakela] Synonyms for var *hirsuticaulis* (Wheelock) Rosend., Butters & Lakela [*Heuchera hirsuticaulis* (Wheelock) Rydb, *H americana* L var *interior* Rosend, Butters & Lakela]

J Kujawski, Jennifer & KM Davis, 2001. Propagation protocol for production of container *Heuchera americana* seeds; Natural Resources Conservation Service - Norman A. Berg National Plant Materials Center, Beltsville, Maryland. In: Native Plant Network. URL: http://www.nativeplantnetwork.org (accessed 7 June 2014). Moscow (ID): University of Idaho, College of Natural Resources, Forest Research Nursery.



Heuchera americana & var *hirsuticaulis*

Heuchera hispida Pursh *Ciwade'iminaga;Wunj,* sour fruit, as Ojibwa medicine for indigestion & diseases of eye, also noting Sioux use for dysentery (den28).

Heuchera richardsonii R Brown PRAIRIE ALUM ROOT, aka ALUM ROOT, CORAL BELLS, MIDLAND ALUMROOT, RICHARDSON'S ALUMROOT, ROUGH HEUCHERA, ROUGH ALUMROOT, (*richardsonii* named for Sir John *Richardson* (1787-1865), British (Scottish) surgeon, naturalist, & boreal & arctic North American explorer, who discovered the sedge *Carex richardsonii* & *Heuchera richardsonii*.) Facultative-
Habitat: Mesic & dry prairies, open woods. Dry to wet prairie & open, often rocky woodlands.
Culture: ①"Prefers cooler soils: sow early spring or late fall. Very light cover. Tiny seeds. Good germination." (mfd93) ②30 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. Plant fresh seed or keep moist. Refrigerate clean seed in a ziplock bag until planting or starting other treatment. (pm09) ③ Sow seeds immediately when ripe, or no pre-treatment needed. Sowing outdoors in the spring is the easiest method. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99) ④ "30 days moist stratification improves germination, but not needed for good greenhouse crop. Field sow fall, spring, early summer" (pnnd). ⑤Fall plant or cold stratify for up to 2 to 3 months for best results. Sow just below the soil surface at 70ºF & water. (ew11) ⑥Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn). ⑦ #1 & 3#, small seeds but easily established, blooms 2nd year, division of roots in spring or fall, can divide stolons in fall or spring (stolons ??), cuttings in mid summer, light or scarification only treatment necessary. (pph) ⑧ "Fresh seed or dry stratification. Sow seeds on surface of soil, light is needed for germination. Seeding heavily may lead to damping off." (tpg)
seed counts & rates: 4,000,000 (gnnd), 6,000,000 (aes10), 6,931,297 (gna04), 9,072,000 (gnh14), 9,869,565 (gna03), 10,202,247 (gnh01), 11,200,000 (pm01), 12,000,000 (ew11), 12,800,000 (jfn04, sh94) seeds per pound.

"*Heuchera richardsonii grayana* General prairie. Blooms late May to late June; CHARTREUSE. Harvest late July. 2'; method #1 only; SEEDLING TRANSPLANT only; seeds tiny but emergence good, growth reliable; blooms 2nd year. Evergreen foliage in tight clump; fine, reliable ornamental." (rs ma)

asexual propagation: "Mature plants can be divided with sharp knife after seed has been produced. Each root section should have a bud. Transplant in spring or fall." (tpg)

cultivation: Space plants 1.25-1.5'. Mesic to dry soils, full sun to partial shade.

bottom line: Dormant seeding is best for field establishment. Dormancy mechanisms are variable, spring works some years, a nondormant lot is known. Flipflopish. Germ 37.5, 43, 54, sd 27.8, r2.0-99 (97)%. Dorm 38, 36.3, 0.0, sd 29.2, r0.0-91 (91)%. Test 37, 37, 37 r21-60 days. (#12).**

greenhouse & garden: For good crops, dormant sow or cold moist stratify.
Description: Erect perennial, 2.0-3.0', flowers green, inconspicuous; fruit is capsule with small seeds; key features: Upper surface of the flower overhanging the shorter lower surface, drooping flowers (fh).
Comments: status: phenology: Blooms 5,6. In northern Illinois, collect seeds in late June-July. Collect seeds in se Wisconsin in July (he99). Landscaping, planted for the texture & color of its foliage; rock gardens, & ground cover. Seed source nursery plantings genetic source RI RR, Wyanet Twp, central Bureau Co, & DuPage, St Charles Twp, Kane, & Will (Horlock) Cos.

Bob Horlock was Seedsman for The Natural Garden in the 1980s & early 1990s, & a pioneer in this industry. We were fortunate to have a friendly business relationship with Bob during the early years of our nursery. Bob's seeds were collected in DuPage, Kane, & Will Cos. We traded back & forth with him, & several of our production plots originate from his collections. Bob passed away in the early 1990s.
Associates: Pollinated by bees. Inflorescence often infested with aphids. Reported as deer resistant.

ethnobotany: Roots were used by early Native Americans as poultice & antiseptic (tpg).

"Common, growing in a great variety of situations, wet & dry, preferring low prairies & dry banks & cliffs. There is a material variation as to pubescens & even in the floral characters. Some of our plants resemble *H hirsuticaulis* (Wheelock) Rydb." (ewf55)


Heuchera with *Anemone canadensis*, interdunal swale, and nearby dry mesic hill, se Whiteside Co.

Heuchera, sp unknown, *Ciwade'imin'ibug,* sour leaf as Ojibwa medicine for sore mouth, den28.

MICRANTHES Haworth 1812 **SAXIFRAGE, AMERICAN SAXIFRAGE** Formerly part of a broadly defined *Saxifraga*, which see.

MITELLA Linnaeus **MITERWORT** *Saxifragaceae Mitella* (mi-TEL-la) from the diminutive of Latin *mitra,* & Hellenistic & Ancient Greek μίτρα, *mitra,* a cap, & *-ella,* Latin feminine diminutive suffix, referring to the capsular fruit. Perennial herbs. Fruit is a capsule, 2-beaked, 2-celled, with two equal valves.

Mitella pentandra, sow at 18-22ºC (64-71ºF) for 2-4 wks, move to +2 to +4ºC (34-39ºF) for 4-6 wks, move to 5-12ºC (41-53ºF) for germination do not cover (tchn).

Mitella diphylla Linnaeus BISHOP'S CAP, aka MITREWORT, TWO-LEAVED MITERWORT, FACU+
Habitat: Mesic woods, swampy woods, shades calcareous rocky slopes, calcareous springy woods, wet mesic to dry mesic savanna & woodlands. Savanna to woodland, wet mesic, mesic, & dry mesic soils. Full sun to partial shade, mesic to dry soils, sandy, loamy, rich soils; woods, forests, cliffs, streambanks.
Culture: ①Cold moist stratify 60 days (Wade 01, pm11). 896,000 (pm01, ew11) seeds per pound.
cultivation: Space plants 0.75-1.25'.
Description: Erect, herbaceous, perennial, native forb; stems 6-16", with one pair of opposite cauline leaves; flowers white, petals fringed; fruit is a capsule, 2-beaked, 2-celled, with two equal valves; seeds black & shiny. key features: Flowers 0.20" wide, fringed petals resembling snowflakes; leaves 1 pair, opposite, stemless (fh). Cauline leaves 2, opposite, subsessile.
Comments: status: phenology: Blooms mid April to mid to late June.

"Frequent in ravines of Kishwaukee River & Hall, Grove, & the Kinnikinnick Creeks, but not elsewhere in the county. In similar situations in Boone & in Stephenson cos." (ewf55)

PARNASSIA Linnaeus 1753 **GRASS-OF-PARNASSUS, PARNASSIA** *Saxifragaceae.* This genus may be placed in *Parnassiaceae*. *Parnassia* (par-NAS-ee-a) from the 16th century name *Gramen Parnassi*, referring to Mount Parnassus, Greece, sacred to Apollo & the Muses & the Graces. New Latin, from Latin *Parnasus*, *Parnassus,* Parnassus, from Greek *Parnasos, Parnassos*, from Dioscorides, & New Latin *-ia.* Fruit is a 1-celled, 4-valved capsule. Formerly in *Parnassieae* or in *Droseraceae*. Mohlenbrock (2014) places this in *Parnassiaceae*.

"*Parnassia* (all spp) are among the most beautiful of our native plants. From a distance the white flowers are attractive but not extraordinary when observed closely, though, the delicate tracery of the green veins on the waxy white petals is astonishing." (w07)

Parnassia palustris, sow at 18-22ºC (64-71ºF) for 2-4 wks, move to +2 to +4ºC (34-39ºF) for 4-6 wks, move to 5-12ºC (41-53ºF) for germination (tchn).

Parnassia glauca Rafinesque GRASS OF PARNASSUS, aka AMERICAN GRASS-OF-PARNASSUS, FEN GRASS-OF PARNASSUS, (*glaucus -a -um* **(**GLOW-kus) glaucous, a white powdery or waxy coating on a leaf or fruit giving a grey-green, dull green, or grayish blue appearance, covered with a 'bloom', as in grapes, blueberries, broccoli, or cabbage, from Latin *glaucus -a -um* , bright, sparkling, gleaming, bluish-grayish,

bluish-green, sea-blue, lavender from Greek γλαυκός, *glaukos*.) obl
Habitat: Fens, fenny woods, rich organic soils. Partial shade, wet soils. pH 7.0-8.0.
Culture: ①Surface sow, seeds are very small or need light to naturally break dormancy & germinate. Further germination pretreatments not sure? (pm09, 11). Sow seeds outdoors in fall, or sow seeds immediately when ripe (he99). ②Sow seeds just below moist soil surface at 70ºF for 1 month. Move to 30ºF for 1 month, then bring back to 50ºF. (ew11). 4,400,000 (ew11), 4,800,000 (pm02) seeds per pound.

asexual propagation: Division?

cultivation: Space plants 0.25-0.75'.

cultivation: Fresh seed or moist cold stratify (45 days) or dormant seed, light, temperature sensitive.

Description: Erect perennial, 0.5-1.0(-1.25)', leaves basal; flowers white, 5-merous, petals with green stripes. key features: Flower petals green striped; leave bases rounded, with a smaller non-clasping leaf on the lower half of the stem (fh).
Comments: status: phenology: Blooms 8,9,10. C3. In northern Illinois, collect seeds in October. Collect seeds in se Wisconsin in September-October (he99). Calcareous soils.

"Other common plants, which presented themselves at different places on our route through the prairies." *Parnassia glauca* as *P palustris sensu auct* non L. (Short 1845).

"In a number of boggy places in Sugar River sand area especially in Coon Creek bottom but not seen elsewhere in the county. Known in Boone Co in a prairie bog near Irene & in Kishwaukee River bottom north of Garden Prairie." (ewf55)
Associates: Pollinated by flies.

SAXIFRAGA Linnaeus **SAXIFRAGE, ROCK-FOIL** *Saxifragaceae* *Saxifraga* Latin *saxum, saxi*, stone, & *frangere*, to break, referring to the plant sometimes growing in rock crevices & appear to be breaking the rocks. Fruits are capsules of 2 connate carpels, opening between the 2 diverging, acuminate beaks (styles); seeds very many. Recent authors place our Midwestern species in *Micranthes* Haworth 1812 AMERICAN SAXIFRAGE (bonap, m14, rvw11, w12).

