

Managing Annual Weeds in Fields Enrolled in the Conservation Reserve Program

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Annual weeds germinate, grow, reproduce, and die within one year, and often one season. These plants only reproduce by seed.

Biology

Annual plants typically germinate in the spring and/or fall. Once germinated, plants develop roots, leaves, and stems before producing flowers, then seeds. After seed production, plants die. Although the timing of germination, growth, and flowering can vary by species and year, the majority of species either germinate in the fall or spring. Fall germinating species are called *winter annuals*, as they typically grow throughout the winter and flower the following spring. Spring germinating species are called *summer annuals*, as they flower during the summer. While soil disturbance and/or lack of other competitive plants often results in the germination of many summer annual weeds, winter annual weeds germinate with or without soil disturbance.

Method of spread

Annual weeds only reproduce by seed. Therefore, management should focus on identifying plants and eliminating seed production and nearby sources of seed.

Conservation Reserve Program (CRP) Management Restrictions

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

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

Cat 2: Cannot go to seed, keep coverage < 10, no patch > 1 acre, individual species or in combination:

- Japanese hedge parsley

Cat 3: Species of concern, keep coverage < 30%, no patch > 1 acre, individual species or in combination:

- Giant ragweed

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 control 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

Mechanical or physical methods that uproot the plant or sever the shoots from the roots can be effective in controlling annual weeds¹. This must be done prior to seed set to prevent seed production, and is most effective if done while the plant is small (Radosevich et al., 1997).

After establishment of a CRP cover crop, most physical weed control methods, such as tillage or cultivation, are not feasible because they will cause extensive damage to desirable plants. In some cases, however, hand tools can be used on a small scale to control weed patches.

Mowing

Mowing annual weeds is effective in preventing seed production if it is done prior to flowering. As plants usually regrow and flower, repeated management of these plants is necessary to prevent seed production. CRP contracts in Wisconsin, however, typically do not allow mowing during the nesting season (see CRP Management Restrictions section), in order to protect ground nesting birds and young wildlife. Mowing after August 1 is usually too late to prevent the plant from going to seed; therefore, mowing alone is not necessarily a good annual weed control option on CRP land.

If listed weeds are present, FSA may grant permission to conduct mowing during restricted times. Mowing when flower buds are present, but not yet open, has the highest likelihood of preventing

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.

seed set and regrowth. Mowed material must be uniformly distributed over the site to avoid smothering of existing desirable vegetation.

Burning²

Burning can be useful in controlling annual weeds if there is a heavy fuel load and it is performed at the proper time. It has been shown to be more effective at controlling annual weeds if performed before seed production or while seed is immature and still attached to the plant. Once the seed falls to the ground, the fire is less likely to kill the seeds and can actually stimulate their germination. Burning is effective at removing thatch and improving conditions for some species, but it 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. In general, burning is a long-term management approach and is often combined with other methods to enhance control (DiTomaso and Johnson, 2006).

Flaming of individual plants or small patches of weeds using a propane torch is very effective on annual weed seedlings. This method is recommended for small areas at the appropriate time, 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.

² Often, the NRCS, local resource managers, and fire authorities have the means to assist landowners with 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.

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. Fencing animals within infested areas can enhance suppression. Like mowing, grazing may need to be done more than once to be effective. The ideal timing, although somewhat species-dependent, is just prior to flower and seed development. Avoid overgrazing sites, as this can increase populations of some weed species.

Herbicides

Several herbicides are effective at controlling these weed species, but results are species- and timing-specific. Caution should be exercised when using herbicides, as desirable plants (e.g. wildflowers, legumes) can also be injured. This can be avoided through the use of selective herbicides and/or selective application techniques. While a wide range of selective herbicides are available that will not harm specific plant groups (e.g. grasses, broadleaf plants), in CRP fields it is difficult to select an herbicide that will control the target weed species and not harm all desirable plants. **If broadcast treatments to a large area are being considered, consult the local FSA County Committee prior to any application, as legumes are highly susceptible to most herbicides.** Another approach is to use non-selective herbicides, such as glyphosate, with a selective application technique (e.g. spot applications using a backpack sprayer). One may also choose to combine both selective herbicides and selective application techniques for maximum protection of non-target species.

The timing of herbicide application is also very important, as it can affect the level of control.

Due to restrictions in management of CRP fields, applications are permitted only during periods outside of the primary nesting season (see CRP Management Restrictions section). Early spring applications can be made prior to weed seed germination to prevent summer annual weeds. Many of these herbicides cause little, if any, injury to existing perennial vegetation, providing a helpful, selective, tool to control annual weed problems when desirable perennial plants are present. To prevent seed production, spring applications of herbicides can be made to plants already emerged. Fall applications are also effective in controlling winter

annual weeds, but applications should be applied prior to a killing frost when air temperatures are above 50 F. By the fall, many desirable plants have already produced seed and senesced/died, limiting herbicide impact to these non-target plants.

Table 1. Effectiveness of herbicides registered in CRP for managing listed annual weed species.

Active Ingredient	Example Products	Giant ragweed	Japanese hedge parsley
2,4-D	Many	G	-
2,4-D + Aminopyralid	Forefront	E	-
2,4-D + Clopyralid	Curtail	G	-
2,4-D + Dicamba	Weedmaster	E	-
2,4-D + Glyphosate	Campaign	F/G	-
2,4-D + Picloram *	Grazon P+D	E	-
2,4-D + Triclopyr	Crossbow	G/E	-
Aminopyralid	Milestone	G	-
Clopyralid	Stinger	G/E	-
Dicamba	Banvel	F/G	-
Dicamba + Diflufenzopyr	Overdrive	F/G	-
Fluroxypur + Triclopyr	Pastureguard	G	-
Glyphosate	Roundup	F/G	G
Imazethapyr	Pursuit	F/G	-
Imazapic	Plateau	F	-
Imazapic + Glyphosate	Journey	F/G	-
Imazapyr	Habitat	F	-
Metsulfuron	Escort	P	-
Metsulfuron + 2,4-D + Dicamba	Cimarron max	F	-
Paraquat*	Gramoxone	P/F	P/F
Picloram*	Tordon	E	-
Triclopyr	Garlon	G/E	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.

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 list of herbicides and their effectiveness on listed annual weeds.

References:

DiTomaso, J.M. and D.W. Johnson (eds.). 2006. The Use of Fire as a Tool for Controlling Invasive Plants. Cal-IPC Publication 2006-01. California Invasive Plant Council: Berkeley, CA. 56 pp.

Radosevich, S., J. Holt, and C. Ghera. 1997. Weed Ecology: implications for management. 2nd Edition. John Wiley & Sons, Inc.

Tu, M., Hurd, C., & J.M. Randall, 2001. Weed Control Methods Handbook, The Nature Conservancy. Retrieved December 27, 2007 from <http://tncweeds.ucdavis.edu/handbook.html>

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