



# PRODUCT STEWARDSHIP BULLETIN

## NUFARM TROOPER™ HERBICIDE PRODUCTS TROOPER™ 22K, TROOPER™ P+D

*Nufarm promotes the responsible use and ongoing stewardship of our products and the critical technology that drives our business and that of our customers.*

*The information herein is provided to hasten product stewardship by offering convenient reference of important technical information, use restrictions, and guidelines for handling during storage and application.*

*Nufarm expects that all employees, customers, advisors and all others involved with the sales and recommendation of these products will be trained and aware of this information and remain committed to the responsible and respectful use of these products.*

### TROOPER™ 22K, TROOPER™ P+D

#### General Information

The Nufarm family of TROOPER™ herbicides is labeled for the long-term control of a wide variety of woody plants, and annual and perennial broadleaf weeds.

Picloram (4-amino-3,5,6-trichloropicolinic acid), a member of the pyridine carboxylic acid chemical family, is the key ingredient in each of the TROOPER™ products. Picloram has a long history of use, and was first registered for sale, distribution, and use in the United States in 1963.

#### Herbicide Mode of Action and Activity

The herbicide mode of action for picloram is similar to that of a plant growth regulator, mimicking naturally occurring plant auxins or hormones in a manner that leads to uncontrolled and abnormal plant growth, resulting in toxicity and death of sensitive species. Picloram is selective to broadleaf plants and woody species while grasses and grains are mostly tolerant.

#### Picloram Toxicity Overview

**ACUTE TOXICITY:** Low acute oral and dermal toxicity for mammals; moderately toxic by inhalation.

Note: the potassium salt and TIPA end use products are potential skin sensitizers.

**CARCINOGENICITY:** EPA has classified as a "Group E" chemical (no evidence of carcinogenicity).

**OTHER TOXICITY:** No evidence of mutagenicity, reproductive, or developmental toxicity.

**DIETARY:** Due to the use patterns for picloram, EPA has classified the picloram dietary risk as low.

**ECOTOXICITY:** Practically non-toxic to birds, mammals and honeybees. Picloram potassium salt is moderately toxic to freshwater fish.

#### Picloram Environmental Fate

Picloram is very persistent and mobile in soil; resistant to degradation by microbes, hydrolysis and photolysis. Picloram has half-life of 167 to 513 days with the primary route of dissipation as leaching due to its high water solubility. Because picloram is extremely phytotoxic to many non-target plants (crop and non crop), understanding environmental fate and mitigation of exposure to non-target species is a critical factor in the stewardship of picloram herbicides.

#### Primary Risk Factors when using Picloram Herbicides:

GROUNDWATER / SURFACE WATER CONTAMINATION

NON-TARGET PLANT PHYTOTOXICITY

THIS INFORMATION IS NOT A SUBSTITUTE FOR THE LABEL. ALWAYS READ AND FOLLOW LABEL DIRECTIONS CAREFULLY.

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## ENVIRONMENTAL HAZARDS AND IMPORTANT USE PRECAUTIONS WHEN USING TROOPER™ HERBICIDES

The following information is provided as a general overview of important product stewardship responsibilities and labeled instructions. **ALWAYS READ AND FOLLOW LABEL DIRECTIONS CAREFULLY PRIOR TO USE.**