Seed ripens early to late summer, approximately 3-4 weeks after flowering. The small seeds germinate easily, generally thick enough to require liquid fertilizer. Seedlings can be transplanted when the size of a nickel, often reaching blooming size first year. Cullina code A seeds will germinate within 4 weeks sown at 70ºF, H seeds require light to germinate. Mature rosettes can be teased apart in summer. (cu00)

Saxifraga pensylvanica Linnaeus SWAMP SAXIFRAGE, aka EASTERN SWAMP SAXIFRAGE , WILD BEET, (*pensylvanicus -a -um* occasionally spelled *pennsylvanicus* of or from Pennsylvania, USA. Pensylvania was an accepted alternative spelling throughout the 1700's to as late as the 1870's. Plants named at that time may have a specific epithet without the double "n". Some botanical authors of the mid-20th century consistently use the double n. One source claims that if the author describing the plant was French, he spelled the epithet the French way, *pensylvanica*. It is an alternative spelling now totally illegitimatized by Internet sites.) facw
Habitat: Fens, wet meadows, upland swamps, springs, bogs, & moist meadows. Mossy boulders in protected, wooded, LaSalle Co, Illinois canyons. Calcareous soils.
Culture: ①"No pretreatment is considered necessary. Success with moist cold treatment, some suggest it may be counter indicated. Light cover. Variable germination." (mfd93) ②60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ③Seeds germinate after about 60 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99)

seed counts & rates: 6,048,000 seeds per pound.

availability: Availability is limited to the extent this sp should not be part of any general seed mix. Very under-represented in the seed & plant trade.

greenhouse & garden: Moist cold stratify, light, fresh seed planted in summer gives good results.

Description: Erect, herbaceous, perennial, native forb, 2.0-3.0'; stems hairy; stems & leaves sticky; flowers yellow-green to white; key features: Inflorescence a diffuse panicle; petals greenish, linear-lanceolate, but little longer than the calyx (Wood 1873)
Comments: status: phenology: Blooms 5,6. In northern Illinois, collect seeds in July. Collect seeds in se Wisconsin in August (he99). Known from Hartz's Sedge Meadow in west Bureau Co & moist canyons at Tomahawk Bluffs, LaSalle Co, where it often grows out of moss-covered, sandstone boulders, appearing to

enact its generic name. We have kept this plant in rich, *insitu,* living, garden soil with afternoon shade at our former location, but it does not like grassy wetlands in se Whiteside Co.

"Rather common in shallow bogs in Sugar River sand area. In low prairies & particularly those in the bottom of the north branch of Kent Creek the under surface of the leaves is at times definitely pubescent. We do not have *S forbesii* Vasey which takes the place of ours in the Castle Rock area in Ogle Co." (ewf55)

Associates: ethnobotany: Used as medicinal plant by Menominee (sm23)

VHFS: Alternate nomenclature this is *Micranthes pensylvanica* (Linnaeus) Haworth. Mohlenbrock includes ssp *interior* Burns.

Saxifraga pensylvanica

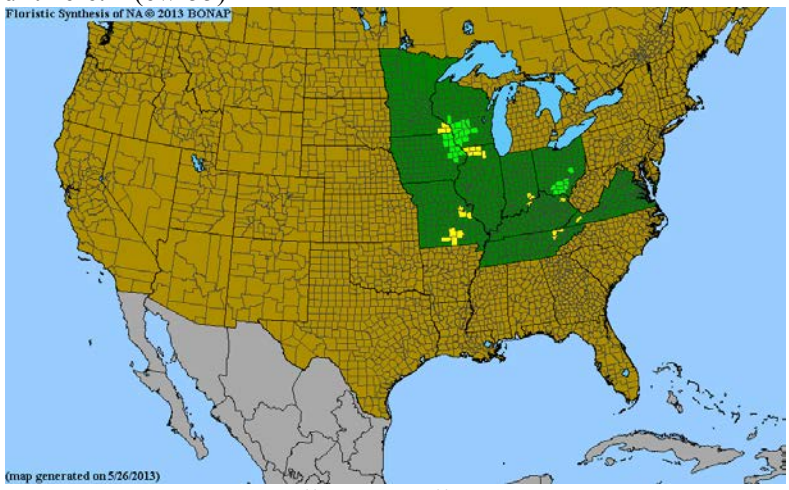
SULLIVANTIA Torrey & A Gray ex A Gray **SULLIVANTIA** *Saxifragaceae Sullivantia* for William Starling *Sullivant* (1803-1873), distinguished muscologist & bryologist. A genus of 4 spp of perennial herbs of central North America. Fruits are capsules, 2-beaked, 2-celled; seeds very many, ascending.

Sullivantia renifolia Rosend. SULLIVANTIA,

Rewrite as *Sullivantia sullivantii* (Torrey & A Gray) Britton.

In the se US, moist limestone cliffs (w12). distribution/range: *S. sullivantii* has a very scattered, relictual distribution, known from w VA (Russell County), e KY, ne TN (Claiborne County), s OH, IL, sw WI, ne IA, se MN, and MO (w12).

"Known to us in Stephenson, Ogle, Jo Daviess & Carroll cos. Though commonly attributed to Winnebago Co we have not found it here." (ewf55)



Sullivantia sullivantii

TIARELLA Linnaeus **FOAMFLOWER, BISHOP'S CAP** *Saxifragaceae Tiarella* New Latin, from Latin *tiara, tiarae,* a mitre, or other head-dress, & *-ella,* Latin feminine diminutive suffix; or diminutive of Greek

tiara, crown, both in reference to the shape of the capsule. Fruit is a capsule 1-celled, 2-valved, one valve much larger.

The hydrophilic seeds ripen late spring to early summer. Collect seeds when lower capsules begin to turn brown & papery. The seeds should be sown immediately or stored in a ziplock bag to sow outdoors in the fall. Fresh sown seed germinates in about one month. Viability drops if seeds are allowed to dry. Small seedlings will need fertilized. Cullina code A seeds will germinate within 4 weeks sown at 70ºF, or B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, * seeds are hydrophilic, intolerant of dry storage. *Tiarella cordifolia* stolons can be rooted in summer. Each cutting must have at least one leaf. (cu00) Native n, e, and se of our area.

SOLANACEAE AL de Jussieu 1789 **NIGHTSHADE FAMILY** The Nightshade family includes several fruits, a vegetable, & ornamentals.

☠. Many poisonous/narcotic spp. Most, if not all Nightshades contain some nicotine and related chemicals, even in the edible fruits.

Charles B Heiser, Jr, 1969, Nightshades The Paradoxical Plants, WH Freeman & Company, San Francisco, 200p.

DATURA Linnaeus **THE DEVIL'S WEED, JIMSONWEED** *Solanaceae Datura* (da-TEWR-ra) from a Native American name, or New Latin, from Hindi *dhatura,* a name for jimsonweed, from Sanskrit *dhattura*. Widely distributed, strong-scented, tender herbs, shrubs, or trees with large funnel-shaped flowers succeeded by spiny capsules. ☠ **Caution!** Poisonous if taken internally, not safe to handle. *Datura* is featured in the writing of Carlos Castañeda.

Datura innoxia J S Miller ANGEL'S TRUMPET, (*innoxius -s -um* (in-OKS-ee-us) not spiny, not injurious, New Latin from Latin *innoxius*, from *in-,* prefix expressing negation or privation, classical Latin *noxius* harmful, injurious, guilty, from *noxa,* harm, injury, & classical Latin *-ōsus* (*-a*, *-um*), forming adjectives, with the sense of 'abounding in, full of, characterized by, of the nature of'. (OED)) upl
Habitat: Native southwest USA & Mexico.
Culture: Can be lifted & over wintered as are *Pelargonium*, *Canna*, & *Dahlia*.
Description: Perennial within its range, but grown as an annual in the Midwest garden.
Comments: status: phenology: Blooms 8,9. Great in a moonlight garden.
Associates: ethnobotany:
VHFS: [*D meteloides* misapplied]

Datura meteloides DC JIMSONWEED, aka SACRED DATURA, JAMESTOWNWEED, (*meteloides* metel-like, similar to *Datura metel,* from the native name.)
Habitat: Tolerant of poor soil. Native to the Four Corners area, Texas & California.
Culture: Soak seeds in water & sow in spring or summer.
Description: Large shrub-like, herbaceous, perennial forb, 3-4' tall, white 8" flowers opening in the evening.
Associates: ethnobotany: Reputedly, a cook served George Washington's army, starving in the Jamestown area, a main course of Jimsonweed greens. The army hallucinated for days. The common name

"Jimsonweed" is a corruption of "Jamestown Weed". Alternately, the incident happened with soldiers sent to Jamestown to quell Bacon's Rebellion in 1676.

Datura stramonium Linnaeus
Rank ag weed, offensive odor, but a killer flower.

Datura stramonium

LYCIUM Linnaeus **MATRIMONY-VINE** *Solanaceae Lycium* New Latin, from Greek *lykion,* a thorn from Lycia, from neuter of *Lykios* Lycian, from Lycia, ancient district in Asia Minor. A genus of about 100 spp of shrubs of warm temperate & tropical areas of the Old World & New World, especially America.

Lycium halimifolium Mill MATRIMONY VINE,
"A rather common escape to railroads & old roads." (ewf55)

NICOTIANA Linnaeus **TOBACCO** *Solanaceae Nicotiana* (nee-ko-tee-AH-na, or ni-ko-she-A-na) After Jean *Nicot,*1530-1600, author of one of the first French language dictionaries & French ambassador in Portugal who introduced the plant to France *ca* 1560. *Nicotiana* is a genus of about 70 (67) spp, herbs to small trees, largely of the New World, but 20 spp in Australia & 1 in SW Africa, & the South Pacific. Typically white or yellow, fragrant, showy, trumpet-shaped flowers & bold foliage. For the border, indoor or patio. ☠ Many are smoked, some grown for insecticidal nicotine, which is organic, biodegradable, but deadly. Sow indoors 30 to 60 days before last frost, or outdoors after danger of frost is past. Surface sown germinates in 1-3 weeks. Seed long lived, half-life 5-10 years. "Rank, acrid-narcotic American herbs" (Fernald 1950 in Weakley 2008).

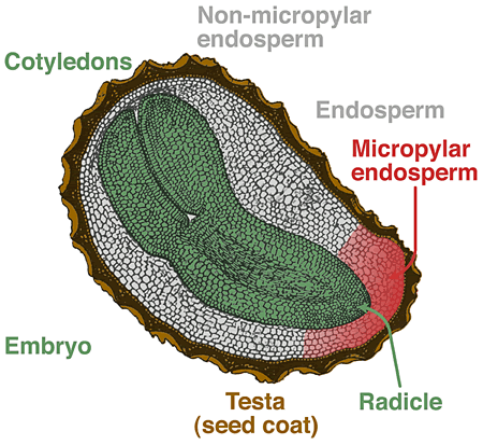
White & yellow flowered tobaccos are pollinated by moths. In some spp including *N rustica*, the nicotine content of the nectar is toxic to pollinators, & these spp have evolved self-pollination.

Nicotiana rustica Linnaeus INDIAN TOBACCO, aka AZTEC TOBACCO, COMMON TOBACCO, EROWID TOBACCO, *MAPACHO* (South America), MIDEWIWAN SACRED TOBACCO, SHAMANIC TOBACCO, WILD TOBACCO, *ahseema*, Miami-Illinois, *nilu-famu*, Shawnee, (*rusticus -a -um* rural, from Latin adjective *rusticus -a -um,* country, rural; plain, homely, rustic.)
Habitat: Formerly found in disturbed areas around American Indian habitations throughout eastern North America. distribution/range: Cultivated for centuries in the Midwest, & for a time, it persisted around some habitation sites. Originally native to Peru. Nativity, like beauty, is in the eye of the beholder. This was the first tobacco taken to & cultivated in Europe.
Culture: ①No pre-treatment necessary other than cold, dry stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). 2,080,000 (pm02, ew11) seeds per pound.
cultivation: Space plants 1.0-1.5'.
Description: Erect, temperate annual to tropical perennial, native South American forb; stems 1.0-3.0'; with oval, sticky (dewy JLH) leaves up to a foot long; flowers yellow, 1.0" long.
Comments: status: phenology: Blooms 7,8,9. Half-hardy annual, occasionally short-lived perennial. We formerly offered Midewiwan & Mohawk tobaccos. This plant is considered a gift from the Great Spirit &

its consumption is ritualistic & sacred, & should be respected as such. Commercially, it is the source of the active ingredient in a deadly insecticide. Species has a much more potent nicotine level than *N Tabacum*. Formerly used as an arrow poison in Mexico, currently used as an immobilizing drug in the capture of wild animals. Excellent (but toxic) home insecticide. Good example of an "organic" but deadly product.

