

Project BudBurst Available Species Sheet

www.budburst.org

Wildflowers and Herbs

- [Alfalfa](#) (*Medicago sativa*)
- [American pasqueflower](#) (*Pulsatilla patens* aka *Anemone patens*)
- [Bigleaf lupine](#) (*Lupinus polyphyllus*)
- [Bitter root](#) (*Lewisia rediviva*)
- [California poppy](#) (*Eschscholzia californica*)
- [Canada thistle](#) (*Cirsium arvense*)
- [Colorado blue columbine](#) (*Aquilegia caerulea*)
- [Common dandelion](#) (*Taraxacum officinale*)
- [Common yarrow](#) (*Achillea millefolium*)
- [Darkthroat shootingstar](#) (*Dodecatheon pulchellum*)
- [Dogtooth violet](#) (*Erythronium americanum*)
- [Field mustard](#) (*Brassica rapa*)
- [Henbit deadnettle](#) (*Lamium amplexicaule*)
- [Indian pink](#) (*Spigelia marilandica*)
- [Jack in the pulpit](#) (*Arisaema triphyllum*)
- [Lanceleaf springbeauty](#) (*Claytonia lanceolata*)
- [Large flowered trillium](#) (*Trillium grandiflorum*)
- [Mayapple](#) (*Podophyllum peltatum*)
- [Pacific trillium](#) (*Trillium ovatum*)
- [Pinkladies](#) (*Oenothera speciosa*)
- [Purple passion flower](#) (*Passiflora incarnata*)
- [Red columbine](#) (*Aquilegia canadensis*)
- [Scarlet gilia](#) (*Ipomopsis aggregata*)
- [Silverleaf phacelia](#) (*Phacelia hastata*)
- [Soft green eyes](#) (*Berlandiera pumila*)
- [Spiderwort](#) (*Tradescantia ohiensis*)
- [Spotted knapweed](#) (*Centaurea stoebe*)
- [Virginia bluebells](#) (*Mertensia virginica*)
- [Western ragweed](#) (*Ambrosia psilostachya*)
- [White clover](#) (*Trifolium repens*)
- [Wild strawberry](#) (*Fragaria virginiana*)

Evergreen Trees and Shrubs

- [Big sagebrush](#) (*Artemisia tridentata*)
- [Curl-leaf mountain mahogany](#) (*Cercocarpus ledifolius*)
- [Kinnikinnick](#) (*Arctostaphylos uva-ursi*)
- [Oregon grape](#) (*Mahonia repens*)
- [Southern live oak](#) (*Quercus virginiana*)
- [Southern magnolia](#) (*Magnolia grandiflora*)

Deciduous Trees and Shrubs

- [American linden](#) (*Tilia americana*)
- [Antelope bitterbrush](#) (*Purshia tridentata*)
- [Apple](#) (*Malus pumila*)
- [Bald cypress](#) (*Taxodium distichum*)
- [Balsam poplar](#) (*Populus balsamifera* (aka *trichocarpa*))
- [Beaked hazelnut](#) (*Corylus cornuta*)
- [Bigleaf maple](#) (*Acer macrophyllum*)
- [Black elderberry](#) (*Sambucus nigra*)
- [Black locust](#) (*Robinia pseudoacacia*)
- [Boxelder](#) (*Acer negundo*)
- [Chokecherry](#) (*Prunus virginiana*)
- [Common lilac](#) (*Syringa vulgaris*)
- [Common snowberry](#) (*Symphoricarpos albus*)
- [Eastern serviceberry](#) (*Amelanchier canadensis*)
- [Flowering dogwood](#) (*Cornus florida*)
- [Forsythia](#) (*Forsythia xintermedia*)
- [Lewis' mock orange](#) (*Philadelphus lewisii*)
- [Pacific dogwood](#) (*Cornus nuttallii*)
- [Paper birch](#) (*Betula papyrifera*)
- [Plains cottonwood](#) (*Populus deltoides*)
- [Quaking aspen](#) (*Populus tremuloides*)
- [Red maple](#) (*Acer rubrum*)
- [Red osier dogwood](#) (*Cornus sericea*)
- [Rocky mountain maple](#) (*Acer glabrum*)
- [Shrubby cinquefoil](#) (*Dasiphora floribunda*)
- [Tulip poplar](#) (*Liriodendron tulipifera*)
- [Western serviceberry](#) (*Amelanchier alnifolia*)
- [Woods' rose](#) (*Rosa woodsii*)


Grasses

- [Big bluestem](#) (*Andropogon gerardii*)
- [Blue grama](#) (*Bouteloua gracilis*)
- [Switchgrass](#) (*Panicum virgatum*)
- [Western wheatgrass](#) (*Pascopyrum smithii*)

Conifers

- [Douglas-fir](#) (*Pseudotsuga menziesii*)
- [Eastern redcedar](#) (*Juniperus virginiana*)
- [Eastern white pine](#) (*Pinus strobus*)
- [Longleaf pine](#) (*Pinus palustris*)
- [Pinyon pine](#) (*Pinus edulis*)
- [Ponderosa pine](#) (*Pinus ponderosa*)

National Phenology Network Approved Plant Species (subset)

 indicates the species is a USA NPN Calibration species. Where possible, please consider monitoring one of these species in addition to any other species you may choose to monitor.

