LEARN MORE ABOUT

Nufarm Polaris®

Q: What is Polaris®herbicide?

A: Polaris is an aqueous solution to be mixed with water and a surfactant and applied as a spray solution to control undesirable vegetation. Polaris will control most annual and perennial grasses and broadleaf weeds in addition to many brush and vine species with some residual control of undesirable species that germinate above the waterline. This product is readily absorbed through emergent leaves and stems and is translocated rapidly throughout the plant, with accumulation in the meristematic regions.

Q: How does Polaris® herbicide work?

A: The active ingredient in Polaris is imazypyr. Imazapyr's mode of action, or the way it attacks the plant, is through acetolactate synthase (ALS) inhibition. ALS an enzyme only found in plants that is common to the biosynthesis of the branch-chain amino acids. ALS inhibitors stops the production of three amino acids (isoleucine, leucine, and valine), which, in turn stops the production of enzymes and other proteins that are built from these amino acids. When imazapyr is applied to vegetation, treated plants stop growing soon after spray application. Chlorosis appears first in the newest leaves, and necrosis spreads from this point. In perennials, the herbicide is translocated into, and kills, underground or submerged storage organs, which prevents regrowth. Chlorosis and tissue necrosis may not be apparent in some plant species until two or more weeks after application. Complete kill of plants may not occur for several weeks. Applications of this product are rainfast one hour after treatment.

Q: What is the toxicology profile of Polaris herbicide?

A: All substances can be toxic. It is the dose level or amount, and conditions of exposure, that make their effect toxic or harmful. All pesticides sold in the U.S. must be registered by the EPA based on scientific studies showing that the pesticide will perform its intended function without unreasonable adverse effects on the environment. The EPA defines unreasonable adverse effects as any unreasonable risk to man or the environment, taking into account the economic, social and environmental costs and benefits of the use of a pesticide. The EPA classifies acute toxicity of a pesticide by placing laboratory testing results into categories with Toxicity Category I being the most toxic and Toxicity Category IV being the least toxic. These categories are based on the dosage at which the toxic effect was observed. *Polaris Herbicide* is classified as Category IV for acute exposure.

Acute (single) Exposure Study Results for *Polaris Herbicide*			
Exposure Route	Species	Toxicity	EPA Category
Oral LD_{50}	Rat	>5,000 mg/kg	IV
Dermal LD_{50}	Rabbit	>5,000 mg/kg	IV
Inhalation LC_{50}	Rat	>2.07 mg/L	IV
Eye Irritation	Rabbit	Minimal	IV
Skin Irritation	Rabbit	Slight	IV
Skin Sensitizer	Guinea Pig	Not a contact sensitizer	IV

Imazapyr, the active ingredient in *Polaris Herbicide*, has been classified as Group E – "no evidence of carcinogenicity" by the EPA (the most favorable classification possible), and has been found to be practically nontoxic to mammals, birds, bees, fish, aquatic invertebrates and non-vascular aquatic plants. Toxicological studies show no evidence that *Imazapyr*, the active ingredient in *Polaris Herbicide*, causes cancer, birth defects, genetic damage, genetic mutations, adverse effects on the immune system or nervous system in humans.

Q: Will Polaris affect my pets / humans after application?

A: The enzyme that is disrupted (as explained above) by imazyapyr is only found in plants. Imazapyr is of relatively low toxicity to mammals, and shows no mutagenic or teratogenic potential. It can be an eye and skin irritant, but is not a dermal sensitizer. Humans and pets are safe to enter an area treated with imazapyr after the plants have dried

Q: What will happen if my pet / a human eats grass or berries after Polaris is applied?

A: Although Polaris applications are a minimal hazard to animals, call 1-877-325-1840 if accidental exposure is expected.

Q: Will Polaris harm my ornamentals or my garden?

A: Polaris has the potential to damage woody or broadleaf plants that are sprayed with the solution, or that pick up Polaris in the soil through the root system. Applicators take great care in only spraying targeted plants and create buffers to take into consideration root zones that may be affected.

Q: What is the hazard of Polaris applications to animals?

A: The mode of action of imazapyr (ALS inhibitor) is only found in plants and not animals.

Q: Will Polaris herbicide remain in the soil?

A: Polaris is broken down primarily by sunlight and to a lesser extent by microbial degradation in the soil. The half life (see below) can vary between 10-120 days depending on temperature and moisture. Exposure to light, warmer temperatures and higher moisture increases the degradation of imazapyr, decreasing the half life in the soil. In areas where the soil may be frozen and extremely dry the half life of imazapyr will extend.

Half-life is the time required for half of the compound to degrade.

1 half-life	**=**	**50% degraded**
2 half-lives	**=**	**75% degraded**
3 half-lives	**=**	**88% degraded**
4 half-lives	**=**	**94% degraded**
5 half-lives	**=**	**97% degraded**

Remember: the amount of a chemical remaining after a half-life will always depend on the amount of the chemical originally applied.

Q: Is it likely that Polaris will seep into the groundwater?

A: Imazapyr has a high water solubility and theoretical potential for leaching. However, the combination of a low use rate, absorption on to soil and chemical degradation factor results in most residues staying in the top 12-18 inches of the soil profile, greatly decreasing the likelihood of imazapyr seeping to the groundwater.

Q: How effective is Polaris?

A: Polaris is the preferred herbicide on right-of-ways, bare ground, roadsides, and in forestry management for control of troublesome grasses such as foxtail, Italian ryegrass, quackgrass, and crabgrass; troublesome broadleaf weeds such as common chickweed, common & giant ragweed, kochia, lambsquarter, pigweed, Russian thistle, and wild parsnip; and vines and brambles such as morningglory, poison ivy, and multiflora rose. Tank mix Polaris with other herbicides to broaden the spectrum of control or when resistance to ALS herbicides is suspected.

Q: How may I obtain more information?

A: Feel free to visit http://www.nufarm.com/USIVM/IVMAquatics or contact your Nufarm sales representative