United States
Environmental Protection
Agency

Office of Pesticides and Toxic Substances
Office of Pesticide Programs (TS-766C)
Washington, DC 20460

EPA Pesticide Fact Sheet

Name of Chemical: PICLORAM
Reason for Issuance:
Date Issued: March 31, 1985
Fact Sheet Number: 48

1. Description of Chemical

Common Name: Picloram
Chemical Name: 4-amino-3,5,6-trichloropicolinic acid
Trade Name: Tordon, Grazon, Amdon
EPA Shaughnessy Code: 005101
Chemical Abstracts Service (CAS) Number: 1918-02-1
Pesticide Type: Herbicide
Chemical Family: Picolinic Acid
U.S. and Foreign Producers: Dow Chemical Company

2. Use Patterns and Formulations

Picloram is used on permanent grass pastures in the eastern half of the United States, and is used primarily for the control of two woody plant species. These are hawthorn and multiflora rose. On rangeland in the western states, picloram is used to control bitterweed, knapweed, leafy spurge, locoweed, larkspur, mesquite, prickly pear, and snakeweed. In Nebraska, Montana, Wyoming, Minnesota and the Dakotas, it is used to control wild buckwheat and thistles in small grain such as wheat, oats, and barley. Formulations of picloram include potassium and amine salts with the potassium and triisopropanolamine salts being the most commonly used. There are nine EPA registered products currently on the market that either contain picloram as their sole active ingredient or contain mixtures of picloram and a phenoxy herbicide.

3. Science Findings

Summary science statement:

Picloram is highly phytotoxic, moderately toxic to cold water fish and certain combinations of picloram and 2,4-D may produce sensitizing reactions in humans. Water contamination is a major concern in the exposure of nontarget plants to picloram since this chemical has been detected in ground water apparently as a result of movement through soil or through contamination of wells and in surface waters from runoff from treated areas. Product chemistry information was generally satisfactory but the impurities need better quantification and analytical methodology. For chronic feeding studies, the acid form of picloram is considered equivalent to salts and ester forms. Although there is no evidence that picloram poses risks of unreasonable adverse

health effects, additional long-term studies have been identified as being necessary to support this conclusion and to support present and future tolerances. The Agency has concluded that the dietary cancer risk to the general public of HCB in the fat and milk of cattle fed picloram treated grass is an acceptable risk; however, the HCB must not exceed 200 ppm in the technical product. In addition, nitrosamine, if present, must not exceed 1 ppm.

Chemical Characteristics:

Picloram is a damp off-white to brown powder substance. Data indicates that picloram has low acute toxicity, low dermal irritation potential and is neither teratogenic nor mutagenic. Picloram is highly phytotoxic, and easily absorbed by roots and foilage. Technical picloram is a damp powder substance, off-white to brown in color, with a chlorine-like odor and a melting point of 215°C. Picloram is stable in both acidic and basic media. It is subject to photodecomposition by ultraviolet radiation in aqueous solution. At 25°C pure picloram is soluble in water at 0.043 grams per 100 milliliters. The vapor pressure of picloram is 6.2×10^{-6}mm at 45°C. The empirical formula for picloram is $C_6H_3Cl_3N_2O_2$.

Toxicology Characteristics:

The data on short term effects, environmental effects and genetic mutation, as well as one NCI cancer study, support the current registration of picloram. The registrant is conducting a new rat feeding study to clarify the ambiguous results of the second NCI study. The Agency has no current evidence indicating that use of picloram may result in unreasonable adverse effects to human health or the environment, although more data are needed on long term effects to support this conclusion.

Environmental Characteristics:

Photodegradation and aerobic soil degradation are the main processes for dissipation of picloram in the environment. Following normal agricultural, forestry, and industrial applications, long-term accumulation of picloram in the soil does not occur. The half-life of picloram under most field conditions is a few months, but it may exceed one year or more, especially in dry climates. Picloram has a moderate mobility in soil and its relatively high water solubility and low soil absorption indicate that it has the potential to leach in soil.

