Fact Sheet
314 Brush Management
Buckthorn (Common and Glossy)





Photos by Minnesota Department of Agriculture

Fruit (left) and Understory Infestation (above)

Buckthorn – Common (Rhamnus cathartica) and Glossy (Rhamnus frangula)

Buckthorn

Buckthorn, common or European and glossy, invade the understory of woodlands and forests to the exclusion of other plants or seedlings in the lower canopy. Both species of buckthorn are considered restricted noxious weeds in Minnesota which means the importation, sale and transportation of the plants or parts of plants are prohibited. Buckthorns were brought into this country in the 1800s for use as hedges, shelterbelts and wildlife plantings.

Description

Buckthorns are fast-growing tall shrubs or small trees reaching about 20 feet tall at maturity. Usually they have multiple stems from the base. The brown bark has prominent pale colored protuberances called lenticels. The wood itself is orange or yellow. Glossy buckthorn has spines erupting from the stem and branches, unlike the common buckthorn branches which terminate in thorns.

The leaves on buckthorn are oval or elliptical, and alternate, but may appear almost opposite. The veins curve up toward the tips of the leaves. Leaf edges of glossy buckthorn are smooth and slightly wavy; those of common buckthorn are finely toothed. The leaves do not turn color in the fall and eventually senesce (fall off), still green, in early winter.

The flowers are fragrant yet very small. Those of common buckthorn bloom in May and are light green to yellow-greenish. Flowers of glossy buckthorn are pink or white, and the plant can bloom from May through September. The plants are dioecious (separate male and female plants) and only the females produce fruit. Common buckthorn has black fruit while glossy buckthorn fruit changes from red to black throughout the growing season. Buckthorn fruit look like plums and cherries, especially choke

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cherry, so it is important to positively identify plants in the areas designated for treatment. There are many references to consult for plant identification.

Habitat

Both buckthorns are natives of moist woody habitats of Eurasia. In Minnesota, common buckthorn infests woodlots, fence rows, roadsides, ditches and abandoned or neglected areas around farmsteads. It can be found in both upland and lowland habitats and thrives on well-drained soils. Glossy buckthorn invades the same areas as common buckthorn however it prefers the upslope areas around ditches, wetland prairies and marshes. They tolerate full sun to deep shade conditions.

Ecological Threat

The sale of common buckthorn was halted in the 1930s after it was discovered that it is an alternate host to oat crown rot, a fungal disease of oat crops. However, many windbreaks, shelterbelts and hedges were established with this plant and it silently and perniciously invaded the Minnesota landscape. In 2001 it was discovered that this plant is a winter host to the soybean aphid, a new insect pest introduced into the U.S.

Cultivars of glossy buckthorn continued to be imported and sold in nurseries until its restriction in 2001. This plant has spread widely near urban areas, wetlands and native woods. Buckthorns grow aggressively and out-compete native vegetation for space, light, water and nutrients. They have a longer growing season than native plants both in the spring and in the fall. This means that leaves break buds very early in the spring and the plants stay actively growing well into early winter. The green leaves are persistent; they stay on the twigs longer than other trees or shrubs and remain photosynthetically active until leaf fall.

It was mistakenly believed that birds and animals benefited from eating the abundant fruit. However due to its laxative nature, it has no nutritional value for wildlife. The fruit has a cathartic (laxative) effect (note the species name carthartica) and is eliminated without being digested. The undigested seeds are viable and get dispersed. They can remain viable for up to 6 years on the ground. It is thought that these plants contain allelopathic compound that suppresses other plants from growing near it.

Buckthorn thickets are so dense that no herbaceous layer is possible beneath it. The ensuing monoculture harms song bird habitat and destroys the natural biodiversity of the invaded area.

Control Methods

Cutting, removal, burning and herbicides offer the best solutions for control. However, there are specific procedures that must be followed for a successful control or eradication program.

Biological Control

There are no known biological controls for buckthorn.

Mechanical or Manual Control

Methods for mechanical or manual treatments are suitable for areas with small infestations and young plants or in areas where chemicals are not practical or allowed. These methods work best with stem diameters less than 2 inches.

Mowing

Mowing can be very effective, but only if the buckthorn stems are very young (2 years old or less) Mow the infested area in the early spring and again in the fall, after nesting season will control the spread of

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buckthorn and eventually kill the plants and deplete the seed bank. Mowing will be most effective in pastures, cleared landscapes and newly restored wetlands, prairies and marshes.

Pulling, Digging or Wrenching

Stems larger than ½ up to 2 inches in diameter can be dug up with a shovel. Start digging about 6 to 8 inches away from the stem completely severing the lateral root system from the ground. Pull out the whole plant and shake off excess soil to fill in the hole, tamp down loose soil. If possible replace the organic matter and leaf litter as well as any desirable plants. Single stems are easier to treat with this method than multiple stemmed plants.