### Precautions for Avoiding Injury to Non-Target Plants

**DO NOT** apply to areas that may be rotated to any broadleaf crop. **DO NOT** use manure from animals grazing treated areas or feeding on treated hay on land used for growing broadleaf crops, ornamentals, orchards or other susceptible, desirable plants. Manure may contain enough picloram to cause injury to susceptible plants. **DO NOT** use grass or hay from treated areas for composting or mulching of susceptible broadleaf plants or crops. **DO NOT** transfer livestock from treated grazing areas (or feeding of treated hay) onto sensitive broadleaf crop areas without first allowing 7 days of grazing on an untreated grass pasture (or feeding of untreated hay). Otherwise, urine and manure may contain enough picloram to cause injury to sensitive broadleaf plants. **DO NOT** contaminate water intended for irrigation or domestic purposes. To avoid injury to crops or other desirable plants, **DO NOT** treat or allow spray drift or run-off to fall onto banks or bottoms of irrigation ditches, either dry or containing water, or other channels that carry water that may be used for irrigation or domestic purposes. **DO NOT** use on flood or sub-irrigated land (such as pastures/meadows areas irrigated by periodic flooding or a shallow water table). **DO NOT** rotate to food or feed crops on treated land if they are not registered for use with picloram until an adequately sensitive bioassay or chemical test shows that no detectable picloram is present in the soil. **DO NOT** spray if the loss of forage legumes, including clover cannot be tolerated. This product may injure or kill legumes. New legume seedlings may not grow for several years following application of this herbicide. **DO NOT** apply to snow or frozen ground. Application during very cold (near freezing) weather is not advisable. TROOPER™ products should not be applied on residential or commercial lawns or near ornamental trees and shrubs. Untreated trees can occasionally be affected by root uptake of herbicide through movement into the topsoil or by excretion of the product from the roots of nearby treated trees. **DO NOT** apply TROOPER™ products within the root zone of desirable trees unless such injury can be tolerated. Conifer planting intervals vary. Pines planted sooner than six months after treatment with this product may be injured in the South or west of the Cascade Mountains. Other conifers, west of the Cascade mountains, may be injured if planted sooner than 8 to 9 months after treatment. For all conifers, the waiting period between treatment and planting should be 11 to 12 months in the area between the Cascade and Rocky Mountains and 8 to 9 months in the lake States and Northeastern U.S. **DO NOT** move treated soil to areas other than sites for which TROOPER™ products are registered for use. Also, **DO NOT** use treated soil to grow plants for which use of TROOPER™ products are not registered until an adequately sensitive bioassay or chemical test shows that no detectable residue of picloram is present in the soil. **DO NOT** make application when circumstances favor movement from treatment site. **DO NOT** apply TROOPER™ products through a mist blower. **DO NOT** apply TROOPER™ products through any type of irrigation system or chemigation system.

### Precautions for Avoiding Spray Drift

**DO NOT** apply or otherwise permit TROOPER™ products or sprays containing this picloram to contact crops or other desirable broadleaf plants, including but not limited to alfalfa, beans, cotton, grapes, melons, peas, potatoes, safflower, soybeans, sugar beets, sunflower, tobacco, tomatoes, and other vegetable crops, flowers, fruit plants, ornamentals or shade trees or the soil containing roots of nearby valuable plants.

Avoid spray drift. Exposure to very small quantities of spray or drift, which may not be visible, may cause serious injury to susceptible plants during active growth or dormant periods. To minimize spray drift, use low nozzle pressure; apply as a coarse spray; and use nozzles designed for herbicide application that do not produce a fine droplet spray. To aid in further reducing spray drift, a drift control or deposition aid may be used with TROOPER™ products, especially when water alone is used as the carrier. If a drift control aid is used, follow all use recommendations and precautions on the product label. **DO NOT** use a thickening agent with Microfoil or Thru-Valve booms, or other systems that cannot accommodate thick sprays.

**Ground Equipment:** With ground equipment spray drift can be lessened by keeping the spray boom as low as possible; by applying 10 gallons or more of spray per acre; by keeping the operating spray pressures at the manufacturer's recommended minimum pressures for the specific nozzle type used (low pressure nozzles are available from spray equipment manufacturers); by spraying when the wind velocity is low (follow state regulations). Avoid calm conditions which may be conducive to air inversions. Direct sprays no higher than the tops of target vegetation and keep spray pressures low enough to provide coarse spray droplets to minimize drift.

