

Penoxsulam Chemical Fact Sheet

Formulations

Penoxsulam was registered with the EPA for aquatic use in 2009. The active ingredient is 2-(2,2-difluoroethoxy)—6-(trifluoromethyl-N-(5,8-dimethoxy[1,2,4] triazolo[1,5,-c]pyrimidin-2-yl)) benzenesulfonamide. It is a liquid (Galleon SC™) and is used for large-scale control of submerged, emergent and floating-leaf vegetation.

Aquatic Use and Considerations

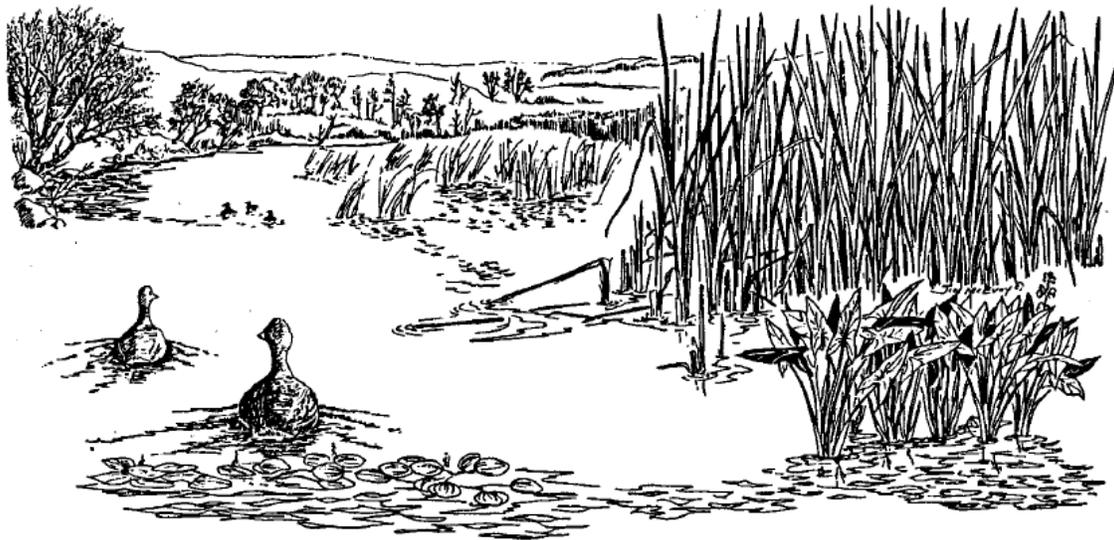
Penoxsulam is a systemic herbicide that moves throughout the plant tissue and prevents plants from producing a necessary enzyme, acetolactate synthase (ALS), which is not found in animals. Susceptible plants will stop growing soon after treatment and become reddish at the tips of the plant. Plant death and decomposition will occur gradually over several weeks to months. Penoxsulam should be applied to plants that are actively growing; mature plants require a higher concentration of herbicide and a longer contact time.

Penoxsulam must remain in contact with plants for around 60 days. A supplemental

“bump” treatment may be needed to maintain the herbicide concentration for the required contact time. Because of this long contact period, penoxsulam is likely to be used for larger-scale or whole-lake treatments and should not be used where rapid dilution can occur such as spot treatments or moving water.

In Wisconsin penoxsulam may be used to treat the invasive Eurasian watermilfoil (*Myriophyllum spicatum*). In other parts of the country, it is valuable as a rotational herbicide against the invasive plant hydrilla (*Hydrilla verticillata*). Desirable native species that may also be affected include sago pondweed (*Stuckenia pectinata*), Illinois pondweed (*Potamogeton illinoensis*), pickerelweed (*Pontederia cordata*), duckweeds (*Lemna* spp.) and arrowhead (*Sagittaria* spp.).

It is important to note that repeated use of herbicides with the same mode of action can lead to herbicide-resistant plants, even in aquatic plants. More resistant weeds have developed to the ALS inhibitor herbicides than to other herbicide types, and so this mechanism of action may be more susceptible to developing resistance. In order to prevent herbicide resistance, avoid using the same type of herbicides year after year, and when possible, use non-herbicide methods of control instead.



Post-Treatment Water Use Restrictions

There are no restrictions on swimming, eating fish from treated water bodies, or using water for drinking water. Before treated water can be used for irrigation, the concentration must be below 30 parts per billion (ppb) for turf grass or rice, and below one ppb for food crops.

Herbicide Degradation, Persistence and Trace Contaminants

Penoxsulam is broken down in the water by light and microbes and has a half-life (the time it takes for half of the active ingredient to degrade) ranging from about 12 to 38 days. Shallow clear-water lakes will have faster degradation than in turbid, shaded, or deep lakes.

As penoxsulam breaks down, twelve degradation products are created. Six of these are more persistent in the environment than penoxsulam itself: BSTCA (half-life 67-770 days), 2-amino-TCA, 5-OH-penoxsulam, SFA, sulfonamide, and 5,8-di-OH.

Penoxsulam doesn't bind to sediments, so leaching through soil into groundwater is likely. Three of the more persistent degradates have been tested for mobility and are also mobile through soil.

Impacts on Fish and Other Aquatic Organisms

Toxicity tests conducted with rainbow trout, water fleas (*Daphnia* sp.), and Ramshorn snail indicate that penoxsulam is not toxic for these species. Additionally, penoxsulam is not toxic to birds, including waterfowl such as mallards.

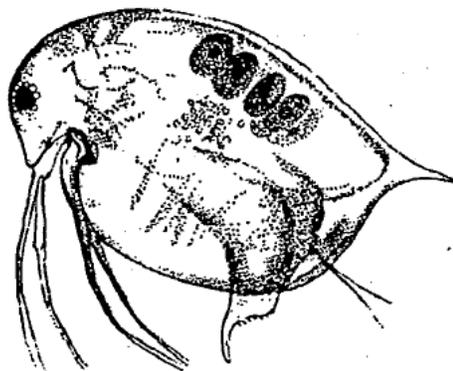
Penoxsulam does not bioaccumulate in fish or freshwater clams.

Human Health

Penoxsulam is not acutely toxic via skin, but may be slightly irritating if it gets in the eyes or harmful if inhaled during mixing or application. Applicators should wear chemical-resistant gloves while handling, and persons not involved

in application should avoid the treatment area during treatment.

Tests of long-term exposure to penoxsulam do not show evidence of birth defects, or genetic mutations in mammals tested. Penoxsulam may be required by EPA to undergo additional testing for endocrine disruption. Penoxsulam is classified as "Suggestive Evidence of Carcinogenic Potential," which means that there is evidence it causes tumors (from one of the rodent studies conducted), however not enough information to extrapolate the risk to humans.



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/>