Properly harvested tobacco is placed in a buffalo scrotum basket. Buffalo Bird Woman's Garden, Gilbert Wilson (1917).

http://www.telegraph.co.uk/gardening/gardeningadvice/10173025/The-toxic-charms-of-nicotiana.html



Nicotiana rustica

Drawing showing a mature seed of *Nicotiana rustica* (Color image based on a drawing by Ioan Grintescu, *In:* Gicquet P & Hitier H, La Production du Tabac, J-B Baillière et fils, Paris 1961, p. 51). Color drawing published in Finch-Savage and Leubner-Metzger (2006). http://www.seedbiology.de/structure.asp

PHYSALIS Linnaeus **GROUND CHERRY, WINTER-CHERRY, NIGHTSHADE** *Solanaceae Physalis* (FI-sa-lis) scientific Latin from Linnaeus from Hellenistic Greek φυσαλλίς, *physallis*, bladder, in ancient Greek denoting a wind instrument, from ancient Greek φῦσα, *physa*, breath wind, bellows, for the bladder-like fruits; alternately Greek *physa,* a bladder. A genus of about 80 spp of perennial herbs, almost cosmopolitan, with much diversity in North America. "The pre-Columbian ranges of these spp are unclear; they may have been introduced into e North America by native Americans." Few of the se USA spp are considered introduced. (w08).

Physalis grandiflora Hooker [new name *Leucophysalis grandiflora* (Hook.) Rydb.] LARGE-FLOWERED GROUND-CHERRY, aka WHITE-FLOWERED GROUND-CHERRY, (*grandiflorus -a -um* large-flowered, with flowers larger than normal, New Latin, from *grandis,* full-grown, great, large, tall, *-i-, & florus, floreo*, to bloom, to flower)
Habitat: Dry to dry mesic prairies. Dry, rocky or sandy soils. distribution/range: Northern Wisconsin.
Culture: ①No pre-treatment needed. Sowing outdoors in the spring is the easiest method. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99)
Description: Erect, herbaceous, perennial, native forb, 1-3', flowers cream to white with a pale yellow center.
Comments: status: Special concern in Wisconsin. phenology: Blooms 6-8. Collect seeds in se Wisconsin in September (he99).
VHFS: [*Chamaesaracha grandiflora* (Hook) Fern, *Leucophysalis grandiflora* (Hook) Rydb, *Physalis grandiflora* Hook.]

Physalis heterophylla Nees GROUND CHERRY, aka CLAMMY GROUND CHERRY, (*heterophyllus -a -um* various-leaved, with different forms of leaves on one plant.)
Habitat: Hill, sand, dry, mesic, & degraded prairies. Dry to dry mesic savannas. "Common along roads & railroads & in cultivated ground & waste places" (ewf55). distribution/range:
Culture: ①Easy by seed. No pre-treatment needed. Sowing outdoors in the spring is the easiest method. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99)
asexual propagation: Easy by division.
Description: Erect, herbaceous, perennial native forb, 0.75-3.0', plant is sticky, hairy; flowers yellow with a dark center; fruit is a berry,
Comments: status: phenology: Blooms 6-9. Collect seeds in se Wisconsin in October (he99).
Associates: Pollinated by bees. Attracts game birds & small mammals.
VHFS:

Physalis pubescens Linnaeus DOWNY GROUND CHERRY, (*pubescens* becoming hairy, slightly hairy, downy, pubescent, with soft downy hair, from Latin *pubescens*, *pubescent*, from *pubesco, pubescere, pubui*, to reach physical maturity or reach puberty, become pubescent, from *pubes*, youth, men; hair that appears at puberty, & *-escens* (like *-ascens*) Latin adjectival suffix from *-escent*, -ish, -part of, -becoming, -becoming more, -being, inceptive, indicating a process of becoming or developing)

Physalis subglabrata Mackenzie & Bush SMOOTH GROUND CHERRY, aka LONG-LEAF GROUND CHERRY, (?) (*subglabratus -a -um* somewhat glabrous or somewhat smoothish, nearly hairless.)
Habitat: Mesic & degraded prairies.
Culture: ①Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 22ºC (72ºF) for germination (tchn).
asexual propagation: Easy by division.
Associates: Pollinated by short-tongued bees.
VHFS: [*Physalis longifolia* Nutt *var subglabrata* (Mack & Bush) Cronq]

Physalis virginiana P Miller VIRGINIA GROUND CHERRY, aka GROUND CHERRY, (*virginianus -a -um* of or from Virginia.)
Habitat: Dry to mesic prairies & savannas. "Common in sandy places along roads, about farms, &c. This & *P heterophylla* are vey common in Sugar River sand area." (ewf55)
Culture: ①No pre-treatment needed. Sowing outdoors in the spring is the easiest method. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99) ②Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 22ºC (72ºF) for germination (tchn).
Description: 0.5-2.0', flowers yellow; followed by green, yellow or red berries.
Comments: status: phenology: Blooms 7-9. Collect seeds in se Wisconsin in October (he99).

SOLANUM Linnaeus 1753 **NIGHTSHADE, TOMATO, POTATO, HORSE-NETTLE** *Solanaceae Solanum*
New Latin, from Latin, nightshade, probably from *sol* sun & *-anum*, neuter of *-anus* -an; alternately from Latin *sōlānum* nightshade, or from *solamen*, Latin for quieting, in reference to the narcotic properties of some spp. The common name nightshade is from the notion the plants were evil & loved the night, or it is an allusion to the poisonous or narcotic properties of some spp. A genus of about 1799 spp of annual &

perennial herbs, trees, & shrubs that are widely distributed in tropical & temperate regions, have often prickly-veined leaves, cymose white, purple, or yellow flowers with a rotate corolla & five stamens with long connivent anthers, & a fruit that is a berry, & include several important culinary, ornamental, & deadly plants. The leaves of *Solanum burbankii* are reported to be narcotic and are sometimes smoked as a cannabis substitute, but we DO NOT recommend this practice.

Solanum carolinense Linnaeus HORSE-NETTLE, aka BALL-NETTLE, (*carolinensis -is -e* of Carolina, Carolinian, of North or South Carolina, USA.)
Habitat: Sand prairies & disturbed areas.
Culture: Easy from seed, self sows.
Description: Fruit is a berry.
"A common weed of fields, roadsides, & waste places" (ewf55).
Associates: Pollinated by long-tongued bees. Attracts many pollinators.

Solanum carolinense

Solanum dulcamara Linnaeus DEADLY NIGHTSHADE, aka BITTERSWEET, CLIMBING NIGHTSHADE, PHEASANT BERRY, FALSE BITTERSWEET, NIGHTSHADE, (*dulcamarus -a -um* bitter-sweet, from Latin *dulcis -is -e*, sweet or pleasant, any taste not acrid, & *amarus -a -um,* bitter.)
Habitat: Poor, dry or moist soils, in swales, bogs, shallow water, fencerows, gullies, brush or rockpiles, thickets, clearings, open woods. Introduced. "Common in damp paces, fields, gardens, dumps, & waste places" (ewf55).
Culture: ①Sow at max 5ºC (41ºF), germination irregular, often several months (tchn). Plant in spring or fall for wildlife.
Description: Woody climbing or twining perennial vine.
Associates: Waterfowl, marsh birds, shorebirds, upland game birds, songbirds, & terrestrial furbearers eat fruits. Small mammals eat fruit & leaves. In a Wisconsin pine plantation, water extracts of leaves from *Prunus serotina* BLACK CHERRY, *Rubus idaeus* RED RASPBERRY, *Eurybia macrophylla* BIGLEAF ASTER, *Lonicera tatarica* TATARIAN HONEYSUCKLE, *Solanum dulcamara* CLIMBING NIGHTSHADE, & *Solidago gigantea* GIANT GOLDENROD reduced red pine height growth, number of secondary needle fascicles, weight increments of roots & shoots, & radicle elongation of red pine seedling (Norby & Kozlowski 1980).

Solanum dulcamara

Solanum nigrum Linnaeus BLACK NIGHTSHADE,
"An annual weed that grows in yards, gardens, fields, & dumps, but also found in undisturbed places as woods & ravines. A polymorphous cosmopolite. The ripe fruit is not poisonous." (ewf55)

Solanum rostratum Dunal BUFFALO-BUR, aka KANSAS-THISTLE,
"BUFFALO-BUR is much more common south & west of us; we have found it only in one pasture west of Camp Grant." (ewf55)

URTICACEAE AL de Jussieu 1789 **NETTLE FAMILY**. A family of about 45 genera & 1,000 spp of herbs, shrubs, vines, & trees, cosmopolitan in tropical, subtropical, & temperate regions.

BOEHMERIA Jacquin 1760 **False Nettle** *Urticaceae* (Georg Rudolph Boehmer (*Böhmer*) (1723-1803), professor at Wittenberg, of the Saxony Boehmers) Genus of about 80 spp, perennial herbs, shrubs, & trees of the warm temperate, subtropical, & tropical regions of the Old World & New World.

Boehmeria cylindrica (Linnaeus) Swartz FALSE NETTLE, aka BOG HEMP, SMALL-SPIKE FALSE NETTLE, STINGLESS NETTLE, (*cylindricus -a -um* cylindrical, modern Latin *cylindric-,* from Greek a roll, cylinder, from κυλινδρικός, *kylindrokos,* from κύλινδρος, *kylindros,* cylinder.) obl Subgenus *Duretia*.
Habitat: Moist or shady ground; wet meadows, wet savannas & wet woodlands, upland swamps. "Common in damp open places & low woods" (ewf55). In the se USA, swamp forests, bottomlands, bogs, & marshes (w07). distribution/range: Throughout Illinois, most of the US except the nw states, West Indies, Bermuda, Central America, disjunct in Argentina, S Brazil, Paraguay, Uruguay, & Venezuela.
Culture: ① Dormant seed. 60 days cold moist stratification. Further germination pretreatments not sure? (pm09). Growth rate moderate. Seedling vigor medium. Vegetative spread rate none. Seed spread rate moderate.

seed counts & rates: 325,000 (usda), 2,579,546 (gnh11), 2,621,965 (gnh13), 2,800,210 (gnh12), 2,891,720 (gniam09), 3,024,000 seeds per pound.

cultivation: Tolerant of medium & fine textured soils. Anaerobic tolerance medium. CaCO3 tolerance low. Drought tolerance low. Fertility requirement medium. Salinity tolerance none. Shade tolerant. pH 5.1-7.0.

bottom line: For field establishment, dormant seed is best. Preliminary test data indicate some lots are non-dormant, but lots with 50- 83% dormancy are known. Flipflop species. Crossover species? Germ 54.6, 52, na, sd 30.7, r12-90 (78)%. Dorm 36.7, 43, 0.0, r0.0-83, (83)%. Test 31, 29, 26, r26-37 days.**
Description: Erect perennial with no stinging hairs; roots 14 inch minimum; stems 1.5-2.5(-4.5)'; leaves long stalked, opposite, coarsely toothed; smooth or slightly scabrous above; inflorescence unbranched, spikes from the upper leaf axils; flowers monoecious, tiny, green, 4-merous, in remote or crowded clusters, oval dry seed; N 2n = 28. key features:
Comments: status: phenology: Blooms 7,8,9. Wetland restoration. Genetic source Nachusa, Lee Co & Taylor Twp, Ogle Co.
Associates: Larval host *Polygonia interrogationis,* Question Mark butterfly.

ethnobotany: Fiber used for bowstring by Ojibwa (Whitford 1941)
VHFS: [*Boehmeria austrina* Small, *B cylindrica* (L) Sw var *cylindrica, B cylindrica* (L) Sw var *drummondiana* (Wedd) Wedd, *B cylindrica* (L) Sw var *scabra* Porter, *B decurrens* Small, *B drummondiana* Wedd, *B scabra* (Porter) Small, *Urtica cylindrica* L]

Variety *drummondiana* (Wedd) Wedd has been called a sun form of the above, seldom seen in shade, & occurring in higher pH soils than the sp (sw94, gc91). This variety has thick, often drooping, lanceolate leaf blades, more or less pilose or puberulent abaxially, scabrous adaxially, with short petioles, pilose or puberulent stems, & densely pubescent achenes (fonac). The varieties grade into each other with abundant intermediates. Typically found in the moist zone about a peat bog where livestock previously grazed; edges of bogs & marshes. The variety is more common in the southeast. The distribution data in Ilpin predates the changes in the ne Illinois cos (sw94).

