



VEGETATION MANAGEMENT GUIDELINE

Winter creeper (*Euonymus fortunei* (Turcs.) Hand.-Mazz.)**SPECIES CHARACTER****DESCRIPTION**

Winter creeper or trailing euonymus (*Euonymus fortunei*) is an evergreen, woody, clinging vine in the staff tree family (Celastraceae). It can form a dense ground cover, a shrub up to one meter tall or can climb 12 - 22 m (40 – 70 feet) high vertical objects with the help of aerial roots. The leaves can be dark green, green-white or green-gold variegation with some cultivars having purplish lower surfaces. Leaves usually occur in pairs, but vigorous shoots may have sections with an alternate arrangement, are ovate (egg-shaped), 2.5 – 6 cm (1 – 2 1/2 inches) long, 2.5 – 4.5 cm (1 – 1 3/4 inches) wide, and thick with the base of the leaf tapering to the stalk. The leaf stalk (petiole) is 0.4 – 1 cm (1/8 – 3/8 inch) long. The leaf margins are finely toothed and somewhat turned under or wavy. The blades are glossy with silvery or whitish veins. During harsh winters, winter creeper may drop some or all of its leaves, leaving only the stems. The stems are stout, green and hairless when young becoming gray, slightly warty or corky and hairy with age, but may turn greenish-purple during severe cold. Small, greenish-yellow, inconspicuous flowers form at the ends of y-shaped stems in May – July. Each flower is 2 – 3 mm (0.1 inch) wide and has four petals. The fruits are dangling, paired or single pinkish to reddish, 0.5 – 1.0 cm (0.2 – 0.4 inch) long capsules (arils) that mature in September – November and split to reveal a fleshy orange to red-covered seed.

SIMILAR SPECIES

Winter creeper can be confused with bittersweet (*Celastrus scandens*), crossvine (*Bignonia capreolata*), larger leaved species of blueberry (*Vaccinium* spp.) and rusty black haw (*Virburnum rufidulum*). Bittersweet is a native woody vine in the same family as winter creeper. The fruits resemble those of winter creeper but are larger, up to 1.0 cm (1/2 inch). Bittersweet leaves are deciduous, alternately arranged along the woody stem, and to 10.0 cm (4 inches) long and 4.0 cm (1 1/2 inches) wide. Crossvine also has a woody stem and opposite leaves. Its leaflets are deciduous, oblong-shaped, occur in pairs at the end of a y-shaped stalk and often have accessory leaves in the axils that resemble stipules. Crossvine flowers are tube-shaped, deep orange to reddish outside and paler orange inside. The fruits are 1.5 – 2.0 cm (6 – 8 inches) long. The winged seeds are 4.0 cm (1 1/2 inches) long. Blueberry has alternate leaves. In rusty black haw, the branchlets, petioles and lower leaf surfaces are covered with dense, reddish-brown, wooly hairs. If identification of the species is in doubt, the plant's identity should be confirmed by a knowledgeable person or by consulting appropriate plant identification manuals or keys.



DISTRIBUTION

Winter creeper is native to China, Korea, and Japan. It was introduced into the U.S. in 1907 as an ornamental groundcover and is now naturalized throughout the eastern U.S. Winter creeper probably occurs as scattered populations in most Illinois counties, but seems to be less common as a spontaneous plant in the northern half of the state.

HABITAT

Although winter creeper tolerates a variety of environmental conditions including full sun to deep shade, poor soils, and a wide pH range, it is primarily a problem of forested habitats. Winter creeper will invade forest margins, natural and human induced forest openings, and recently burned areas. In floodplain forests winter creeper, seems to prefer well-drained sites and become established on the rise at the base of trees then climb up the tree. Areas near lawns, gardens or abandoned home sites with winter creeper are particularly vulnerable. Winter creeper does not grow well in heavy, wet soils and has rarely been reported as a problem species in prairies.

LIFE HISTORY

Winter creeper's shade tolerance, evergreen nature, and climbing ability give it a competitive advantage over most native species. Its seeds can be dispersed by birds, other animals or water. It can spread vegetatively by lateral shoots that arise from the main stem and rootlets that develop at short intervals along the stem. Aerial roots are known to grow down through crevices or hollow trees and eventually root in soil. New plants can also develop from stem fragments that have developed adventitious roots. Once established, winter creeper forms dense colonies of trailing and climbing vines that root at the node.

