

# Herbicides in Native Habitat Management:

## A comparative guide and explanations

The herbicides and their active ingredients presented on the reverse side are used to control invasive and weedy species. These herbicides may possess attributes harmful to native habitats and species. The information in each column is explained below. Look for shaded or bolded information which denotes harmful attributes.

To mitigate environmental harm, use chemicals as a last resort and sparingly. Make spot applications by hand only while **following label directions** to protect yourself and the environment. Alternatively, devise non-chemical methods to interrupt invasive species' life cycles. Plant competitive native species in treated areas.

What problems might the product of choice cause the applicator and nearby people? Check the **signal word** in the table on the reverse page. DANGER indicates acute toxicity, be it through oral, dermal, or eye contact, or inhalation. DANGER is of most concern, followed by WARNING, then CAUTION which signifies the least toxic. Always follow pesticide label directions when using herbicides or other pesticides or employ alternative methods of control.

How long will the herbicide remain in its toxic state in the environment? The longer the **half-life** of the product, the more time it has to move off-site, affect non-target organisms, or reach groundwater. The breakdown products may also be toxic to species or affect the environment.

How mobile is the pesticide? Check **vapor pressure** for **drift potential**, and **solubility/soil sorption** for **leach potential**. Most of the given products have relatively low vapor pressures but drift can also be caused by wind, high temperature, and by the application pressure. Higher pressures produce smaller droplets which are more likely to drift. For protection from drift, follow label instructions, make applications only under favorable wind direction and speed, and provide non-chemical buffer zones.

Products with high solubility and low soil sorption are more likely to leach i.e. move through the soil or offsite and end up in non-target areas on non-target organisms, particularly if the herbicide has a long half-life. Porous soils such as sands enable leaching to take place more than organic soils. Note that soil movement can also move chemicals which are bound to the soil. The U.S. EPA suggests protecting sites from leaching by reducing the pesticide volume and/or using alternate products, biological controls, or cultivation methods.

What is the **toxicity to terrestrial vertebrates**? Quail, mallard, rat, mouse and rabbit are the usual test species. Wild and rare species and their predators might be affected differently and perhaps more seriously.

What is the **toxicity to terrestrial invertebrates**? Honeybees serve as a model for pollinating insects. Impacts on other insect groups, invertebrates and the food web may not be well known. These groups need protection.

How **selective** is the product for the pest you wish to control? Non-selective herbicides are likely to affect many species they contact while selective products spare at least some of the non-target organisms. Check pest control manuals, labels and websites for more information.

What is the **toxicity to aquatic species**? Aquatic species including vertebrates such as amphibians and fish, invertebrates, and wetland plants and animals, differ from terrestrial organisms in their sensitivity to a pesticide or its inert ingredients. If aquatic toxicity is likely, protective actions are usually prescribed on the label. Follow these carefully to prevent negative impacts during and after application. Consider larger buffer zones than on the label and alternative types of pest control to protect the aquatic environment.