LAPORTEA Gaudichaud-Beaupré 1830 **WOOD NETTLE** *Urticaceae* New Latin, from Francois Louis Nompar de Caumont La Force, comte de Castelnau, aka François *Laporte,* François Delaporte or Francis de Castelnau, 25 December 1810 to 4 February 1880, London born natural historian, versed in geography, paleontology, anthropology, mammals, birds, reptiles, fish, & insects, who studied in Paris & took part in

expeditions to Canada, the United States, Texas (then a nation), & South America. He also served as French consul to Brazil, Siam, & Australia. He authored or coauthored over 90 papers under the names Laporte, Delaporte, & Castelnau. About 21 spp of stinging perennial herbs, annual herbs, shrubs, or trees having large serrate leaves & axillary stipules. Genus of ca 21 sp annual & perennial herbs & shrubs, chiefly tropical, known from tropical & warm temperate east Asia & temperate east North America.

Laportea canadensis (Linnaeus) Weddell WOOD NETTLE, aka CANADIAN WOOD NETTLE, FALSE NETTLE, *ZE'SUB,* (*canadensis -is -e* kan-a-DEN-sis, of Canada or northeast USA.)
Habitat: Low woods & stream banks. "Common in low woods" (ewf55). Mesic & moist, nutrient-rich woods, & forests, in rich soils.
Culture: This is not in the seed or plant trade, though it is occasionally specified in native plantings.
Description: Erect, herbaceous, perennial, forb; roots minimum depth; stems 16-40"; leaves widely oval, alternate, coarsely toothed, hairy; inflorescence cyme, female flowers in loose, long clusters from upper leaf axils; male flowers with 4 -parts from lower leaf axils; flowers green to white; 5-merous; N. key features: Sting hairs, alternate leaves.
Comments: status: Native. phenology: Blooms July-August. Potentially invasive native. This sp may dominate rich forests, visually replacing the spring flora. The stinging hairs can penetrate light weight clothing or loosely woven fabrics.
Associates: ethnobotany: Roots used as medicinal beverage by Ojibwa (sm32). Ojibwa, Menominee, & Sauk-Fox used it for utility fiber. Fiber used for sewing, twine, & weaving bags by Ojibwa & Menominee (sm23, 32). "Important as basswood bark to the industries of the Chippewa woman (den29). Ojibwa utility plant (den28). Identified in Ohio Hopewell & rock shelter fabrics (Whitford 1941)
VHFS: [*Urtica canadensis* L, *U divaricata* L, *Urticastrum divaricatum* (L) Kuntze]

PARIETARIA Linnaeus 1753 **PELLITORY** *Urticaceae*

Parietaria pensylvanica Muhlenberg ex Willdenow PENNSYLVANIA PELLITORY, aka ROCK PELLITORY, "Common in woods" (ewf55)

PILEA Lindley 1821 **CLEARWEED** *Urticaceae Pilea* New Latin from classical Latin *pīleus*, a felt cap, referring to the shape of the larger sepal in female flowers, which partially covers the achene. About 250 spp of tender annual & perennial herbs, sometimes evergreen, pantropical & in the temperate regions of the Old & New World.

Pilea pumila (Linnaeus) A Gray CLEARWEED, aka GREENFRUIT CLEARWEED, COOLWORT, RICHWEED, (*pumilus -a -um* New Latin, small, dwarf, dwarfish, low or little, from *pumilus, pumili* m, Latin noun, dwarf. (same as *nanus*).
Habitat: "Common in damp shady places" (ewf55). Rich low or alluvial ground in wooded valleys, often in solid stands where other plants are discouraged by standing water; cool moist shaded places, including rock, canyons; under bridges with weedy neighbors (Ilpin). distribution/range:
Culture: unknown
availability: Sp is not in the native seed trade.
Description: Erect annual, clear, translucent native forb with no stinging hairs; roots minimum depth; stems 4-20" tall; leaves long-stalked, opposite, shiny; leaf blades with cuneate bases & 3-11 rounded teeth on each margin; Inflorescence a dichasium or raceme, branched clusters from the middle & upper leaf axils; flowers green flowers 3(4) or 4-merous, 1/8" wide; fruit pale green, oval dry seed, with purple edges; N 2n = 24, 26.
key features: Stems very smooth & pellucid; inflorescence branched; achene with purple edges; leaves opposite.
Comments: status: phenology: Blooms July-September. This sp is not in the native plant trade.
Associates: Wind pollinated. Non-mycorrhizal.
VHFS: [*Adicea deamii* Lunell, *A pumila* (L) Raf, *Pilea pumila* (L) Gray var *deamii* (Lunell) Fern, *P pumila* (L) Gray var *pumila*, *Urtica pumila* L]
Plants having rounded leaf bases & 11 to 17 less rounded or acute teeth on each margin have been called variety *deamii* (Lunell) Fern. Typical *P pumila*, two additional varieties & a closely related spp are known from eastern Asia. Minor differences in the sculpting & markings on the achenes help distinguish these taxa.

URTICA Linnaeus 1753 **STINGING NETTLE** *Urticaceae* New Latin, from Latin, nettle; probably akin to Latin *urere* to burn; from its sting, Greek *heuein* to singe, Sanskrit *osati* he burns. Widely distributed plants having opposite stipulate leaves with stinging hairs & small greenish tetramerous flowers; the type of the family *Urticaceae.* Larval host *Polygonia interrogationis* QUESTION MARK BUTTERFLY.

Urtica dioica Linnaeus STINGING NETTLE, aka NETTLE, *Ma'zana'tig, Bepadji'ckanakiz'it Ma'zana'tig,* a prickly nettle (Ojibwa),
Habitat: Thickets & rich damp soil, rich woods, moist waste ground. distribution/range: Occasional to common in north ½ of Illinois, rare in s ½.
Associates: ethnobotany: Used as medicinal beverage by Pottawatomie & Ojibwa (sm32, 33). Ojibwa medicine for urinary & dysentery (den28) related spp of nettle used as local irritants & as diuretics. Ojibwa, Pottawatomie, & Menominee, & Sauk-Fox used fiber for sewing, twine, & weaving bags (sm23, 32, 33, Morse 1822). Identified in Ohio Hopewell & Roch shelter fabrics by Whitford (1941)
VHFS: Including *Urtica gracilis* Aiton & *U procera* Muhl.

Urtica procera Muhlenberg COMMON NETTLE "Common on roadsides & in waste places. There is a difference of opinion as to whether this is distinct from *Urtica dioica*. We are following Deam's Flora in considering the latter to be a rare eastern introduction & are omitting it from our list." (ewf55)

VALERIANACEAE Batsch 1802 **VALERIAN FAMILY** Seeds solitary, pendulous, in a dry, indehiscent pericarp.

VALERIANA Linnaeus **VALERIAN** *Valerianaceae Valeriana* New Latin, from Medieval Latin for valerian, meaning strong, from *valere*, to be healthy or well from its use in treating nervousness & hysteria, a reference to the medicinal properties, or Medieval Latin from *valeriana*, feminine singular of the adjective *valerianus*, from the personal name *Valerius*. King Valerius was a patron & friend of botanists. A sedative was made from its root. 200 spp of widely distributed perennial herbs & shrubs having lobed or dissected leaves & cymose white or pink flowers with spurless corollas. Fruit 1-celled, 1-seeded.

The valerian of the shops is from *Valeriana officinalis*, & is used to treat hysteria & epilepsy. The roots of several other spp have a heavy odor & are tonic, antispasmodic, & febrifugal. The biblical spikenard (John xii, 8 (3?)), valued as a stimulant & perfume, was from the root of *Nardostachys Jatamansi*.

Valeriana ciliata (Torr & Gray) FG Mey VALERIAN, aka COMMON VALERIAN, EDIBLE VALERIAN, TAP-ROOTED VALERIAN, (*ciliatus -a -um* ki-lee-AH-tus New Latin ciliate, with marginal hairs, fringed with hairs like an eyelash or eyelid, from *cilium, cilii* n., Latin noun, upper eyelid; edge of upper eyelid; eyelid, lower eyelid.)
Habitat: Wet prairies, calcareous fens. distribution/range: Occasional in north ⅕ of state.
Culture: ①Sow seeds outdoors in fall (he99). ②Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn).

"*Valeriana ciliata* Moist, alkaline prairie. Blooms mid May to early June; CREAM. Harvest late June. 20"; SEEDLING TRANSPLANT; sow seeds in flats while fresh, seedlings emerge in a few days & are transplanted to field in a few weeks; will bloom following spring; reliable. Plants stink." (rs ma)
Description: Erect perennial, 1-4', flowers cream colored, 0.13" long, wide-flaring, tubular, 5-merous.
Comments: status: Native. phenology: Blooms May to June. Collect seeds in se Wisconsin in late June (he99). Plant has a strong odor. "Rare, being found only in the bogs in Coon Creek bottom & in a low prairie south of Killbuck Forest Preserve" (ewf55).
Associates: ethnobotany: Root used as medicinal plant by Menominee (sm23).
VHFS: Alternate nomenclature is *Valeriana edulis* Nutt ssp *ciliata* (T&G) FG Mey.

Valeriana sitchensis Bong ssp **uliginosa** (Torrey & Gray) FG Mey [*Valeriana uliginosa* (Torrey & Gray) Rydberg] SWAMP VALERIAN, aka MARSH VALERIAN, MOUNTAIN VALERIAN, (*sitchensis* from the island of Sitka, Alaska; *uliginosus -a -um* of wet or marshy places, growing in swamps or wet places, from Latin adjective *uliginosus -a -um*, marshy, full of moisture, wet, moist, damp, from *uligo, uliginis* water-logged ground, marsh, from *udus -a -um, uvidus -a -um,* damp, moist, wet.)
Habitat: Calcareous swamps & wet woods, wet soil, rare McHenry Co.

Description: Blooms June to July.
Associates: ethnobotany: Root used as medicinal beverage by Menominee (sm23). Root juices used on hooks to lure fish by Menominee (sm23)

VERBENACEAE J St.-Hiliare 1805 **VERBENA FAMILY**

CALLICARPA Linnaeus 1753 **BEAUTYBERRY** *Verbenaceae Callicarpa* (kal-li-KAR-pa) beautiful-fruited, or sometimes beautiful seeded, from Greek καλλος, *kallos*, beauty, & καρπος, *karpos* fruit, & *-us*. Tropicals & some temperate spp hardy to zone 5. 140 species of small trees, shrubs, & lianas with clustered small flowers followed by bright, showy fruit, mostly tropical & subtropical. Tropical spp are often grown as greenhouse plants. W12b & others place this in the *Lamiaceae.*

Harvest the magenta colored fruits fall to early winter. Remove seeds from fruits. Sow in fall and place in unheated coldframe. Seeds sown in spring will germinate more slowly. Code A seeds will germinate within 4 weeks sown at 70ºF or B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, & G chemical inhibitors. 2-3 node softwood cuttings from below the growing tip treated with 1000 ppm IBA under mist or a polytent. (cu02)

Callicarpa americana Linnaeus FRENCH MULBERRY, aka AMERICAN BEAUTYBERRY, BEAUTY BERRY, BEAUTYBERRY,
Habitat: Moist soil. distribution/range: Virginia to s Missouri, Florida to Texas.
Culture: propagation: ①GA3 to germinate in 1-8 months (jlh).
Description: Shrub to 6.'; leaves 6" long; bluish white 4-merous flowers in dense clusters, prominent stamens, followed by violet blue berries with 3-4 seeds each; key features:
Comments: status: phenology: Blooms Ornamental for South.
Associates: Good deer browse.
VHFS:

PHYLA Loureiro 1790 **FROGFRUIT, FOGFRUIT** *Verbenaceae* A genus of about 11-15 spp of herbs of tropical, subtropical, & warm temperate regions of the New & Old worlds.

