Tallgrass Prairie Center's Restoration Guide

Collecting Seed from Tallgrass Prairies

Seed of many native species are now commercially available for prairie reconstructions, large or small. Yet many people have an interest in collecting and growing native species for butterfly gardens, backyard and schoolyard wildlife habitat, and prairie restorations. Seed collecting is satisfying and rewarding, a great volunteer activity for introducing people to prairies, and a good way to obtain seed for local prairie restorations.

Which species?

Any species can be collected by hand, but hand collecting is particularly useful in collecting seed of native species which:

- Occur on specific sites that may be inaccessible to machine harvest.
- Are very low- or high-growing species or early- or late-ripening species.
- Occur as uncommon or patchy species in native prairie.
- Have explosive seed dispersal mechanisms (phlox, violets).

Equipment Needed

This is a basic list of equipment necessary for efficient hand harvesting:

- Leather work gloves
- Good quality pruning shears or heavy-duty scissors (and band-aids!)
- Large plastic unbreakable combs
- Durable, light weight tubs of various sizes
- Cloth or paper bags of various sizes
- Backpack for carrying extra bags
- Appropriate clothing - sturdy footwear, long pants, hat, extra water
- Binoculars for scouting
- Willing companions!

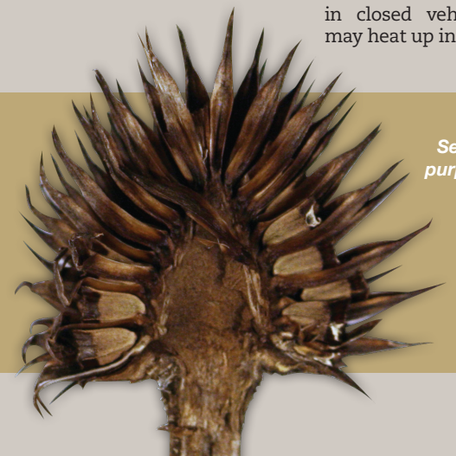
How to Collect?

Seed can be stripped by hand from many species. Efficiency can be improved by keeping both hands free by fastening collection bags and containers around the waist. In species with seed in 'salt-shaker' pods, try tipping the pod into an open container to collect (shooting star, giant St. John's wort, larkspur, wild columbine). This will minimize the need to clean seed later. If seed is held tightly in the seedhead, simply clip a portion of the seedhead for later cleaning. Prickly seedheads like rattlesnake master (Eryngium yuccifolium) or pale purple coneflower (Echinacea pallida) will require gloves and shears for efficient collecting. Plastic combs aid stripping of seed from grasses as illustrated in the photo below. Species with explosive pods can be bagged with nylon hosiery just prior to seed dispersal.

Good quality scissors and plastic combs are handy tools. Keep both hands free for collecting by attaching collecting bags around waist.

Leather gloves and good-quality scissors or shears are a must for effective seed collecting. Unbreakable plastic combs are inexpensive and efficient tools for stripping grass seed. Choose brightly colored tools that will be easy to spot if dropped or misplaced in the prairie while collecting. Use breathable bags (cloth or paper) for collecting that will allow moisture to escape. Even seemingly dry seed/seedheads retain enough moisture when first collected to cause mildew or rot if left unchecked in plastic bags. Use care not to leave collected material in closed vehicles that may heat up in the sun.

Small comb teeth strip seed fom little blue stem; large comb teeth for coarse grasses like big bluestem and Indian grass.



Seedhead of pale purple cone flower** (Echinacea pallida) **sliced in half to reveal lighter-colored seeds tucked in between bracts.

Where to Collect?

Many areas have been planted to native species (reconstructed prairies). Planted prairies provide important wildlife, soil and water quality benefits. They have far fewer species than remnant prairies, and often the original source of seed for the planting has not been recorded or is unknown. If seed source is important for your project, collect from planted prairies only if you know the original source of the seed and it meets your restoration goals.

