



VEGETATION MANAGEMENT GUIDELINE

Gray Dogwood (*Cornus racemosa* Lam.)

SPECIES CHARACTER

DESCRIPTION

Gray dogwood is a medium to large ascending shrub often 6 to 12 ft (1.8 to 3.6 meters) in height. The leaves are simple with entire margins, opposite, ovate lanceolate to narrow elliptic, approximately 2 to 4 inches long and 0.8 to 1.6 inches wide (5-10 cm. long and 2-4 cm. wide). Twigs are slender, smooth, and gray to red-brown. Small, creamy white, ill-scented flowers are borne in late May through early to mid-June on loose, upright, cone-shaped clusters. The fruit of gray dogwood are glossy, milky white berries about 1/4" inch (0.6 cm.) in diameter on bright red pedicels.

SIMILAR SPECIES

Rough-leaved Dogwood (*Cornus drummondii* Mey.) and Pale Dogwood (*Cornus obliqua* Raf.) closely resemble gray dogwood (simple, opposite) depending on time of year. Rough-leaved dogwood is a large shrub with elliptic to narrowly ovate leaves up to 4 in. (10 cm.) long and 2 in. (5 cm.) wide. Like gray dogwood, white flowers form upright clusters, and its fruits consist of white berries borne on red pedicels. A diagnostic feature of rough-leaved dogwood, however, is a rough-hairy upper leaf surface. It is the only dogwood in the State with this leaf characteristic. Pale dogwood has leaves with a smooth upper surface, that are usually 1 1/4 to 3 1/2 in. (0.6 to 8.8 cm.) long, and less than half as wide. Unlike gray dogwood, this shrub bears blue fruit and has puberulent twigs.

In addition to the above species, Nannyberry (*Viburnum lentago* L.) and Black Haw (*Viburnum prunifolium* L.) also have simple, opposite leaves, but the margins are serrate on Viburnums and entire on dogwoods. Gray dogwood 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 and/or by consulting appropriate books.

DISTRIBUTION

Gray dogwood is native to the U.S. and is found from central Maine to southern Ontario and Minnesota, south to Missouri and east to Virginia.

HABITAT

Gray dogwood inhabits a wide variety of habitats ranging from prairies to forests. Originally gray dogwood was a scattered colonizer in prairies, savannas and woodlands. This opportunistic species tends to increase with the degree of openness and disturbance. Gray dogwood occurs in dry to moist open areas, in moist soil and thickets of riparian zones, along roadsides, on sandy slopes, and on limestone ridges. It is prevalent along fence rows as well as in



moist woods, however, it is scarce in undisturbed mesic woods.

LIFE HISTORY

Seeds are usually produced after plants are 3 - 4 years old; each drupe contains only 1 viable seed. Dispersal of seeds is aided by avifauna from fall through winter. Smith (1975) found that most gray dogwood seeds were deposited within 82 ft. (24.8 m.) of the seed source. Germination requires 2 periods of stratification, also known as "double dormancy". The most successful form of reproduction for this species is the formation of vegetative clones following seedling establishment.

EFFECTS UPON NATURAL AREAS

Gray dogwood is an aggressive and opportunistic native shrub which invades open areas both by seed and vegetative means. It often forms dense clusters with canopies capable of producing 100% shade cover. Rapid extensive cloning by rhizomatous growth and a high tolerance to adverse conditions (i.e. drought and shade) enables this shrub to create dense thickets and crowd out other native grasses, sedges, and forbs, thereby altering wildlife habitat and whole community structures.

CONTROL RECOMMENDATIONS

It should be noted that the intent of this management guideline is not to prescribe methods for completely eliminating gray dogwood from ecosystems where it naturally occurs, but rather to recommend measures for controlling the rapid spread of dogwood in communities to preserve rare species or restore species diversity. Reduction in cover is important because dormant but viable seeds and rootstocks of desired vegetation respond to shade release even in the early years of restoration management (McGrath 1988).

RECOMMENDED PRACTICES IN NATURAL COMMUNITIES OF HIGH QUALITY

Burning

The ultimate management goal for gray dogwood and many problem species is to reduce abundance to a point that it can be controlled by prescribed fire. When adequate levels of fuel are available, prescribed burning has been one of the most successful tools for controlling dogwood species in natural areas and nature preserves. Spring and fall burning during periods of dormancy are effective in reducing shade cover. Unfortunately, many sites do not have fuel levels great enough to carry a hot fire throughout the site, therefore, shade reduction can be a slow process. Prescribed burning can surface kill gray dogwood < 3ft. (0.9 m.) tall. Before commencing any prescribed burns, open burning permits must be obtained from the Illinois Environmental Protection Agency and often the appropriate local agencies too. Burns should be administered by persons trained or experienced in conducting prescribed burns, and proper safety precautions should be followed.