Phyla lanceolata (Michaux) Greene MARSH FROGFRUIT, aka NORTHERN FROGFRUIT,
"Common on streambanks, in ditches & in other wet places. (*Lippia lanceolata* var *recognita* Fern & Grisc)" (ewf55).

VERBENA Linnaeus **VERBENA, VERVAIN** *Verbenaceae* New Latin, from Latin singular of *verbena*, *verbenae* f, sacred ceremonial boughs of laurel or olive or myrtle, a class of medicinal plants, or *verbeneca, verbenecae* f, vervain. Related to Latin *verber* rod, Greek *rhabdos* rod, *rhamnos* buckthorn & probably to Greek *rhembein* to whirl, Old High German *werfan* to throw. A genus of 200-250 spp of tropical, subtropical, & warm temperate parts of the New World, chiefly American, rarely Old World herbs or subshrubs having bracted flowers in heads or spikes, a regular corolla with a 5-lobed limb, & four one-seeded nutlets. The type genus of the family *Verbenaceae. V canadensis* is placed in *Glandularia* by some authors (m14).

The seeds ripen from summer to fall, sequentially in the long inflorescences of some spp. Seed requires moist cold stratification & light to germinate. Seedlings grow rapidly & bloom 1st or 2nd year. Cullina code B seeds will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF, H seeds require light to germinate. Seed is easier, but both prostrate & upright spp can be grown from 2-node nonflowering stem cuttings. (cu00)

"Variations in individuals & extensive hybridization among our 5 native verbenas produce such a mingling of characters that picking out the parents is difficult & at times quite impossible. Dr Moldenke has named some of these hybrids in his account of the genus in the New Illustrated Britton & Brown & he has reviewed some of our specimens. Hybrids are much more common in some pastures than in others where the opportunity of crossing seems as great. The prairies about Camp Grant & pastures in Kishwaukee River bottom near Perryville road bridge & on River road south of Cherry Valley are especially prolific. The most common crosses here are X *rhydbergii* & X *moechina*." (ewf55)

Verbena stricta hybrid?

Verbena bracteata Lagasca & Rodriguez PROSTRATE VERVAIN, aka CREEPING VERVAIN, LARGE BRACTED VERVAIN, (*bracteatus -a -um* New Latin for bracted, bracteate, bearing bracts, modified leaves immediately below the calyx, or on the peduncle.)
Habitat: Open disturbed sites. distribution/range:
Culture: ①Seeds germinate after about 30(?) days of cold moist stratification (he99).
Description: Creeping annual, biennial, perennial; square stems, 1-12"; leaves deeply pinnately-cut or 3-lobed; inflorescence 0.50" thick, terminal, hairy spike with many bracts; flowers blue to purple, 5-merous;
key features: Spike with many bracts, leaf deeply pinnately-cut or 3-lobed.
Comments: status: phenology: Blooms 5-10. Collect seeds in se Wisconsin in October-November (he99).
" A decumbent that is common on railroads, roads, & in waste places. A hybrid on the C & NW Ry track near US Rt No 51 tends to be more upright, the bracts are short & the leaves less divided (X *perriana*). X *deamii* Moldenke, stout & semidecumbent, resembling *V stricta* but having bracted flowers, is uncommon on roadsides." (ewf55)
Associates: Attracts butterflies.

Verbena hastata Linnaeus BLUE VERVAIN, aka SWAMP VERBENA, SWAMP VERVAIN, SIMPLER'S JOY, VERVAIN, WILD HYSSOP, (*hastatus -a -um* hastate, with a spear, spear-shaped, spear-like, halberd-like, with equal more or less triangular basal lobes directing outwards, from Latin *hasti-*, *hasta,* spear. Among the Roman front line soldiers were the *hastati,* or spearmen.) Facultative Wet (+)
Habitat: Wet meadows & marshes, wet savannas, mesic savanna, upland swamps, swales, damp thickets, & shores, wet woods, wet prairies, wet waste ground. distribution/range:
Culture: ①"Cold moist treatment, or fall sow. Very light to no cover. Excellent germination. Self sows." (mfd93). ②60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ③Seeds germinate after about 30 days of cold, moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover. (he99) ④"No pre-treatment needed. Sow seeds just below soil surface in darkness at 50ºF & water." (ew12) ⑤Sow at max 5ºC (41ºF), germination irregular, often several months (tchn). ⑥Deno notes germination is good when seed is dry stored @ 40º F then shifted to 70ºF with light. Seed needs light to germinate, sow on surface of soil. GA3, dry storage (180 days), cold moist stratify (90) or dormant seed.
seed counts & rates: 1,488,000 (pm01, ecs), 1,578,752 (wns01), 1,600,000 (pn02, shirley, ew12), 1,719,696 (gnh03), 1,920,000 (*rosea* ew12), 1,991,228 (gna06), 1,955,604 (gnh02), 2,000,000 (jfn04),

2,004,415 (gna04), 2,268,000 (lhn91), 2,272,000 (aes10) seeds per pound. In mixes plant 0.015 to 0.125 lbs pls per acre (usda 1997).

availability: This may be short-lived or successional in plantings, & is short lived in production fields. Seed widely available from commercial sources. Because production plots are short-lived, supply & prices may vary significantly from year to year.

asexual propagation: Division of mature plants in spring. Stem cuttings work well in summer.

cultivation: Space plants on 1.5-2.0' centers. Rich, wet to mesic soils, full sun to partial shade. Tolerant of moderate inundation, up to 8", similar to the rhythms of wet prairies, stream banks & marshes. pH 6-7. Nutrient load tolerance moderate. Salt (saline) tolerance moderate to high. Siltation tolerance moderate to high.

bottom line: Spring seeding works well in 50% of lots, but strongly dormant lots are prevalent of late. Flipflop species. Our experience has shown that some seed lots may have low TZ tests but high germination tests. Germ 41.6, 50, 5.0, sd 32.6, r4.0-88 (84)%. Dorm 41.6, 35, 0.0, sd 37.1, r0.0-92 (92)%. Test 33, 34, 23, r19-51 days.**

greenhouse & garden: Easy from seed. Seed may need cold moist stratification @ 33-38°F for 30-90 days. Forma *rosea* requires stratification & light as does the sp.

Description: Native, erect, herbaceous, biennial or perennial forb; stems up to 3.0-6.0(7.0')'; hastate leaves; inflorescence to 8+", flowers blue/purple (blue/violet), occasionally pink;

Comments: status: Considered invasive by some authorities (Whitson et al 1996.) phenology: Blooms 7,8,9. In northern Illinois, collect seeds in mid-September-early November. Collect seeds in se Wisconsin in October (he99). Aggressive, early successional, short-lived in plantings & production plots. Seeds are photodormant, & photodormancy is a trait necessary for a wetland seedbank spp. Attractive cut flowers & dried seed heads. Useful in landscaping moist areas, bog gardens, rain gardens, water gardens, wet meadows, & swales. Seed source nursery plantings, genetic sources farmed wetlands, drainage ditches, Green River Lowland, Greenville Twp, Bureau & Hannaman Twp, Whiteside Co.

"Other common plants, which presented themselves at different places on our route through the prairies" *Verbena hastata* L. (Short 1845).

"Common on roadsides & in open woods & pastures, but usually in damp soil. X *rydbergii* Moldenke, a hybrid with *V stricta* is common & variable." (ewf55)

Associates: Pollinator friendly. Attracts butterflies, nectar plant for *Ancyloxypha numitor* LEAST SKIPPER, *Poanes viator* BROAD-WINGED SKIPPER, *Polites peckius* PECK'S SKIPPER. Attracts hummingbirds. Seeds are eaten by wildlife. Small mammals eat new shoots. Deer resistant.

ethnobotany: Used as medicinal beverage by Menominee & Ojibwa (sm23, den28). Ojibwa medicine for nosebleed (den28)

VHFS: (Includes f *rosea* Cheney) Variety *hastata* occurs east of the Rocky Mountains. Var *scabra* Moldenke occurs in Indiana, Michigan, Wisconsin, & west, but not in Illinois. We have had hybrids of this sp & *V urticifolia* on our farm

Verbena hastata 200 cell

Verbena simplex Lehman NARROW-LEAF VERVAIN,

"Not uncommon on dry prairies. Less weedy than the last (*V hastata*) & the next (*V stricta)*. Crossing with the above (*V hastata*) gives the common X *blanchari* & with the next (*V stricta*) gives X *moechina* which is common & variable" (ewf55).
Culture: propagation: 567,728 seeds per pound.
Comments: status: phenology: Blooms Seed source gravel road sides.

Verbena stricta Ventenat HOARY VERVAIN, aka PURPLE VERVAIN, PURPLE VERBENA, TALL VERVAIN, WOOLLY VERVAIN, (*strictus -a -um* strict, stiff, upright, erect, tight, drawn together, rigid, from Latin *strictus*, drawn tight, bound up) upl
Habitat: Dry, hill, & sand prairies, dry savanna, dry prairies, dry pastures, & dry old fields, common, degraded prairies.
Culture: ①Moist cold stratify (30) or dormant seed, small seeds need light to germinate, shallow cover. "No pretreatment, or moist cold treatment, of fall sow. Very light cover." (mfd93). ② 60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate (pm09). ③No pre-treatment needed, sowing outdoors in the spring is the easiest method, or seeds germinate after about 60 days of cold, moist stratification. (he99) ④Sow at +2 to +4ºC (34-39ºF) for 4 wks, move to 20ºC (68ºF)for germination (tchn).

seed counts & rates: 425,000 (gran), 436,352 (wns01), 448,000 (pm02), 471,000 (ecs), 480,000 (ew12), 502,490 (gna06), 504,164 (gna11), 512,000 (pn02, jfn04, sh94, aes10), 519,748 (gna06), 550,303 (gnh03), 567,728, 650,646 (gnh02) seeds per pound. Pure stand plant 6 lb per acre (gran). In northern Illinois mixes, plant 0.031 to 0.063 lbs per acre.

cultivation: Space plants on 1.0-1.5' centers. Dry soils, full sun. Extremely drought tolerant once established, growing on droughty soils & flowering in the heat of summer. Clay soil tolerant. Tolerates poor soils. Low moisture requirements. Coarse to moderately fine soils. Neutral to acidic soils. May be short lived in rich soils.

bottom line: Dormant seed is necessary in 90% of lots. Flipflop species. Germ 16.9, 8.0, 8.0, sd 19.4, r2.0-71 (69)%. Dorm 64.3, 63, na, sd 22, r13-94 (81)%. Test 34, 33, 28, r20-49 days. (#18).**

greenhouse & garden: Easily grown from cold moist stratified seed.
Description: Annual or perennial, 1.5-2.5', with long spikes of deep blue to blue-violet flowers; pale hairy leaves.
Comments: status: Native. This sp is considered invasive in parts of its range by some authorities (Stubbendieck et al 1994). phenology: Blooms 6,7,8,9. In northern Illinois, collect seeds in mid-September-October. Collect seeds in se Wisconsin in October (he99). Attractive cut flowers & dried seed heads. Landscaping, xeriscaping, dry pollinator gardens. If you think of your garden as a single floral arrrangement, *VERHAS* is filler and texture. Flourishes in poor soils, growing well in rich soils, but it is non-competitive. This sp behaves as a sandy-soil seed bank sp providing a flush of color for a few years, & may be short-lived. In large populations of plants, white & pink color forms are not uncommon. HOARY VERVAIN may be initially aggressive to somewhat weedy, but it is early successional, short-lived, & soon fades away with competition. Recommended for initial roadside stabilization & mass planting in dry soils. Species is unsuited for mesic soils except as a short-lived accent plant. Seed source nursery production & remnant sand prairies, Green River Lowland, Tampico Twp, Cornfield Co.

In describing the Terre Haute, Indiana prairie, "almost the only relicts of these to be seen, were occasionally (page 188) on the road-side, or in fence-corners, a few plants of *Verbena stricta* and *Vernonia corymbosa*." "Other common plants, which presented themselves at different places on our route through the prairies." *Verbena stricta* Vent. (Short 1845).

