

Rhamnus cathartica

Rhamnaceae family

Common buckthorn, Carolina buckthorn, European buckthorn, European waythorn, Hart's thorn, Rhineberry

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Description: *Rhamnus cathartica* is a fast-growing, deciduous, dioecious or occasionally flowers perfect, large shrub to small tree. Flowering occurs after budburst and during leaf expansion. On a sunny site, a plant can become mature and produce seed in a few years; on a shady site, maturity may occur between 10-20 years. Reproduces primarily from seeds. Sprouts vigorously when damaged or disturbed.

Variation: *Rhamnus cathartica* is native to Europe; no varieties or cultivars have been found in searches to date. *Need info.

Size: Grows to 3.3-25 ft. (1-7.6 m) tall; 15-20 ft. (4.6-6.1 m) wide. It can have a trunk up to 10 in. (25.4 cm) wide.

Stems: Stems erect to ascending; thorns present, needle-like; 0.1-0.4 in. (0.3-1 cm) long; often occurring on twig ends. It can have few stems to being profusely branched, from the base.

Leaves: Leaves opposite to subopposite, with some alternate; stipules present, deciduous to persistent, scale-like, minute. Leaves blades/lamina simple; ovate elliptic to oblong; 0.8-3 in. (2-7.6 cm) long; 0.6-2.2 in. (1.5-5.5cm) wide; deeply veined, veins strongly curved with 2-3 lateral veins on each side of the central vein; margins serrulate, teeth often ending in minute, red-orange glands; apex acuminate, cuspidate or obtuse; upper surface medium to dark green, glabrous; lower surface light green to yellow-green, glabrous or with sparse long white hairs along midvein; petiolate, 0.3-1 in. (0.7-2.5 cm) long; glabrous, or with sparse long erect hairs.

Inflorescence: Usually male and female flowers on separate plants (dioecious). Single flowers or dense clusters (umbels) of flowers; axillary. Fragrant.

Staminate (male): Axillary clusters, 2-8 flowers.

Pistillate (female): Axillary clusters, 2-15 flowers.

Flowers:

Staminate (male) flowers: Flowers 0.3 in. (0.6 cm) in diameter; calyx of free sepals, sepals 4, narrowly triangular, apex acute, greenish yellow, glabrous, spreading, expanded into campanulate hypanthium; corolla of free petals, petals 4, light yellowish-green to yellowish-brown, insignificant, 1-1.3 mm long; stamens 4, yellow.

Pistillate (female) flowers: Flowers 0.3 in. (0.6 cm) in diameter; calyx of free sepals, sepals 4, narrowly triangular, apex acute, greenish-yellow, glabrous, spreading, expanded into campanulate hypanthium; corolla of free petals, petals 4, lanceolate, 0.6 mm long, light yellowish-green to yellowish-brown, deciduous and often absent; style 4-parted; stamens sterile, 4.

Fruit: A drupe; ovoid; 0.2-0.3 in. (0.5-0.8 cm) long; 0.2-0.3 in. (0.5-0.8 cm) wide; fleshy; glabrous; glossy; black; seeds 4. Not edible.

Seeds: Gray to brown to dark yellowish-green; glabrous; smooth; trigonus in cross-section; pointed; 0.2 in. (0.5-0.6 cm) long; 0.1-0.2 in. (0.3-0.4 cm) wide.

Bark: Bark smooth; brown to gray; shiny; numerous white lenticels, when young. Becoming dark gray and scaly, with larger plants becoming rectangular blocky. Twigs brown or reddish-brown to gray; smooth or warty; glabrous.

Roots: Root system consists of a woody taproot.

Habitat: *Rhamnus cathartica* occurs in moist to mesic areas, and occasionally on drier sites; roadsides, fields, thickets, woods and wood edges. It prefers lightly shaded sites, but can also be found in full sun. It tolerates many soil types, from well-drained sand, clay, to poorly drained calcareous soils, neutral to alkaline. Tolerates drought and air pollution.

