

Protecting Iowa's Rare and Endangered Plants

Herbicides are an important part of modern agriculture. These crop protection tools are currently used on more than 95 percent of the corn and soybean acres in Iowa, making them the most widely used pesticides in the state. When applied correctly, herbicides pose little threat to plants not targeted for control. However, due to the high activity level of many herbicides, sensitive plants found in or adjacent to treated areas may be injured if proper precautions are not taken. The concern for herbicide injury to nontarget plants becomes even greater if the plants are rare or endangered in Iowa. Federally endangered and threatened plant species are listed in Appendix I.

Application of herbicides to cropland, pastures, or other areas can threaten sensitive plants. Use caution when applying herbicides in or near habitat containing endangered and threatened plant species. Development of integrated weed management programs, careful selection of herbicides, and the use of appropriate application techniques will allow landowners to benefit from herbicide use without harm to those species that might be present on or near their property.

Plant species vary widely in susceptibility to different herbicides. Because the exact toxicity of herbicides to endangered species is unknown, use the following general guidelines when developing herbicide management plans to minimize the risk of injuring these plants.

Endangered Species Habitat

Endangered and threatened plant species present in Iowa are typically found in prairie remnants or other undisturbed, non-cropland areas. Most herbicides registered for use in these areas are used to control broadleaf weeds and may be highly toxic to those plant species. Because of

this, herbicide use should be avoided in these habitats whenever possible.

The invasion of certain weeds, such as Canada thistle, garlic mustard, musk thistle, or leafy spurge, into protected areas may make herbicide use necessary. In many situations, weeds may move from adjacent land into areas where endangered species are present. Controlling weeds in neighboring fields may reduce spread of the weed into the habitat of the endangered species and eliminate the need for herbicide use near the protected plant. Prior to initiating control measures, determine the most effective control strategies against the specific target weed. Careful selection of products and appropriate application techniques will allow herbicides and endangered species to coexist.

Controlling herbaceous broadleaf species.

Appendix II lists herbicides commonly used on non-cropland and pastures to control broadleaf weeds. Avoid broadcast applications of these herbicides in protected areas because they may be toxic to endangered species. If herbicide application is necessary, spot treat infested areas, preferably with hand-held equipment. When using hand-held equipment, leave a 50-foot buffer around all endangered species. If boom equipment is used, maintain a 100-foot buffer. Adjust spray equipment to minimize drift potential and avoid spraying when wind speeds exceed 5 miles per hour. Herbicides with short residual activity—those that break down quickly in the environment—are preferred because they create less risk to nontarget species.



**Northern
wild monkshood**

Controlling woody species. Several control options are available to control brush and other woody species that may invade protected habitat. Nonchemical strategies are preferred whenever feasible. Mowing during the dormant season or cutting can effectively control many woody species. Cutting stems near the soil line will reduce the potential for resprouting of many species. Controlled burning is another effective management strategy that may be appropriate in certain situations.

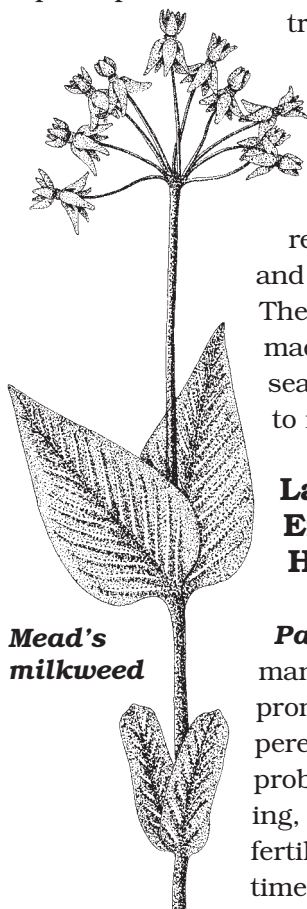
Herbicides that control woody vegetation are highly toxic to most broadleaf species; therefore, use caution when applying these materials near endangered plants. Selective application procedures, such as basal bark sprays and cut-surface treatments, minimize the quantity of herbicide used and reduce the risk of off-target movement. Because of these advantages, basal bark sprays and cut-surface treatments are recommended rather than foliar applications.