"A common roadside weed. On a high prairie road north of Ill Rt 70 near Meridian road we found the white form (f *albiflora* Wadmond) covering considerable areas to the exclusion of the purple form. Roseate flowers (f *roseiflora* Benke) are very uncommon on Camp Grant prairies." (ewf55)
Associates: Pollinator friendly, desirable in pollinator gardens. Butterfly nectar source, *Erynnis martialis* MOTTLED DUSKYWING *Thorybes pylades* NORTHERN CLOUDYWING. Pollinated by long-tongued bees, short-tongued bees, other *Hymenoptera, Diptera, Lepidoptera*, and occassionally hummingbirds. Attracts seed eating songbirds. Said to be deer resistant.
VHFS: Includes f *albiflora* Wadmond & f *roseiflora* Benke.

Verbena stricta

Verbena tenuisecta, sow at 20ºC (68ºF), germination slow (tchn).

Verbena urticifolia Linnaeus *ME WHITE VERVAIN, aka NETTLE-LEAVED VERVAIN, (*urticifolius -a -um* nettle-leaved, with leaves like *Urtica*, nettle) upl
Habitat: Wooded fringes of wet meadows, wet & mesic savannas, fields, thickets, ditch banks, disturbed woods.
Culture: ①Seeds germinate after about 60 days of cold, moist stratification, or no pre-treatment needed, sowing outdoors in the spring is the easiest method. (he99) ② "No pre-treatment needed. Sow seeds just below soil surface in darkness at 50ºF & water." (ew12).

seed counts & rates: 1,116,851 (gnae06), 1,246,154 (gnh12), 1,440,000 (ew12), 2,268,000 seeds per pound.

cultivation: Space plants on 1.25-2.0' center. Wet-mesic to mesic soils, full sun to partial shade. Tolerates clay soils.

bottom line: Most lots significantly or strongly require dormant seeding, but a nondormant lot is known. Flipflop species. Germ 26.2, 8.0, 6.0, sd 27.7, r6.0-92 (86)%. Dorm 57, 79, 88, sd 33.6, r0.0-90 (90)%. Test 32, 35, 41, r20-41 days. (#11).**

greenhouse & garden: Moist cold stratify or dormant seed, small seeds need light to germinate, shallow cover. Successional restoration
Description: Erect, herbaceous, perennial, native forb; stems 2.0-5.0'; sp has leaves hirsute on lower surfaces; inflorescence to 12"; flowers white; nutlets about 2 mm long, corrugated on back;
Comments: status: Possibly extirpated in Maine. This sp is also considered invasive by some sources (Haragan 1991). phenology: Blooms 7,8,9. In northern Illinois, collect seeds in late September-October. Collect seeds in se Wisconsin in October-November (he99). Landscaping, wetland & woodland restoration, especially wooded wetland fringe. The dried seed heads on a robust plant & the velutinous leaves make an interesting textural statement. Seed source nursery production, genetic source Prestons' Timber, Greenville Twp, Bureau Co & nursery remnant, Tampico Twp, Whiteside Co.

"This commonly grows in damp shady places. On Mitchell road near Ill Rt No 173 we found a patch with blue flowers but lacking other evidence of hybridization. Crosses with *V hastata*, X *engelmanni*, have small blue flowers. Not common." (ewf55)
Associates: Attracts butterflies. Low food value for deer.
VHFS: Variety *urticifolia* synonyms include *Verbena urticifolia* L var *incarnata* (Raf) Moldenke, *V urticifolia* L var *simplex* Farw.

Var *leiocarpa* Perry & Fern, VELVETLEAF VERVAIN, with leaves velutinous on the lower surface, nutlets about 1.5 mm long, not corrugated on back, Cook & Kane cos.

Verbena urticifolia

THE EARTH LAUGHS IN FLOWERS. Waldo Emerson

VIOLACEAE Batsch 1802 **VIOLET FAMILY** A family of about 20 genera & 900 spp of herbs, shrubs, & trees. Cosmopolitan, but mostly north temperate. The roots of many *Violaceae* have emetic properties.

Hybanthus *Violaceae Hybanthus* from Greek ὕβος, *hybos,* hump, ὑβός, *hybos*, hump-backed, bent outward, a hump, & ἄνθος*, anthos*, flower, referring to the anterior pouched petal. Fruits are capsules.

Hybanthus concolor GREEN VIOLET,
Erect, leafy plant; flowers axillary, inconspicuous. Recalcitrant?
[*Solea concolor* Gingins]

VIOLA Linnaeus 1753 **VIOLET, JOHNNY-JUMP-UP, PANSY** *Violaceae Viola* from *viola,* the classical Latin name for violets, a name for one of several scented flowers, a term of non-Indo-European origin; akin to the source of Greek *ion,* violet. A genus of about 525-600 spp of herbs & rarely subshrubs of temperate regions of the Old & New Worlds. VIOLETS are the state flowers of Illinois, New Jersey, Rhode Island, & Wisconsin. The leaves & flowers are edible & are high in vitamins A & C.

Fruits are 1-celled, 3-valved capsules that spring open, throwing seed when ripe. Seeds are many, with a crustaceous testa & distinct chalaza. Most spp produce showy, open, chasmogamous (CH) flowers & non-opening, cleistogamous (CL) flowers.

The hydrophilic seeds ripen from spring to summer. The seed capsules explode when the seeds ripen; the ripening seeds turning from white to brown. Cullina (2000) notes that when pods are about to split, the stalks uncurl & straighten upright, & lengthen. The capsule color changes from green to yellowish or mauve. Place seed capsules in a sealed, but "inflated" paper bag. You may wish to place the paper bag in your office & listen to the drying capsules exploding like a glacially slow-motion bag of microwave popcorn. Readily clean seed, store in a ziplock, refrigerate, & plant in the fall. Cullina code B Seed will germinate upon shifting to 70ºF after 90 days of cold moist stratification at 40ºF. * Seed is hydrophilic, intolerant of dry storage.

V pedata can be grown from …

VIOLETS are notoriously promiscuous. Most spp produce normal, open, chasmogamous flowers in spring (some again in fall), & closed, self-fertile, cleistogamous flowers in late summer & fall. The normal, showy, spring flowers are pollinated by insects (small bees, butterflies, & moths) & are often cross-pollinated (though some spp, if not insect pollinated, are capable of selfing). Woodland violets are capable of producing CL flowers in the full canopy, low light levels of summer & early fall. In some spp, the showy flowers (eg *V papilionaceae*) are infertile, or others may simply fail to set seed. The seeds of the showy CH flowers often produce hybrids while the seeds of the inconspicuous CL flowers are true to species but clones of the mother plant. Fruits are 3-valved capsules that open wide, exposing the boat-shaped valves with 3 rows of seed. As the valves dry, they narrow & forcibly expel the seeds from 3.0 or 4.0', up to 16.5'. The seeds of some spp have elaiosomes & are further dispersed by ants up to an additional 3 plus feet from the mother plant.

VIOLETS are extremely sensitive to habitat & populations are thought to be in equilibrium with very specific microhabitats in which they originated. Many *Violet* colonies are thought to be predominantly composed of the selfed-progeny from the CL flowers of the parent plant that are pre-adapted to the environment of the site. The majority of the showy CH cross-fertilized seeds are not adapted to the microsite & do not survive.

It's disheartening to have greenhouse trays largely consisting of mongrel violets that look nothing like the mother plant.

VIOLETS are host plants for the following butterflies & moths: Butterfly spp: *Boloria bellona* MEADOW FRITILLARY, *Boloria selene myrina* SILVER-BORDERED FRITILLARY, *Euptoieta claudia* VARIEGATED FRITILLARY, *Speyeria Aphrodite* APHRODITE FRITILLARY, *Speyeria atlantis* ATLANTIS FRITILLARY, *Speyeria cybele* GREAT SPANGLED FRITILLARY, *Speyeria diana* DIANA, *Speyeria idalia* REGAL FRITILLARY. Moth spp: *Apantesis nais* NAIS TIGER MOTH, *Archips purpurana* TORTRICID MOTH SP., *Ecpantheria scribonia* GIANT LEOPARD MOTH, *Elaphria grata* GRATEFUL MIDGET, *Eubatha mendica* THE BEGGAR, *Spodoptera dolichos* DOLICHOS ARMYWORM MOTH. After http://www.illinoiswildflowers.info/savanna/tables/table25.htm

Mice, mourning doves, & dark-eyed juncos eat the seeds. Wild turkeys eat the rhizomes, & rabbits eat the leaves.

Viola adunca Smith HOOK-SPUR VIOLET, aka SAND VIOLET, (*aduncus -a -um* Latin adjective hooked, bent like a hook, having hooks, hooked; curved from Latin *ad-* & *uncus*.)
Habitat: Moist to dry woods, in gravelly or sandy soils. distribution/range:
Culture: ①Seeds germinate after about 60 days of cold moist stratification, or sow seeds outdoors in fall. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover (or light cover). (he99)
Description: Erect perennial to 6", flowers blue or violet. key features: Spur 0.25", conspicuous.
Comments: status: phenology: Blooms 5-6. Collect seeds in se Wisconsin in July (he99).
Associates:
VHFS:

Viola affinis LeConte LECONTE'S VIOLET, aka THINLEAF VIOLET, (*affinis -is -e* Latin *affinis,* related to, allied, similar, of near alliance, neighbor, from Latin *ad*, to, & *finis*, boundary, meaning to the border of.)
"Uncommon. The wooded bank of Willow Creek in Rock Cut & the shaded bank of Pecatonica River at Harrison." (ewf55)

Viola X **bernardi** Greene "Rather uncommon on prairies, south of Harrison, the Searle Tract & near Rock Cut" (ewf55).

Viola canadensis Linnaeus CANADA VIOLET, "Formerly extensively planted as a ground cover & tending to persist & spread. We have not found it where it was unquestionably native." (ewf55)

Viola cornuta JOHNNY JUMP UP,
Habitat: Dry meadows. distribution/range:
Culture: ① Sow at 20ºC (68ºF), germinates in less than two wks (tchn). 400,000 (ecs) seeds per pound.
Description: Pansy-like, to 6".
Comments: status: phenology: Blooms May to August. Added to seed mixes for early color.
Associates:
VHFS:

Viola cuculata Aiton HOODED VIOLET, aka BLUE MARSH VIOLET, MARSH BLUE VIOLET, (*cucullatus -a -um* hooded, cap-shaped or hood-shaped, from the Latin adjective *cucullatus -a -um*, hooded, having a hood.)
Habitat: Wet meadows, wet woods, bogs, & swamps. distribution/range:
Culture: ①Seeds germinate after about 60 days of cold moist stratification, or sow seeds outdoors in fall. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover (or light cover). (he99)

Description: Erect perennial, 4", basically stemless; key features:
Comments: status: phenology: Blooms 4-6. Collect seeds in se Wisconsin in July (he99).
Associates:
VHFS:

"Our common blue marsh violet found in boggy places & on low prairies throughout. A good sized, long-stemmed violet that has a beardless spurred petal & with many hairs on the bearded lateral petals clubbed." (ewf55)

Viola eriocarpa Schw. SMOOTH YELLOW VIOLET,

"Common in low woods. Usually quite distinct but occasionally it is somewhat pubescent & basal leaves are not always present, thus suggesting *V pubescens*." (ewf55)

Viola fimbriatula Smith SAND VIOLET,

"Not uncommon in Sugar River sand area & occasional on sandy prairies. A minute plant when in flower but later becoming more robust. Resembles *V sagittata*." (ewf55)