**Aerial Application:** Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment-and weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions. The following drift management requirements must be followed to avoid off-target drift movement from aerial applications: 1. The distance of the outer most operating nozzles on the boom must not exceed 3/4 the length of the wingspan or 90% of rotor width. 2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees. Where states have more stringent regulations, they must be observed. The aerial applicator should be familiar with and take into account the information covered in the Aerial Drift Reduction Advisory included on the label.

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TROOPER™ 22K	TROOPER™ P+D	Environmental Hazard Label Statements
	X	This pesticide is toxic to fish and aquatic invertebrates.
X	X	This pesticide is toxic to some plants at very low concentrations. Nontarget plants may be adversely affected if pesticide is allowed to drift from areas of application.
X	X	Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark.
X	X	Do not contaminate water when disposing of equipment washwaters.
X	X	Do not contaminate water used for irrigation or domestic purposes by cleaning of equipment or disposal of wastes.
X	X	Do not allow run-off or spray to contaminate wells, irrigation ditches or any body of water used for irrigation or domestic purposes.
X	X	Do not make application when circumstances favor movement from treatment site.
X		Picloram is a chemical which can travel (seep or leach) through soil and under certain conditions has the potential to contaminate groundwater which may be used for irrigation and drinking purposes. Users are advised not to apply picloram where soils have a rapid to very rapid permeability throughout the profile (such as loamy sand to sand) and the water table of an underlying aquifer is shallow or to soils containing sink-holes over limestone bedrock, severely fractured surfaces, and substrates which would allow direct introduction into an aquifer. Your local agricultural agencies can provide further information on the type of soil in your area and the location of groundwater.
X		An aquifer is defined as "an underground, saturated, permeable, geologic formation capable of producing significant quantities of water to a well or spring. It is the ability of the saturated zone, or portion of that zone, to yield water which makes it an aquifer" (American Chemical Society, 1983).
	X	Picloram is known to leach through soil into ground water under certain conditions as a result of agricultural use. 2,4-D has properties and characteristics associated with chemicals detected in groundwater. Use of these chemicals in areas where soils are permeable, particularly where the water table is shallow, may result in ground water contamination.
X	X	This chemical can contaminate surface water through spray drift. Under some conditions, picloram may also have a high potential for runoff into surface water (primarily via dissolution in runoff water). These include poorly draining or wet soils with readily visible slopes toward adjacent surface waters, frequently flooded areas, areas over-laying extremely shallow ground water, areas with in-field canals or ditches that drain to surface water, areas not separated from adjacent surface waters with vegetated filter strips, and areas overlaying tile drainage systems that drain to surface water.
	X	Most cases of groundwater contamination involving phenoxy herbicides such as 2,4-D have been associated with mixing/loading and disposal sites. Caution should be exercised when handling 2,4-D pesticides at such sites to prevent contamination of groundwater supplies. Use of closed systems for mixing or transferring this pesticide will reduce the probability of spills. Placement of the mixing/loading equipment on an impervious pad to contain spills will help prevent groundwater contamination.

## BEST MANAGEMENT PRACTICES AND PRODUCT STEWARDSHIP CONSIDERATIONS FOR TROOPER™ HERBICIDES

Is the applicator trained and certified to make the pending application?

Is the site properly buffered from sensitive crops and other off-target species, including ornamentals?

Is there surface water (ponds or streams) on site? If so, does the applicator know to keep a 50 feet buffer?

Are the wind conditions calm enough to prevent drift?

Is rain in the forecast? If so, should the application be delayed?

Does the applicator/land manager understand the grazing, haying and manure restrictions specified on the label?

Is there a risk of surface runoff of the herbicide, including erosion? (e.g., does the site contain steep slopes with bare soil?) If so, the application is not recommended.

Is the site a permanent pasture? (If there is intention to rotate to any field crops, ornamentals, tobacco, vegetables or other vegetation, application is not recommended.)

