

Alnus incana

Betulaceae family

Gray alder, thinleaf alder, thin-leafed alder, mountain alder, river alder, speckled alder, swamp alder, tag alder, hoary alder, hazel alder

[Description](#)

[Distribution in US](#)

[Images](#)

[Timing of growth](#)

[Phenophases to be monitored for NPN](#)

[Did you know](#)

[Bibliography](#)

[Notes](#)

Description: *Alnus incana* is an often multi-stemmed, rhizomatous, thicket-forming, monoecious, deciduous, large shrub to tree. Flowering generally occurs before leaf emergence. Pollination is by wind. Reproduction is by seed and by sprouting. Plants will sprout from the root crown, root collar, or stump, by layering, and from underground stems; sprouting is initiated independent of damage and also following damage and disturbance. There is discussion as to whether the thickets of this species are clonal. Nodules on its roots contain nitrogen-fixing bacteria.

Variation: *Alnus incana* is part of a very large circumboreal complex with differences in characteristics across its distribution; as for its classification, there is taxonomic disagreement. Several taxonomic systems recognize several subspecies and varieties; yet, in other systems these subspecies are identified as separate species. There is some overlap in distribution of these taxa in which intermediate botanical characteristics exist. Cultivars have been developed in the horticultural trade.

Size: Grows mostly 25-40 ft. (7.6-12.2 m) and up to 82 ft. (25 m) tall; with a 4-8 in. (10-20 cm) diameter stem.

Leaves: Leaves alternate, simple, short-petioled; stipules deciduous. Leaves blade/lamina thin and papery to thick and firm, narrowly ovate to broadly elliptic, 1.6-4.3 in. (4-11 cm) long, 1-3.2 in. (2.5-8 cm) wide, margins double serrate with distinct large secondary teeth to nearly crenate, apex short-acuminate to acute to obtuse; upper surface dark green, dull, midrib and major veins generally indented; lower surface yellow-green, glabrous to sparsely pubescent especially along veins.

Inflorescence: This species is monoecious, with male and female flowers separate but on the same plant. Peduncles short, stout.

Staminate (male) inflorescence: Catkins, elongate racemose, pendent, solitary or in clusters of 2-5; 0.5-4 in. (1.3-10 cm) long or more, slender, green; 3 flowers per subtending bract.

Pistillate (female) inflorescence: Catkins solitary or in racemose cluster, 2-9, ovoid to ellipsoid, 0.2-0.6 in. (0.5-1.5 cm) long, reddish to reddish green to purplish red, on short branchlets; erect to nearly pendulous; 2 flowers per subtending scale.

Flowers:

Staminate (male) flowers: Sepals 4, minute; petals 0; stamens 4.

Pistillate (female) flowers: Sepals 0; petals 0; stamens 0; pistil 1, stigmas 2. Usually 2 flowers per subtending scale.

Infructescence: Small cone-like catkin, ovoid, 0.4-0.7 in. (1-1.7 cm) long, 0.3-0.5 in. (0.8-1.2 cm) wide; peduncles 0.03-0.2 in. (0.1-0.5 cm) long; bracts/scales 0.1 in. (3 mm) long, woody, winged, brown, persistent long after release of fruits.

Fruit: Samara, tiny, elliptic to obovate, 0.6 in. (1.6 cm) long, 0.3 in. (0.8 cm) wide; 2 wings narrower than body; subtended to enclosed by 1-2 bracts of the infructescence.

Bark: When young bark is thin, smooth, gray-green, grayish-brown, or reddish-brown, lenticels present or absent, horizontal, conspicuous; as it ages, bark becomes broken into irregular plates. Twigs glabrous to finely hairy, reddish gray.

Roots: Root nodules contain nitrogen-fixing bacteria. This plant is described as rhizomatous, having stem tissue below the soil surface which sprouts.

Habitat: *Alnus incana* is found on a wide range of soil types, and grows best in heavy, nutrient-rich, moist soils in lightly shaded areas, in lowlands. This species has a high tolerance for flooding; it is commonly found near rivers and moist stream borders on poorly developed soil. One subspecies is frequently found in bogs and nutrient-rich swamp communities. Despite these qualities, it is sensitive to prolonged flooding above the root crown. It also is frequently found as understory in moist sites of coniferous forests.

Species distribution in US states: AK, AZ, CA, CO, CT, ID, IL, IN, MA, ME, MI, MN, MT, ND, NH, NJ, NM, NV, NY, OH, OR, PA, RI, UT, VA, VT, WA, WI, WV, WY

Species images:

Whole plant:

http://www.uwgb.edu/biodiversity/herbarium/trees/alnrug_aspect02.jpg

http://calphotos.berkeley.edu/cgi/img_query?query_src=photos_index&enlarge=1351+3151+4005+0117

Bark:

young:

http://www.uwgb.edu/biodiversity/herbarium/trees/alnrug_bark01.jpg
<http://www.cnr.vt.edu/DENDRO/dendrology/syllabus2/factsheet.cfm?ID=824>

Leaf:

<http://ontariotrees.com/main/species.php?id=2004>
<http://www.forestryimages.org/images/768x512/5084097.jpg>

stipule:

<http://www.forestryimages.org/images/768x512/5084095.jpg>

Leaf underside:

http://www.uwgb.edu/biodiversity/herbarium/trees/alnrug_leaf01.jpg
<http://ontariotrees.com/main/species.php?id=2004>

Buds:

http://www.uwgb.edu/biodiversity/herbarium/trees/alnrug_bud_leaf_scar01.jpg
<http://ontariotrees.com/main/species.php?id=2004>

Staminate (male) flowers:

http://www.uwgb.edu/biodiversity/herbarium/trees/alnrug_flowers01.jpg
http://calphotos.berkeley.edu/cgi/img_query?query_src=photos_index&enlarge=0000+0000+0506+1080

immature:

<http://gemini.oscs.montana.edu/~mlavin/b436/hamamel/alnuinca3.jpg>

Pistillate (female) flowers:

http://calphotos.berkeley.edu/cgi/img_query?query_src=photos_index&enlarge=0000+0000+0207+0859
http://calphotos.berkeley.edu/cgi/img_query?query_src=photos_index&enlarge=7335+3182+4414+0092

detail:

<http://gemini.oscs.montana.edu/~mlavin/b436/hamamel/alnuinca1.jpg>

Infructescence:

ripening:

http://calphotos.berkeley.edu/cgi/img_query?query_src=photos_index&enlarge=7335+3182+4414+0088
<http://www.malag.aes.oregonstate.edu/wildflowers/images.php/id-573>

mature:

http://www.uwgb.edu/biodiversity/herbarium/trees/alnrug_matureFemaleAment01.jpg
<http://www.forestryimages.org/images/768x512/1353002.jpg>

Fruit:

http://www.uwgb.edu/biodiversity/herbarium/trees/alninc_fruit01gf400.jpg
http://plants.usda.gov/java/largeImage?imageID=alin2_003_ahp.tif

Expected timing of growth stages:

Flowering: February-August, depending on location.

Bud swell: *Need info.

Bud break: May (Montana and Idaho), depending on location.

Leaf out: *Need info.

Leaf/canopy development: Fully expanded in June (Montana and Idaho), depending on location.

Bud formation: Male catkins are produced in the autumn, female catkins are produced in late winter-early spring; exposed during winter.

Fruit development: *Need info.

Fruit ripening: August -September, depending on location. The infructescence remains on the tree for approximately a year, although seeds are dispersed earlier.

Seed dispersal: Following fruit ripening, starting June-September, through April, depending on location.

Leaf coloration: Leaves remain green until dropped in the fall.

Leaf fall: September-October, depending on location.

Phenophases to be monitored for NPN:

Flowering

- *First pollen released* **[Intensive only]**
In at least 3 locations on the plant, pollen is released from a flower when gently shaken or blown. For *Alnus incana*, the male flowers from which pollen is released are arranged on catkins. Where catkins are out of reach, pollen release may be estimated by observing the degree of catkin elongation and looseness. Once the initially compact catkins have unfolded and are hanging loosely, pollen will be released.

Leaf out

- *First leaf*

In at least 3 locations on the plant, the very first green tip of a young leaf has visibly moved out of the leaf bud.

Leaf elongation

Note: These measures can be difficult to estimate without a few seasons of practice.

- *25% leaf elongation [Intensive only]*
The majority of young leaves have unfolded completely and have expanded to one-quarter (25%) of their mature size. Leaf elongation may also be estimated by viewing the canopy as a whole. At 25% leaf elongation, the canopy appears to be approximately one-quarter (25%) full.
- *50% leaf elongation [Intensive only]*
The majority of young leaves have unfolded completely and have expanded to half (50%) of their mature size. Leaf elongation may also be estimated by viewing the canopy as a whole. At 50% leaf elongation, the canopy appears to be approximately half (50%) full.
- *75% leaf elongation*
The majority of young leaves have unfolded completely and have expanded to three-quarters (75%) of their mature size. Leaf elongation may also be estimated by viewing the canopy as a whole. At 75% leaf elongation, the canopy appears to be approximately three-quarters (75%) full.
- *Full leaf elongation [Intensive only]*
The majority of young leaves have unfolded completely and have expanded to 95-100% of their mature size. At full leaf elongation, the canopy appears to have reached its full density.

Fruit ripening

- *First fruit ripe*
In at least 3 locations on the plant, a fruit has become ripe. In *Alnus incana*, a good test for ripeness is fruit drop; mature cones will release winged nutlets into your hand when touched or gently handled. Ripeness may also be indicated by the presence of at least 3 nutlets on the ground below the plant (that are not apparently from a nearby tree). The cones (or catkins) reach maturity when they have changed from a green to brown color and the scales have spread apart.
- *50% of fruit ripe [Intensive only]*
For the whole plant, half (50%) of the fruits are ripe. In *Alnus incana*, this occurs when half (50%) of the nutlets have dropped.

