GLYPHOSATE CHEMICAL FACT SHEET

Formulations

Glyphosate is a commonly used herbicide that is used in both aquatic and terrestrial sites. It was first registered with the U.S. EPA for use in 1974 and is currently under registration review. An interim registration review decision was released in 2020. Different formulations of glyphosate are available, including isopropylamine salt of glyphosate and potassium glyphosate. It is labeled for control of emergent vegetation using direct foliar application. Commercial formulations approved for aquatic use in Wisconsin include AquaPro®, Imitator®, GlyphoMate® and Roundup® Custom for Aquatic & Terrestrial Use.* Most glyphosate-based products are solely intended for terrestrial use and are highly toxic to aquatic life. The use of glyphosate-based herbicides in aquatic environments that are not approved for aquatic use is a violation of federal and state pesticide laws.

Aquatic Use and Considerations

Glyphosate is a systemic herbicide (i.e., it moves throughout the plant tissue). It is a WSSA Group 9 herbicide, meaning that the mechanism of action is by inhibiting enolpyruvyl shikimate-3-phosphate synthase, an important enzyme needed for multiple plant processes including growth. Following treatment, plants will gradually wilt, appear yellow, and decompose in approximately two to seven days. It may take up to 30 days for effects to become apparent on woody species.

It is important to note that repeated use of herbicides in the same WSSA group (i.e., with the same mechanism of action) can lead to herbicide-resistant plants, even in aquatic environments. In order to reduce the risk of developing resistant genotypes, avoid using the same type of herbicides year after year, and utilize effective integrated pest management strategies as part of any long-term control program.

Glyphosate is only effective on plants that are actively growing above the water. It will not be effective on submerged aquatic plants, nor will it control regrowth from seed. Glyphosate treatments may not be as effective if applied when plants are growing poorly, which may occur due to drought stress, disease, or insect damage.

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. Care must be used when applying glyphosate to prevent injury or death to nontarget plants. Broadcast spray treatment can be ineffective if surrounding nontarget plants are killed since the target species can rapidly recolonize the newly cleared area.

An alternative method of glyphosate application for small stands is painting cut stems with glyphosate using a wick-type applicator. This method is effective, albeit time intensive. The herbicide will travel from the cut stem down into the roots and kill the remaining portion of the plant. With some species, such as non-native phragmites (*Phragmites australis* subsp. *australis*), it is important to remove the cut vegetation to avoid re-rooting from the cut material that is not treated with herbicide.

Unless the glyphosate product used includes a pre-mixed surfactant, chemical applicators must mix a surfactant approved for aquatic sites with glyphosate before application. A surfactant helps the herbicide “stick” to the plant surfaces and increases the rate of

* Product names are provided solely for your reference and should not be considered exhaustive nor endorsements.

absorption. Not all surfactants are approved for use in aquatic environments, and some may be toxic to aquatic organisms; the surfactant labels must be carefully read and followed.

Application should be avoided when heavy rain is predicted within six hours, as rainfall may wash herbicide off plant exterior.

Glyphosate is labeled to control invasive reed canary grass (*Phalaris arundinacea*), cattails (*Typha* spp.), purple loosestrife (*Lythrum salicaria*) and non-native phragmites (*Phragmites australis* subsp. *australis*)†. Glyphosate is also labeled to control native waterlilies (*Nymphaea* spp. & *Nuphar* spp.).†

Post-Treatment Water Use Restrictions

Most aquatic forms of glyphosate have no post-treatment restrictions on water use for swimming, irrigation, or fishing. However, potable water intakes within one-half of a mile of application must be turned off for 48 hours after treatment or until glyphosate levels reach below 0.7 parts per million.†

Herbicide Degradation, Persistence and Trace Contaminants

Glyphosate is primarily broken down by microbes. The half-life of glyphosate (the time it takes for half of the active ingredient to degrade) is between 3 and 133 days, depending on environmental conditions. Glyphosate disappears quickly from the water column due to water dispersal and sediment binding. It adsorbs strongly to sediment particles, so leaching into groundwater is unlikely. The primary breakdown product of glyphosate is aminomethylphosphonic acid (AMPA), which is also degraded by microbes and is immobile once bound to sediment. However, AMPA is much more persistent in sediment than glyphosate; its half-life ranges from 119 to 958 days.

† May vary by formulation, application rate, and/or product. Every product label must be carefully reviewed and followed by the user.

Impacts on Fish and Other Aquatic Organisms

Since the mechanism of action involves an enzyme that isn't found in animals, glyphosate has low toxicity to animals. Glyphosate is rated practically non-toxic to slightly toxic to freshwater fish, freshwater invertebrates and birds. However, some formulations of glyphosate may be moderately toxic to fish due to the presence of an inert ingredient. As with all herbicide applications, it is important to read and follow all label instructions to prevent adverse environmental impacts.

Human Health

Most glyphosate-related health concerns for humans involve applicator exposure, exposure through drift and surfactant exposure. Some adverse effects from direct contact with the herbicide include temporary symptoms of dermatitis, eye ailments, headaches, dizziness and nausea. Wear proper personal protective equipment and follow label instructions while handling.

The U.S. EPA has determined that glyphosate does not pose any long-term health risks to humans when used according to label directions and established tolerance levels.

For Additional Information

U.S. Environmental Protection Agency (EPA)
Office of Pesticide Programs
epa.gov/pesticides

Wisconsin Department of Agriculture, Trade, and Consumer Protection
datcp.wi.gov/Pages/Programs_Services/ACMOverview.aspx

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

Wisconsin Department of Health Services
dhs.wisconsin.gov

National Pesticide Information Center
1-800-858-7378
npic.orst.edu

Wisconsin Department of Natural Resources
PO Box 7921
Madison, WI 53707-7921

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