Does the applicator understand the sprayer clean-out and container disposal requirements?

Does the applicator have knowledge about the soil type of target site?

Does the applicator have knowledge about the water table depth of target site?

Is the intended application an approved and labeled use of the herbicide?

Is the selected herbicide and application method the best choice for management in this application zone?

### Additional Considerations:

**DIRECTED APPLICATION:** Banded or spot applications reduce the amount of chemical subject to drift.

**SPRAY ADDITIVES:** Drift control adjuvants are useful for management of droplet size and reduction of overspray.

**THRESHOLDS:** Make sure the infestation pressure justifies broadcast herbicide application.

**TANK-MIX PARTNERS:** Always consider the use precautions and restrictions for tank-mix partners.

**NO-APPLICATION BUFFER ZONES:** Applicators should vary the size of the buffer depending on factors affecting drift at the time and location of the application. Buffers must be downwind of treated crops and upwind of sensitive non-target sites.

**WIND EROSION:** Avoid treating powdery dry or light sandy soils when conditions are favorable wind blown displacement of soil particles with herbicide.

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REGISTERED PRODUCTS	TROOPER™ 22K	TROOPER™ P+D
EPA Reg No. **	228-535	228-530
Signal Word	CAUTION	WARNING
Restricted Use (RUP)	YES	YES
Lbs. of Picloram Acid Equivalent	2 lb (24.4% 4-amino-3,5,6-trichloropicolinic acid, potassium salt)	.54 lb (10.2% 4-amino-3,5,6-trichloropicolinic acid, triisopropanolamine salt)
Co-Formulation Acid Equivalent	none	2 lb 2,4-D (39.6% 2,4-dichlorophenoxyacetic acid, triisopropanolamine salt)
<b>** IMPORTANT: TROOPER™ products are not registered in all states.</b> Please refer to label or contact your local Nufarm distributor or representative for more information.		
LABELED USES		
Rangeland & Permanent Grass Pastures Conservation Reserve Program (CRP)	X	X
Fallow Cropland	X	
Non-Crop - Forest Planting & Manufacturing Sites	X	
Rights of Way - Electrical Power Line, Communication Lines, Pipelines, Roadsides, and Railroads	X	
Wildlife Openings in Forest and Non-Crop Areas	X	
APPLICATION METHODS		
Broadcast Ground & Aerial	X	X
High Volume Foliar	X	X
Modified High Volume Leaf-Stem	X	
Spot Treatment, Soil Spot Concentrate, Broadcast Cut Stubble, Special Ground Equipment	X	

User Safety Recommendations	Product	Personal Protective Equipment (PPE)	Restricted Entry Interval (REI)	Early Entry PPE
<b>Users Should:</b> <ul style="list-style-type: none"> <li>Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.</li> <li>Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.</li> <li>Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.</li> </ul>	TROOPER™ 22K	<b>Applicators and other handlers must wear:</b> Long-sleeved shirt and long pants Waterproof gloves Shoes plus socks.	12 hours	Coveralls Waterproof gloves Shoes plus socks.
	TROOPER™ P+D	Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category C on an EPA chemical resistance category selections chart. <b>All mixers, loaders, applicators, flaggers and other handlers must wear:</b> Long-sleeved shirt and long pants Chemical-resistant gloves such as Barrier Laminate, Nitrile Rubber, Neoprene Rubber or Viton Shoes plus socks and Protective eyewear. <b>Note: For containers of more than 1 gallon, but less than 5 gallons:</b> Mixer and loaders who do not use a mechanical system (such as probe and pump or spigot) to transfer the contents of the container must wear coveralls or chemical resistant apron in addition to other required PPE. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry. After each day of use, clothing or PPE must not be reused until it has been cleaned.	48 hours	Coveralls Chemical-resistant gloves Shoes plus socks, and protective eyewear.

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For additional information and technical support for Nufarm picloram based herbicides please contact:

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