A weed wrench may be used for plants that are hard to pull or dig, up to 2.5 inches in diameter. This is a specially designed lever that grabs the stem, so it can be pulled out. As above, replace soil, organic matter and leaf litter and replant uprooted desirable plants as much as possible.

Stem Cutting (Hacking)

Cutting or hacking stems up to 4 inches in diameter will reduce the spread of infestation, but to eradicate the plants it will need to be done several times during the growing season and on an annual basis until the plants no longer sprout. Buckthorn roots from cut stems if not followed by chemical treatments. The minimum length of the cut stump is 2 inches, maximum is 6 inches. Cut all stems present 2 to 6 inches above the base of the trunk. Tools such as hand pruners, loppers, pruning saws, brush cutters or chain saws, depending on the size of the site and the diameter of the plants, are all used to cut stems or trunks.

If stems are cut between flowering and the fruit set, the rate of spread will be reduced by decreasing seed dispersion. This is an annual treatment and consistency of the treatment is key to its effectiveness. If the stump of the cut plant is small enough to fit into an inverted metal can such as a coffee can, attach a can with a long enough nail to keep it from falling off. Be sure the stump is no more than 1 inch shorter than the height of the can and that the can is touching the ground when it is secured. Any sprouts that appear will not be able to escape the can and die, eventually the root system will be depleted, and the plant will die. Heavy gauge black plastic or fabric will also work if tightly secured. Remove the can or plastic after one or two growing seasons.

Prescribed Burning

In prairies or savannahs where there is enough material for a hot burn, prescribed burning can be used to control buckthorn seedlings less than 1 inch in diameter. Larger plants may need a follow-up burn, or chemical or mechanical treatment for complete control or eradication. Refer to the NRCS Conservation Practice Stand, Prescribed Burn, code 338, for information on burning.

Mature buckthorn will be a seed source if located near a burned area. The exposed soil creates a desired habitat for buckthorn seedlings especially if the area is a wetland, wet prairie or marsh that experiences drying after the burn.

If there are buckthorn seedlings revegetating a treated site or re-sprouts from cut stumps following treatment, a prescribed burn is effective in knocking back the regrowth.

Chemical Control

The right chemical applied at the right amount at the right time is very effective in controlling buckthorn. Chemical treatments work best when plants are storing energy or dormant. For buckthorn, the most effective time for chemical application is mid-summer through winter (July to March) when the plant moving sugars to the roots or dormant. The nature of the plants can work against them between mid-fall and early winter because their green persistent leaves can be easily identified against native fall colors and bare branches.

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Chemical treatments involve several methods including: basal spraying, cut-stump, injection, hack and squirt.

Hack and Squirt

This is the most effective and most preferred method for controlling or eradicating buckthorn. Hack and squirt refer to cutting off the trunk or stems and applying herbicide to the cut end(s). It is imperative that the herbicide is applied as soon as possible but no more than 2 hours later for most chemicals to be effective. Refer to the first paragraph under-stem cutting for information on hacking.

The chemical can be applied with a squirt bottle, low volume sprayer, a wick or wand, or a paint brush. A spray bottle set to stream with the nozzle placed against the cut end with a gentle squeeze will apply the herbicide effectively without delivering a spray to surrounding plants. Soaking the cut end is not necessary since the herbicide concentration is sufficiently strong to kill the plant. The most efficient and effective placement is to target the ring of cambium (green layer) just inside the bark.

Basal Bark

The basal stem treatment works through the bark eliminating the need for cutting stems or trunks. Use on buckthorns with stems less than 3 inches in diameter. A low volume sprayer is needed to use this method. The chemical is applied directly to the bark from the root collar up to about 12 to 18 inches. The buckthorn plants can be left standing for wildlife purposes or cut later. This method can be used as part of a hack and squirt treatment by spraying the cut end and the remaining bark around the stump.

Management After Treatment

Buckthorns are very prolific seeders. The seeds are long-lived and sprout vigorously when given the chance. Areas newly cleared of buckthorn are quickly inundated with seedlings or stump sprouts if follow-up is not adequate or consistent.

Post-treatment of the area includes destroying the seedbank and stump sprouts and replanting with desirable species. Seed the treated area with temporary cover and see if seedlings or sprouts appear. Chemically treat Mow, apply herbicide or annually burn until the seedlings and stump sprouts are eliminated. Once the seedbank is depleted, plant the desired species mix to reclaim the site. Inventory or monitor the site and treat any buckthorn seedlings that are dispersed into the treated area. If nearby sites are the source of buckthorn, try to get those sites cleared as well.

Many native plants can be substituted for buckthorn. Choices include high-bush cranberry, nannyberry, chokecherry, grey dogwood, American hazelnut, black chokeberry, blue beech, ironwood, downy serviceberry, common ninebark, witchhazel and many others.

