

# Invasive Plant Control with Herbicides: Safety & Environmental Precautions Fact Sheet

**License Requirements:** You must obtain a *Commercial Pesticide Applicator License* if you work for hire applying “general use” herbicides in Rhode Island, such as triclopyr and glyphosate.

## **READ THE LABEL FIRST!**

Follow all instructions on the label. It is a violation of state and federal law to use a pesticide product contrary to label directions.

### **Tips for understanding the label:**

1. There are three signal words used on labels, ranking the material in the container from highest to lowest human toxicity: **Danger**, **Warning** and **Caution**
  - When the product is diluted (usually with water), the toxicity will decrease proportionately.
  - NOTE: Dilution with oil may make the chemical more easily absorbed through the skin, thus the above statement may not apply in this case.
2. Labels will indicate the protective clothing to be worn and health hazards.
  - Make sure to check labels for the specific area the signal word applies to (oral, dermal, inhalation, skin and eye irritation).
3. Specific statements on labels give precautions to be followed. For example:
  - Pesticides not designated for aquatic use will say “Do not apply directly to water or areas below the high tide mark”.
  - Highly toxic pesticides will be classified as “Restricted Use Pesticides” and you must be state certified in order to purchase and use the product.
  - Pesticides toxic to fish often require a setback from fish bearing waters.

### **More info on the most commonly used herbicides:**

**Glyphosate** - the active ingredient in Rodeo™ and Roundup Pro™\*

- Low oral toxicity to humans and other animals.

- Some formulations are irritating to skin and eyes, so take proper precautions.
- Does not persist or bioaccumulate in the environment.
- Controls invasive grasses such as Phragmites.
- No soil activity - will not injure desirable plants via root uptake, rapidly deactivated and biodegraded in soil.
- Very low health and environmental risks.

**\*NOTE:** Roundup™ is not approved for use where surface water is present or in intertidal areas below the mean high water mark.

**Triclopyr**- the active ingredient in Renovate 3™ and Garlon 3A™

- Fairly low oral toxicity, but not as low as glyphosate.
- Take precautions to avoid exposure
- Amine-based triclopyr formulations are corrosive and damaging to eyes and skin and must be handled with a great deal of care.
- Toxicity to birds and fish is relatively low, although ester formulations are more toxic to fish than amine formulations or the parent acid of triclopyr.
- Does not kill grasses or sedges, thus unlikely to result in bare ground situation.
- More effective than glyphosate on some woody species (e.g. Oriental bittersweet, black locust).
- Often provides better early-season control of perennial weeds.

**\*NOTE:** Garlon 3A™ has specific restrictions regarding use in and around water.

### **Glyphosate: General Information**

Glyphosate is a broad-spectrum herbicide that is absorbed by plant leaves and is systemic (translocated) within the plant. Nearly all herbaceous plants and most woody plants are susceptible to glyphosate, which inhibits synthesis of three amino acids necessary for plant growth. Glyphosate is a rather slow-acting herbicide; symptoms appearing within a week include chlorosis (yellowing) and stunting of the youngest leaves and growing point. It may take more than 2 weeks for the plant to die. Injury symptoms and death occur more rapidly in young, actively growing plants and when temperatures are warm. Woody plants are more susceptible to glyphosate when treated in late summer or fall. Damage may not be apparent until the following spring as leaves either fail to emerge from buds or are dwarfed, misshapen, and yellow. Glyphosate does not exhibit herbicidal activity in the soil. It is bound rapidly and tightly to soil particles (organic matter and clay), and therefore is not taken up by plant roots and does not affect seed germination. Although it is not absorbed by roots or through intact bark, it can cause damage if sprayed on exposed roots, or on bark that is very thin, green or cracked. Glyphosate is readily biodegraded by microorganisms, thus it does not persist in soil or water. When used properly, glyphosate poses minimal risk to human health or to the environment.

Both ROUNDUP PRO™ and ROUNDUP ULTRA™ contain a surfactant that enhances glyphosate absorption into treated leaves. If using a glyphosate formulation other than these two, addition of a non-ionic surfactant (0.5 fl. oz. per gallon) to the spray tank will increase the herbicidal activity of glyphosate.

For control of emergent or floating aquatic plants or plants growing along a shoreline (where spray will contact the water), the RODEO™ formulation of glyphosate should be used. RODEO™ does not contain surfactants included in ROUNDUP™ products. Prior to applying any pesticide to

a body of water or to plants in a wetland, one must obtain a permit from the RI Department of Environmental Management (DEM). The half-life of glyphosate in water is approximately 2 weeks, but it does not significantly affect submerged plants. Glyphosate toxicity to fish and other aquatic organisms is very low.

### **Triclopyr: General Information**

Triclopyr is a systemic herbicide that controls most broadleaf plants (herbaceous and woody) but not grasses or sedges at normal use rates. It is especially useful in brush control and for use on freshly cut stumps to prevent re-sprouting.

Triclopyr interferes with normal expansion and division of plant cells, resulting in distorted growth (cupped leaves, twisted stems, plugged vascular tissues). The herbicidal activity of triclopyr is more rapid than that of glyphosate. Herbaceous plants sprayed with triclopyr may show injury symptoms within 24 hours and usually die in a few days. Triclopyr is most effective when applied to actively growing plants. Woody plants treated late in the growing season are susceptible, but may not show injury symptoms until the following spring when leaves and stems fail to emerge or are greatly distorted.

Triclopyr is not strongly bound by soil particles, thus it could potentially leach into groundwater or run off into surface waters. However, it has rarely been detected in groundwater monitoring surveys. Triclopyr has residual herbicidal activity in soils (half-life approximately 6 weeks). Desirable plants can be injured by spray drift, or if their roots are exposed to triclopyr in the soil. Triclopyr has low to moderate toxicity to humans and wildlife. Addition of a non-ionic surfactant [0.5 fl. oz. per gallon] to the spray tank will enhance herbicidal activity of triclopyr. Triclopyr has herbicidal activity on aquatic vegetation, but a formulation for aquatic weed control in development has not yet been approved by EPA.

## **References**

CT Invasive Plant Working Group. 2008. Safety and Environmental Considerations for the Use of Herbicides to Control Invasive Plants. Last accessed 13 March 2008. [http://www.hort.uconn.edu/cipwg/art\\_pubs/GUIDE/consideration.htm](http://www.hort.uconn.edu/cipwg/art_pubs/GUIDE/consideration.htm)