Florpyrauxifen-benzyl

DEPARTMENT OF AGRICULTURE

CAS 1390661-72-9; EPA PC CODE 030093 | NEW ACTIVE INGREDIENT REVIEW | MAY 2018

PESTICIDE TYPE	HERBICIDE
Chemical Class	Arylpicolinate
Common Trade Names	ProcellaCOR™ EC
Major Degradate	Multiple degradates
Application Rate (lb a.i/A/year)	Max Annual: 0.1054
Registration Status	EPA: Registered unconditionally in September 2017 Minnesota: 2018
Toxicity Profile for Applicators	Signal word: Caution IV *(oral, dermal, and inhalation)* III *(eye exposure)*
Basic Manufacturer	SePRO Corporation
MDA Laboratory Capabilities	In discussion
HUMAN HEALTH	
Non-Cancer	Acute PAD= not needed* Chronic PAD= not needed
Cancer	Not likely to be carcinogenic to humans
Acute and chronic PADs are doses that include all relevant uncertainty and safety factors	
ENVIRONMENTAL AQUATIC TOXICITY	
Fish	Acute: >24.5 ppb Chronic: 37.3 ppb
Invertebrate	Acute: >20.9 ppb Chronic: >38.5 ppb
Aquatic Plants	Vascular (NOAEC): 0.0048 ppb Non-vascular (NOAEC): 12.4 ppb
POLLINATOR TOXICITY	
Honey Bee	Acute Contact (LD50): >40 µg/bee Acute Oral (LD50): >105.4 µg/bee
Level of Concern (LOC) has been applied to all values. **Because no residues of toxicological concern are expected in drinking water or diet. EPA's Health Effects Division did not need these values.*	

INTRODUCTION

Florpyrauxifen-benzyl is a new active ingredient that belongs to WSSA (Weed Science Society of America) Group 4 or HRAC (Herbicide Resistance Action Committee) Group O. Florpyrauxifen-benzyl is a new synthetic auxin which kills susceptible plants by causing disruption of growth processes. The USEPA has unconditionally registered florpyrauxifen-benzyl for postemergence weed control in freshwater aquatic sites including foliar application to emergent aquatic vegetation or direct application to water body use sites. The aquatic use is intended for management of freshwater aquatic vegetation in slow-moving/quiescent waters with little or no continuous outflow in ponds, lakes, reservoirs, freshwater marshes, wetlands, bayous, drainage ditches, and non-irrigation canals, including shoreline and riparian areas in or adjacent to these sites, as well as, management of invasive freshwater aquatic vegetation in slow-moving/quiescent areas of rivers. As per USEPA, florpyrauxifen-benzyl is classified as a Reduced Risk status based predominantly on reduced risk to human health compared to other registered alternatives. The Minnesota Department of Agriculture (MDA) extensive review of the USEPA florpyrauxifen-benzyl product labels and risk assessments for issues relevant to Minnesota is summarized below.

PROJECTED USE IN MINNESOTA

- This new active ingredient can be applied to aquatic sites for the control of target plants such as hydrilla, Eurasian watermilfoil, and crested floating heart. For the in-water use, the concentration of the active ingredient in the volume of water must be calculated. Three applications of florpyrauxifen-benzyl are permitted per year, with a maximum active ingredient concentration of 50 ppb per application. For the aquatic foliar application, the maximum allowed single application rate is 0.0527 lb a.i./A, with a maximum of two applications per year. A 14 day interval is required between two applications. According to the Department of Natural Resources (DNR), the use of florpyrauxifen-benzyl may expand in the state especially for the management of Eurasian watermilfoil. This herbicide is found in 2 end-use products. Currently, the following product is registered in MN.
- **ProcellaCOR™ EC** (EPA Reg. No. 67690-80) – The product carries 2.7% of florpyrauxifen-benzyl and is approved for postemergence weed management in aquatic sites.

LABEL ENVIRONMENTAL HAZARDS

- Under certain condition, treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants, which may cause fish suffocation.
- Water bodies containing very high densities of weeds should be treated in sections to prevent the potential suffocation of fish.
- Consult with the State agency (DNR) for fish and game before applying to public waters to determine if a permit is needed.