Basal bark treatments are applied to the crown and lower 18 inches of stems or trunks to kill brush and trees up to 6 inches in diameter. Diesel fuel is typically used as a carrier to improve penetration into the bark. Cut-surface

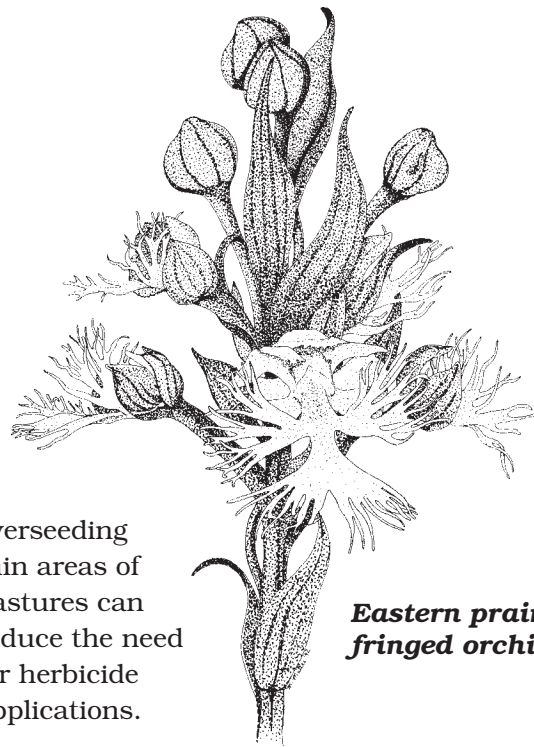
treatments are applied to the stems of woody plants soon after the tree or shrub has been cut down. This type of application prevents resprouting from the roots and crowns of woody species. These applications can be made during the dormant season to minimize the risk to nontarget species.

Land Adjacent to Endangered Species Habitat

Pastures. Proper pasture management practices that promote vigorous growth of perennial sod reduce weed problems. Avoiding overgrazing, maintaining proper soil fertility through soil testing, timely mowing, and



Mead's milkweed



Eastern prairie fringed orchid

overseeding thin areas of pastures can reduce the need for herbicide applications.

If a herbicide treatment is warranted on pastures adjacent to endangered species habitat, take precautions to avoid drift into protected areas. Avoid spraying when wind speed is above 5 miles per hour or when wind direction favors movement into the protected area. Sprayers should be adjusted (nozzle selection, spray pressure, and boom height) to minimize the formation of small spray droplets and prevent off-target movement. Maintain a 100-foot buffer between sprayed areas and any protected plants. Avoid spraying volatile herbicides (2,4-D ester, Banvel) when air temperatures exceed 85 degrees.

Cropland. Herbicides used in corn and soybean production vary widely in their toxicity to nontarget plants. Appendix III classifies herbicides according to the relative risk to off-target broadleaf plants. Category 3 herbicides have a high potential for injuring off-target plants, so use alternative products whenever possible. Category 2 herbicides also may injure nontarget plants following normal use but present a lower risk than Category 3 herbicides. Herbicides listed under Category 1 pose little threat to off-target plants when accepted pesticide application procedures are followed; they are the preferred choice whenever feasible.

When herbicides are applied to cropland adjacent to rare or endangered plants, steps should

be taken to minimize off-target movement. The potential for off-target herbicide movement and injury to nontarget plants can be reduced in many ways. Avoid herbicide application if wind speed exceeds 5 miles per hour or wind direction favors movement into the protected area. Maintain a 100-foot buffer between sprayed areas and all protected plants when using Category 2 or 3 herbicides.

Nozzle type, spray pressure, and nozzle height all influence the potential for herbicide drift. Careful adjustment of the sprayer can reduce the likelihood of injury to nontarget plants. Many preemergence herbicides can be applied without using water as a carrier, either with granular herbicide formulations or by impregnating dry fertilizer with the herbicide.

Further information regarding weed management may be obtained through your county extension office.

For information concerning endangered species in Iowa, contact:

Pesticide Bureau
Iowa Department of
Agriculture
and Land Stewardship
Wallace State Office
Building
Des Moines, Iowa 50319
(515) 281-8506



Prairie bush-clover

Iowa Department of Natural Resources
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Appendix I. Federally listed endangered and threatened plants found in Iowa.¹

Scientific Name	Common Name
<i>Aconitum noveboracense</i>	Northern wild monkshood
<i>Asclepias meadii</i>	Mead's milkweed
<i>Lespedeza leptostachya</i>	Prairie bush-clover
<i>Platanthera leucophaea</i>	Eastern prairie fringed orchid
<i>Platanthera praeclara</i>	Western prairie fringed orchid

¹U.S. Fish and Wildlife Service
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Appendix II. Herbicides commonly used in Iowa pastures and non-cropland areas.