-  Alfalfa (*Medicago sativa*)
- **American basswood (*Tilia americana*)**
- American plum (*Prunus americana*)
- Antelope bitterbrush (*Purshia tridentata*)
-  Apple (*Malus pumila*)
- Arnold red honeysuckle (*Lonicera tatarica*)
- Beaked hazelnut (*Corylus cornuta*)
-  Big bluestem (*Andropogon gerardii*)
- Big sagebrush (*Artemisia tridentata*)
- Black elderberry (*Sambucus nigra*)
- Black locust (*Robinia pseudoacacia*)
-  Blue grama (*Bouteloua gracilis*)
- Bluebunch wheatgrass (*Pseudoroegneria spicata*)
- Buffalograss (*Buchloe dactyloides*)
- Bunchberry (*Cornus canadensis*)
- Butterfly milkweed (*Asclepias tuberosa*)
-  **Canada thistle (*Cirsium arvense*)**
- Cheatgrass (*Bromus tectorum*)
-  Choke cherry (*Prunus virginiana*)
- Colorado blue columbine (*Aquilegia coerulea*)
- Common buckthorn (*Rhamnus cathartica*)
- **Common milkweed (*Asclepias syriaca*)**
-  **Common lilac (*Syringa vulgaris*)**
-  **Common ragweed (*Ambrosia artemisiifolia*)**
- Common reed (*Phragmites australis*)
- Common sunflower (*Helianthus annuus*)
- Creeping barberry (*Mahonia repens*)
-  **Dandelion (*Taraxacum officinale*)**
- Eastern purple coneflower (*Echinacea purpurea*)
-  Eastern redcedar (*Juniperus virginiana*)
- Green ash (*Fraxinus pennsylvanica*)
- Grey alder (*Alnus incana*)
- Honey mesquite (*Prosopis glandulosa*)
- Jewelweed (*Impatiens capensis*)
- Limber Pine (*Pinus flexilis*)
- Manitoba maple (*Acer negundo*)
- Mountain maple (*Acer glabrum*)
- Needle and thread (*Hesperostipa comata*)
-  Pinyon pine (*Pinus edulis*)
-  **Ponderosa pine (*Pinus ponderosa*)**
- Prairie ironweed (*Vernonia fasciculata*)
-  **Quaking aspen (*Populus tremuloides*)**
- Red-osier dogwood (*Cornus sericea*)
- Rigid goldenrod (*Oligoneuron rigidum*)
- Scarlet globemallow (*Sphaeralcea coccinea*)
- Side-oats grama (*Bouteloua curtipendula*)
-  Spotted knapweed (*Centaurea stoebe*)
- Swamp milkweed (*Asclepias incarnata*)
-  Switchgrass (*Panicum virgatum*)
- Tufted hairgrass (*Deschampsia cespitosa*)
- Utah serviceberry (*Amelanchier utahensis*)
-  Western ragweed (*Ambrosia psilostachya*)
-  Western wheatgrass (*Pascopyrum smithii*)
- Wheat (*Triticum* sp.)
- **White ash (*Fraxinus americana*)**
- White birch (*Betula papyrifera*)
- White heath aster (*Symphyotrichum ericoides*)
-  Wild strawberry (*Fragaria virginiana*)
- Yellow poplar/Tulip tree (*Liriodendron tulipifera*)

National Phenology Network

www.usanpn.org

Project BudBurst



Identification Guide
www.budburst.org

Plains cottonwood (*Populus deltoides*)

Also Known As: Eastern cottonwood, Common cottonwood, Plains poplar

Plant Family: Willow (*Salicaceae*)



Identification Hints: Large coarse triangular leaves with flattened stems and glands at the tips distinguish it from most other species of cottonwood.

Did you know? Although Plains cottonwoods are very fast growing trees, they are not long lived trees. They are susceptible to disease, fire, and drought. The light wood was important as a construction material to Native Americans and European settlers to the Mid-west and Great Plains states. It is the state tree of Kansas, Nebraska, and Wyoming. Note that in older books plains cottonwood and eastern cottonwood were considered separate species.

Phenological observations of interest: First Leaf, All Leaves Unfolded, First Pollen, Full Pollen, End of Pollen, 50% Color, 50% Leaf Fall, First Ripe Fruit

General: Fast growing native, deciduous tree with a broad crown. These trees are generally 25 to 30 m (80 to 100 ft).

Leaves: The leaves are simple and alternate. The 'deltoides' part of the scientific name refers to the triangular-shaped leaves. They are 8 to 15 cm (3 to 6 inches) long and are narrow and commonly long-pointed with fine to coarse rounded teeth. They have a very distinct odor when crushed, turning yellow in autumn.

Flowers: The many tiny yellowish or greenish flowers usually appear in early spring before leaves. The trees are dioecious which means the male (staminate) and female (pistillate) flowers are found on separate trees. Flowers are found in hanging catkins.

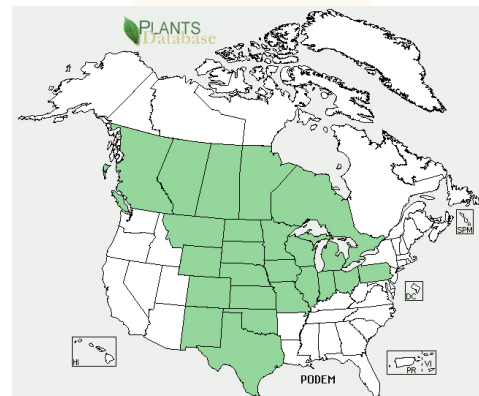
Fruits: The fruits are capsules with 3 or 4 valves about .64 cm (.25 in) long. It is the fluffy, white, 'cotton' like seeds produced by the females in early summer that give the tree its name. The numerous tiny seeds are widely dispersed by the wind.

Bark: The bark is gray or brown and smooth on younger trees, becoming rough, scaly or furrowed with age. The slender twigs are yellowish brown and are flexible to the touch, often shedding or easily detached at forks.

Habitat: Widely distributed in Great Plains states eastward throughout the Midwestern and eastern US especially in riparian areas. It grows best on moist well-drained sands or silts near streams, irrigation ditches, riverbanks, and roadsides.

Bloom time: The flowers appear in April or May before the leaves develop. The seeds generally mature between June and August.

Distribution Area



Compiled by: Sandra Henderson and Paul Alaback
Sources: USDA Plants Database; Petrides, Eastern Trees; USDA Forest Service FEIS database
Photograph by: J.S. Peterson, USDA NRCS Plants Database

Project BudBurst

Phenophase Field Guide
www.budburst.org

Plains cottonwood (*Populus deltoides*)



First Pollen



Full Pollen



Photo Needed!
Share your photo
of this phenophase.
budburstweb@ucar.edu

End of Pollen



Photo Needed!
Share your photo
of this phenophase.
budburstweb@ucar.edu

First Leaf



All Leaves Unfolded



First Ripe Fruit



50% Color



50% Leaf Fall

First Pollen: Report the date at which the first flowers (catkins) are dispersing pollen on three or more branches. You should be able to see the yellowish pollen on the surface of the catkins and see it when you gently touch the flowers. Catkins usually develop very quickly, so you need to watch closely (daily) soon as they start developing to determine when pollen starts dispersing.

Full Pollen: Report the date when 50% of the branches with flowers have pollen.

End of Pollen: Report the date when the last catkin has withered, dried up, and you no longer can see pollen when touching the surface. Catkins generally fall off branches shortly after end of pollen.

First Leaf: Report the date at which the first leaves are completely unfolded from the bud on three or more branches. The leaves need to be opened completely and the leaf blade flat. Leaves normally emerge rolled or folded then flatten out and later expand to their mature size.

All Leaves Unfolded: Report the date when nearly all (at least 95%) of the growing leaf buds have already reached the completely unfolded stage described above (First Leaf).

First Ripe Fruit : Report the date when you notice the first fruits becoming fully ripe or seeds dropping naturally from 3 or more branches on the plant. Ripening is usually indicated by the drying and splitting open of capsules revealing the cottony threads of the fruits.

50% Color: Report the date when 50% of the branches have leaves which have started to change color.

50% Leaf Fall: Report the date when 50% of the leaves have fallen off the tree or shrub.