Obtain permission from the landowner or proper land management agency pior to collecting.

Be mindful that removal of any plant or plant part from preserves, natural areas, and parks is restricted, so check with the proper agency before collecting in these areas. Harvesting from roadsides may be restricted in some states and counties. Many counties in Iowa, for example, are planting native prairie in roadside rights-of-way. Ask permission from the county roadside managers, engineers, or state department of transportation before collecting from roadsides.

Removal of any plant or plant part from preserves, natural areas, and parks is restricted; check with the proper agency before collecting in these areas.

Collecting from Remnant Prairies

Remnants are small remaining patches of the original prairie landscape that have not been cropped, over-grazed, or otherwise destroyed. Very few remnant prairies exist in the mid-west today, and most are in need of careful management if they are to be conserved. A commonly expressed rule is "take half, leave half" when harvesting seed from remnants. Be mindful of legal and ethical considerations when collecting. While remnants are important local genetic sources of seed stock for restorations or seed nurseries, they should not be directly exploited for commercial production of seed.

Federal and state endangered and threatened species cannot be collected without proper permits, and should only be done as part of a recovery effort by qualified professionals. Go to http://www.iowadnr.com/other/threatened.html to download a list of Iowa's threatened and endangered species.

Are there negative impacts to collecting from remnants?

Most prairie species are perennial, meaning their roots survive over winter to regrow shoots the next spring, so an annual seed crop is not essential to the perpetuation of the population. Exceptions are annual, biennial, and short-lived perennial species; rare and uncommon species; or common species poorly represented in a remnant. Avoid intense, repeated, annual harvesting of the same remnant area. The negative impacts of over-collecting include trampling of vegetation and introduction of exotic or invasive plants brought in on clothing or equipment. Manipulation of a remnant prairie to maximize seed production – such as whole-site, repeated annual burns; herbicide treatments; or fertilizing – is inappropriate and damaging to biodiversity. Finally, any mechanical harvesting occurring in remnant sites should include a careful inspection and cleaning of equipment, including vehicles, prior to use, to avoid introducing exotic/invasive species that may contaminate the site and lead to the degradation of the remnant or create long-term management issues.

Federal and state endangered and threatened species cannot be collected without proper permits, and should only be done as part of a recovery effort by qualified professionals.

Remnant prairies provide genetically adapted seed for restoring prairies for future generations of Iowans!

Collecting Seed for Genetic Diversity

An important restoration goal should be to capture genetic diversity from remnant populations. Here are some rules of thumb to guide your efforts. First, of course, be reasonably sure the site is a remnant (never plowed, not planted).

Collect seed from at least 20 to 30 well-dispersed individual plants within a population, if possible. Randomize the process, avoid intentionally selecting plants based on size, color, vigor or any other trait. The point is to capture genetic diversity, not novelty. To sample large populations, walk transects and collect seed perhaps every 10 paces. Collect roughly equal amounts of material (seed or seedhead) from each plant you encounter. If collecting from multiple sites, attempt to equalize the contribution of seed from each site, particularly if collecting seed as foundation stock for nursery production to generate seed for other reconstructions

Keep in mind two important ideas:
- ***Attempt to collect roughly equal amounts of seed from several individuals in the population.***
- ***Generally speaking, near neighbors are more closely related genetically than distant individuals, so it is important to collect seed from throughout the population.***

