

PESTICIDE TYPE	FUNGICIDE
CHEMICAL CLASS	Phenyl-acetamide FRAC Code: U6
COMMON TRADE NAMES	Miltrex, Cyflufenamid
APPLICATION RATE (lbs a.i./A)	0.011-0.022 0.044 maximum
REGISTRATION STATUS	EPA: Registered June 2012
TOXICITY PROFILE FOR APPLICATORS	Signal word: Caution Toxicity Category III
BASIC MANUFACTURER	Nippon Soda Co.
MDA LABORATORY CAPABILITIES	In discussion

HUMAN HEALTH

NON-CANCER	Acute PAD = N/A Chronic PAD = 0.044 mg/kg/day
CANCER	Likely to be Carcinogenic to Humans <u>Unit Risk Factor (Q*)</u> : 6.61×10^{-3} mg/kg/day ⁻¹ <u>Lifetime Dietary Risk (U.S. Population)</u> : 9.5×10^{-7}

Acute PAD and Chronic PAD are the PODs with all relevant uncertainty and safety factors included

ENVIRONMENTAL AQUATIC TOXICITY

FISH	Acute: 520 ppb Chronic: 200 ppb
INVERTEBRATE	Acute: 1,730 ppb Chronic: N/A
AQUATIC PLANTS	Vascular: 247 ppb Non-vascular: 269 ppb

OPP LOCs have been applied to all values

Introduction

Cyflufenamid acts as both a protective and curative fungicide used to control powdery mildew on vegetables, fruits and outdoor landscape and nursery ornamentals. It is formulated as a suspension concentrate, and applied as postemergence broadcast foliar spray using ground or aerial equipment. The mode of action of cyflufenamid is unknown, it is suggested that the mechanism is different from that of existing fungicides and that it may exhibit inhibitory effects at multiple life-cycle stages. Minnesota Department of Agriculture (MDA) extensive review of the U.S. Environmental Protection Agency (EPA) cyflufenamid labels and risk assessments for issues relevant to Minnesota is summarized below.

Projected Use in Minnesota

Cyflufenamid is labeled for use on some minor crops in Minnesota: apple, grapes, various berries, and pumpkin. It's projected or potential use in Minnesota cannot be predicted at this time, though the minor use patterns associated with proposed registrations are unlikely to result in significant use.

The EPA has granted the conditional registration of 2 end-use products. Both products are the same 10% active ingredient suspension concentrate. Cyflufenamid is labeled for residential uses.

- **Miltrex 10 SC Fungicide** (EPA Reg. No. 8033-103; Registered in MN) – Distributor label trade name is Torino. For agricultural use only, labeled for cucurbit vegetables, grapes, pome fruit and low growing berries.
- **Cyflufenamid 10 SC Fungicide** (EPA Reg. No. 8033-104) – Powdery mildew control in outdoor landscape and outdoor nursery ornamentals.

Label Environmental Hazards

Water quality:

- The cyflufenamid label carries enforceable language related to direct application to surface waters, equipment cleaning and drift.
- Labels for pesticide applications carry advisories for surface water, runoff reduction potential from vegetative buffers, and avoiding applications before rainfall.

Other:

- This pesticide is toxic to fish and aquatic invertebrates

Toxicology and Exposure

EPA's screening models generate high-end, conservative exposure estimates for active ingredients and toxicologically significant degradates. Model inputs include annual usage at maximum use rates, maximum treated acres, maximum food residues, peak runoff and drift scenarios, etc. Some proposed products, application rates and use scenarios are not relevant to Minnesota. EPA's estimates, therefore, may not reflect future use and impacts in Minnesota.

Human Health

- **Carcinogenic Effects**- Classified as "Likely to be Carcinogenic to Humans." EPA has determined the chronic population adjusted dose (PAD) is protective of all long-term effects, including potential carcinogenicity. As a result, a separate dietary exposure assessment for the purpose of assessing cancer risk was not considered necessary.
- **Drinking Water Guidance**- High-end, screening exposure estimates for drinking water suggest that applications of cyflufenamid may result in surface water and groundwater detections; however, EPA concludes that conservative exposure estimates are below levels of concern for the general population and all population subgroups.
- **Occupational Exposure**- Low acute toxicity. Occupational exposure and risk estimates indicate that worker handler and post-application exposures are not of concern at the maximum allowable application rates for the proposed uses. Occupational short-term and intermediate-term dermal and inhalation exposures are expected from cyflufenamid handler activities, but the margin of exposure is below the level of concern. No hazard was identified for the dermal route of exposure, so non-cancer dermal risks were not assessed.

Environment- Non-target Species

- **Aquatic Life Exposure** – High-end screening exposure estimates for risks to fish generated some concern and cyflufenamid is classified as moderately toxic to fish; however, EPA concludes risks are mitigated by labeling requirements. Estimated surface water concentrations do not exceed 1% of the available aquatic toxicity benchmarks.
- **Ecotoxicity Database** – Studies were not submitted or were considered scientifically invalid for a number of surrogate animal and plant species. In the absence of such studies, the ecological risk assessment estimates the likelihood of risk based on previously submitted related studies and addresses uncertainties through label mitigation. Risk assessments may change with the submittal of additional data on: chronic risk to freshwater fish, risk to nonvascular plants and risk to listed terrestrial plants.

Environmental Fate

Soil

- **Half-life**- Aerobic = 7 to 408 days (six of 7 soils tested had half-life between 7 to 40 days); Anaerobic = stable
- **Adsorption**- K_{oc} : 1,934 to 3,087 mg/L (low mobility).
- **Persistence**- Cyflufenamid is moderately persistent to persistent. It has the potential to bioaccumulate in aquatic organisms.

Water

- **Half-life via hydrolysis**- stable
- **Surface water**- Cyflufenamid may contaminate surface water through spray drift and by penetrating the foliar canopy during application and foliar wash-off to the soil followed by runoff of soil particles to which cyflufenamid is absorbed
- **Groundwater**- Based on environmental fate properties and the proposed application methods, cyflufenamid use may lead to ground water contamination.

Air

- **Volatilization**- Volatilization of cyflufenamid (low vapor pressure 3.54×10^{-5} Pa at 20°C) is not likely.

Degradates

There are four environmental degradation products of cyflufenamid are known, three major (149-F, 149-F1, and 149-F11) and one minor (149-F6). Available data indicate that the four degradates are less toxic than cyflufenamid. They are mobile to very mobile compounds and have short to very long half-lives. These products may reach surface water following runoff of cyflufenamid-adsorbed soil particles or runoff of the degradation products in the dissolved phase. Some of the degradation products are highly mobile in soil and are likely to leach into ground water and may recharge to surface water. Although there is potential for ground water contamination by degradation products, it is expected that the total toxic residue approach used in EPA risk assessment will provide surface water concentration that are protective for all aquatic environments.