- *All fruit ripe* [**Intensive only**]
For the whole plant, virtually all (95-100%) of the fruits are ripe. In *Alnus incana*, this occurs when all (95-100%) of the nutlets have dropped.

Leaf color change

Note: If drought seems to be the cause of leaf color change for a plant, please make a comment about it for that plant.

- *First leaf colored* [**Intensive only**]
In at least 3 locations on the plant, the green leaves have begun to change to their late season colors.
- *25% of leaves colored* [**Intensive only**]
For the whole plant, one-quarter (25%) of the leaves (including any that have fallen to the ground) have changed to their late season colors.
- *50% of leaves colored*
For the whole plant, half (50%) of the leaves (including any that have fallen to the ground) have changed to their late season colors.
- *75% of leaves colored* [**Intensive only**]
For the whole plant, three-quarters (75%) of the leaves (including any that have fallen to the ground) have changed to their late season colors.
- *All leaves colored*
For the whole plant, virtually all (95-100%) of the leaves (including any that have fallen to the ground) have changed to their late season colors and there is virtually no green left in the leaves.

Leaf fall

Note: If drought seems to be the cause of leaf fall for a plant, please make a comment about it for that plant.

- *First leaf fallen* [**Intensive only**]
In at least 3 locations on the plant, a leaf easily falls off into your hand when touched or gently handled. First leaf fallen may also be indicated by the presence of at least 3 leaves on the ground below the plant (that are not apparently from another individual nearby).

- *25% of leaves fallen [Intensive only]*
For the whole plant, one-quarter (25%) of the leaves have fallen.
- *50% of leaves fallen*
For the whole plant, half (50%) of the leaves have fallen.
- *75% of leaves fallen [Intensive only]*
For the whole plant, three-quarters (75%) of the leaves have fallen.
- *All leaves fallen*
For the whole plant, virtually all (95-100%) of the leaves have fallen.

Did you know? *Alnus incana*'s wood was used to produce a dye, and is also used to make clogs, bowls, woodcuts and fuel. Many wildlife and birds use this plant for food, eating leaves and twigs, buds, catkins, and seeds. It is also commonly used for windbreaks and in revegetation projects. Native Americans use this plant medicinally. Due to its association with nitrogen-fixing bacteria in its roots, in nodules, yields of timber-producing trees in many genera benefit when grown in association with this species. Also, due to this property, this species is used for soil conditioning, improving soil fertility.

Bibliography:

Cofrin Center for Biodiversity, Herbarium, University of Wisconsin, Green Bay; accessed 4/16/08: <http://www.uwgb.edu/biodiversity/herbarium/trees/alninc01.htm>

Favorite, J. 2003. Thinleaf alder, *Alnus incana* (L.) Moench., USDA, NRCS, Plant Guide, http://plants.usda.gov/plantguide/pdf/cs_alin2.pdf ; accessed 4/15/08.

Flora of North America; accessed 4/16/08:
http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=233500034

Jepson Flora Project, Jepson Interchange; accessed 4/15/08:
http://ucjeps.berkeley.edu/cgi-bin/get_JM_treatment.pl?2016,2017,0,2018

Lady Bird Johnson Wildflower Center, University of Texas at Austin, Native Plant Database; accessed 4/16/08:
http://www.wildflower.org/plants/result.php?id_plant=ALIN2

Ontario Trees and Shrubs; accessed 4/16/08:
<http://ontariotrees.com/main/species.php?id=2004>

Uchytal, Ronald J. 1989. *Alnus incana* subsp. *tenuifolia*. 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/> ; accessed 4/16/08:
<http://www.fs.fed.us/database/feis/plants/tree/alninct/all.html>.

USDA Plants Database; accessed 4/10/08: <http://plants.usda.gov/>

Utah State University, Forestry Extension; accessed 4/16/08:
<http://extension.usu.edu/forestry/UtahForests/TreeID/alte.htm>

Van Deelen, T.R. 1991. *Alnus incana* subsp. *rugosa*. 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/> ; accessed 4/16/08:
<http://www.fs.fed.us/database/feis/plants/tree/alninct/all.html>.

Virginia Tech, Department of Forestry, College of Natural Resources; accessed 4/16/08:
<http://www.cnr.vt.edu/DENDRO/dendrology/syllabus/factsheet.cfm?ID=370> ,
<http://www.cnr.vt.edu/DENDRO/dendrology/syllabus2/factsheet.cfm?ID=824>

Notes

The USDA PLANTS symbol for this plant is ALIN2.
The ITIS Taxonomic Serial No. for this species is 181887.

BBCH codes for phenophases used for this plant are available from the USA-NPN office upon request.

Proposed modifications, updates or corrections to this protocol are welcome; please direct correspondence to the USA-NPN National Coordinating Office.

Prior versions of this species protocol will be made available in a documents library on USA-NPN webpage.

Document history: V1.0 (beta) 08/20/08

Protocol compiler: Patty Guertin, Theresa Crimmins

Reviewers: Ellen Denny

USA National Phenology Network
National Coordinating Office
1955 East 6th Street
Tucson, AZ 85719
www.usanpn.org