



INVASIVE PLANT FACT SHEET

Burning Bush

(*Euonymus alatus*)

Photo credit: Eric Burkhart

Background

Burning bush (*Euonymus alatus*), or “winged euonymus,” is an extremely popular landscape shrub, even after its invasive habit became known. Originally introduced from Asia in the mid-1800s, its ability to invade natural areas was first documented in the 1970s. Because its attractive fall color and eye-catching fruit are unique among shrubs, homeowners can be reluctant to remove burning bush from their yards. Though not as aggressive as other invasive shrubs, its ability to grow under a mature canopy and prolific fruiting make it a shrub of enough concern to be ranked a “significant threat” by the Pennsylvania DCNR.

Description

Size: Up to 15 feet tall.

Leaves: Football shaped, oppositely arranged, finely toothed along the leaf edge or margin, and between 1 and 2 inches long. In the fall, the leaves turn brilliant crimson before senescing.

Flowers: The greenish flowers are held in groups of three on the stems, each less than ½ inch across. Emerging in early spring, these flowers are not showy and can be easily missed.

Fruit: Ripening in the fall, the fruits are brilliant red with a split, purplish husk, each about ½ inch in diameter. The husk splits to expose four red-orange seeds. Despite their bright coloring, they tend to blend in with the even more showy fall foliage.

Stems: Vibrant green with raised, tan, or brown corky “wings.” They may follow the stem strictly lengthwise or be whorled or twisted slightly. Height of the wings is variable among individuals.

Look-alikes

Native euonymus species (*E. americanus*, *E. atropurpureus*, *E. obovatus*) all lack the corky wings of the invasive shrub. Though young sweetgum (*Liquidambar styraciflua*) can have winged twigs, its leaves are star shaped, contain five lobes, and do not possess the vibrant fall color of burning bush.

Dispersal

Burning bush is primarily spread by birds dispersing their abundant and highly visible fruit. The fruit often persist into winter when they become even more visible to birds and mammals.

Site

Burning bush's tolerance of deep shade is at the core of its success in invading woodlands. Though they can also grow in full or partial sun, they thrive in forest interiors where there is less competition from other invasive shrubs. They grow on a wide range of sites, though are often found not far from a source of seed in a landscape setting.



A. Flowers and leaves
 B. Stem showing corky wings and leaves
 C. Ripe fruit after leaf drop
 D. Invaded woodlands
 Photos by Eric Burkhart and Dave Jackson

Control

Burning bush, though a prolific seeder, is not difficult to control individually, nor does it spread as aggressively as other invasive shrubs. This species leafs out early and drops its foliage late compared to most native woody species, creating a longer operational window for herbicide treatments. Foliar herbicide treatments are an option for burning bush from early May

into October. Basal bark and stump herbicide treatments can be done all year, weather permitting.

Small infestations of young plants can be pulled effectively by hand. For larger plants in low-density invasions, a root-wrenching tool or hoe can be used to remove the majority of the root system, which the plant will not recover from.

Management Calendar

The management calendar for burning bush is quite flexible because the foliage emerges early and falls late, though foliar applications should be made before the onset of fall color. Stem treatments to intact or cut stems provide a year-round window of opportunity.

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Leaf Out												
Flowering and Seed Ripening												
Foliar Herbicide Application												
Basal Bark and Cut Stump Treatments												

Treatment and Timing

Basal bark and cut stump treatments can be made anytime the weather permits. Product names reflect the current Pennsylvania state herbicide contract; additional brands with the same active ingredients are available.