Photographs courtesy of Mary S. Bowen and G. Suanne Bacque, Louisiana State University AgCenter, <http://www.mnr.lsu.edu/plantid/>; Sally and Andy Wasowski, Benny Simpson, LadyBird Johnson Wildflower Center, www.wildflower.org. Phenophase descriptions written by Paul Alaback, University of Montana.

Project BudBurst

Identification Guide
www.budburst.org

Quaking aspen (*Populus tremuloides*)

Alternate name: Common aspen

Plant Family: Willow (*Salicaceae*)



Identification Hints: Quaking aspen is unique in its smooth rounded leaves which flutter in the slightest breeze, due to the thin flattened stems (petioles) and its bright white or cream colored bark. In the Midwest and northeastern US you can also see bigtooth aspen (*Populus grandidentata*) which has coarse rounded teeth on the leaf margin, and fine hairs on stout twigs and dusty gray buds and brown or green bark. The European aspen (*Populus tremula*) is also similar but has rounded irregular teeth on its leaves, and grayish bark. Poplars and cottonwoods generally have triangular-shaped leaves.

Did you know? Quaking aspen is the most widely distributed tree in North America. In Minnesota, Wisconsin, and Utah quaking aspen occupies more land than any other forest type. Stands of quaking aspen are good firebreaks, often dropping crown fires in conifer stands to the ground when they reach aspens and even sometimes extinguishing the fire because of the small amount of flammable accumulation. One male clone in the Wasatch Mountains of Utah occupies 17.2 acres (43 ha) and has more than 47,000 stem! Although individual ramets/trees of a clone may be short-lived, the clone may be long-lived.

Phenological observations of interest: First Leaf, All Leaves Unfolded, First Pollen, Full Pollen, End of Pollen, 50% Color, 50% Leaf Fall, First Ripe Fruit

General: Quaking aspen is a native, deciduous medium to large tree that generally ranges from about 11 to 22 meters (36 to 72 feet) in height and varies in width from about 6 to 9 meters (20 to 30 feet).

Leaves: They are simple, deciduous, broadly ovate to nearly round, 3.8 to 6.4 cm (1.5 to 2.5 in) long with small, rounded teeth on the margins. They have a slender, flattened petiole and are dark green and shiny above, pale green below, turning bright yellow, yellow-orange, gold, or reddish after the first frosts.

Flowers: The male (staminate) and female (pistillate) flowers are on separate trees. Each type of flower is borne in pendent catkins (they resemble soft caterpillars hanging from twigs).

Fruit: The catkin becomes a 5 to 13 cm (2 to 5 inch) long, string of small, light green capsules. The capsules are small, tufted, white, and one-celled each having between 6-10 seeds. The seeds are brown and surrounded by tufts of long, white silky hairs. Water and wind help to disperse the seeds.

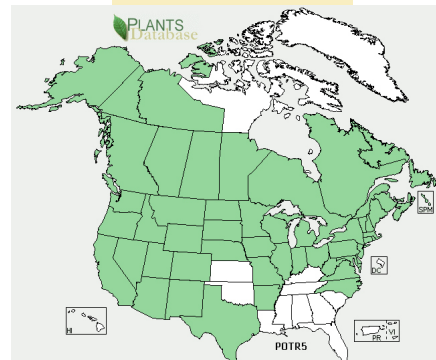
Bark: Typically smooth, greenish-white to gray-white, often thin and peeling, becoming thicker and furrowed with age, especially toward the base of the tree. Large trees can have black cracks in the bark at the base.

Habitat: Quaking aspen occurs in a wide variety of habitats and at a great range of elevations. It characteristically forms pure stands or mixed stands with bigtooth aspen. It is common in both dry and moist woods, but cannot tolerate shade.

Quaking aspen occurs along streamsides, slopes near valley bottoms, dry mountainsides, high plateaus and mesas, talus, avalanche chutes, and openings and slopes in montane and subalpine forests and woodlands. It is quick to pioneer disturbed sites where soil has been made bare.

Bloom time: Flowering requires sustained air temperatures above 54°F for about 6 days to apparently trigger flowering. Female trees generally flower and leaf out before male trees. The catkins appear from mid-March to June depending on location and generally mature in about 4 to 6 weeks. Seeds begin to disperse within a few days of ripening.

Distribution Area



Compiled by: Brooke McBride, Sara Mulder, and Sandra Henderson
Sources: USDA Plants Database; USANPN; Lady Bird Johnson Wildflower Center; Bailey, Manual of Cultivated Plants; Preston, North American Trees; Coombes, Trees

Photograph by: John J. Mosesso/NBII.gov

Project BudBurst

Phenophase Field Guide
www.budburst.org

Quaking Aspen (*Populus tremuloides*)



First Pollen



Full Pollen



Photo Needed!

Share your photo
of this phenophase.
budburstweb@ucar.edu

End of Pollen



First Leaf



All Leaves Unfolded



First Ripe Fruit



50% Color



Photo Needed!
Share your photo
of this phenophase.
budburstweb@ucar.edu

50% Leaf Fall

First Pollen: Report the date at which the first flowers (catkins) are completely open and pollen is visible on at least three branches on the tree or shrub. You must be able to see the pollen of the surface or when you touch the flowers. Flowers first emerge with reddish scales, then catkins fully expand then finally stamens produce many long cottony hairs and have black anthers at the tip. Shortly after this pollen emerges from the tips. You often have to touch the anthers to see the pollen.

Full Pollen: Report the date when 50% of the branches with flowers have pollen

End of Pollen: Report the date when the last flower has withered, dried up, or died. Catkins generally start falling of tree shortly after end of pollen.

First Leaf: Report the date at which the first leaves are completely unfolded from the bud on three or more branches. This generally occurs shortly after budburst. The young leaves are rounded and often have long hairs and are shiny in texture.

All Leaves Unfolded: Report the date when nearly all (at least 95%) of the growing leaf buds have already reached the completely unfolded stage described above (First Leaf).

First Ripe Fruit : Report the date when you notice the first fruits becoming fully ripe or seeds dropping naturally from the plant. Record when stalks on three or more branches have ripe or dispersing fruit. Ripening is usually indicated by the capsules drying and splitting open, exposing cottony plumes from the fruits.

50% Color: Report the date when 50% of the leaves have started to change color.

50% Leaf Fall: Report the date when 50% of the leaves have fallen off the tree or shrub.

Photographs courtesy of Paul Alaback, University of Montana; Kirsten K. Meymaris, UCAR.
Phenophase descriptions written by Paul Alaback, University of Montana.

