



VEGETATION MANAGEMENT GUIDELINE

Black Locust (*Robinia pseudoacacia* L.)

SPECIES CHARACTER

DESCRIPTION

Black locust is a fast growing tree that attains heights of over 25 m. Mature trees have deeply furrowed bark with flat topped-ridges. Black locust has ladder-like (pinnately compound) leaves with 7-21 leaflets with a leaflet at the end of the leaf. The leaflets are oval and 2-4 cm long. A pair of short, sharp spines occur where the leaf is attached to the strong, zigzag stem. The alternate branches lack a terminal bud. The fragrant, drooping, white, pea-like flowers occur in clusters that appear in May and June and develop into smooth fruit pods (legumes) up to 10 cm long, 1 cm wide and contain 4-8 seeds. Seedlings and sprouts exhibit rapid growth and heavy thorns that occur in pairs. The seeds are toxic and children have been reportedly poisoned from chewing the licorice-like roots and inner bark.

SIMILAR SPECIES

This member of the legume family (Fabaceae) is identified by its pinnately compound leaves with up to 21 oval, smooth-edged leaflets, together with the pairs of spines where the leaf is attached to the stem. Two other species, bristly locust (*Robinia hispida*) and clammy locust (*Robinia viscosa*) are distinguished from black locust by the flower color and the branchlets. Bristly locust is a rhizomatous shrub up to 3 m tall, with rose-purple flowers and bristly branchlets. Clammy locust is a large shrub or small tree with pink flowers and sticky glandular branchlets. Both species are native to the southern Appalachian Mountains and have escaped cultivation and become naturalized in Illinois. Honey locust (*Gleditsia triacanthos*) has bipinnately compound leaves, 3-parted spines, and fruits up to 45 cm long and 2.5 cm wide. Prickly ash (*Zanthoxylum americanum*) is a tall shrub or small tree up to 8 m tall with prickly stems, leaves with 5-11 leaflets, yellow-green flowers and fruits with 1-2 seeds. Black locust should be accurately identified before attempting any control measures. If identification of the species is in doubt, the plant's identity should be confirmed by a knowledgeable individual or by consulting plant identification manuals or keys.

DISTRIBUTION

The natural distribution of black locust originally centered on the lower slopes of the Appalachian Mountains in the southeastern United States with outliers north along the slopes and forest margins Indiana, and Missouri. In Illinois, its native range is confined the extreme southeastern part of the state along the Ohio river. Planted extensively for its rapid growth, nitrogen-fixing capability, hardwood qualities, and ability to grow in poor soil conditions (such as strip mine reclamation), black locust has been reported to be the most widely planted North American tree. It has been planted



extensively for its nitrogen fixing abilities, as a source of nectar for honeybees, and for fence posts and hardwood lumber. Due to the successful reproduction by root suckering, black locust (including many cultivated forms) has become naturalized throughout much of the New and Old Worlds. In North American *Robinia pseudoacacia* has expanded its range north to Nova Scotia, Quebec and Ontario. In Illinois, it has been reported from nearly every county.

HABITAT

Black locust prefers well-drained soils and full sun. It occurs in a variety of disturbed habitats including pastures, degraded woods, thickets, old fields, roadsides and other rights-of-way. It has become naturalized in disturbed upland forests, prairies, and savannas throughout the United States and southern Canada.

LIFE HISTORY

Black locust grows best in humid climates, although it has been introduced in many parts of the world where the climate is much drier. Black locust is a prolific seed-producer but seedlings are not common as few seeds germinate during their first year after ripening because of the impermeable seed coat. Most natural reproduction is vegetative by means of root suckering and stump sprouting. Root suckers arise spontaneously from the extensive root system of trees as young as 4-5 years old. Productivity of root suckers increases in full sun, open areas and sandy loamy soils. They are interconnected by fibrous roots forming groves of trees with the oldest plants in the center and the youngest on the periphery.

EFFECTS UPON NATURAL AREAS

Black locust reduces competition from other sun-loving species and is a potential threat to all upland natural areas, especially hill prairies, sand prairies and sand savannas.

CONTROL RECOMMENDATIONS

RECOMMENDED PRACTICES IN HIGH QUALITY NATURAL COMMUNITIES

Mechanical control

Black locust is difficult to control due to its rapid growth and clonal spread. Mowing and burning can temporarily reduce above ground biomass, but will not inhibit the tree's ability to spread vegetatively. Growth of suckering sprouts from the parent tree may be kept in check by mowing and burning (Wieseler 1998). Cutting alone is effective only if repeated several times per year for many years. As a result, management has concentrated on chemical control with variable success. Whatever control measure is adopted, a follow-up treatment is usually necessary. Black locust clones which appear to be killed can resprout several years later with most treatments.

Chemical control

In general, foliar spray application of herbicides should not be used in high-quality areas

because of potential damage to non-target plants. Herbicide application to cut stumps or cut surfaces is preferred in high-quality natural areas because this minimizes damage to non-target plants.

Garlon 3A (a formulation of triclopyr) is a selective, translocated herbicide that can be applied as a foliar or cut-surface treatment. Cut-surface treatment provides high level control of tree root systems, especially for suckering species such as black locust. Cut-surface application can be done during any season of the year, but application during the dormant season reduces the potential for injury to non-target species. Undiluted or diluted Garlon 3A at a rate of 50% water can either be sprayed on the cut surface or wiped on with a sponge applicator such as a sponge-type paint applicator. Either a stump or girdle can be used for the cut surface. Girdles around the stem can be made quickly using a chainsaw. Application should be within a few hours of cutting, adhering closely to label precautions and directions.