EARLY SEASON NATIVE FORBS		May			June			July			August			September		
SCIENTIFIC NAME	COMMON NAME	1-10	10-20	20-30	1-10	10-20	20-30	1-10	10-20	20-30	1-10	10-20	20-30	1-10	10-20	20-30
Caltha palustris	Marsh marigold															
Geum triflorum	Prairie smoke															
Antennaria neglecta	Pussytoes															
Castilleja coccinea	Indian paintbrush															
Krigia biflora	False dandelion															
Saxifraga pensylvanica	Swamp saxifrage															
Senecio aureus	Golden ragwort															
Sisyrinchium campestre	Blue-eyed grass															
Hypoxis hirsuta	Yellow star grass															
Pedicularis canadensis	Lousewort															
Viola pedatifida	Prairie violet															
Cardamine bulbosa	Spring cress															
Allium canadense	Wild garlic															
Lithospermum canescens	Hoary puccoon															
Phlox maculata	Marsh phlox															
Phlox pilosa	Prairie phlox															
Anemone canadensis	Canada anemone															
Prunella vulgaris var. lanceolata	Self heal															
Zigadenus elegans	White camass															
Dodecatheon media	Shooting star															
Campanula aparinoides	Marsh bellflower															
Oxalis violacea	Violet wood sorrel															
Comandra umbellata	Bastard toadflax															
TOTAL EARLY SEASON FORB SPECIES POTENTIALLY RIPE				2	3	10	12	9	9	11	3	4	6	12		

NATIVE GRASSES		June			July			August			September			October			November		
SCIENTIFIC NAME	COMMON NAME	1-10	10-20	20-30	1-10	10-20	20-30	1-10	10-20	20-30	1-10	10-20	20-30	1-10	10-20	20-30	1-10	10-20	20-30
Hierochloe odorata	Sweet grass																		
Heterostipa spartea	Porcupine grass																		
Sphenopholis obtusata	Prairie wedgegrass																		
Calamagrostis canadensis	Blue joint grass																		
Koeleria macrantha	June Grass																		
Glyceria striata	Fowl manna grass																		
Agropyron trachycaulum	Slender wheat grass																		
Bouteloua curtipendula	Sideoats grama																		
Elymus canadensis	Canada wildrye																		
Schizachyrium scoparium	Little bluestem																		
Spartina pectinata	Prairie cord grass																		
Panicum virgatum	Switchgrass																		
Sorghastrum nutans	Indiangrass																		
Sporobolus heterolepis	Prairie dropseed																		
Andropogon gerardii	Big bluestem grass																		
Sporobolus compositus	Tall dropseed																		
Muhlenbergia racemosa	Upland wild timothy																		
Elymus virginicus	Virginia wildrye																		
Cinna arundinacea	Woodland reedgrass																		
TOTAL GRASS SPECIES POTENTIALLY RIPE			1	2	5	3	3				1	8	9	11	8	5	1		

NATIVE LEGUMES		July			August			September			October			November		
SCIENTIFIC NAME	COMMON NAME	1-10	10-20	20-30	1-10	10-20	20-30	1-10	10-20	20-30	1-10	10-20	20-30	1-10	10-20	20-30
Lathyrus venosus	Veiny pea															
Lathyrus palustris	Marsh vetchling															
Astragalus canadensis	Canada milkvetch															
Desmodium illinoense	Illinois tick trefoil															
Desmodium canadense	Showy tick trefoil															
Dalea purpureum	Purple prairie clover															
Lespedeza capitata	Roundhead bushclover															
Dalea candida	White prairie clover															
Baptisia bracteata var. leucophaea	Cream wild indigo															
Baptisia alba var. macrophylla	White wild indigo															
TOTAL LEGUME SPECIES POTENTIALLY RIPE				1	1		2	5	6	8	7	6	3	1		

NATIVE SEDGES		May			June			July		
SCIENTIFIC NAME	COMMON NAME	1-10	10-20	20-30	1-10	10-20	20-30	1-10	10-20	20-30
Carex annectans	Yellow foxsedge									
Carex interior	Prairie star sedge									
Carex stricta	Tussock sedge									
Carex meadii	Mead's sedge									
Carex bicknelli	Prairie sedge									
Carex brevior	Plains oval sedge									
Carex gravida	Heavy sedge									
Carex molesta	Troublesome sedge									
Carex vulpinoidea	Brown fox sedge									
Carex pellita	Woolly sedge									
Carex bebbii	Bebb's sedge									
TOTAL SEDGE SPECIES POTENTIALLY RIPE						3	8	8	7	2