Project BudBurst



Identification Guide
www.budburst.org

Balsam Poplar (*Populus balsamifera* AKA *Populus trichocarpa*)

Also Known As: Black Cottonwood, California poplar

Plant Family: Willows (*Salicaceae*)



Identification Hints: Cottonwoods are extremely variable because they often hybridize between species. Balsam poplar is unique in having rounded lance-shaped leaves with short stems. Plains cottonwood has a more triangular (deltoid) leaf shape with rounded teeth and may occur close to black cottonwoods at the eastern foot of the Rocky Mountains. Another species, narrow-leaved cottonwoods, have leaves (2.5 times longer than wide). Balsam poplar is a closely related subspecies which has capsules which split in 2 (rather than 3 parts).

Did you know? In urban areas, the aggressive root system of black cottonwood can invade and damage drainage systems. Balsam poplar is a commercially valuable tree with the primary products including particle board, plywood, veneer, and lumber. Native Americans used the resin from buds to treat sore throats, coughs, lung pain, and rheumatism. It is still used in some modern natural health ointments. These trees create some of the most biodiverse communities in the Pacific Northwest and northern Rockies providing habitat for many bird and insect species. They are declining because of dams and other alterations of river habitats.

Phenological observations of interest: First Leaf, All Leaves Unfolded, First Pollen, Full Pollen, End of Pollen, 50% Color, 50% Leaf Fall, First Ripe Fruit

General: Large, native, deciduous tree, 30 to 60 m (98 to 196 feet) making it the largest American poplar and the largest hardwood tree in western North America. It has a broad, rounded crown.

Leaves: The leaves are simple and alternate. They vary in size and shape on the same tree. They can be broadly triangular (deltoid) or lance shaped -- longer than they are wide with a broad base (ovate- lanceolate). The leaves are rounded or heart-shaped (cordate) at the base. They are generally 7 to 12 cm long (2.7 to 4.7) and 3.5 to 7.5 cm (1.3 to 3 inches) wide. The margins are finely toothed, dark green above, and slightly paler beneath, commonly with whitish or brownish resin blotches, turning yellow in autumn. The leaves are hairless or nearly so. The petioles (the stalk that attaches the leaf to the plant) are round and short (approximately 3 to 4 mm or about a tenth of an inch) long.

Flowers: Tiny, long, slender flowers hang in loose catkins. The trees are dioecious which means the male (staminate) and female (pistillate) flowers are found on separate trees.

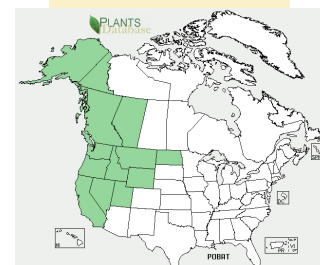
Fruits: The fruits are egg shaped, green capsules in hanging catkins. The capsules split into 2 to 3 parts when ripe. Tiny seeds have a tuft of soft, white hairs at the tip and are often dispersed in large, fluffy masses.

Bark: The bark is gray to gray-brown on mature trees and is deeply furrowed into flat ridges on older portions of the tree.

Habitat: Balsam poplar grows on alluvial sites, riparian habituates, and moist woods on mountain slopes from southern Alaska to northern California east to the Rocky Mountains in Idaho and Montana. It often forms extensive stands on bottomlands of major streams and rivers at low elevations along the Pacific Coast. In drier areas, it is restricted to protected valleys and canyon bottoms, along stream banks, and edges of ponds and meadows. It grows on a variety of soils from moist silts, gravels, and sands to rich humus, loams, and occasionally clays.

Bloom time: Flowering generally occurs from late March to June, just before or during leaf emergence. Fruiting occurs in late May to early or mid-July and when rivers are most often in the flood stage.

Distribution Area



Compiled by Sandra Henderson and Paul Alaback
Sources: USDA Plants Database; ECOS Guide to the Ecology of the Northern Rockies; Arno and Hammerly, Northwest Trees
Photograph by: Ben Legler, The Burke Museum of Natural History and Culture

Project BudBurst

Phenophase Field Guide

Balsam poplar (*Populus balsamifera* (aka *trichocarpa*)) www.budburst.org



First Pollen

Photo Needed!
Share your photo
of this phenophase.
budburstweb@ucar.edu

Full Pollen

Photo Needed!
Share your photo
of this phenophase.
budburstweb@ucar.edu

End of Pollen



First Leaf



All Leaves Unfolded



First Ripe Fruit



50% Color

Photo Needed!
Share your photo
of this phenophase.
budburstweb@ucar.edu

50% Leaf Fall

First Pollen: Report the date at which the first flowers (catkins) are dispersing pollen on three or more branches. You should be able to see the yellowish pollen on the surface of the catkins and see it when you gently touch the flowers. Catkins usually develop very quickly, so you need to watch closely (daily) soon as they start developing to determine when pollen starts dispersing.

Full Pollen: Report the date when 50% of the branches with flowers have pollen.

End of Pollen: Report the date when the last catkin has withered, dried up, and you no longer can see pollen when touching the surface. Catkins generally fall off branches shortly after end of pollen.

First Leaf: Report the date at which the first leaves are completely unfolded from the bud on three or more branches. The leaves need to be opened completely and the leaf blade flat. Leaves normally emerge rolled then flatten out and later expand to their mature size.

All Leaves Unfolded: Report the date when nearly all (at least 95%) of the growing leaf buds have already reached the completely unfolded stage described above (First Leaf).

First Ripe Fruit : Report the date when you notice the first fruits becoming fully ripe or seeds dropping naturally from 3 or more branches on the plant. Ripening is usually indicated by a change in color from green to yellow and the capsules split open revealing the cottony threads on the fruits.

50% Color: Report the date when 50% of the branches have leaves which have started to change color.

50% Leaf Fall: Report the date when 50% of the leaves have fallen off the tree or shrub.

*Photographs courtesy of Paul Alaback, University of Montana.
Phenophase descriptions written by Paul Alaback, University of Montana.*

Project BudBurst

Identification Guide
www.budburst.org

Ponderosa pine (*Pinus ponderosa*)

Also Known As: Yellow pine, Western yellow pine, Bull pine

Plant Family: Pine (*Pinaceae*)



Identification Hints: Ponderosa pine is the iconic pine of the interior west, with its thick colorful bark which can be bright orange or yellow in color in open sunny spots. It is the only 3-needle pine in the Rockies. In California, and near its borders in Oregon and Nevada and in the Southwest there are other 3-needle pines and ornamental pines that can be confused with ponderosa. Jeffrey pine is very similar but usually has larger cones up to 38 cm (15 in), and purplish twigs (the twigs are orange to red in ponderosa). Jeffrey pine twigs have a pineapple-like odor. In Arizona and New Mexico Apache pine is found which has longer needles up to 38 cm (15 in).