Foliar application of clopyralid (Transline) with surfactant is effective when applied during full leafout. For large populations or in areas dominated by black locust, high pressure spray systems may be the most efficient application technique. For those applications, Transline should be mixed at the rate of 21 ounces per 100 gallons of water with surfactant. Low pressure backpack sprayers can be used for smaller populations or spot treatment. For these applications, Transline should be mixed at the rate of 0.5 ounces per gallon of water with surfactant. Legumes, composites, nightshades, and many smartweeds are highly susceptible to Transline. Transline is not recommended for use in areas that have sandy soil. **Do not spray so heavily that herbicide drips off the target species.**

Any herbicide should be applied while backing away from the treated area to avoid walking through the wet herbicide. By law, herbicides only may be applied according to label directions and by licensed herbicide applicators or operators when working on public properties.

Basal bark treatment with Garlon 4 can be effective, although resprouting may occur following this treatment. For basal bark applications, mix two and one half gallons of Garlon 4 with 12.5 gallons of vegetable or mineral basal oil. The addition of up to 2 quarts of Stalker to the Garlon 4/penetrating agent solution can aid in uptake through the bark or exposed roots. Spray this mixture on the base of the black locust trunk using a hand sprayer. Spray to a height of 30-38 cm (12-15 inches). A thorough spraying that includes spraying until run-off at the ground line is noticed is necessary to hinder resprouting. **Petroleum carriers such as diesel fuel or kerosene should not be used in place of mineral or vegetable-based oil additives because they may harm non-target plant and animal species.**

Use of triclopyr (Garlon) is best done in the dormant season to lessen damage to non-target species. Great care should be exercised to avoid getting any of the herbicide mixture on the ground near the target plant since some non-target species may be harmed. Avoid using triclopyr if rain is forecast for the following 1-4 days; otherwise runoff will harm non-target species. Garlon 4 should not be applied to stems near water or when snow cover is present. Splash, drift or overspray collected on snow may run into adjacent aquatic areas at snow melt.

Injection using the EZ-Ject lance with Roundup capsules is an effective control. For plants with numerous stems, each stem greater than 2 cm (3/4 inch) may need to be treated to ensure the plant is killed. Stems larger than 5 cm (2 inches) in diameter should be injected with an additional capsule for each 2.5 cm (1 inch) increase in stem diameter. For plants with

multiple stems less than 1.5 cm (1/2 inch), a capsule may be injected into the upper portion of the root crown.

Monitoring after herbicide treatment is essential as death of active stems and root systems usually stimulates growth and resprouting from underground portions. Also, seeds can persist in the seedbank for many years.

RECOMMENDED PRACTICES ON BUFFER AND SEVERELY DISTURBED SITES

Control methods recommended for high quality natural communities are also applicable to buffer and severely disturbed sites.

_____ A 1% solution of Krenite (a formulation of fosamine ammonium), a non-volatile, contact, brush herbicide, can be applied as a foliar spray to leaves during the 2-month period before fall coloration. Krenite should be applied only in July-September. In northern Illinois, Krenite should be applied before September 15 and is most effective when applied in August. Thorough coverage with soft water carrier is required and a nonionic surfactant will improve results. Krenite inhibits bud expansion in the spring and control effects are not seen until the following spring. Slight regrowth may occur the following season but saplings will die during the summer. Follow label recommendations to obtain best results; minimize drift. Care should be taken to avoid contacting non-target species. **Do not spray so heavily that herbicide drips off the target species.** As mentioned earlier, follow-up treatments are usually necessary because of black locust's prolific sprouting and rapid growth.

Bulldozing of black locust in Wisconsin, in which trees were dozed into piles and burned, resulted in the removal of most stumps. A 95% control was achieved with the treatment of the remaining stumps with glyphosate (Liegel et al. 1983).

BIOLOGICAL CONTROL

Time and competition may shade out some colonies, especially on rich soils where disturbed forests are regenerating. Shading from taller woody vegetation may suppress resprouting and seedling recruitment. The locust borer (*Megacyllene robiniae*), locust leaf miner (*Chalepus dorsalis*) and locust wig borer (*Ecdytolopha insticiana*) can damage black locust. Black locust is susceptible heart rot (*Fomes rimosus*) following borer attack.

FAILED OR INEFFECTIVE PRACTICES

Glyphosate (trade name Roundup) has been used extensively as a foliar spray (1/2 to 1 1/2 % solution) and for cut stump applications (6.25 - 20% concentration). In order for a foliar application of Roundup to be effective all of the leaves on all shoots must be treated. This method of application increases the chance of drift to non-target species and has been largely ineffective in preventing resprouts. Glyphosate is a non-selective contact herbicide, so care should be taken not to let it come in contact with non-target species. The application of Roundup to cut stumps and frills does kill the tree but has proven ineffective in controlling resprouts from

the extensive root systems of black locust colonies (Liegel et al. 1986).

In California, a 2% solution of Ortho Brush-B-Gon (triclopyr) was mixed with 7.5% Dexol Vitamin B-1 fertilizer and 0.5% dish soap was applied to black locust foliage and bark during August using a backpack sprayer. This method was effective only in controlling small saplings less than 3-4 m in height and was not effective in killing the large mature trees and clonal root system (Weitzenberg et al. 1997).

Tordon RTU (picloram) is a premixed general use herbicide labeled for cut-surface application only. This herbicide kills treated black locust stems, but vigorous sprouts develop from the roots. Tordon RTU has high soil mobility and persistence and is no longer labeled for use on sandy soils.

Girdling kills the black locust stem that is girdled, but it does not prevent the formation of sucker sprouts. Trees girdled in July and treated with a 4.8% 2,4-D solution caused die-back within two weeks; however, vigorous resprouts appeared the following year (Liegel et al. 1983). Mowing areas around mature trees where seed pods have dropped may scarify seeds and promote seed germination.

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