Treatment	Timing	Herbicide	Product Rate	Comments
Foliar	Mid-May to onset of fall color	Aquaneat (glyphosate) plus Garlon 3A or Vastlan (triclopyr)	3 quarts/acre plus 2 quarts/acre or 1.5 quarts/acre	A combination of glyphosate plus triclopyr is effective against a broad spectrum of woody species. Additionally, this mixture reduces risk to nontargets because it has practically no soil activity and the herbicide products are safe for aquatic applications. Garlon 3A and Vastlan are both water-soluble, aquatic-labeled triclopyr formulations, but have different active ingredient concentrations. A surfactant (e.g., CWC 90) needs to be added. If using a different glyphosate product, be sure to check the product label to see if a surfactant is needed; some come premixed.
Basal Bark	Year-round	Pathfinder II or Garlon 4 Ultra (triclopyr ester)	Ready-to-use or 20%, 1:4 in basal oil	Oil-based herbicides penetrate the plant's bark and travel systemically through the plant. Basal bark applications wet the entire circumference of the lower 12 to 18 inches of the stem. Aim for full coverage on stems without creating excessive runoff.
Cut Stump	Year-round	Pathfinder II or Garlon 4 Ultra (triclopyr ester)	Ready-to-use or 20%, 1:4 in basal oil	Cut stump treatments with oil-based triclopyr ester herbicides are applied to the cut surface as well as the bark of the stump and can be applied anytime after the stems are cut. An oil-soluble colorant should be added to improve tracking, avoid skips, and duplicate treatment.
		Aquaneat (glyphosate) or Garlon 3A or Vastlan (triclopyr)	50%, 1:1 mix with water	Unlike the oil-based herbicides, water-based treatments are only applied to the cut surface and must be made immediately after the stems are cut. A water-soluble colorant should be added to improve tracking, avoid skips, and duplicate treatment.

Mowing is an option to remove the shrub canopy and eliminates the need to drag and chip or burn the stems following cutting. Smaller stems are readily dispensed with heavy-duty rotary or flail cutters (i.e., “brush hogs”). For larger stems, fixed-tooth, drum-type forestry cutters have the capacity to cut stems to the ground-line and finely chop the debris. Mowing is not a stand-alone treatment and is ineffective at controlling the plants without follow-up herbicide applications to resprouts. Treating regrowth with a fall foliar or basal bark application (or the next season) is likely easier than stump or stubble treatments following mowing because the targets

are easier to find and selectively treating knee-to-waist-high resprouts with a backpack sprayer is a relatively quick process. Another advantage to treating resprouts is that it makes it easier to distinguish exotic species from native sprouts you wish to release on the site.

Foliar treatments with a backpack sprayer are the most effective means to treat sites with low to moderate plant density. An effective solution for treating burning bush is a water-based mixture of glyphosate and triclopyr at a 2:1 ratio. Be sure to calibrate your spray application to achieve the desired dosage. This mix provides a broader control spectrum than either

ingredient alone, is nonselective, and poses minimal risk to nontargets via root absorption of herbicide.

Stem treatments are effective against burning bush and can be implemented throughout the year, providing scheduling flexibility. Treatment options include basal bark and stump treatments. Basal bark treatment uses a concentrated mixture of the herbicide triclopyr ester in basal oil applied to the entire circumference of the lower 12 to 18 inches of the intact stem, treating farther up on larger stems. If the shrub's top growth needs to be removed, the preferred approach is to cut the stems close to the soil line and treat the stump. Use a 50 percent, 1:1 mixture of water with a glyphosate or a water-soluble triclopyr product and spray the cut surface, but avoid runoff. Or use a 20 percent, 1:4 concentration of triclopyr ester in basal oil and treat the cut surface as well as the sides of the stump. Oil-based triclopyr ester can be applied anytime after cutting—as long as the stumps can be found—while water-based treatments (50 percent, 1:1 mixture) should be applied immediately after the stems are cut.

Human Use

Burning bush continues to be used extensively by the landscape industry. Homeowners are often reluctant to remove these shrubs, as they are often centerpieces of their yards. However, the best way to prevent burning bush invasions into natural areas is to remove the closest seed source. There are many native alternatives for those looking to capture the vibrant fall colors burning bush offers—for example, native viburnum shrubs have both attractive spring flowers and glossy, maroon fall foliage, and shrubby dogwood species, including silky (*Cornus amomum*), gray (*Cornus racemosa*), and red stem (*Cornus sericea*), have similarly vibrant fall coloration. Both viburnum and dogwood shrubs provide valuable food and shelter for wildlife in addition to aesthetically beautiful foliage and flowers.

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