EFFECTS UPON NATURAL AREAS

Winter creeper outcompetes native vegetation by depleting soil moisture and nutrients, blocking sunlight and by forming dense mats that impede seedling growth of native species. Winter creeper can overtop trees, shrubs and groundlayer species causing their death.

CONTROL RECOMMENDATIONS

RECOMMENDED PRACTICES IN HIGH QUALITY NATURAL COMMUNITIES

MECHANICAL CONTROL

Small populations of winter creeper may be removed by hand pulling or grubbing. The entire plant, including all of the roots, stems and runners must be removed as any portion of the root system that is not removed may resprout. Juvenile plants can be pulled when the soil is moist and root systems are small. All portions of the plant including stem fragments, roots, and seeds should be removed from the site in trash bags or burned to prevent re-establishment.

CHEMICAL CONTROL

Cut stem treatment with systemic herbicides applied to freshly cut stems is effective in areas where vines are well established on or around non-target species, or where they have grown

into tree canopies or onto other vertical surfaces. Stems should be cut as close to the ground as possible and immediately treated with herbicide. A 2 % solution triclopyr (tradename Garlon 3A, Tahoe 3A) and water is effective and can be used at temperatures as low as 40^o F. Follow-up treatment will likely be necessary. Triclopyr is selective for broadleaf species and may be a better option if native grasses are present. Care should be taken to avoid contacting non-target species.

For larger populations, foliar applications of herbicide may be more appropriate. A single application of a 1.5 % solution of Roundup Pro (4.75 ounces of a 40% concentrate per gallon of solution) applied as a foliar spray in early September resulted in a kill rate of 25 - 30 % after six months and a 50 % kill rate after 12 months (Solodar 2005). A single application of a 2 % solution of Roundup Pro (6.3 ounces of a 40% concentrate per gallon of solution) resulted in a 40 % kill rate after six months and an 80 % kill rate after 12 months. Roundup Pro was most effective when applied to plants that were actively growing and at least one month prior to the first killing frost. Leaf surfaces were thoroughly wetted, but not to the point of runoff. **Do not spray so heavily that herbicide drips off the target species.** The herbicide should be applied while backing away from the area to avoid walking through wet herbicide. Roundup Pro is a non-selective systemic herbicide that may kill even partially sprayed non-target plants. Care should be taken to avoid spraying non-target species. By law, herbicides may only be applied as per label instructions and by licensed herbicide applicators or operators when working on public properties. Regardless of the control method that is chosen, monitoring and followup treatments will likely be necessary as the entire clone must be killed to prevent spread.

Prescribed burning

Prescribed burning may topkill plants in areas where stem density is low enough to allow fire to burn through a colony. Burning will reduce above ground biomass and reduce the amount of herbicide needed for control the following growing season. The evergreen nature of winter creeper will likely prevent fire from burning through large, dense colonies. Resprouting of topkilled plants will occur. Disturbances associated with prescribed burning may provide suitable habitat for new colonies of winter creeper if existing colonies are near and are not being managed. The effect of fire on winter creeper seed germination is not known.

RECOMMENDED PRACTICES ON BUFFER AND SEVERELY DISTURBED SITES

Same as for high quality areas. Additionally, a single application of a 6 % solution of Roundup Pro (18.9 ounces of a 40 % concentrate per gallon of solution) or the application of a 2 % solution followed by a second application one month later resulted 90 % kill rate after six months and 90 - 95 % after 12 months.

BIOLOGICAL CONTROL AGENTS

No biocontrol of winter creeper is known, but it is susceptible to a number of diseases and insect pests. Among the diseases, powdery mildew, caused by the fungus *Oidium euonymi-japonici*, is the most common and destructive. Powdery mildew appears as a flat, white to gray growth, primarily on the upper surface of the leaves and is easily rubbed off. Symptoms include yellowing and dropping of leaves.

Crown gall is caused by the soil-borne bacteria *Agrobacterium tumefaciens*. Galls appear at the base of the plant and on stems and roots. The large corky galls can be several inches in diameter and disrupt flow of water and nutrients to the top of the plant. Plants with numerous galls are weak and experience slow growth, yellowing of leaves, and dieback of branches.

