

BUCKTHORNS

Rhamnus cathartica

Rhamnus frangula

Common names: *R. cathartica*
Buckthorn, Common Buckthorn

R. frangula
Glossy buckthorn, Fen Buckthorn, Alder Buckthorn

Introduction and Identification

Common buckthorn is a deciduous (leaves drop in autumn) shrub or small tree ranging from 6 to 18 feet high. The dull green leaves are oval shaped, hairless and possess slightly toothed margins. Leaf arrangement on stems is alternate or nearly opposite. Common buckthorn twigs and bark are colored black with obvious lenticels, apertures for gas exchange. The hairless twigs may have thorns. Leaves are 1.5 to 3 inches long with side veins curved upwards. Four petaled green-yellow flowers occur in clusters such as in Queen Anne's Lace. Male and female flowers occur on separate plants. Sapwood is yellow and heartwood is pink to orange.

Glossy buckthorn is a shrub or small tree that grows to 21 feet. The brown green branches are discerned by long lenticels and may possess some hairs. Glossy green leaves are egg shaped with smooth or slightly scalloped margins. Leaves are arranged on the stem in alternate fashion and are hairless or slightly hairy, and are pinnate. Yellow five petaled flowers are borne in stemless umbels.

Natural History

Common buckthorn is native to much of Europe except Iceland and Turkey and is found in western and northern Asia, and at low elevations in Algeria and Morocco. Glossy buckthorn is indigenous to Europe, North Africa and Asia.

Common buckthorn is naturalized in North America, from Nova Scotia to Saskatchewan and Alberta south to Missouri and east to Michigan, North Carolina and Virginia, and is found throughout New England. The shrub also is found in the Dakotas west to Utah and California. Glossy Buckthorn ranges from Nova Scotia west to Manitoba, south to Minnesota and Illinois and east to New Jersey. Diverse native habitats in Asia and Europe include open oak understories, oak-beech or ash woods, riverine woods, exposed thickets in rocky sites, hedgerows, pastures and basic shrub carr fens. Common buckthorn thrives on well drained sand, clay or poorly drained calcium rich soil, preferring neutral or basic soil. The plant grows well in dense shade and may be found on the fringe of woodlands or exposed southern and western faces.

Glossy buckthorn is found in moist, less shaded and more acidic soils of any texture. Habitats include alder calcium rich and wetland soils, heath oak woods, pine, and spruce with this plant occurring as understory vegetation. European reforestation calls for glossy buckthorn to be placed in a water logged podzolized clay soils, a lower level of soil that develops in humid climates, deficient in nutrients and humus.

Common buckthorn and glossy buckthorn were introduced to North America before 2800 and spread and naturalized themselves circa 1900. Both are cultivated for hedges, forestry purposed and wildlife habitats. Common buckthorn has usage for shelter belt plantings. Other naturalized habitats include pasture, fencerows, roadsides and ravine slopes.

Life Cycles

Plants sexually reproduce reaching seed bearing age quickly. Common buckthorn flowers bloom in May to June. Glossy buckthorn flowers bloom in late May through September sometimes on the current season's growth. The round black stone fruits of common buckthorn ripen in August through September containing 3 to 4 grooved seeds. The slightly round and flattened stone fruits of glossy buckthorn ripen in July through August, possessing 2 or 3 ungrooved seeds. Both species fruit abundantly, common buckthorn being more prolific than glossy buckthorn. Fruit water extractions possess some growth inhibitor properties to in vitro leukemia cell lines. Blackbirds, starlings, cedar waxwings, robins, blue jays, wood ducks, elk and mice disperse fruit. Immature fruits of both species contain a defense chemical called emodin and few bird species tolerate this compound thus preventing premature dispersal. Common buckthorn retains fruit throughout winter and glossy buckthorn fruits fall to the ground after ripening. Common buckthorn fruit is more obvious to dispersal species and is found covering long distances. Small grain producers show interests in Common Buckthorn because it is an alternate host to oat crown rust which impacts quality and yield. Dry common buckthorn fruits may float for 6 days and seeds may float 3 days, dry seeds may float for 7 days.