Species Harvest Times for Iowa

Approximate seed maturity times for selected tallgrass prairie species in Iowa. Cold, moist conditions will tend to delay seed maturity, while hot, dry conditions hasten it. Latitude will also affect ripening since many plants flower and set seed in response to photoperiod. Seed maturity occurs earlier in populations adapted to northern Iowa, and later in populations adapted to southern Iowa. Optimal Collection Periods when the most species are likely to be in fruit are indicated in red. Data compiled from collection records of the Iowa Ecotype Project, Iowa NRCS Staff Biologist Jennifer Anderson-Cruz, and The Tallgrass Restoration Handbook.

Key:

= Optimal Collection Period

= Seed Ripening Period

LATE SEASON NATIVE FORBS		August			September			October			November		
SCIENTIFIC NAME	COMMON NAME	1-10	10-20	20-30	1-10	10-20	20-30	1-10	10-20	20-30	1-10	10-20	20-30
Stachys palustris	Woundwort												
Vicia americana	Vetch												
Rudbeckia hirta	Black-eyed Susan												
Lobelia spicata	Spiked lobelia												
Iris shrevei	Blue flag												
Rosa carolina	Pasture rose												
Oxypolis rigidior	Cowbane												
Vernonia fasciculata	Ironweed												
Veronicastrum virginicum	Culver's root												
Heliopsis helianthoides	False sunflower												
Lysimachia quadriflora	Narrow-leaved loosestrife												
Lythrum alatum	Winged loosestrife												
Ceanothus americana	New Jersey tea												
Eupatorium maculatum	Spotted Joe Pye												
Thalictrum dasycarpum	Purple meadow rue												
Pycnanthemum pilosum	Hairy mtn. mint												
Lobelia cardinalis	Cardinal flower												
Lilium philadelphicum	Wood lily												
Zizia aurea	Golden alexanders												
Silphium laciniatum	Compass plant												
Eryngium yuccifolium	Rattlesnake master												
Allium cernuum	Prairie onion												
Asclepias tuberosa	Butterfly milkweed												
Lobelia siphilitica	Great blue lobelia												
Silphium integrifolium	Rosinweed												
Pycnanthemum tenuifolium	Slender mtn. mint												
Lysimachia ciliata	Fringed loosestrife												
Asclepias incarnata	Swamp milkweed												
Echinacea pallida	Pale purple coneflower												
Amorpha canescens	Lead plant												
Rudbeckia subtomentosa	Sweet coneflower												
Pycnanthemum virginianum	Common mtn. mint												
Coreopsis palmata	Prairie coreopsis												
Anemone cylindrica	Thimbleweed												
Ratibida pinnata	Gray-headed coneflower												
Pedicularis lanceolata	Swamp lousewort												
Eupatorium perfoliatum	Common boneset												
Potentilla arguta	Prairie cinquefoil												
Oligoneuron rigidum	Rigid goldenrod												
Lilium michiganense	Michigan lily												
Liatris pycnostachya	Prairie blazingstar												
Symphyotrichum sericeum	Silky aster												
Symphyotrichum oolentagniense	Skyblue aster												
Symphyotrichum laeve	Smooth blue aster												
Monarda fistulosa	Wild bergamot												
Verbena stricta	Hoary vervain												
Symphyotrichum novae-angliae	New England aster												
Prenanthes racemosa	Rattlesnake root												
Oligoneuron riddellii	Riddell's goldenrod												
Artemisia ludoviciana	Prairie sage												
Symphyotrichum praealtum	Willowleaf aster												
Parthenium integrifolium	Wild quinine												
Liatris aspera	Rough blazingstar												
Anemone virginiana	Virginia anemone												
Coreopsis tripteris	Tall coreopsis												
Solidago missouriensis	Missouri goldenrod												
Solidago nemoralis	Gray goldenrod												
Solidago speciosa	Showy goldenrod												
Euthamia graminifolia	Grass-leaved goldenrod												
Gentiana andrewsii	Bottle gentian												
TOTAL LATE SEASON FORB SPECIES POTENTIALLY RIPE		4	6	12	32	41	47	45	34	19	4	1	

Selected Prairie Resources

An illustrated guide to Iowa prairie plants. Christiansen P, and M. Muller. 1999. University of Iowa Press. Iowa City, Iowa. 237p.

