

CARFENTRAZONE-ETHYL

CHEMICAL FACT SHEET

Formulations

Carfentrazone-ethyl was registered with the U.S. EPA in 1998. It is currently under registration review. An interim registration review decision was released in 2017. The active ingredient is ethyl 2-chloro-3-[2-chloro-4-fluoro-5-[4-(difluoromethyl)-4,5-dihydro-3-methyl-5-oxo-1H-1,2,4-triazol-1-yl]phenyl]propanoate. It is labeled for control of floating-leaf vegetation using surface application and for control of submerged vegetation using subsurface application. Commercial formulations approved for aquatic use in Wisconsin include Stingray®.*

Aquatic Use and Considerations

Carfentrazone-ethyl is a contact herbicide (i.e., it causes damage at the area of contact). It is a WSSA Group 14 herbicide, meaning that the mechanism of action is by inhibiting protoporphyrinogen oxidase, which interferes with the chlorophyll biosynthetic pathway. The herbicide causes membrane disruption and plant tissue necrosis. After application, affected plants will show signs of injury within a few hours and will decompose in subsequent weeks.

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.

Treatment of dense plants beds may result in dissolved oxygen declines from plant

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

decomposition, which may lead to fish suffocation or death. To minimize impacts, applicators should treat up to a maximum of half of the waterbody at a time and wait a minimum of 14 days before retreatment or treatment of the remaining half of the waterbody.

Environmental conditions like temperature and pH may affect the activity of the herbicide; herbicide symptoms are accelerated under warm conditions.

Carfentrazone-ethyl is labeled for control of non-native Eurasian watermilfoil (*Myriophyllum spicatum*), and native duckweeds (*Lemna* spp.) and watermeals (*Wolffia* spp.). Other submerged aquatic plants may also be susceptible.†

Post-Treatment Water Use Restrictions

There is no restriction on the use of treated water for recreation (e.g., fishing and swimming).

Carfentrazone-ethyl should not be applied directly to water within one-fourth of a mile of an active potable water intake. If applied around or within potable water intakes, intakes must be turned off prior to application and remain turned off for a minimum of 24 hours following application; the intake may be turned on prior to 24 hours only if the carfentrazone-ethyl and major degradate level is determined by laboratory analysis to be below 0.2 parts per million (ppm). Treated water may only be used for livestock consumption when the carfentrazone-ethyl and major degradate level has dropped below 0.2 ppm.

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

Do not use water treated with carfentrazone-ethyl for irrigation in commercial nurseries or greenhouses. When treatment occurs on 20% or more of the surface area of a waterbody, treated water should not be used for irrigation of crops, turf or ornamentals until 14 days after treatment, or until the carfentrazone-ethyl and major degradate level is determined by analysis to be below 5 parts per billion (ppb). When the herbicide is applied as a spot treatment to less than 20% of the waterbody surface area, treated water may be used for irrigation of crops, turf, or ornamentals without restriction.†

Herbicide Degradation, Persistence and Trace Contaminants

Although carfentrazone-ethyl breaks down rapidly in the environment, its degradates are persistent. The herbicide is broken down by water (hydrolysis) and light (photolysis) to carfentrazone-chloropropionic acid, which is then further degraded to carfentrazone - cinnamic, -propionic, -benzoic and 3-(hydroxymethyl)-carfentrazone-benzoic acids. The half-life typically ranges from approximately three hours to nine days but can be longer (over 34 days) in acidic waters (pH = 5).

While low levels of chemical residue may occur in surface water and groundwater, risk concerns to non-target organisms are not expected. If applied into water, carfentrazone-ethyl is expected to adsorb to suspended solids and sediment.

Impacts on Fish and Other Aquatic Organisms

Carfentrazone-ethyl is moderately toxic to freshwater fish and moderately toxic to practically non-toxic to freshwater invertebrates. Carfentrazone-ethyl is practically non-toxic to birds on a short- and medium-term exposure basis. As with all chemical herbicide applications, read and follow all label instructions to prevent adverse environmental impacts.

Human Health

Chemical applicators are primarily at risk of short-term toxic effects from carfentrazone-ethyl exposure. Carfentrazone-ethyl is harmful if swallowed, absorbed through the skin or inhaled. Wear proper personal protective equipment and follow label instructions while handling.

Carfentrazone-ethyl is not carcinogenic, neurotoxic, or mutagenic and is not a developmental or reproductive toxicant.

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/ACMOV
erview.aspx](http://datcp.wi.gov/Pages/Programs_Services/ACMOVerview.aspx)

Wisconsin Department of Natural Resources
dnr.wi.gov/lakes/plants

Wisconsin Department of Health Services
dhs.wisconsin.gov

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

