

Managing Woody Weeds in Fields Enrolled in the Conservation Reserve Program

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Woody weeds are vines, shrubs, or trees that live longer than two years and have secondary growth which leads to thick, woody stems covered in bark. Although they typically reproduce from seed, some woody weeds have creeping root/rhizome systems and/or resprout from the crown.

Biology

Woody weed seeds germinate under a wide range of timings, but most species germinate in the spring. While seedling shoot development appears slow, roots are rapidly establishing deep into the soil. This can make detection and removal of young plants by hand difficult, as they are small and have developed an extensive root system (Doll, 2006). Depending on the species, flowering occurs from spring through summer, but may not occur at all for several years while plants establish. Plants may lose their leaves and go dormant in winter, but woody stems and roots persist and growth resumes the following spring.

Method of spread

Woody weeds spread through a variety of methods depending on the species. Most species reproduce by seed, but some may also spread vegetatively. Woody weeds can be separated into three categories according to how they spread vegetatively: those unable to resprout once cut, those able to resprout from the base (crown), and those able to resprout from roots/rhizomes (creeping). Species that reproduce vegetatively must be managed carefully, as inappropriate methods can lead to further spread. Such species warrant development of long-term management plans that focus on preventing seed spread, controlling plants while they are seedlings, and managing the resprouts of older plants.

Conservation Reserve Program (CRP) Management Restrictions

The ideal time to manage weeds is prior to establishment of the desired cover. Once conservation

Listed WOODY WEEDS on CRP grasslands BY NRCS WISCONSIN JOB SHEET 397

Cat 1: No tolerance, must attempt to eliminate:

- Multiflora rose

cover is established, weed management becomes more difficult because of management restrictions designed to minimize impact to nesting birds. When developing weed management plans in CRP fields, there are specific restrictions one must be aware of, including the following:

- During the seeding year, mowing can be conducted to suppress weed competition and allow for the establishment of desirable cover. All other maintenance and management must occur outside of the primary nesting season, unless approved by the local Farm Service Agency (FSA) County Committee. These dates have varied over time and are specified in the CRP contract. The current primary nesting season for new CRP contracts is May 15 to August 1.
- CRP participants are required to control invasive and weedy plant species before they produce viable seed. Unfortunately, the optimum timing for this typically conflicts with the primary nesting season. Participants can either contact their local FSA to ask for approval to manage during the primary nesting season, or conduct management before or after the nesting season..
- Management techniques that disrupt CRP cover on a recurring schedule (e.g. broadcast herbicide applications) require prior approval from the local FSA County Committee.
- If mowed plant material is removed from the site, as with haying or grazing, a reduction in the annual CRP payment will occur. Haying and

grazing are only allowed once every three years and also require prior approval from FSA.

Management Methods

Prevention

Preventing the introduction and establishment of any weed is the most cost-effective management strategy. This can be achieved by maintaining a healthy stand of desirable vegetation which can resist weed invasion, and by monitoring sites to detect and remove new weed invaders. Pay particular attention to roadsides, storage areas, dump sites, and other areas subjected to repeated disturbances, as invasions typically begin here. If equipment is to be used within the field, remove all dirt and debris which may contain seeds or other vegetative tissue that could lead to new invasions.

Physical/Mechanical

Physical and mechanical methods are effective for some species, but accurate plant identification is critical to determine if the species in question will resprout vigorously when cut, and/or has a creeping root/rhizome. Non-resprouting species can be successfully managed by cutting them at the soil surface. Trees/shrubs that only resprout from the root crown can be effectively removed by excavating the root crown from the soil (typically 6-8 inches deep¹). Woody plants with creeping roots are very difficult to remove with physical methods because rarely can all of their roots be removed from the soil. Often, these techniques lead to an increase of shoots because they cause resprouting along the entire fragment of creeping root that remains in the soil. If mechanical/physical methods are used for these species, repeated removal for many years will be required to eradicate populations.

While mechanical methods of control, such as cutting, can be conducted any time of the year, the least amount of resprouting occurs when plants are cut after leaves have expanded. If possible, trees should be cut as low to the ground as possible to reduce resprouting.

Mowing

Mowing woody weeds repeatedly over the growing season and over multiple years can kill woody weeds. For example, mowing multiflora rose close to the ground three to six times per year for two to

¹ Plants pulled or dug after flowers appear should be removed from the site and carefully disposed of to destroy viable seed contained in the flowers.

three years can kill shrubs (Loux et al., 2005). Mowing should be conducted before plants flower and produce seed. Plants typically resprout, but do not flower until the following year. This enables the use of multiple mowing treatments outside of the restricted period (see CRP Management Restrictions section). If listed weeds are present, FSA may grant permission to conduct mowing during restricted times.

Burning²

Woody plants can be problematic because they often encroach upon grassland habitats due to fire suppression. Reinstating a burn program may be useful in maintaining grassland or other desirable habitats and reduce woody species cover (Tu et al., 2001). The success of burning in controlling woody weeds, however, can vary greatly between sites. Success of burning is dependant on the weed species present, time of the year it is burned, and temperature of the fire at the site. Resprouting and creeping brush will regrow as a result of the fire and still require additional management. Burning is most successful for woody species when large thickets are present which prevent the use of other management methods. Although burning can kill very young plants (seedlings), it is similar to mowing in that older plants with established root systems often regrow. If the fire is hot enough, weed seeds can be killed near the soil surface, but those that survive are stimulated to germinate. Burning is effective at removing thatch and improving conditions for some species, but may also damage desirable vegetation if the fire is too hot and/or timed incorrectly. Like mowing, the timing of a burn may be governed by CRP restrictions designed to protect nesting birds and young wildlife. Control may be improved on woody weeds if followed by herbicide applications. In general, burning is a long-term management approach and is often combined with other control methods (DiTomaso and Johnson, 2006).