Trade Name	Common Name
<i>Short soil residual</i>	
Numerous products	2,4-D
Weedone 2,4-DP	2,4-DP
Banvel, Clarity	dicamba
Roundup, many others	glyphosate
<i>Moderate to long soil residual</i>	
Ally, Escort	metsulfuron methyl
Garlon, Crossbow, Remedy	triclopyr
Grazon P & D	picloram
Redeem R & D	clopyralid
Spike	tebuthiuron
Stinger, Transline	clopyralid

Appendix III. Relative risk for injury to broadleaf plants from off-target movement of herbicides commonly used in Iowa corn and soybean production.¹

Category 1—Low risk

<i>Trade Name²</i>	<i>Active Ingredient</i>
Assure II	quizalofop
Cinch	metolachlor
Define	flufenacet
Degree	acetochlor
Dual II Magnum	metolachlor
Frontier	dimethenamid
Fusilade	fluazifop
Fusion*	fluazifop
Harness	acetochlor
Lasso	alachlor
Outlook	dimethenamid
Pentagon	pendimethalin
Poast Plus	sethoxydim
Prowl	pendimethalin
Select	clethodim
Surpass	acetochlor
TopNotch	acetochlor
Treflan, Tri-4	trifluralin

Category 2—Moderate risk

<i>Trade Name²</i>	<i>Active Ingredient</i>
Aatrex, atrazine	atrazine
Aim	carfentrazone
Authority	sulfentrazone
Axiom*	metribuzin
Balance Pro	isoxaflutole
Basagran	bentazon
Boundary*	metribuzin
Blazer	acifluorfen
Buctril	bromoxynil
Callisto	mesotrione
Cobra	lactofen
Commence	clomozone
Conclude Xact*	acifluorfen
Domain*	metribuzin
Epic	isoxaflutole
Flexstar	fomesafen
Gramoxone Extra	paraquat
Liberty	glufosinate
Lorox	linuron
Lumax	mesotrione
Phoenix	lactofen
Princep	simazine
Reflex	fomesafen

Category 2—Moderate risk

<i>Trade Name²</i>	<i>Active Ingredient</i>
Resource	flumiclorac
Rezult	bentazon
Sencor	metribuzin
Simazine	simazine
Spartan	sulfentrazone
Storm*	acifluorfen
Tough	pyridate
UltraBlazer	acifluorfen
Valor	flumioxazin

The following products are premixes that contain atrazine: Bicep II Magnum, Bicep II Magnum Lite, Bullet, Cinch ATZ, Axiom AT, Bullet, Degree Xtra, FieldMaster, FulTime, Guardsman Max, Harness Xtra, Keystone, Keystone LALariat, Leadoff, Liberty ATZ

Category 3—High risk

<i>Trade Name²</i>	<i>Active Ingredient</i>
2,4-D	many
Accent, Accent Gold*	nicosulfuron
Amplify	cloransulam
Banvel	dicamba
Basis, Basis Gold*	rimsulfuron
Beacon	primisulfuron
Celebrity Plus*	dicamba
Clarity	dicamba
Command	clomozone
Distinct*	dicamba
Exceed*	prosulfuron
FirstRate	cloransulam
Gangster*	cloransulam
Gauntlet*	cloransulam
Glyphomax	glyphosate
Glyphosate	glyphosate
Harmony GT	thifensulfuron
Hornet	clopyralid
Landmaster II*	glyphosate
Lightning*	imazapyr
Marksman*	dicamba
NorthStar*	dicamba
Python	flumetsulam
Pursuit	imazethapyr
Raptor	imazamox
Roundup	glyphosate
Scepter	imazaquin
Shotgun	2,4-D
Spirit*	prosulfuron
Steadfast*	nicosulfuron
Touchdown	glyphosate
Yukon*	dicamba

File: Agronomy 9

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¹ The risk of significant injury to nontarget plants is determined by the rate of herbicide contacting the plant and its susceptibility to the herbicide. Because the sensitivity of endangered plants to these herbicides is unknown, these ratings are based on the following criteria: herbicide mode of action, amount of translocation of the herbicide in plants, and the potential of the herbicide to cause phytotoxicity at low rates associated with off-target movement.

² Products with * are premixes containing more than one active ingredient.