Did You Know? Ponderosa pine got its name because of its ponderous, or heavy, wood. It is one of the most widely distributed pines in western North America. Ponderosa pine is a major source of timber, which is especially suited for window frames and panel doors. Ponderosa pine forests are also important as wildlife habitat. Quail, nutcrackers, squirrels, and many other kinds of wildlife consume the seeds. Dispersal is aided by chipmunks that store the seeds in their caches.

Phenological observations of interest: First Needles, First Pollen, Full Pollen, First Ripe Fruit

General: Ponderosa pine is a large, long-lived native evergreen conifer that grows between 18 to 30.5 m (60 to 100 ft) and frequently lives for over two hundred years. It is common throughout the western U.S. Young trees are narrow and pyramid shaped. As they mature, the crown becomes irregular in shape.

Leaves: The curved, rigid needles are clustered in bundles of 3. They can be dark green to yellow green. The needles remain attached and continue growing for approximately 5 years.

Bark: When the tree is young, the bark is dark brown to nearly black. As the tree matures, the bark turns from cinnamon brown to orange-yellow at about 90 years of age. The bark of older trees is split into broad plates covered with small concave scales. The bark has a fragrance of vanilla or butterscotch.

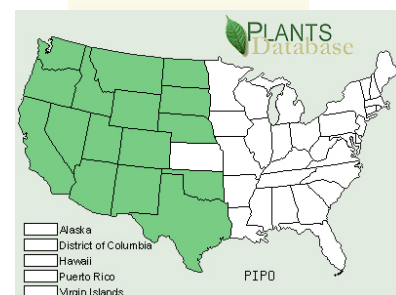
Cones: Male and female cones are separate but found on the same tree. Female cones are pineapple-shaped, 7.6 to 15 cm (3 to 6 inches) long, and take 2 years to mature. They are borne singly or in clusters of 3 to 5. They are light reddish brown. The male cones are small, yellowish, and in clusters. The tips of the cone scales are armed with short, sharp, prickles that curve out.

Fruit: The small seeds are about 0.6 cm (.25 in) long, with a broad terminal wing about 2.5 cm (1 in) long.

Habitat: Ponderosa pine is found in rocky hills and low elevations in mountains. It is well adapted to grow on bare rock with its roots following crevices or cracks in the rocks. It needs sun and prefers deep moist well-drained soil, but will grow in a wide range of conditions. Ponderosa pine is drought and salt tolerant.

Bloom time: First pollen is correlated closely with the passing of freezing weather and generally occurs in mid-Spring.

Distribution Area



Compiled by: Brooke McBride and Sara Mulder
Sources: USDA Plant Database; USA-NPN; Lady Bird Johnson Wildflower Center; Preston, *North American Trees*; ECOS guide to the Ecology of the Northern Rockies; Utah State Extension
Photograph by: Sally and Andy Wasowski, Lady Bird Johnson Wildflower Center

Project BudBurst

Phenophase Field Guide
www.budburst.org

Ponderosa pine (*Pinus ponderosa*)



First Pollen



Full Pollen



First Needles



First Ripe Fruit

First Pollen: Report the date when the plant starts releasing the powdery, yellow pollen from their cones on three or more branches. If there is pollen you should see the pollen dust in the air or on your fingers when you gently touch the cones. Male cones are generally reddish in color and when pollen starts to disperse first needles start to appear

Full Pollen: Report the date when 50% of the branches with cones have pollen.

First Needles: Report when new needles emerge from tips of buds, or are visible from the side of the buds. First needles generally show green tips which grow out of brownish scales for each cluster of needles.

First Ripe Fruit: Report the date when you notice the first fruits becoming fully ripe or seeds dropping naturally from the plant. Record when the cones turn brown and the scales expand on 3 or more branches (seeds should start dispersing shortly thereafter)

Photographs courtesy of Paul Alaback, University of Montana.
Phenophase descriptions written by Paul Alaback, University of Montana.

Project BudBurst

Identification Guide
www.budburst.org

Douglas-fir (*Pseudotsuga menziesii*) Also Known As: Interior douglas-fir, Coastal douglas-fir Plant Family: Pine (*Pinaceae*)



Identification Hints: Douglas-firs are called firs because like firs they have a series of needles that are separately attached to the twigs as contrasted with pines or larches which have needles in bundles (fascicles) or spurs. Pointed red buds distinguish Douglas-firs from true firs, such as grand-fir (*Abies grandis*) and subalpine fir (*Abies lasiocarpa*). True firs have sticky rounded green to whitish buds. True firs also have more stiff rounded needles (with a tiny notch at the tip), and cones which are erect and born on the upper sides of branches. The most distinctive feature of Douglas-firs are the “mouse-tails” or exerted bracts on the cone scales, which extend outside of scales and have long narrow point (the tail).

Did You Know? Douglas-fir is the one of the most valuable lumber trees in the world. The wood is used as poles, beams, in bridges, as rail road ties, structural timber, in plywood, and to make furniture. It is found in many homes every December as a popular Christmas tree. Native Americans used the resin as an antiseptic in the treatment of burns, scrapes, and rashes. European explorers often placed young shoots in their boots to prevent athlete’s foot and nail fungus. The tallest Douglas-fir on record is 100 meters (330 feet) high! This long lived species can exceed 1,000 years of age.

Phenophases of Interest: First Needles, First Pollen, Full Pollen, First Ripe Fruit

General: Large, native, coniferous evergreen tree with a broad, pointed pyramidal crown. It is one of the worlds’ tallest trees, commonly reaching over 76 meters (250 feet) in height.

Leaves: Small, crowded, flat, straight evergreen needles that are spirally arranged, but can appear flattened in 2 rows due to twisting at the base. They are 2 to 3 cm (0.8 to-1.3 inches) long, pointed at the tip. The needles are flexible and soft to touch, dark yellowish green to blue-green in color and aromatic when crushed.

Bark: On young trees, the bark is gray or ashy-brown and thin and smooth with distinctive resin blisters. As the tree matures, the color becomes more grayish-brown with deep and irregular ridges and fissures and develops distinctive thick bark, which can be many inches thick in older trees

Male Cones: As a conifer, Douglas-fir does not have true flowers. It produces male and female cones on trees at least 12 to 15 years old. Male cones are yellow to deep red located at branch tips and are about 2.5 cm (1 in) long.

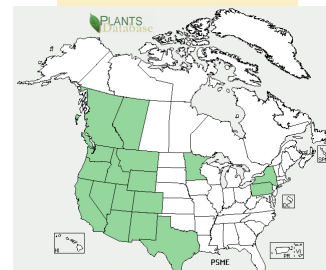
Female Cones: Female cones are approximately 3 cm (1.2 inches) long and green to deep red, they have large distinctive leaf-like bracts and occur along the sides of branch tips.