Viola labradorica Schrank DOG VIOLET, aka AMERICAN DOG VIOLET, ALPINE VIOLET, (*conspersus -a -um* scattered, sprinkled over, thickly covered, from the past participle of the Latin verb *conspergere*, to sprinkle, to spatter.)
Habitat: Meadows, damp woods, bottomlands, & moist woods. Full sun or shade, dry to moderate moisture, woos, meadows, sandy loam soils. distribution/range: Rare, Cook, DeKalb, Lake, & Richland cos.
Culture: ①Seeds germinate after about 60 days of cold moist stratification, or sow seeds outdoors in fall. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover (or light cover). (he99) ②Sow at max 5ºC (41ºF), germination irregular, often several months (tchn). Self sows modestly, scattering fresh seed works. Occasionally available in the ornamental plant trade, rare in native nurseries.
Description: Native, erect to drooping perennial forb; stems 0.50-8" tall; roots minimum depth; stems hairless, flowering when only 0.50-0.75" tall; stems clustered; leaves basal, thin, pale green, mostly smooth, roundish to kidney-shaped; stem leaves mostly 0.50-1.50" wide, round with a heart-shaped base; flowers solitary from the leaf axils on a long stalk taller than the leaves; flowers light blue to purple, 5-merous, 0.25-0.50" long, petals with dark veins, 2 side petals bearded; fruits elliptical capsule, seeds light brown; N. key features: Flowers solitary from the leaf axils, leaves thin, pale green, mostly smooth. The style is bent down at the tips & somewhat hairy.
Comments: status: phenology: Blooms (March)June to August. Collect seeds in se Wisconsin in June-July (he99). We had this sp show up in our "formal" landscape plantings, mixed with some purple-leaved *Ajuga,* with which it blends quite well. Produces many cleistogamous flowers after its "bloom" season, & rarely a chasmogamous flower in fall (September 2012).
Associates: ethnobotany: Used as medicinal beverage by Ojibwa (sm33)
VHFS: [*Viola adunca* Sm var *minor* (Hook) Fern, *V conspersa* Rchb, *V labradorica* Schrank, *V conspersa* Rchb]

Viola labradorica

Viola lanceolata Linnaeus *MN, VT LANCE-LEAVED VIOLET, aka BOG WHITE VIOLET, STRAP-LEAVED VIOLET, (*lanceolatus -a -um* (lan-kee-o-LAH-tus) lanceolate, little-spear-shaped, lancelet-like in form, New Latin from *lancea,* lance or spear, *-olus- a- um-,* diminutive, & *-atus*, possessive of or likeness of, for the lanceolate leaves) OBL
Habitat: Moist sandy soils or mucks, sandy peat flats, & wet loamy sand. Open moist meadows, bogs, streambanks, in sandy soils. distribution/range:
Culture: ①Seeds germinate after about 60 days of cold moist stratification, or sow seeds outdoors in fall. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover (or light cover). (he99) ②Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn).
Description: Erect, herbaceous, perennial, native forb; roots; stems very short, basically stemless; leaves narrow, usually 3.5 to 6 times as long as wide, tapering to the base, rounded teeth; flowers white 5-merous, 1.0-1.50" wide, beardless, 3-lower petals with brownish lines at the base, 2-upper petals oblong; solitary; fruits are elliptical capsule, seeds light brown; N. key features: Stemless, flowers beardless, leaves 3.5-6 times long as wide
Comments: status: Threatened in Minnesota & Vermont. phenology: Blooms April to June. Collect seeds in se Wisconsin in August (he99). 2,500,000 (jfn04) seeds per pound.
Associates:
VHFS:

Viola missouriensis Greene MISSOURI VIOLET,
"Very uncommon. The wooded bank of Pecatonica River at Harrison." (ewf55)

Viola nephrophylla Greene NORTHERN BOG VIOLET, (*nephrophyllus -a -um* with kidney-shaped leaves, from ancient Greek νεφρο-, νεφρός, *nephro-, nephros,* kidney, & Latin *folium,* leaf.)
"The violet we have placed here has leaves that tend to be reniform; it blooms profusely & the stems tend to over-top the leaves; the spurred petal is bearded & few if any of the bearded lateral petals are clubbed. Not uncommon in boggy places in Coon Creek bottom & occasional in low prairies west of Winnebago, in Grove Creek bottom. Also in a small prairie bog in Boone Co & in DeKalb Co." (ewf55)

Viola pallens (Banks) Brainard SMOOTH WHITE VIOLET, aka SMALL WHITE VIOLET, (*pallens* pale in color, from *pallens*, (gen), *pallentis* Latin adjective, pale; greenish.)
Habitat: Wet forests, bogs, streambanks, shallows, usually near cold water. distribution/range:
Culture: ①Seeds germinate after about 60 days of cold moist stratification, or sow seeds outdoors in fall. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover (or light cover). (he99)
Description: key features:
Comments: status: phenology: Blooms 5-6. Collect seeds in se Wisconsin in June-July (he99). Flowers purple veined. "Frequent in most of the boggy places in Sugar River sand area. On peat it is often quite small." (ewf55)
Associates:
VHFS: The new nomenclature will be *Viola macloskeyi* FE Lloyd subsp *pallens* (Banks ex Ging) MS Baker. (*macloskeyi* after George Macloskie (1834-1920), naturalist, educator, author, ordained Presbyterian minister, & lawyer; born in the village of Castledawson, Co Londonderry, Northern Ireland; Chair of Biology at Princeton University in 1874 (or hired as Professor of Biology & Botany in 1874 (or 5?)), advocate of a theistic interpretation of evolution, & student of the flora of Patagonia.)

Viola x palmata L (pro sp) EARLY BLUE VIOLET, aka WOOD VIOLET,
Habitat: Dry, well drained; woods, clearings, glades. distribution/range:
Culture:
Description: Erect, perennial native forb, basically stemless; leaves usually variously lobed but usually not to the base (palm-like), sometimes only 3-lobed; flower violet, 5-parted, 0.75-1.25" wide, petals often streaked with white, lower 3 petals bearded; solitary, basal, long-stalked & often taller than the leaves; fruit oval to elliptical capsule with brown seeds; key features: "Stemless, lower 3 petals bearded, flowers basal, leaf variously lobed but not to the base, or palm-like" (fh).
Comments: status: phenology: Blooms April-May.

Associates:
VHFS:

Viola x palmata

Viola papilionacea Pursh See *Viola sororia* Willd. (*papilionaceous -a -um* having a butterfly-shaped corolla like that of the pea, like the pea-family whose individual flowers are somewhat similar in form to a butterfly.)

Fields & open areas, woodlands. Aggressive & will invade lawns. Quick, call Chemlawn! 866.369.9539. distribution/range:

"Common blue violet, subject here to its usual variations & hybridizations" (ewf55).
①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. Best planted outdoors in the fall. (pm09). ②Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn).

Woodland gardens. Butterfly host plant. Clay soil tolerant. Walnut tolerant.

Viola pedata Linnaeus BIRDFOOT VIOLET, aka CROWFOOT PANSY, CROWFOOT VIOLET, PANSY VIOLET, HENS & ROOSTERS, (*pedatus -a -um* footed, (by implication bird-footed, bird's foot-like, with leaf-lobes at the foot of the leaves), from *pedatus*, from the Latin verb *pedo*, I furnish with feet or I have feet.)
Habitat: Mesic, dry, gravel, & sand prairies, savannas, dry open rocky woods & prairies, sandy or acid soils. not in areas of intense competition. distribution/range:
Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. Best planted outdoors in the fall. (pm09). ②Seeds germinate after about 60 days of cold moist stratification, or sow seeds outdoors in fall. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover (or light cover). (he99) ③Sow seeds just below moist soil surface at 70ºF for 1 month. Move to 30ºF for 1 month, then bring back to 50ºF (ew10). ④Sow at 18-22ºC (64-71ºF) for 2-4 wks, move to +2 to +4ºC (34-39ºF) for 4-6 wks, move to 5-12ºC (41-53ºF) for germination (tchn).

seed counts & rates: 300,000 (jih), 400,000 (ew11) seeds per pound. Seed at 4 lb per acre (heaven forbid you had 4 lbs!) (JH)

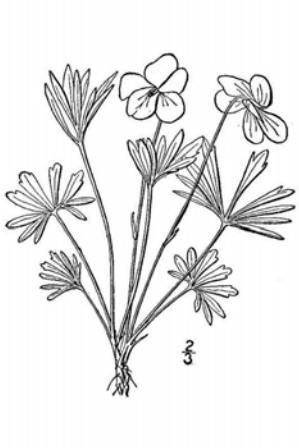
cultivation: Space plants 0.25-0.75' centers. Mesic to dry soils, full sun to partial shade. Slowly self sows where grassy competition in light.

greenhouse & garden: Difficult to grow, best from dry stratified seed (?). Cold moist stratification or dormant seed.
Description: Erect, herbaceous, perennial, native forb; stems 0.25-0.5'; distinctive divided leaves; flowers blue, showy, pleasingly fragrant;
Comments: status: phenology: Blooms 5-6. In northern Illinois, collect seeds in June. Collect seeds in se Wisconsin in July (he99). This is said to be the only noncleistogamous *Viola* sp (cu00). Only moderately competitive.

"Common in sand areas. The white form grows north of Shirland near the state line & the roseate form in Sugar River Forest Preserve. It frequently blooms again in the fall. We do not have it in the bi-colored form." (ewf55)

Associates: Pollinated by long-tongued bees, *Diptera, Lepidoptera*. Larval host *Speyeria idalia* REGAL FRITILLARY BUTTERFLY, nectar source *Hesperia metea* COBWEB SKIPPER. Attracts ants, butterflies, butterfly larvae, game birds eat roots. Reported as deer resistant.

ethnobotany: Used as an expectorant, leaves as laxative, or to induce vomiting (jlh)



Viola pedata

Viola pedatifida G Don PRAIRIE VIOLET, aka CROWFOOT VIOLET, LARKSPUR VIOLET, PRAIRIE BIRD'S FOOT VIOLET, PURPLE PRAIRIE VIOLET, (*pedatifidus -a -um* Modern Latin literally foot divided, (by implication bird-footed, palmately divided with the side divisions split again, bird's foot-like) from *pedatus*, from *pedo*, I furnish with feet or I have feet, & *fidus*, past participle of *findo*, I cleave, split, separate, divide; or also said to be generally "divided from a central point with divisions also deeply-clefted".)

Habitat: Mesic, dry, & upland prairies. Sandy soils. distribution/range:

Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. Best planted outdoors in the fall. (pm09). ②Seeds germinate after about 60 days of cold moist stratification, or sow seeds outdoors in fall. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover (or light cover). (he99) ③Sow seeds just below moist soil surface at 70ºF for 1 month. Move to 30ºF for 1 month, then bring back to 50ºF (ew10). ④Sow at 20ºC (68ºF), if no germination in 3-4 wks, move to +2 to +4ºC (34-39ºF) for 2-4 wks (tchn).

seed counts & rates: 136,000 (aes10), 279,654 (gnhm12), 282,617 (gnhm11), 352,000 (sh94), 448,000 (pm02, ew11) seeds per pound.

"*Viola pedatifida* Mesic to dry prairie. Blooms mid May; PURPLE-BLUE. Harvest June +. 6"; SEEDLING TRANSPLANT; seeds should be planted while fresh; there is seed production by cleistogamous flowers after the conspicuous flowers cease. Short-lived in cultivation." (rs ma)

cultivation: Space plants 0.50-0.75' centers. Mesic to dry soils, full sun to partial shade.

bottom line: The hydrophilic seeds should be sown as fresh seed, or dormant seeded from moist-stored, refrigerated seed. Do not dry store. Hybrids are prevalent. Chasmogamous & cleistogamous fruits.

greenhouse & garden: Best from fresh seed immediately stratified.

Description: 3-6", showy flowers.

Comments: status: phenology: Blooms 4-6. Collect seeds in se Wisconsin in July (he99). Only moderately competitive.

"A very pretty blue-violet found on most upland & many low prairies. The tendency to hybridize is marked, particularly with *V sororia* & *V papilionacea*. Gravelly prairie west of Rockton, prairie hillside south of Roscoe, low prairie northeast of Shirland & the C & NW Ry east & west of Rockford." (ewf55)

Associates: Pollinated by long-tongued bees. Attracts ants, butterfly larvae. Game birds eat roots. Said to be deer resistant.