Ecological Characteristics

Picloram is highly phytotoxic and is easily absorbed by roots and foilage. In soils not subject to leaching, it is very persistent; phytotoxicity has been detected in some cases well over one year after application. Picloram appears to be practically non-toxic to birds, moderately toxic to cold water fish and slightly toxic to warm water fish. However, chronic studies on lake trout suggest that low concentrations of picloram will adversely affect the rate of yolk sac absorption and growth of fry.

Efficacy review results, where conducted:

No efficacy data was reviewed because no public health uses were involved.

Tolerance assessment:

The established tolerances for picloram are not supported by the data now available to the Agency. Until significant toxicological studies are submitted and reviewed and it is determined whether there are concerns, the Agency cannot consider any new petitions for tolerances. If the toxicological studies indicate that additional residue data are required, an assessment of existing tolerances and new tolerance petitions will be made.

4. Summary of Regulatory Position and Rationale:

°Use

Picloram is classified as a Restricted Use Pesticide due to possible groundwater contamination and hazard to fish and wildlife.

°Formulations

Formulations of picloram include potassium and amine salts with the potassium and triisopropanolamine salts being the most commonly used. Liquid product concentrations of picloram range from 0.25 to 2 pounds acid equivalent per gallon while pelleted formulations of picloram range from 2 to 10 percent acid equivalent by weight.

°Manufacturing process or geographical restrictions

The Agency will require precautionary label statements advising against the use of picloram in very permeable,

i.e., well-drained soils such as karst limestone and loamy sands. The Agency will require the registrants to do ground-water monitoring studies. While the data gaps are being filled, currently registered manufacturing-use products containing picloram as the sole active ingredient may be sold, distributed, formulated and used in the United States, subject to the terms and conditions of this standard.

°Unique warning statements

Manufacturing-Use Products - "Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or public waters unless this product is specifically identified and addressed in an NPDES permit. Do not discharge effluent containing this product into sewer systems without previously notifying the sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the Environmental Protection Agency."

End-Use Products - "Restricted Use Pesticide. Potential ground water contaminant. Toxic to non-target plants. For retail sale to and use only by applied by certified applicators or persons under their supervision and only for those uses covered by the certified applicator's certification. Picloram is a chemical which can travel (seep or leach) through soil and can contaminate ground water which may be used as drinking water. Picloram has been found in ground water as a result of agricultural use. Users are advised not to apply picloram where the soils are very permeable, i.e., well-drained soils such as karst limestone and loamy sands. Your local agricultural agencies can provide further information on the type of soil in your area and the location of ground water."

For rotated crops: "Do not rotate food or feed crops on treated land if they are not registered for picloram."

For ditchbank uses: "Water contaminated with residues of picloram from ditch bank uses shall not be used to irrigate crops which are not registered for use with this chemical."

For picloram mixtures with 2,4-D: "Warning: Avoid contact with skin, eyes or clothing. Avoid repeated skin contact since sensitizing reactions may occur."

For non-aquatic uses: "Do not apply directly to water or wetlands. Do not contaminate water by cleaning of equipment or disposal of wastes."

For aquatic uses: "Consult your State Fish and Game Agency before applying to public waters. Permits may be required before treating such waters. Do not apply directly to water except as directed on the labeling. Do not contaminate water by cleaning of equipment or disposal of wastes."

5. Summary of major data gaps

Major Data gaps exist for all scientific disciplines:

Product Chemistry - Product Composition, Analysis of Ingredients.
Residue Chemistry - Plant, Animal Metabolism, Analytical Methods.
Toxicology - Acute, Chronic and Mutagenicity Testing.
Environmental Assement - Metabolism, Mobility, Degradation Studies
Ecological Effects - Avian and Mammalian, Aquatic Organism, Non-target phytotoxicity and Non-target Insect Testing.

6. Contact person at EPA

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