Fruit: They are 8 to 10 cm (3 to 4 inches) long, ovoid-cylindrical cones that are pendant and green to reddish brown with semi-woody scales. A distinctive feature is the 3-pronged bract that extends beyond the scales (sometimes referred to as “the mouse tail”).

Habitat: Grows best in well drained, deep, moist soils, but can also exist in dry soils. Often in pure conifer forests or in transition zones with the forest and found from dry grassy valleys to timberline.

Bloom time: Blooms (pollen disperses) in mid spring (March-April in southern range, May-June in Montana or at higher elevations). Dispersal generally occurs between mid August and late September depending on elevation and latitude.

Distribution Area



Compiled By: Paul Alaback and Sandra Henderson
Sources: USDA Plants Database; Preston, North American Trees; ECOS guide to the Ecology of the Northern Rockies; Uconn Plant Database
Photograph by: Walter Siegmund, Wikimedia Commons

Project BudBurst

Phenophase Field Guide
www.budburst.org

Douglas-fir (*Pseudotsuga menziesii*)

Photo Needed!

Share your photo
of this phenophase.
budburstweb@ucar.edu



First Pollen

Full Pollen



First Needles



First Ripe Fruit

First Pollen: Report the date when the plant starts releasing the powdery, yellow pollen from their cones on three or more branches. If there is pollen you should see the pollen dust in the air or on your fingers when you gently touch the flowers. This often occurs before first needles.

Full Pollen: Report the date when 50% of the branches with cones have pollen.

First Needles: Report when green tips of needles emerge from buds, or are visible from the side of the buds.

First Ripe Fruit: Report the date when you notice the first fruits becoming fully ripe or seeds dropping naturally from the plant. Record when the cones on three or more branches turn brown and the scales expand (seeds should start dispersing shortly thereafter).

Photographs courtesy of Paul Alaback, University of Montana
Phenophase descriptions written by Paul Alaback, University of Montana.

Project BudBurst

Identification Guide
www.budburst.org

Common Lilac (*Syringa vulgaris*)

Also Known As: Lilac

Plant Family: Olive (*Oleaceae*)



Identification Hints: Common lilac is distinctive in having smooth (hairless) dark heart-shaped leaves which are arranged in opposite pairs, and twigs with opposite (lateral) buds, but no large terminal bud at the tip (so branches do not grow straight out). There are hundreds of varieties, but only a few closely related species. One (*Syringa oblata*) has rounded leaves (just as wide as long), and several species including the “Chinese” lilac (*Syringa chinensis*) which have leaves which taper at their base.

Did you know? Homesick settlers from Europe introduced common lilac. Bushes still can be seen thriving near abandoned pioneer homesteads. Ethnobotanical uses for the plant have been fever reducer, malaria treatment, perfume, tonic, and homeopathy.

Phenological observations of interest: First Leaf, All Leaves Unfolded, First Flower, Full Flower, End of Flowering, 50% Color, 50% Leaf Fall, First Ripe Fruit

General: Common lilac is an introduced, perennial, deciduous shrub that grows between 2.5 to 4.5 m (8 to 15 ft) high and 1.8 to 3.5 m (6 to 12 ft) wide. Common lilac is widely used as an ornamental.

Leaves: The leaves are simple, smooth, and heart-shaped. They are 5 to 12.5 cm (2 to 5 in) long and dark green in color.

Flowers: Common lilac has very conspicuous flowers. The small, fragrant, showy, flowers grow in clusters 10 to 20 cm (4 to 8 in) long. Generally, they are purple, lilac, or white in color.

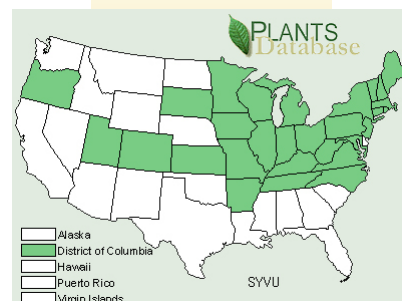
Fruits: The fruiting capsules are 1 to 1.5 centimeters long, with flat winged seeds.

Bark: Light-gray and smooth with small, raised bumps and raised leaf scars

Habitat: As a non-native garden shrub, common lilac bushes only grow where they have been planted, such as in parks and gardens. They thrive in the eastern, Midwestern, and northern parts of the U.S. as they prefer areas with colder winters.

Bloom time: The greatest bloom is usually observed in the late spring, with fruit and seed production starting in the summer. In the middle of winter, common lilac buds are desiccated (dried out) and appear somewhat “shriveled.” In late winter, after conditions begin to warm, the buds hydrate (swell due to becoming moist) and the tips open slightly. Watching for these two events is the best way to know when to start daily observations looking for first leaf. Once the buds have swelled and bud ends are slightly open and a bit green, the next round of warm weather can force the first leaf event.

Distribution Area



Compiled by: Brooke McBride and Sara Mulder
Sources: USDA Plants Database; USA-NPN; Plant Watch Canada; Uconn Plant Database; Bailey, *Manual of Cultivated Plants*
Photograph by: Prof. Mark D. Schwartz, Dept. of Geography, UW-Milwaukee, Milwaukee, WI

Project BudBurst

Phenophase Field Guide
www.budburst.org

Common Lilac (*Syringa vulgaris*)



First Leaf



All Leaves Unfolded



First Flower



Full Flower

Photo Needed!
Share your photo
of this phenophase.
budburstweb@ucar.edu



First Ripe Fruit



50% Color



50% Leaf Fall

End of Flowering

First Leaf: Report the date at which the first leaves are completely unfolded from the bud on at least three places on the tree or shrub. The leaves need to be opened completely and the leaf stem or leaf base must be visible. For lilacs, probably because of the early dates and cold weather in which they develop, they usually have very thick stiff young leaves which look more like scales than leaves. They take a long time to expand into mature thin leaves.

All Leaves Unfolded: Report the date when nearly all (at least 95%) of the growing leaf buds have already reached the completely unfolded stage described above (First Leaf).

First Flower: Report the date at which the first flowers are completely open on at least three branches. You must be able to see the stamens among the unfolded petals. Only one open flower is needed in each stalk for the stalk to be recorded as in flower.

Full Flower: Report the date when 50% of the branches with flowers have fully opened flowers. Note that some trees and shrubs, especially in southern areas never reach full flowering (never have 50% of flowers open at one time). For these plants just record first flower and end of flowering.

End of Flowering: Report the date when the last flower has withered, dried up, or died. Stalks should have no open flowers.

First Ripe Fruit: Report the date when you notice the first fruits becoming fully ripe or seeds dropping naturally from three or more branches on the plant. Ripening is usually indicated by a change in color to brown, and by drying and splitting open of capsules.

50% Color: Report the date when 50% of the leaves have started to change color (yellow or brown).