Cutting and Herbiciding

Cut-surface Applications:

Cut-surface/cut-stump treatments are commonly used for gray dogwood control at many high quality sites. Cut gray dogwood ≥ 3 ft. (0.9 m.) in height with loppers or clearing saws during the dormant season and treat the stumps with herbicide. Effective herbicides are: a 16-30% solution of Garlon 4 mixed with plant-based or mineral oil carrier and applied during the dormant season; an 18-33% solution of Garlon 3A in water applied during the growing season. A 20 -50% solution of Roundup during any season above freezing using a low pressure sprayer also has proven effective with minimal resprouts occurring. With Roundup application, it is usually necessary to treat an area at least 2-3 times. Herbicide (Garlon 4, Garlon 3A, Tahoe 3A or Roundup) is applied by painting or spraying it onto the cut stump immediately after cutting. Apply herbicide using sponge applicators or low pressure sprayers. Low pressure sprayers are a very efficient method with little or no over application if stem diameter is ≥ 1 in. (2.5 cm.). When using Garlon 3A or Garlon 4, cut the stems about 2-3 in. (5-7.5 cm.) off ground and apply Garlon to the top 1-2 in. (2.5-5 cm.) of the stump to maximize bark contact and minimize chances for resprouting.

In Indiana, cut-surfaces have been treated during summer only with 100% Garlon 3A and as low as a 25% solution of Roundup using foam or brush applicators. Only limited resprouting was observed after treatment. Limited resprouting usually occurs when applying a 50% Roundup solution to cut stumps late in dormancy (above freezing conditions) or during the growing season, and retreatment is necessary.

In all cases, it is important to treat cut-surfaces with herbicide as soon after cutting as possible to limit chances of resprouts. Care should be taken when herbiciding to avoid contacting nontarget vegetation. **Do not spray or paint so heavily that herbicide drips off the target species.** By law, herbicides may only be applied according to label directions and by licensed herbicide applicators or operators when working on properties not owned by the applicator. Herbicides should be applied as backing out of an infested area to prevent contamination of the worker and spreading of the herbicide on boots and other protective clothing.

Basal Bark Applications:

Another popular and effective method for treating gray dogwood is basal bark application of herbicide. Herbiciding areas of dispersed gray dogwood is easiest after winter snows and storms have flattened the stems of grasses and forbs leaving the dogwood stems exposed. Resprouts can be hand swiped using roller tongs (modified wick applicators) with a 1:1 Garlon 4 and mineral oil solution during late winter through early spring (April 1st). This technique effectively killed treated stems. Mel Hoff constructed an 8 ft. two-person, hand-held "Super Swiper" to treat large areas with greater efficiency. Roughly 2 pints of 1:1 Garlon 4 and mineral oil were used in treating a 12,500 sq ft/hr area at West Chicago Prairie during Feb-Mar 1995. Application appeared to remain on contacted stems with little or no impact on nontarget vegetation. About 90% of all treated stems were effectively killed. Treated areas should be monitored for resprouts. Where gray dogwood is at least 3 ft. (0.9 m.) tall, it can be mowed during frozen conditions and allowed to resprout to 2-3 ft. (0.6-0.9 m.). Herbicide is then applied

to basal bark using a sponge bar (swiper) attached to an enclosed ATV or Mule during the dormant season with a 50% solution of Garlon 4 and basal oil. This is a multi-year process which yields very good results if enough of the stem is exposed so that $\geq 3/4$ of the stem is treated. This technique has killed 90% of treated dogwood stems.

Basal bark application can be done during the dormant season (winter) using a 16-18% solution of Garlon 4 and Penevator oil or 13.5% mixture of Pathfinder (Garlon 4 pre-mixed with carrier). Herbicide is applied using a wick applicator on basal bark. While Garlon 4 is labelled for use with diesel fuel or kerosene as the carrier, the Illinois Nature Preserves Commission does not allow the use of diesel fuel or kerosene because the fuel easily damages non-target plants. Care should be taken when herbiciding to avoid contacting nontarget vegetation. **Do not spray or paint so heavily that herbicide drips off the target species.** Do not use Garlon 4 when snow, ice or water is present on the ground surface. By law, herbicides may only be applied according to label directions and by licensed herbicide applicators or operators when working on properties not owned by the applicator.

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.

Foliar Applications:

Foliar application of a 2% solution of Krenite in water yields good results if extreme caution is used to avoid impacting adjacent vegetation. However, hard water can reduce the effectiveness of Krenite. **Foliar treatments are not recommended for high quality sites.** Generally, foliar applications should only be used in less sensitive areas because the potential for contacting nontarget species is greatly increased through unavoidable drift. Care should be taken when herbiciding to avoid contacting nontarget vegetation. **Do not spray or paint so heavily that herbicide drips off the target species.** By law, herbicides may only be applied according to label directions and by licensed herbicide applicators or operators when working on properties not owned by the applicator. Herbicides should be applied as backing out of an infested area to prevent contamination of the worker and spreading of the herbicide on boots and other protective clothing.

