Flutriafol

CAS 76674-21-0; EPA PC CODE 128940

New Use Review
August 2012

PESTICIDE TYPE	**Fungicide**
CHEMICAL CLASS	DMI FRAC Code 3
COMMON TRADE NAMES	TopGuard
APPLICATION RATE (lbs a.i./A)	Single: 0.057-0.114 Max Annual: 0.228
REGISTRATION STATUS	EPA: Registered 4/29/10 Minnesota: 6/1/10
TOXICITY PROFILE FOR APPLICATORS	Signal word- Caution Toxicity III or IV
BASIC MANUFACTURER	Cheminova
MDA LABORATORY CAPABILITIES	In discussion

HUMAN HEALTH	
NON-CANCER	Acute PAD = 2.5 mg/kg/day Chronic PAD = 0.05 mg/kg/day
CANCER	Not Likely to be Carcinogenic

Acute and chronic PADs are doses that include all relevant uncertainty and safety factors

ENVIRONMENTAL AQUATIC TOXICITY	
FISH	Acute: 33,000 ppb Chronic: 4,800 ppb
INVERTEBRATE	Acute: 67,100 ppb Chronic: 310 ppb
AQUATIC PLANTS	Vascular: 780 ppb Non-vascular: 460 ppb

Level of Concern (LOC) has been applied to all values

Introduction

Flutriafol is a systemic, demethylation inhibitor (DMI) fungicide that can be used as a curative or a preventive treatment. It was first registered by EPA for use on apples and soybeans in 2010. It is registered in Minnesota, but has never been sold here. In 2012 it was approved by EPA for use in corn, both field and pop. Flutriafol is formulated as a suspension-concentrate (SC) containing. Broadcast applications can be made with ground and aerial equipment. Flutriafol inhibits the specific enzyme, C14-demethylase, a fungal cyctochrome P450, which plays a role in sterol production. Sterols, such as ergosterol, are needed for fungal membrane structure and function, and are essential for the development of functional cell walls. Minnesota Department of Agriculture (MDA) extensive review of the U.S. Environmental Protection Agency (EPA) flutriafol labels and risk assessments for issues relevant to Minnesota is summarized below.

Projected New Use in Minnesota

Flutriafol has been previously registered for use on soybeans, but has not been sold in Minnesota. The new approved use of flutriafol on corn will be added to the TopGuard label already listing soybean and apple use. It has not appeared in University of Minnesota Extension corn fungicide evaluation trials. Furthermore, heavy use is not likely due to the many products already in the corn fungicide market.

Label Environmental Hazards

Water Quality:

- Labels for crop applications carry advisories for surface water and groundwater impacts, runoff reduction potential from vegetative buffers, and avoiding applications before rainfall.
- Flutriafol cannot by applied through any type of irrigation system.

MINNESOTA DEPARTMENT OF AGRICULTURE

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 "Not Likely to be Carcinogenic to Humans"
- Drinking Water Guidance- High-end, screening exposure estimates for drinking water suggest that applications of flutriafol may result in surface water and, in some environmental conditions, groundwater detections requiring a Minnesota-specific risk assessment by the Minnesota Department of Health; however, EPA concludes that conservative exposure estimates are below levels of concern for the general population and all population subgroups. The MDA will further explore laboratory and monitoring capabilities to assess potential impacts and related risks.
- Occupational Exposure- Low acute toxicity. Based on the proposed uses risks to applicators are not of concern, except post-application risks for detasselling of corn and girding/turning of grapes. For these crop/activity combinations, exposures are not acceptable until day 5 after application, and label crop re-entry restrictions are designed to mitigate related risk concerns. In addition, dislodgeable foliar residue (DFR) data are being requested to further refine risk estimates.

Environment- Non-target Species

- Aquatic Life Exposure – High-end, screening exposure estimates for risks to fish and invertebrates generated some concern and flutriafol is classified as slightly toxic to fish and invertebrates; however, EPA concludes risks are mitigated by labeling requirements.
- New Use Exposure - The proposed new use does not generate unacceptable risks to terrestrial plants, terrestrial invertebrates, fish, aquatic invertebrates, aquatic non-vascular and vascular plants.

Environmental Fate

Soil

- Half-life- Aerobic = 84-3466 days
- Adsorption- K_d: 2.0-13.6 mL/g
- Persistence- Flutriafol is expected to be persistent in soils. Bioaccumulation is not expected.

Water

- Half-life via hydrolysis- Greater than one year.
- Surface water- Flutriafol is expected to reach surface water and/or adjacent terrestrial environments through drift, runoff, and discharge from groundwater.
- Groundwater- The potential for mobility, combined with half-lives greater than one year, indicate that under some environmental conditions, flutriafol does possess the potential to reach groundwater.

Air

- Volatilization- The vapor pressure (4×10^{-7} Pa) of flutriafol indicates that volatility is not a major route of dissipation for this chemical in the environment.

Degradates

Major degradates were not detected in laboratory or field studies. A minor degradate, which is a common degradate to other fungicides, 1,2,4-triazole was found in studies. 1,2,4-triazole has been determined to be of toxicological significance for human health, and was included in the dietary and drinking water exposure assessments.