50% Leaf Fall: Report the date when 50% of the leaves have fallen off the shrub.

Photographs courtesy of Paul Alaback, University of Montana.
Phenophase descriptions written by Paul Alaback, University of Montana.

Project BudBurst

Identification Guide
www.budburst.org

Common dandelion (*Taraxacum officinale*)

Also Known As: Faceclock, Blowball

Plant Family: Sunflower (*Asteraceae*)



Identification Hints: Dandelions are one of the most common and easily identifiable weeds in the country. They have bright yellow heads that turn into round balls of silver tufted seeds, with no leaves on the flower stem. The leaves are distinctive in having a large lobe at the tip, and many sharply pointed outward-facing teeth or lobes along the sides.

Did you know? The popular name comes from dent de lion, French for "lion's tooth," referring to the distinctive teeth on the leaves. The tender young leaves, rich in vitamins and minerals, make good salad or cooked greens. The mildly laxative and diuretic leaves have been used in medicinal teas, digestive aids, wine, and rustic beers. It originated in Europe and is one of the most widely distributed plants. Dandelion is particularly efficient in producing seeds because it does so without pollination (this also explains why it can make seeds so early in the season).

Phenological observations of interest: First flower, End of Flower, First Ripe Fruit, All Leaves Withered

General: Small to medium sized herbaceous perennial that is typically 10 to 40 cm (4 to 15 in) in height occasionally growing to 70 cm (27 in).

Leaves: The leaves grow in a rosette shape from the base of the plant. They are long, lance-shaped to spoon-shaped, with a large round lobe at the tip and typically with triangular backwards pointing lobes or teeth on the sides. Generally, they are 7.5 to 30 cm (7.5 to 30 in) long and 1 to 10 cm (0.4 to 4 in) wide.

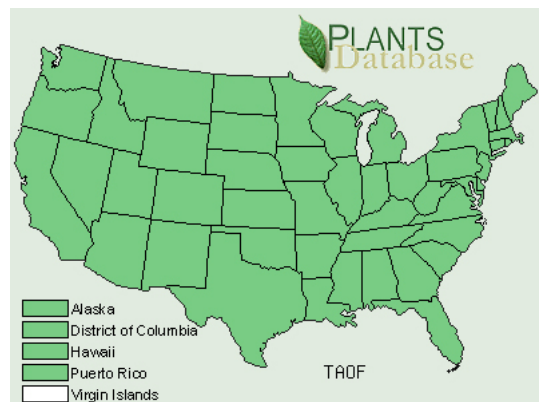
Flowers: The composite flowers grow individually on hollow stalks. Each bright yellow flower head is about 2.5 to 5 cm (1 to 2 in) wide and consists of hundred of tiny ray flowers. When broken, the hollow, leafless stems exude a white, milky juice.

Fruit: Overnight, the flower head can change into white, globular seed heads. Each seed has a tiny 'parachute' that disperses easily in the wind.

Habitat: Dandelions are very wide-spread and often considered to be a nuisance, especially by gardeners. They thrive in 'disturbed' environments such as lawns, parks, pastures, and other open sunny spaces with nitrogen rich soils.

Bloom time: In more temperate environments, they bloom almost continuously. In colder regions, they start to bloom in early spring and continue to bloom throughout the growing season even into late fall.

Distribution Area



Compiled by: Brooke McBride, Sandra Henderson, and Paul Alaback
Sources: Lady Bird Johnson Wildflower Center Database; USDA Plants Database; ECOS Guide to the Ecology of the Northern Rockies; Taylor, *Northwest Weeds*; Flora of North America (efloras.org); Kershaw et al., *Plants of the Rocky Mountains*
Photograph by: Gary A. Monroe, USDA-NRCS PLANTS Database

Project BudBurst

Common dandelion (*Taraxacum officinale*)

Phenophase Field Guide
www.budburst.org



First Flower

Photo Needed!
Share your photo
of this phenophase.
budburstweb@ucar.edu

End of Flowering



First Ripe Fruit

Photo Needed!
Share your photo
of this phenophase.
budburstweb@ucar.edu

All Leaves Withered

First Flower: Report the date at which the first flowers are completely open. You must be able to see the stamens among the unfolded petals. If flowers are in clusters or stalks then there need to be open flowers on at least one stalk

End of Flowering: Report the date when the last flower has withered, dried up, or died. If flowers are in clusters or stalks then the stalks should have no open flowers.

First Ripe Fruit: Report the date when you notice the first fruits becoming fully ripe or seeds dropping naturally from the plant. Fruits are considered ripe when a head forms with feather-like plumes attached to dark brown achenes or the fruits start dispersing.

All Leaves Withered: Report when virtually all (95-100%) of the leaves that developed this season, have lost green color or are dried and dead.

*Photographs courtesy of Paul Alaback, University of Montana.
Phenophase descriptions written by Paul Alaback, University of Montana.*



Project BudBurst

A National Phenology Network Field Campaign for Citizen Scientists



www.budburst.org

Common Name: Colorado blue columbine; Rocky Mountain columbine
Scientific Name: *Aquilegia caerulea*
Plant Family: Ranunculaceae

Identifying Characteristics:

Size: Colorado blue columbine is a bushy, clump-forming perennial herb less than 1 m (3 ft) in height.

Leaves: Compound, biternate, glabrous leaves with lobed and deeply-cleft leaflets.

Flowers: 5 sepals (generally pale-sky blue), 5 petals (generally whitish) with backward-extending, straight and slender spurs to 5 cm (2 in). Typically upward-facing flowers, 5 to 8 cm across (2 to 3 in).

Habitat: Partly shady, moist, well-drained, sandy-loamy, organic rich soil in moderate to montane elevations.

Bloom time: Late spring to early summer

Information sources:

UW-Madison Botanical Garden (www.botany.wisc.edu/garden)
The State of Colorado (www.colorado.gov)
USDA, NRCS (plants.usda.gov)
Missouri Botanical Garden (www.mobot.org/gardeninghelp)

Did you know? *Aquilegia* is the Latin term for eagle; the five flower spurs of this plant resemble eagle talons. While most authors have spelled the epithet "*caerulea*," the original spelling is "*coerulea*." It has been noted that an infusion made from the roots of *Aquilegia caerulea* was used by the Gosiwite tribe to treat abdominal pains or as a panacea. Colorado blue columbine is the state flower of Colorado, whose state song also happens to be "Where the Columbines Grow" (A.J. Fynn, 1915).