Cutting, Herbiciding, and Burning

When trying to control gray dogwood populations, a combination of cutting, herbiciding, and burning (when adequate fuel loads exist) is the tactic used most often by many Illinois land managers. This combination of techniques offers a management solution for even the most degraded sites. Gray dogwood may be reduced to levels that can be controlled by biennial spring burning alone after several years of cutting, herbiciding, seeding, and burning. Based on four years of fen management in Indiana, McGrath (1998) concluded that a combination of burning, cutting and herbiciding was the preferred method of woody control (primarily dogwood) in fens. Throughout that period, dogwood was cut and treated with herbicide during summer months by

cutting 5-10 ft. (1.5-3 m.) into large stands and applying herbicide to all cut surfaces. This process was repeated the following year beginning at the "new" edge of the stand. Burns were conducted in alternating years in the spring when above ground fluid transport in stems occurs and optimum burning conditions exist. No area was burned during consecutive years. This technique proved best in controlling dogwood populations.

In a five year study period at Bluff Springs Fen, Bowles et al. (1993) found that cutting and burning without subsequent herbicide treatment reduced the amount of cover of gray dogwood, but not its frequency of occurrence. Furthermore, the study indicated that cutting without herbiciding may stimulate stem production and spread of dogwood, especially in areas that are not burned regularly. It has been suggested that first year stems may have photosynthetic capabilities (McClain, pers. communication). Of course, photosynthesis would not be nearly as efficient in bark as in leaves, but if the plant is feeding itself even before leaf-out, the use of herbicides becomes even more important. Increased rates of herbicide application may likely help reduce the occurrence of this species.

Spring blooming prairie forbs and spring ephemerals may persist under stands of gray dogwood. Area to be treated must be checked before early application to avoid adverse impacts to these herbaceous species.

RECOMMENDED PRACTICES ON BUFFER AND DISTURBED SITES

Cutting and Herbiciding

Cut-surface Applications:

Use of cut-surface treatments in low quality areas was not widely reported probably due to time and labor involved. However, a cut-surface treatment of dogwood using an 18% solution of Garlon 3A and water during the growing season (summer) is reportedly successful. Stumps are cut and herbicide is applied to both the stump and root crown. For best results, it is very important to treat the cut-surface as soon as possible (preferably immediately) after cutting. Application of a 25% solution of Garlon 4 in diesel fuel during dormancy has been highly effective in controlling dogwood, however, the use of diesel fuel to achieve maximum success is not recommended. In addition, do not use Garlon 4 if snow, ice or water is present on the surface of the ground. By law, herbicides may only be applied according to label directions and by licensed herbicide applicators or operators when working on properties not owned by the applicator. Herbicides should be applied as backing out of an infested area to prevent contamination of the worker and spreading of the herbicide on boots and other protective clothing.

Foliar Applications:

Foliar application of herbicides is a favored method of woody control on degraded or semi-degraded sites because it is less labor intensive and exceptionally faster than basal bark and cut-stump treatments. In resprout areas that have previously been cut without herbiciding, application of an 18-25% solution of Garlon 3A in water using a low pressure backpack sprayer has proven effective. Three foliar applications about 2 weeks apart beginning at leaf-up in the spring on resprouts that were previously mowed without herbiciding has proven successful.

Care should be taken when herbiciding to avoid contacting nontarget vegetation. **Do not spray or paint so heavily that herbicide drips off the target species.** By law, herbicides may only be applied according to label directions and by licensed herbicide applicators or operators when working on properties not owned by the applicator. Herbicides should be applied as backing out of an infested area to prevent contamination of the worker and spreading of the herbicide on boots and other protective clothing.

FAILED OR INEFFECTIVE PRACTICES

Due to the extreme toxicity of diesel fuel, treating dogwood with a mixture of herbicide and diesel oil or kerosene is not allowed in nature preserves and is not recommended for use on any sites. Despite tempting results, use of kerosene compromises the effectiveness of the herbicide and threatens all adjacent vegetation because of its nonselective nature. For this reason, mineral and plant-based oils should be used when an oil carrier is needed for herbicide.

Brushhogging alone is not a preferred method of regular control because it increases stem density, and the shredding action makes it difficult to get good contact with herbicides and disrupts herbicide translocation within the stem.

The long-term effectiveness of mowing alone to control populations of gray dogwood is unknown. Mowing reduces the amount of cover and immediately opens an area up to sunlight, thus promoting growth of grasses and forbs. However, this decrease in shade is accompanied by an increase in stem density. The big question is, "How long must mowing continue to negatively impact dogwood abundance?" When mowing was discontinued on an area which had been mowed for 3 years at Wolf Road Prairie, gray dogwoods grew to heights of 4-7 ft. (10-17.5 cm.) in just 2 growing seasons and were more abundant because of the added stems. It is important that mowing takes place during the dormant season and when the ground is frozen for moist areas to minimize impact on vegetation. Long-term studies and follow-up on mowed areas are needed to document the success or failure of this technique in reducing populations of gray dogwood.

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