Ecological Impact

Seeds possess an embryo or seed coat dormancy and need stratification, that is, covered with sand and place in a cold environment for 6 to 8 weeks to simulate winter, or scarification, or nicking the seed coat allowing water penetration. A greater number of seeds are found in lighted areas. Seed density of glossy buckthorn is higher nearest the plat. Buckthorns have long growing seasons growing rapidly and resprouting after top removal. Both plants produce leaves before most deciduous woody plants in North America, common buckthorn from late April to mid-May and glossy buckthorn in mid-to-late May. Both keep their leaves in late September through October and often as late as November.

Buckthorns from dense thickets until branches merge with adjacent shrubs creating sense shade. Seedlings of common buckthorn establish under semi-light and glossy buckthorn

becomes less shade tolerant than common buckthorn. Lower leaves are shaded out and a more columnar growth results. Common buckthorn often retains lower leaves. Glossy buckthorn adult plant growth may be somewhat tempered by other canopy species. *Viburnum opulus* and *Betula pumila* may be crowded out by buckthorn species.

Management and Control Methods

Selectively cut or grazed woods show the greatest invasion of common buckthorn along woodland edges, windfall openings and dead stands. Other typically invaded habitats include sugar maple woods and lowland woods. Prairie forest border fire suppression increased invasion in open woods. Common buckthorn tolerance of heavy clay soils and various sites increase colonization success. Glossy buckthorn often invades wetlands, wet prairies, calcium rich soils and sphagnum bogs, tamarack swamps and drier wetlands.

Common and glossy buckthorns are invasive because

- 1) Both species become nuisances when disturbances create areas for seedling to grow and mature.
- 2) Naturalized habitats resemble to indigenous habitats
- 3) Efficient seed production and germination.
- 4) Dense colonies produced offer much shade
- 5) Tops resprout quickly after removal.

Repeated cutting leads to weaker plants. Mowing prevents seedling establishment maintaining open areas. If 2 to 3 cm wide saw cuts are made of glossy buckthorn phloem (sugar conducting vessels), the plants do not resprout. Girdling may be performed all winter. Seedlings or small plants may be pulled or taken out by a hoe and larger plants removed with heavier equipment, a technique more useful to control low density invasions along roads, trails or woodland edges. Make 2 parallel cuts 4 to 5 inches apart with an ax or saw slightly deeper than the cambium and use a blunt object to knock off the bark. Remove the phloem without damaging xylem, water conducting tissue. Check after a few weeks to be certain the bark does not regrow. Positive results may not be seen for a year. A MERI crusher mounted on the tractor back grinds wood into mulch. "Underplanting" with indigenous woody species may prevent invasion or reinvasion. Restoring wetland water levels will kill glossy buckthorn.

Burning seedlings in the first growing season after removal is the most effective method of buckthorn control. Weather is noted on the site before and during a burn operation and the area to be cleared is checked for fire hazards. Crew positions themselves in parallel lines walking slowly burning in overlapping patterns. Non selective burning is easier to and to be planted with native seed at a later time. A "heat shield" may be used to separate the target buckthorn species and isolate the nontarget species. The maximum flame temperature is reached a 6-12" from the torch bell tip and it is more efficient to

torch with the wind direction. Torch seedlings until wilted, Flame torch applications for 5 seconds around the stem will result in cambium dysfunction (the layer of cells giving rise to secondary growth) in stems less than 1 inch in diameter. One treatment will due to remove plants and repeat only for resprouting and establishment of new seedlings. Resprouting of buckthorn species will not occur if seedlings are burned before August. Burning yearly or every other year may be required for 5 to 6 plus years.

References

<http://www.tncweeds.ucdavis.edu/esadcs/Franalnu.html>
<http://www.invasivespeciesinfo.gov/plants/main/shtml>
<http://www.inhs.uiuc.edu/cht/outreach/VMG/VMG/html>
<http://invasives.eeb.uconn.edu/ipane/>