Other

- A set of Best management Practices given on the label must be followed while applying products comprising florpyrauxifen–benzyl.
- Do not apply products containing florpyrauxifen–benzyl through any type of irrigation systems.
- The product label has restrictions for use of treated water for irrigation.
- Do not allow livestock to drink treated water and do not compost any plant material from treated area.
- Do not apply where spray drift may occur to food, forage, or other plantings that might be damaged. The product requires to follow spray drift management for both aerial and ground applications.

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

According to the USEPA's Health Effects Division quantitative risk assessment was not required for dietary, residential, occupational, or aggregate exposure. No risks of concerns have been identified from the qualitative human health risk assessments.

- **Carcinogenic Effects** – Florpyrauxifen–benzyl is classified as "not likely to be carcinogenic to humans".
- **Drinking Water Guidance** – Because of low mobility of florpyrauxifen–benzyl leaching is not expected to leach to groundwater. Based on the proposed aquatic uses, florpyrauxifen–benzyl reaching water bodies by drift or by direct application is expected to degrade quickly to XDE–848 acid which is structurally similar to florpyrauxifen–benzyl and have same or lesser toxicity as the parent chemical. The USEPA did not have any hazard concern from florpyrauxifen–benzyl or its degradates in surface drinking water sources as they are not expected to cause any human health adverse effects.
- **Occupational Exposure** – The USEPA concluded that occupational risks to florpyrauxifen–benzyl do not pose a significant human health risk regardless of the route of exposure.

Non–target Species

- **Stressor of concern** – Florpyrauxifen–benzyl is toxic to plants and may pose a risk of concern to non–target aquatic and terrestrial plants.
- **Aquatic & Terrestrial Life Exposure** – Risk from aquatic use exceeded USEPA's level of concern for aquatic vascular plants. To reduce the risk, the label allows application of florpyrauxifen–benzyl at or below 50 ppb in the treatment area at the time of application. Chronic risk did not exceed for freshwater fish or invertebrates. However, acute risks to freshwater fish and invertebrates slightly exceeded the USEPA's level of concern. Florpyrauxifen–benzyl is not expected to bioaccumulate in fish. Florpyrauxifen–benzyl is practically non–toxic on an acute basis to birds, mammals, reptiles, and bees. Exposure may occur to terrestrial plants through spray drift or runoff. Label carries a language to reduce spray drift.

ENVIRONMENTAL FATE

Florpyrauxifen–benzyl (XDE–848 benzyl ester) is expected to dissipate quickly from water because of its rapid photolysis and aerobic aquatic metabolism. It has a relatively low potential for volatility from water, moist soils, and dry surfaces. It shows low mobility in soils and readily binds to soil or sediment.

Soil

- **Half–life** (20°C) – Aerobic: 55.3 days
  Anaerobic: 41.5 days
- **Mobility** – K_{OC} is 32,280 L/kg_{oc}

Aquatic

- **Half–Life** – Aerobic: 4–6 days
  Anaerobic: 2 days
- **Half–life via hydrolysis** – 111 days (pH=7)
- **Photolysis in water** – 0.16 days
- **Persistence** – DT_{50} value 1.4 to 6.4 days

Sediment

- **Half–Life** – Aerobic: 8.36 days, Anaerobic: 2.65 days

Air

- **Volatilization** – slightly volatile from water surface, vapor pressure = 3.5 X 10^{-7} Torr at 25°C; Henry's law constant 1.3 X 10^{-5} atm m^3 $mole^{-1}$

Degradates

Florpyrauxifen–benzyl transforms into several degradates while XDE–848 acid, XDE–848 hydroxy acid, and XDE–848 benzyl hydroxy are the major degradates. Major degradates are expected to have the same or lesser toxicity and hazard concern similar to florpyrauxifen–benzyl. These major degradates persist longer than the parent compound; however, potential accumulation of the total toxic residues in sediment for extended periods of time appears to be low, since the degradates have low mobility than the parent compound. USEPA does not have higher hazard concern from these degradates than the parent for drinking water, aquatic life, or terrestrial life.