Cercospora leaf spot is caused by the fungi *Cercospora destructiva* and *C. euonymi*. This disease causes irregularly-shaped spots on leaves that can vary in size from pinpoints to 1 cm (1/2 inch) in diameter. The spots may merge to cover the entire leaf surface. Spores are produced from black fruiting bodies that develop on grayish tan portions on the leaf spot.

Anthrachnose is caused by the fungus *Colletotrichum* spp. Symptoms consist of a small brownish spots with light-colored centers on the leaves and twigs. Fruiting structures appear in tiny cracks in the leaf spots. Anthracnose is most severe in cool, wet springs and can result in considerable defoliation.

Several species of scale insects are pests on *Euonymus*. Among the most common is *Unaspis euonymi*. Scale insects are small, immobile with no visible legs, and feed by piercing the stem or leaf with their mouthparts and sucking out the sap. Initial symptoms of scale insect infestation are yellow spots on leaves. Heavy infestations can cause death the branches and possibly the entire plant.

FAILED OR INEFFECTIVE PRACTICES

A single cutting, pulling, or grubbing will probably not eliminate winter creeper. Repeated treatment during the same growing season and follow-up treatments the next few years will be necessary. A single cutting or mowing can encourage rootsprouting and could result in increased stem density.

To minimize re-invasion, the entire clone, including those portions adjoining properties with the property owners consent, should be treated simultaneously.

Treating or cutting only the visible portions of winter creeper plants that have extensive aerial roots may not provide adequate control.

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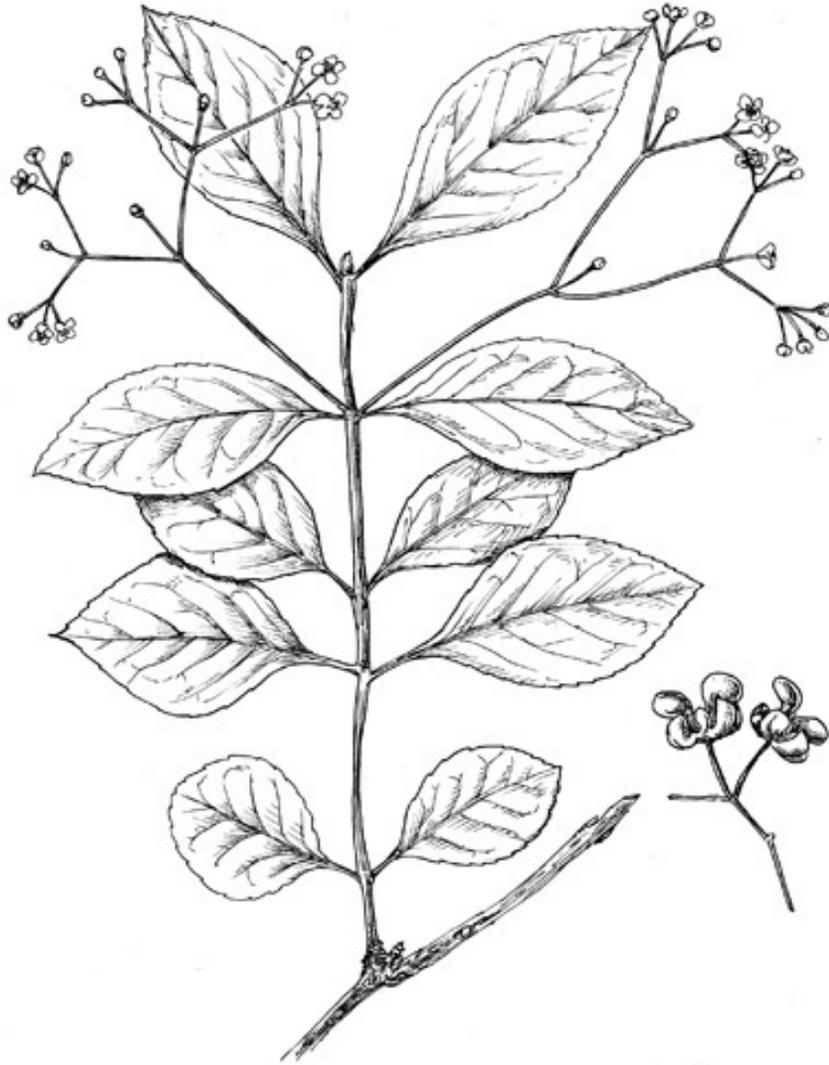
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