## Appendix B. Attributes and ecological impacts of herbicides used in native habitat management

Herbicide/ active ingredient	Signal Word	1/2 life in environment	Vapor pressure	Solubility; soil sorption	Leach potential	Toxicity to terrest- rial vertebrates	Toxicity to terrestrial invertebrates	Selective control of plants	Toxicity to aquatic spp
<b>Garlon 3a/</b> triclopyr	DANGER	10 - 46 days	low	high low	high	quail, mallard none; <b>eye irritation!</b>	bees none	broadleaf and woody	practically none
<b>Garlon 4,Pathfinder/</b> triclopyr	CAUTION	10 - 46 days	?	low high	low	quail, mallard none; rat, rabbit low	?	broadleaf and woody	<b>very toxic to fish and Daphnia</b>
<b>Crossbow</b>	WARNING	see triclopyr	and	2,4-D					
<b>Roundup/</b> glyphosate	CAUTION	3 - 47 days	low	high high	low	<b>rat: inhalation; eye irritation</b>	earthworm, bee none; toxic to fruit insects	no	<b>fish, Daphnia, oyster toxic;</b> crayfish, shrimp, crab none
<b>Rodeo/</b> glyphosate (aquatic)	CAUTION	3 - 47 days	low	high high	low	<b>inhalation!</b>	see Roundup	no	fish and Daphnia none
<b>Krenite/</b> fosamine ammonium	WARNING	8 - 10 days	low	high low	medium	none quail; <b>rat: inhalation some</b>	bee none	broadleaf and woody	none to trout, minnow
<b>Tordon*/</b> picloram	WARNING, RUP	20-300 days	low	high low	high	quail, mallard none; <b>rat: inhalation high</b>	bee low	broadleaf and woody	<b>some trout, bluegill, catfish, Daphnia toxic</b>
<b>Tordon RTU</b>	WARNING	see	picloram	and	2,4-D				
<b>Banvel/</b> dicamba	WARNING	14 - 100 days	low	high low	high	slightly toxic	bee none	broadleaf and woody	fish and Daphnia some
<b>2,4-D</b> (many products)	DANGER - CAUTION	7 - 28 days	low to <b>high</b>	varies low	varies	slight	bee some dosages toxic	broadleaf and sedges	<b>bluegill, trout, crab, shrimp toxic</b>
<b>Velpar/</b> hexazinone	DANGER some	60 - 120 days	low	high low	high	quail, mallard none	none bee	safe to many	fish and Daphnia low
<b>Liberty nc/</b> glufos- inate ammonium	WARNING	7 days	low	high low?	low	quail none	honeybee nontoxic	no	trout slight
<b>Basagran/</b> bentazon	CAUTION	14 - 20 days	low	high low?	low	slightly toxic	not to bees	broadleaf, sedges	slight to aquatics
<b>Transline/</b> clopyralid	CAUTION Eyes, skin!	12 - 170 days	low	high low	high	non-toxic	toxic to bees	legumes, composites, smartweeds	slightly toxic to fish
<b>Stinger/</b> clopyralid	CAUTION	30 - 170 days	low	high low	high	non-toxic	toxic to bees	legumes, composites, smartweeds	slightly toxic to fish
<b>Surflan/</b> oryzalin	CAUTION	28 - 180 days	low	low low	low	non-toxic	non-toxic to bees	non-woody	moderately toxic
<b>Oust/</b> sulfometuron methyl	CAUTION	20-28 days	low	high low	high	practically non-toxic in quail, mallard	?	safe for perennial grasses	<b>high to some minnow embryos, fish, crayfish</b>
<b>Plateau*/</b> imazapic	CAUTION	30-200 days	low	low	?	don't use in grazing area; rat inhalation	low bee and earthworm	some broadleaves and grasses	slight in bluegill, trout, Daphnia
<b>Poast, Vantage/</b> sethoxydim	WARNING	4 - 10 days	low	high/ low-med.	none	low mallard, quail	none to bees	grasses	some in Daphnia
<b>Habitat</b> (imazapyr and degradates) (TNC)	CAUTION	<b>25-141 days, incr. w. pH</b>	Incr. w. temp.	High low	<b>high</b>	<b>Possible eye damage with some</b>	?	<b>No</b>	LC50 <100 mg/Kg but considered PNT

**Information sources:** (1) Farm Chemicals Handbook '97; (2) Herbicide Handbook 1994; (3) EXTTOXNET 1997; (4) Montgomery, J.H. 1993. Agrochemicals Desk Reference. **Web sites:** <http://ace.orst.edu/info/exttoxnet/ghindex.html>; [www.pesticide.org/factsheets.html](http://www.pesticide.org/factsheets.html); <http://www.cdpr.ca.gov/docs/epa/epachem.htm> **Notes:** Shaded cells and bolded font indicate concern. ? indicates no information found. **Compilation:** Ursula C. Petersen, Bureau of Agrichemical Management, Wisconsin Dept of Agriculture, Trade and Consumer Protection 1997. Revised 9/03. Updated with help from Dr. J. Doll 10/06. **Questions:** 608/224-4538 or ursula.petersen@datcp.state.wi.us