Tallgrass Restoration Handbook. Packard S, and C. Mutel. 1997. Island Press. Washington, D.C. 463p

Tallgrass Prairie Wildflowers.Ladd, D. and F. Oberle. 1995. Published in cooperation with The Nature Conservancy. Falcon Press Publishing Co., Inc. Helena-Billings, MT.

The Prairie Garden: 70 native plants you can grow in town or country.Smith R, and B. Smith. 1980. University of Wisconsin Press. Madison, Wisconsin. 219p.

Wildflowers of the Tallgrass Prairie, the Upper Midwest.Runkel, S. and D. Roosa. 1989. Iowa State University Press, Ames, IA.

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Restoring a National Treasure

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Brent Butler

When to Collect?

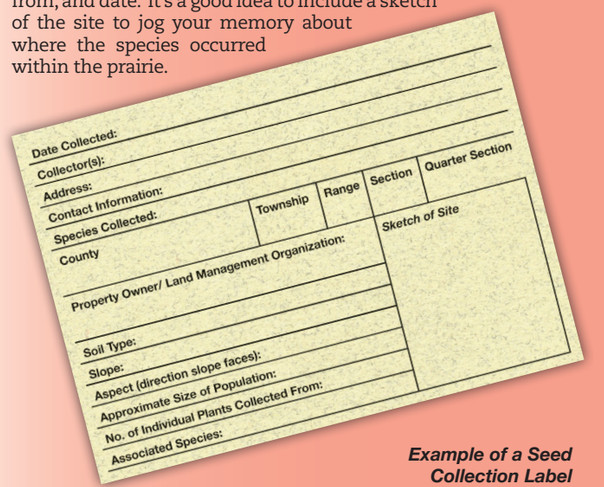
Seed ripening and timing of harvest varies by species, environmental conditions, and regional adaptation of plants. Most species ripen gradually, so not all seed will be at the same stage of maturity at any given time. Seed maturity usually progresses from top to bottom of the seed head in grasses and many forbs species. However some ripen from the bottom up, as in the blazingstars. Mature seeds are usually quickly dispersed either by gravity, wind, water, or animals, so it's important not to delay collecting.

Harvest grasses at the hard-dough stage, when firm thumbnail pressure slightly dents the caryopsis. Many grasses do not hold seed long after maturity. Test ripeness by firmly striking the seed head against palm; if some shattering occurs, the seed is ready to harvested.

In forb species, the seedhead or stalk immediately below will appear dry or discolored as seed matures. A notable exception are the spiderworts (Tradescantia), members of the day-flower family, which drop mature seed while bracts remain green and other flowers in the same cluster are in bud or blooming. Species with dispersal apparatus, i.e. 'parachutes' (blazingstars, asters, goldenrods, milkweeds) will appear dry and fluffy at maturity and should be picked immediately at this stage. Some species forcefully eject seed at maturity (phlox and violets, for example), and must be checked daily or bagged loosely with a mesh bag so seed is captured upon dispersal.

Keeping Records

Keeping records of where and when you collect provides important information about a prairie restoration. Basic information to include is location (county, township, section and quarter section), soil type (sandy, clayey, loamy) and moisture (wet, medium, dry), slope and aspect (direction slope faces), approximate size of population, number of plants collected from, and date. It's a good idea to include a sketch of the site to jog your memory about where the species occurred within the prairie.



Example of a Seed Collection Label