

Glyphosate Chemical Fact Sheet

Formulations

Glyphosate is a commonly used herbicide that is used in both aquatic and terrestrial sites. The use of glyphosate-based herbicides that are not approved for aquatic use is very unsafe and is a violation of federal and state pesticide laws. Different formulations of glyphosate are available, including isopropylamine salt of glyphosate (Rodeo[®], Shore-Klear[®], Aquapro[®]) and potassium glyphosate (Refuge[®]).

Aquatic Use and Considerations

Glyphosate is a systemic herbicide that moves throughout the plant tissue and works by inhibiting an important enzyme needed for multiple plant processes, including growth.

Glyphosate is effective only on plants that grow above the water. It will not be effective on plants that are submerged or have most of their foliage under water, nor will it control regrowth from seed. Glyphosate can be used to control reed canarygrass (*Phalaris arundinacea*), cattails (*Typha* spp.), purple loosestrife (*Lythrum salicaria*), phragmites (*Phragmites australis*), water hyacinth (*Eichornia crassipes*) and water lettuce (*Pistia stratiotes*).

Glyphosate needs to be applied to plants that are actively growing. Effectiveness of glyphosate treatments may be reduced if applied when plants are growing poorly, such as due to drought stress, disease, or insect damage.

Experience with species such as purple loosestrife has shown that broadcast spray treatment can be ineffective if surrounding non-target plants are killed, since this clears an area for rapid regrowth from seeds. An alternative method of glyphosate application for small stands is effective but time-intensive: painting cut stems with glyphosate using a wick type applicator. The herbicide will then travel from the cut stem down into the roots and kill the remaining portion of the plant. With some species, such as phragmites, it is important to remove the cut vegetation to avoid re-rooting

from the cut material that is not treated with herbicide.

A surfactant approved for aquatic sites must be mixed with glyphosate before application. A surfactant helps the herbicide "stick" to the plant surfaces, and increases the rate of absorption. Not all surfactants are approved for use in aquatic environments and some may be toxic to aquatic organisms; the surfactant labels should be carefully read and followed.

Care must be used when applying glyphosate to prevent injury or death to desirable plants. To avoid drift, application is not recommended when winds exceed 5 mph. In addition, excessive speed or pressure during application may allow spray to drift and must be avoided.

Following treatment, plants will gradually wilt, appear yellow, and will die in approximately 2 to 7 days. It may take up to 30 days for woody plants. Cooler or cloudy weather following treatment may delay the visible effects of treatment. Application should be avoided when heavy rain is predicted within 6 hours, because the herbicide may wash off the plants.

Post-Treatment Water Use Restrictions

Most aquatic forms of glyphosate have no restrictions on swimming or eating fish from treated water bodies. However, potable water intakes within ½ mile must be turned off for 48 hours after treatment. Due to different formulations and products containing glyphosate, every product label should be carefully reviewed by the user for varying post-treatment water use restrictions.

Herbicide Degradation, Persistence and Trace Contaminants

In water, the concentration of glyphosate is reduced through dispersal by water movement,

binding to the sediments, and break-down by microorganisms. Glyphosate's half-life (the time it takes for half of the active ingredient to degrade) is between 3 days and 19 weeks depending on water conditions. Glyphosate disperses rapidly in water so dilution occurs quickly, thus moving water will decrease concentration, but not half-life. The primary breakdown product of glyphosate is aminomethylphosphonic acid (AMPA), which is also degraded by microbes in water and soil. According to the EPA, available data do not suggest that this compound poses any hazard distinct from its parent compound, glyphosate.

Glyphosate contains a nitrosamine (n-nitroso-glyphosate) as a contaminant at levels of 0.1 ppm or less. Tests to determine the potential health risks of nitrosamines are not required by the EPA unless the level exceeds 1.0 ppm.

Impacts on Fish and Other Aquatic Organisms

Laboratory testing by an herbicide manufacturer indicates that glyphosate is toxic to carp, bluegills, trout, and water fleas (*Daphnia* spp.) only at dosages well above the label application rates. Similarly, it is rated practically non-toxic to aquatic species tested. Studies by other researchers with glyphosate on important food chain organisms such as midge larvae, mayfly nymphs, and scuds have demonstrated a wide margin of safety between application rates and toxic dosages to rats and rabbits.

Human Health

Most concerns about glyphosate's adverse health effects revolve around applicator exposure or exposure via drift and the surfactant used in application. Some adverse effects from direct contact with the herbicide include temporary symptoms of dermatitis, eye ailments, headaches, dizziness, and nausea. Protective clothing (goggles, a face shield, chemical resistant gloves, aprons, and footwear) should be worn by applicators to reduce exposure to glyphosate. Confirmed and unconfirmed incidences involving the active ingredient glyphosate have been reported to the Health Effects Branch of the EPA. Recently it has been

demonstrated that glyphosate is toxic effect to human embryonic cells and linked to endocrine disruption.



For Additional Information

Environmental Protection Agency
Office of Pesticide Programs
www.epa.gov/pesticides

Wisconsin Department of Agriculture, Trade,
and Consumer Protection
<http://datcp.wi.gov/Plants/Pesticides/>

Wisconsin Department of Natural Resources
608-266-2621
<http://dnr.wi.gov/lakes/plants/>

Wisconsin Department of Health Services
<http://www.dhs.wisconsin.gov/>

National Pesticide Information Center
1-800-858-7378
<http://npic.orst.edu/>