Disposal

It is important to consider how the stems, branches and trunks generated from control or eradication methods will be handled. Stems and branches without berries can be left on the site to provide hiding places for wildlife. For small diameter trunks, make sure all roots are exposed to prevent re-rooting. Other solutions include burning or removing the material for appropriate off-site disposal. If berries are present, destroy the branches by burning. Decide how the excess material will be disposed before beginning any treatment method.

Important Note

Mention of specific products in this document does not constitute an endorsement. These products are mentioned specifically in control literature used to create this document.

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Follow all label instructions when applying pesticides including “grazing and re-entry level restrictions” (Is the product labeled for “the application site” you are considering?).

By law, herbicides may only be applied as per label instructions. If the plant to be controlled or eradicated is not listed on the label, it is illegal to use the product on that plant.

Many products listed in this series of invasive plant control fact sheets are not acutely toxic but have high potentials to move off-site via leaching or runoff under certain conditions. Off-site movement potential can be minimized by spot treating; applying to foliage instead of the ground surface (check label).; using a surfactant if suggested on the label; and following the instructions in the Chemical Control portion of this fact sheet. Specifically, avoid over-spraying or application to the point where products are reaching or dripping onto the ground.

Recommendations provided in this publication were current at the time of development, but herbicide labels change frequently. Obtain and read the product label and follow the directions on that document for conditions at the time of herbicide use.

References

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BUCKTHORN CONTROL QUICK GUIDE					
Control Activity	Appropriate For	Pros	Cons	Tools	Process/Info
Manual pulling by hand or weed wrench or grubbing out with shovels	Small plots or parks < ½ acre, back yards, natural areas, sites where herbicides cannot be used.	No chemicals No cost for pulling	Slow, may injure back, may pull or dislodge desirable plants, disturb soil, weed wrench can be expensive	Gloves, container for disposing plants if not leaving on site, weed wrench, shovels	Best on plants <1/2 to 3/8 inches in diameter. Soil must be moist, loose. Shake soil off root and lightly tamp in hole.
Cover with black plastic, fabric, or tin can	Small plots or parks <1/2 acre, back yards, places where people won't trip over cut stumps	Low cost for used cans, plastic or fabric, nails, wire	Plastic or metal debris to clean up, slow	Gloves, nails, cans or plastic, plastic ties or wire	Leave 2 to 6 inch stump, cover, secure cover to the ground to keep out all light
Basal bark spraying	Larger plots, can be done any time of year	Use on stems up to 6 inches in diameter, very effective, low toxicity, no cutting, dead stems provide wildlife habitats	Expensive materials and chemicals	Ultra low volume sprayer and wand, Triclopyr, gloves	Wet bark from base to 6 inches above base for plants up to 1 inch in diameter, scale up to 18 inches above base for larger plants.
Cut stem with chainsaw	Larger stems > 4 inches	Fast on large stems should follow up with herbicides	Dangerous, loud, high maintenance, costly	Chainsaw, safety apparel, partner, chemicals	Leave stumps $\leq$ 6 inches above the base. Treat with herbicide or cover stumps.
Cut with brush cutter	Larger plots	Fast on stems < 2 inches, should follow up with herbicides	Noisy, costly, restricted during nesting time	Brush cutter, safety apparel, gas, oil	Cut stems and treat with herbicide of choice.
Drag out, load and dispose of stems	Small to medium areas, fire prone areas, areas where aesthetics is important	Reduces fire fuel, enhances aesthetics	Messy, physically hard, time consuming, may spread berries and seeds through the site	Gloves, saws, ropes or chains, small tractor or skid steer loader	Drag cut stems to a burn pile or hauler.
Leaving cut stems on-site	Any size area where fire danger is low or aesthetics is unimportant	Inexpensive, no effort	Piles or brush looks messy; may add to seed bank	None	Avoid blocking trails when piling or leaving brush
Burn piles	Open area appropriate for burning	Reduces fire fuel, enhances aesthetics	Smoke, burn in winter only	Burning permit, DNR or other assistance	Use for stems killed by the ultra-low volume spray or girdled
Misting wand to control sprouts	Up to a medium sized area, Use on re-sprouts from cut stumps	Low labor and chemical use	Late autumn only	Mist wand, herbicide, safety apparel and equipment	Use in late fall; non-selective herbicide will not harm dormant plants
Mist blower with electrostatic accessory to charge and attract droplets to live foliage	Large area with young seedlings from seed bank or newly treated sites	Low labor and chemical use for large area	Late fall only, drift, equipment costs	Mist blower and electrostatic accessory, safety apparel and equipment	Use in late fall, non-selective herbicide will not harm dormant plants.

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