Species distribution in US states: CO, CT, ID, IL, KY, MA, ME, MI, MN, MO, MT, ND, NE, NH, NJ, NY, OH, PA, RI, SD, UT, VA, VT, WI, WV, WY

Species images:

Whole plant:

http://www.uwgb.edu/BIODIVERSITY/herbarium/trees/rhacat_aspect01.jpg

<http://ontariotrees.com/main/species.php?id=2022>

Bark:

younger:

<http://www.forestryimages.org/images/768x512/1334024.jpg>

<http://www.forestryimages.org/images/768x512/1334008.jpg>

<http://ontariotrees.com/main/species.php?id=2022>

older:

<http://www.cnr.vt.edu/DENDRO/dendrology/syllabus2/factsheet.cfm?ID=559>
<http://ontariotrees.com/main/species.php?id=2022>

Leaf:

leaf development after budburst:

<http://tncweeds.ucdavis.edu/photos/rhaca07.jpg>

leaf arrangement:

http://msuplants.com/images/Rhamnus/Rhamncath_LF01.jpg

general:

http://www.uwgb.edu/BIODIVERSITY/herbarium/trees/rhacat_leaf01.jpg

http://calphotos.berkeley.edu/cgi/img_query?query_src=photos_index&enlarge=0000+0000+0105+2388

<http://www.forestryimages.org/images/768x512/0008306.jpg>

Colored leaves:

*Need photo.

Buds:

http://msuplants.com/images/Rhamnus/Rhamncath_HT09_Dec21.jpg

http://www.uwgb.edu/BIODIVERSITY/herbarium/trees/rhacat_twig01.jpg

<http://www.forestryimages.org/images/768x512/0008477.jpg>

thorns:

http://www.uwgb.edu/BIODIVERSITY/herbarium/trees/rhacat_thorn02_web500gf.jpg

flowers:

<http://www.forestryimages.org/images/768x512/5341022.jpg>

Staminate (male) flowers:

http://www.illinoiswildflowers.info/weeds/plants/cm_buckthorn.htm

http://www.mntca.org/Reference_manual/Tree_info/Images/Rhamnaceae/Rhamnus%20c%20-%20nice-%20flowers%20-%205-23-05.jpg

Pistillate (female) flowers:

<http://www.forestryimages.org/images/768x512/5274027.jpg>

<http://ontariotrees.com/main/species.php?id=2022>

Fruit:

<http://ontariotrees.com/main/species.php?id=2022>

http://calphotos.berkeley.edu/cgi/img_query?query_src=photos_index&enlarge=0000+0000+0105+2387

http://calphotos.berkeley.edu/cgi/img_query?query_src=photos_index&enlarge=0000+0000+0105+2389

<http://www.forestryimages.org/images/768x512/0008184.jpg>

Seeds:

http://plants.usda.gov/java/largeImage?imageID=rhca3_005_ahp.tif

Expected timing of growth stages:

Flowering: May-June.

Bud break/Leaf out: April to mid-May.

Leaf/canopy development: Leaf expansion occurs during flowering. *Need info.

Fruit ripening: August-September.

Seed dispersion: Fruit can remain on the plant throughout winter following ripening. This may increase dispersion due to visibility to birds.

Leaf coloration: *Need info.

Leaf fall: Leaves are retained till late September through October, and sometimes into November.

Phenophases to be monitored for NPN:

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.

Flowering

- *First flower*
In at least 3 locations on the plant, a flower has opened completely. Flowers are considered 'opened' when the reproductive parts are visible between unfolded or opened flower parts. For *Rhamnus cathartica*, if you know whether the flowers you are observing are male or female, please report this information as well.
- *Full flower [Intensive only]*
The plant has reached its peak floral display. This occurs when half (50%) of the flowers on the whole plant have opened completely.
- *Last flower*
The last visible flower has opened completely and is still fresh.

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 *Rhamnus cathartica*, a fruit is considered ripe when it is black in color or when it has been eaten by wildlife. (Note that *Rhamnus cathartica* individuals with only male flowers will not produce fruit.)
- *50% of fruit ripe [Intensive only]*
For the whole plant, half (50%) of the fruits are ripe.
- *All fruit ripe [Intensive only]*
For the whole plant, virtually all (95-100%) of the fruits are ripe.

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? *Rhamnus cathartica* fruits are eaten by birds and mice, which facilitates the long-distance dispersal of the seeds. It can invade areas and become problematic. As a non-native understory shrub species, *Rhamnus cathartica* individuals leaf out very early and retain their leaves late in the growing season, causing the shading out of native wildflowers and herbaceous species.

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Notes

The USDA PLANTS symbol for this plant is RHCA3.

The ITIS Taxonomic Serial No. for this species is 28573.

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.

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Protocol compiler: Patty Guertin

Reviewers: Ellen Denny

USA National Phenology Network

National Coordinating Office

1955 East 6th Street

Tucson, AZ 85719

www.usanpn.org