Viola pedatifida

Viola pensylvanica Michaux see *V pubescens.*

Viola pubescens Aiton DOWNY YELLOW VIOLET, aka YELLOW FOREST VIOLET, YELLOW VIOLET, (*pubescens* becoming hairy, slightly hairy, downy, pubescent, with soft downy hair, from Latin *pubescens*, *pubescent*, from *pubesco, pubescere, pubui*, reach physical maturity or reach puberty, become pubescent, from *pubes*, youth, men; hair that appears at puberty, & *-escens* (like *-ascens*) Latin adjectival suffix from *-escent*, -ish, -part of, -becoming, -becoming more, -being, inceptive, indicating a process of becoming or developing, becoming like, having an incomplete resemblance, often translated as the English suffix -ish.)
Habitat: The sp occurs in rich woods, rare. distribution/range:
Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. Best planted outdoors in the fall. (pm09). ②Sow seeds outdoors in fall, or 60 days cold moist stratification. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover (or light cover). (he99 as *V pensylvanica* & *V pubescens*)
Seeds are not available.
Description: Leaves & at least the upper half of the stem densely pubescent, basal leaves 1-2, rare, n ½ of Ill. Includes var *peckii* House with glabrous capsules.
Comments: status: phenology: Blooms Apr-May. Collect seeds in se Wisconsin in June-July (he99).
"Much less common than *V eriocarpa* from which it is not well separated. In the hilly dry woods northeast of Roscoe is a plant that has basal leaves at flowering time & is definitely pubescent." (ewf55)
Associates: ethnobotany: Root used as medicinal plant by Pottawatomie (sm33)
VHFS: Mohlenbrock lists the var *eriocarpa* (Schwein) Russell, SMOOTH YELLOW VIOLET, blooms Apr-May. Leaves & stems glabrous or puberulent, basal leaves 5 or more. Woods, common, probably in every county. The following synonyms & forms are listed: *V eriocarpa* Schw. *V pennsylvanica* Michx ???? including *V pennsylvanica* var *leiocarpa* [Fern & Weis] Fern with glabrous capsules.

Viola pubescens

Viola rugulosa Greene (*rugulosus -a -um* somewhat wrinkled, wrinkled.)

"Much like V *canadense* but with leaves less attenuate & the root stock slender & stoloniferous. The places that we have found it, in Shirland & Rockton, suggest that it may be an introduction." (ewf55)

Viola sagittata Aiton ARROW-LEAVED VIOLET, aka SAND VIOLET, (*sagittatus -a -um* shaped like an arrowhead (used of leaves), from *sagitta, sagittae* f, Latin noun, an arrow, & *-atus -a -um*, from Latin *–atus*, suffix indicating possession, likeness, or 'provided with'.)

Habitat: distribution/range:

Culture: ①Seeds germinate after about 60 days of cold moist stratification, or sow seeds outdoors in fall. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover (or light cover). (he99) ②Sow at +2 to +4ºC (34-39ºF) for 12 wks, move to 20ºC (68ºF) for germination (tchn).

Description: Narrow arrowhead-shaped leaves, flowers white centered; key features:

Comments: status: phenology: Blooms 4-6. In northern Illinois, collect seeds in June. Collect seeds in se Wisconsin in July (he99). "Common in low prairies & other moist places" (ewf55).

Associates:

VHFS:

Viola sagittata

Viola sororia Willdenow COMMON BLUE VIOLET, aka DOORYARD VIOLET, CONFEDERATE VIOLET, HAIRY WOOD VIOLET, WOOLLY BLUE VIOLET, (*sororia* sisterly, very closely related, from Latin *sororius -a um*, of a sister)

Habitat: Disturbed woodlands, floodplains, abandoned fields, lawns, roadsides, degraded prairies, grassy fields, & open meadows. Forests. The common violet of meadows & open woods. distribution/range:

Culture: ①60 days cold moist stratification. Surface sow, seeds are very small or need light to naturally break dormancy & germinate. Best planted outdoors in the fall. (pm09 as *V papilionaceae*). ②Seeds germinate after about 60 days of cold moist stratification, or sow seeds outdoors in fall. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover (or light cover). (he99 as *V papilionaceae* & *V sororia*) ③Sow at 18-22ºC (64-71ºF) for 2-4 wks, move to +2 to +4ºC (34-39ºF) for 4-6 wks, move to 5-12ºC (41-53ºF) for germination (tchn).

cultivation: Clay soil tolerant.

Description: Erect annual/perennial; 3-4" tall, basically stemless; flowers violet (blue/violet) to white, side petals with tufts of hairs inside, both open & closed flowers are produced;

Comments: status: phenology: Blooms 4-6. Collect seeds in se Wisconsin in July (he99). Aggressive, invades lawns. Floral emblem of Wisconsin. Landscaping, woodland gardens, & ecological lawns.

"Common in woods; white or striped flowers are not uncommon" (ewf55). "Common blue violet, subject here to its usual variations & hybridizations" (ewf55 as *V papilionaceae*).

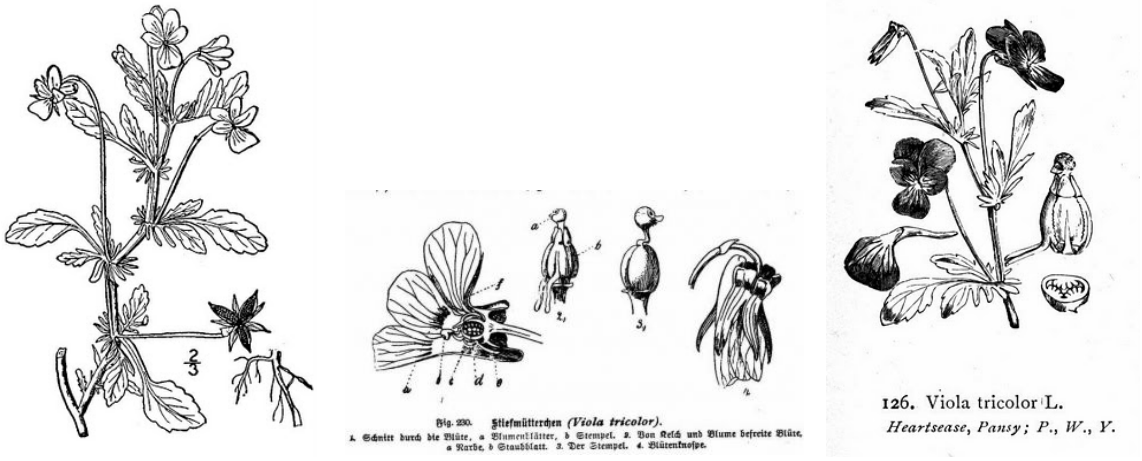
Associates: Butterfly host plant, including FRITILLARIES. Walnut tolerant.

ethnobotany:

Viola sororia

Viola striata Aiton CREAM VIOLET, aka CREAMY VIOLET, STRIPED VIOLET, STRIPED WHITE VIOLET, (*striatus -a -um* striated, striped, marked with fine, longitudinal flutings or groovings, from the past participle of the Latin verb *strio, striare, -, striatus,* provide with channels; to groove; to wrinkle.)
Habitat: Mesic woods, meadows, streambanks, & ditches. Full to partial sun. distribution/range:
Culture: ①Germination pretreatments unsure (pm09) Seeds germinate after about 60 days of cold moist stratification, or sow seeds outdoors in fall. Seeds need light to break dormancy & germinate. Plant on top of growing media & do not cover (or light cover). (he99)
Description: key features:
Comments: status: phenology: Blooms 4-6. Collect seeds in se Wisconsin in July (he99).
Associates:
VHFS:

Viola tricolor Linnaeus JOHNNY JUMP-UP, aka HORNED PANSY, HORNED VIOLET, TUFTED VIOLET,
Culture: propagation: No pretreatment needed. Sow seeds just below the soil surface at 70ºF. & water (ew11)



Viola tricolor

And as the sun sinks slowly in the west, we bid a reluctant farewell to the Miscellaneous Dicotyledon Section.

Endnotes & abbreviations. The following math functions violate Abbey's 1st Law, which see.
++ The listed numbers are seed count mean, seed count median, seed count mode, seed count standard deviation, seed count max, seed count min, seed count range.

** The listed numbers are Germ mean, germ median, germ mode, germ standard deviation, germ range (range); Dorm mean, dorm median, dorm mode, dorm standard deviation, dorm range (range); Test mean, test median, test mode, test range. (#germ test : tz etc)

Reference abbreviations May 04 2014

CEPPC	California Exotic Pest Plant Council
CIPC	California Invasive Plant Council
SEPPC	Southeast Exotic Pest Plant Council
SWSS	Southern Weed Science Society
RBG Kew	RBG Kew, Wakehurst Place
aes10	(AES 2010)
afvp	(Atlas of Florida Vascular Plants)
anef	(Angelo & Boufford: Atlas of New England flora)
apl	(Applewood)
asfg	(Audubon Society Field Guide)
wade	(Alan Wade, nd, various years, 95, &c)
bsh	(Baker Seed Herbarium, California)
bb02	(Baskin & Baskin 2002, 2001, &c.)
nlb05	Britton 1905
cb03	(CC Baskin 2003, 2001, &c.)
crfg	California Rare Fruit Growers
csvd	(Currah, Smreciu, & Van Dyk 1983)
tchn	tomclothier.hort.net (-4ºC 24ºF stratification being corrected)
cu00	(or cu02, &c, Cullina 2000, 2002, 2008)
nd91	(Norm Deno, 1991, 1993)
den28	(Densmore 1928)
do63	(Dobbs 1963)
mfd93	(Mary Fisher Dunham 1993)
dh87	(Dirr & Heusser 1987)
drwfp	(Directory of Resources on Wildflower Propagation)
ecs	(Ernst Conservation Seeds catalog)
ew12	(Everwilde 2012) also ew11
ewf55	(Egbert W Fell 1955)
ewf59	(Egbert W Fell 1959)
fh	(Robert W Freckmann Herbarium)
fna	(Flora of North America project)
foc	(Flora of China online)
fop	(Flora of Pakistan online)
gni	(Genesis Nursery, Inc)
gc63	(Gleason & Cronquist 1963, 1991)
gran	(Granite Seeds)
he99	(Heon et al 1999)
hk83	(Hartman & Kester 1983)
hpi	(Hill Prairies of Illinois (Hilty website)
Ilpin	(Illinois Plant Information network)
jf55	(Jones & Fuller 1955)
jlh	(JL Hudson, Seedsman, (if the phone doesn't ring its me))
kpw	(Kansas Prairie Wildflowers)
krr	(Kenneth R Robertson)
lbj	(Lady Bird Johnson Wildflower Center Native Plant Information Network)
m14	(Mohlenbrock 2014) also m86, m99, m02, m05, m06, &c
mbg	(Missouri Botanic Garden)
msue	(Michigan State University Extension)
nae	Native American Ethnobotany (Moerman, University of Michigan Dearborn)

now36 (Nowosad et al 1936)
nyfa (New York Flora Atlas)
orghp (Ontario Rock Garden Hardy Plant Society)
ppc (Philips Petroleum Company)
pots (Plants of the Southwest 2000)
pm09 (Prairie Moon 2009) also pm02, pm11, &c
pnnd (Prairie Nursery no date)
pph (Prairie Propagation Handbook)
ppi (Prairie Plants of Illinois)
psdg (Plants of South Dakota Grasslands)
pug13 (plants.usda.gov accessed 2013, 2014)
oed Oxford English Dictionary online
rain (Ranier Seeds)
rrn97 (Reeseville Ridge Nursery 1997)
rvw11 (Reznicek et al 2011)
rs ma (Ray Schulenburg Morton Arboretum)
rhs Royal Horticultural Society
sh94 (Shirley Shirley 1994) & don't call me Shirley
sk08 (Stuppy & Kesseler 2008)
sm23 (Smith 1923) also sm32, sm33, sm28, &c.
sw79 (Swink & Wilhelm 1979)
sw94 (Swink & Wilhelm 1994)
tlp (Time Life Perennials)
tlw (Time Life Wildflowers)
tpg The Prairie Garden
uconn (UConn Plant Database)
us97 (USDA 1997)
w12b (Weakley Nov 2012) also w07-12
wfatp (Vance & Vance 1979)
wfn (Wildflowers of Nebraska)
wfnp Wildflowers northern prairies)
ws92 (Wilhelm & Swink 1992)
w73 (Alphonso Wood 1873)
ry64 (Richard Yarnell 1964)
yy92 (Young & Young 1992)
Reliquum etiam non scriptum est.