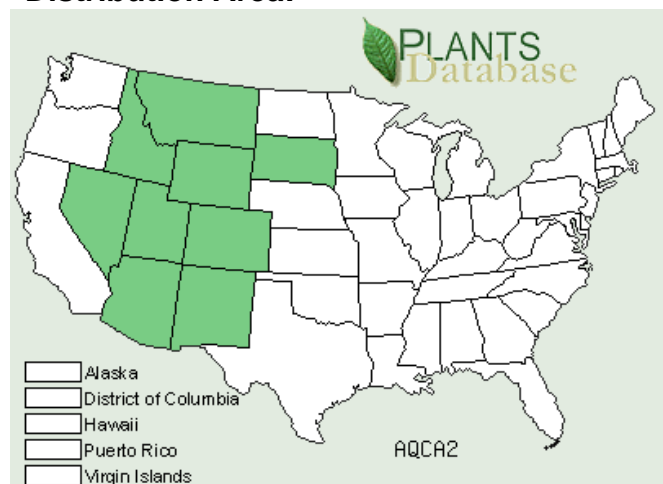
Photograph by G.A. Cooper @ USDA-NRCS PLANTS Database



Photograph by Al Schneider @ USDA-NRCS PLANTS Database

Phenological observations of interest:
First Flower, End of Flowering, First Ripe Fruit, All Leaves Withered

Distribution Area:



Project BudBurst

Phenophase Field Guide
www.budburst.org

Colorado blue columbine (*Aquilegia caerulea*)



First Flower



End of Flowering



First Ripe Fruit



All Leaves Withered

First Flower: Report the date at which the first flowers are completely open. You must be able to see the stamens among the unfolded petals. If flowers are in clusters or stalks then there need to be open flowers on at least one stalk

End of Flowering: Report the date when the last flower has withered, dried up, or died. If flowers are in clusters or stalks then the stalks should have no open flowers.

First Ripe Fruit: Report the date when you notice the first fruits becoming fully ripe or seeds dropping naturally from the plant. Columbine has fruits which are follicles (like magnolia) so they fall apart and release seeds when they are mature.

All Leaves Withered: Report when virtually all (95-100%) of the leaves that developed this season, have lost green color or are dried and dead.

Photographs courtesy of Robin Carlson, Chicago Botanic Garden.

Phenophase descriptions written by Paul Alaback, University of Montana.

Project BudBurst

Identification Guide
www.budburst.org

Canada thistle (*Cirsium arvense*)

Also Known As: Creeping thistle, California thistle

Plant Family: Sunflower (*Asteraceae*)



Identification Hints: Canada thistle is distinguished from other thistles by its deep running perennial rootstocks, dense clonal growth, more slender stems, spiny lobed leaves, and small compact flower heads. Other weedy thistles have winged stems and large flower clusters.

Did you know? Although a native species in most of the temperate regions in Europe, Canada thistle threatens many natural plant communities in the US. This highly invasive thistle prevents the coexistence of other plant species through shading, competition for soil resources, and possibly through the release of chemical toxins poisonous to other plants. Like all other thistles it is a biennial, so it puts out a basal rosette of leaves the first year, flowers the second year, then dies. So if you can pull the basal rosettes in the first year you can control its spread. Note that there are many native thistle species, so make sure you do not accidentally pull native species! Natives generally have a large stem and often have whitish hairs on bottom sides of leaves or on the stem.

Phenological observations of interest: First flower, End of Flower, First Ripe Fruit, All Leaves Withered

General: Canada thistle is an herbaceous, perennial with erect stems, 0.4 to 1.2 meters (1.5 to 4 feet) tall with prickly leaves and an extensive creeping rootstock. Canada thistle is considered to be an invasive, hard to eradicate, noxious weed species that can outcompete desirable native species.

Leaves and stems: The stems are branched, often slightly hairy and ridged. The stems become hairier with age. The leaves are simple, lance-shaped, with irregular lobes and spiny, toothed margins and wooly hair on the lower surface. They vary in size from 7.6 to 20 cm (3 to 8 inches) long. The leaves are found both singularly and alternately along the stem.

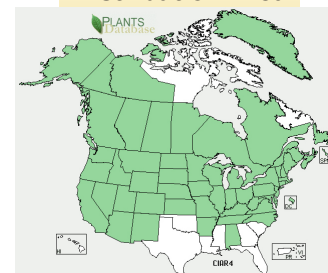
Flowers: One to several flowerheads are located at the ends of branches. The fragrant florets are rose purple to lavender and sometimes white. They appear in rounded umbrella shaped clusters. Note that plants are unisexual so some plants only have male flowers and others only have female flowers. The male flowers are larger and more showy.

Fruit: Small light brown seeds with a long tuft of feathery bristles on the end, so that flowerheads have a 'cottony' appearance. The seeds break off easily, fall near parent plant and are wind dispersed. One plant can produce 1,500 to 5,000 seeds each year.

Habitat: It is found widely distributed throughout the northern US and Canada. Canada thistle does best in upland disturbed areas and is found in barrens, glades, meadows, fields, pastures, and abandoned lands. It is known to invade wet and marshy meadows and can be found in rivers and streams. Canada thistle is not fussy about soil and is found in many soil types including gravelly and clay soils. It tolerates severe cold weather so it is one of the few weeds that can colonize alpine areas and mountains.

Bloom time: Leaf development generally occurs from May to June. Flower heads appear from June to October. The seeds are capable of germinating within a few weeks of pollination.

Distribution Area



Compiled by: Sandra Henderson and Paul Alaback
Sources: USDA Plant Database: USA-NPN; USDA Forest Service (Weed of the Week); Taylor, *Northwest Weeds*; USGS Northern Prairie Wildlife Research Center
Photograph by: Mrs. W.D. Bransford, Lady Bird Johnson Wildflower Center

Project BudBurst

Phenophase Field Guide
www.budburst.org

Canada thistle (*Cirsium arvense*)



First Flower



First Ripe Fruit

Photo Needed!
Share your photo
of this phenophase.
budburstweb@ucar.edu

End of Flowering

Photo Needed!
Share your photo
of this phenophase.
budburstweb@ucar.edu

All Leaves Withered

First Flower: Report the date at which the first flowers are completely open. You must be able to see the stamens among the unfolded petals. If flowers are in clusters or stalks then there need to be open flowers on at least one stalk

End of Flowering: Report the date when the last flower has withered, dried up, or died. If flowers are in clusters or stalks then the stalks should have no open flowers.

First Ripe Fruit: Report the date when you notice the first fruits becoming fully ripe or seeds dropping naturally from the plant. If fruits are in clusters or stalks then record date when stalks have the first ripe or dispersing fruit. Ripening is usually indicated by a change in color from green to brown, and by drying and splitting open revealing many long feathery hairs.

All Leaves Withered: Report when virtually all (95-100%) of the leaves that developed this season, have lost green color or are dried and dead.

Photographs courtesy of Steve Dewey, Utah State University, Bugwood.org; Al Schneider, USDA-NRCS PLANTS Database.

Phenophase descriptions written by Paul Alaback, University of Montana.