Flaming of individual plants or small patches of weeds using a propane torch is useful on woody weed seedlings. This method is recommended for

² Often, the NRCS, local resource managers, and fire authorities have the means to assist landowners in developing burn plans and safe burn implementation. Burning should be conducted using a burn plan based on Wisconsin's Conservation Practice Standard 338 (Prescribed Burning) and in compliance with all local, state, and federal authorities, including the local air quality control board.

small areas at the appropriate timing when risk of fire ignition and escape is low (Tu et al., 2001).

Biological Control

Natural or introduced insects or diseases can also be used to manage invasive weeds. If agents are released and established, they can help suppress weed populations for years. However, success of agents is typically specific to the weed, and results may not be visible for several years. If you are interested in using biological control agents, consult local agencies for more detailed information.

Grazing

The grazing of animals, such as cattle, sheep, and/or goats, can effectively suppress some weed species. Success of grazing as a management method may vary, depending on the species of weed and grazing animal, timing of implementation, density of weed species, and number of animals used. Sheep, goats, and highland cattle would be most effective in grazing species such as multiflora rose (Loux et al., 2005). Like mowing, grazing damages the aboveground vegetation but does not damage the underground root system; therefore, this method must be repeated multiple times to kill woody weeds. Fencing animals within infested areas can enhance suppression. Avoid overgrazing sites, as this can increase populations of some weed species. Some livestock avoid grazing many of these weeds as they have spines or are poisonous.

Herbicides

Several herbicides are effective at controlling woody species, but results are species- and timing-specific. Due to restrictions in management of CRP fields, applications are permitted only during periods outside of the primary nesting season without prior approval (see CRP Management Restrictions section). There are many herbicide application methods available for consideration. A summary of common application methods follows (Renz and Doll, 2007):

- **Foliar applications** are applied onto the leaves of the plant with a water carrier. Treatments can be made throughout the growing season, once leaves are fully expanded. Herbicides should not be applied if the plant is stressed from drought or heat. Care should be taken to prevent herbicide drift onto non-target plants.
- **Basal sprays** are applied to the bark at the base (bottom 12-18 inches) of the plant, usually with an oil carrier (e.g. bark oil or diesel). Applications can be made any time of year, as

long as the base of the plant is not covered with water or snow. This method works best on stems, canes, and trees less than six inches in diameter. This is a very selective technique and is useful when desirable species are nearby.

- **Cut-stump treatments** are applied onto the surface of freshly cut stems. Since the herbicide must penetrate bark and woody tissue, an oil carrier (e.g. bark oil or diesel) is used to mix with the herbicide (except with glyphosate, which uses water). For small-diameter stems, the entire surface must be treated. For larger stems, focus treatments towards the outer ring of the cut surface (cambium) and the collar (the outer bark leading down from the cut area). This method can also be used year-round, as long as the plant is not exuding sap.
- **Injection, hack and squirt, or frill applications** involve placing herbicide into a freshly made wound in the bark. Injections require special equipment that injects herbicide into the stem. With “hack and squirt” or frill applications, a cut is made with an axe or other sharp device on the side of the stem, at a downward angle through the bark (Tu et al., 2001). Herbicide is then applied to the wound with a sprayer, paint brush, squirt bottle, etc. This is repeated every two inches around the stem or overlapping around the entire stem (frill) (Everest and Patterson, 1997).
- **Soil applications** involve spraying or dropping herbicide around the base of the plant which will then, with rainfall or watering, be carried to the root system of the plant. Treatments should be avoided if the ground is frozen. Soil applications can affect other species whose roots reach the treated soil.

For specific information about the success of a particular application method and herbicide on common woody species found in Wisconsin, consult “Brush Management in Wisconsin,” available at the website:

http://ipcm.wisc.edu/Portals/0/Blog/Files/20/509/brush_manage07.pdf

It is important to read the herbicide label BEFORE making any application, as different herbicides have different requirements and restrictions.

See Table 1 for a description of herbicides and their effectiveness on listed woody weeds (multiflora rose).



Table 1. Effectiveness of herbicides for foliar application for managing listed woody weeds.

Active Ingredient	Example products	Multiflora rose
2,4-D	Many	P/F
2,4-D + Aminopyralid	Forefront	F/G
2,4-D + Dicamba	Weedmaster	F
2,4-D + Picloram *	Grazon P+D	G
2,4-D + Triclopyr	Crossbow	G
Aminopyralid	Milestone	F
Chlorsulfuron	Telar	F/G
Clopyralid	Stinger	P
Clopyralid + Triclopyr	Redeem	P
Dicamba	Banvel	F/G
Fluroxypyr + Triclopyr	Pastureguard	G/E
Fosamine	Krenite	F
Glyphosate	Roundup	G
Imazapic	Plateau	N
Imazapic + Glyphosate	Journey	P
Imazapyr	Habitat	G/E
Metsulfuron	Escort	G/E
Metsulfuron + 2,4-D + Dicamba	Cimarron max	G/E
Metsulfuron + Chlorsulfuron	Cimarron plus	F/G
Paraquat *	Gramoxone	P
Picloram *	Tordon	G
Triclopyr	Garlon	F/G

E = excellent (90-100%) control; G = good (80-100%) control; F = fair (60-80%) control; P = poor (<60%) control; N = no (0%) control; - = no information.

* = Herbicides with these active ingredients are restricted-use products in Wisconsin.

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