STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION AND FORESTRY
BOARD OF PESTICIDES CONTROL
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GOVERNOR

AMANDA E. BEAL
COMMISSIONER

To: Board Members
From: P. Bryer, BPC Toxicologist
Re: Summary of toxicity topics for the Specialized Local Needs (SLN) application of Express, *a.i. tribenuron-methyl* [Allows the use of Express to control bunchberry on lowbush blueberry crops.]
Date: February 28, 2019

Tribenuron-methyl is an herbicide in the sulfonylurea family. It is typically used as a post-emergent herbicide in cereal crops; there is no tolerance for tribenuron-methyl for blueberries. It is taken up across the leaf surface and has little to no soil activity. Tribenuron-methyl acts by inhibiting cell division, specifically by inhibiting acetolactate synthase (ALS). Chlorosis appears within days then typically followed by plant death within 3 weeks.

Known fate summary:
Tribenuron-methyl is not expected to volatilize from wet or dry soils. In the air it will remain in particulate form. Sunlight does not cause the molecule to breakdown. The K_{OC} (63) of tribenuron-methyl indicates potential for groundwater leaching. Once in the soil breakdown is promoted by microbial communities and acid soils. The microbial biodegradation half-life is approximately 10 days. The abiotic degradation half-live ranges from 1 to 15.8 days in soils of pHs of 5 to 7, respectively.

Long term soil leaching studies show that tribenuron-methyl penetrates to a depth of 2-6 inches but not deeper. The same study showed an aquatic tracer to move through the entire soil column (much deeper than 6 inches). These field data indicate that in practice this a.i. does not pose a significant threat to groundwater because of rapid biodegradation and decay of the molecule.

Known toxicity summary:
In laboratory animals (rabbits, rats, dogs, and guinea pigs) the following areas have been examined: dermal responses, hematology, urinalysis, histopathology, ophthalmologic changes, organ weights, blood markers of organ function, growth, development, reproduction, chromosome alterations, gene mutation (Ames assay), and estrogenic activity. Tribenuron-methyl can be a sensitizer in some situations, though the animal data are inconsistent. Tribenuron-methyl is classified as a possible human carcinogen though there are no animal data supporting carcinogenicity. Tribenuron-methyl and several metabolites have weak estrogenic activity in female rats. The NOAEL is 20 mg/kg/d and the LOAEL is 125 mg/kg/day.

The short-term, acute, data indicate that fairly high levels are required to kill a variety of organisms. This compound has LD_{50}s developed on rats, rabbits, mallard ducks, bobwhite quail, honey bees, bluegill sunfish, freshwater microalgae, rainbow trout, water flea, and green algae. Of this list only the algae showed unusual sensitivity to the compound. For example, in rainbow trout the LD_{50} was >1,000 ppm in a static exposure test of the formulated product; whereas, the freshwater microalgae, *Chlorella fusca*, has a LD_{50} of 80 ppb. The honey bee oral LD_{50} is >100 ug; in honey bees 100 ug is a benchmark level that indicates no significant oral toxicity.

Once in the body tribenuron-methyl is rapidly and extensively metabolized. The primary route of elimination is the urine. The potential for bioaccumulation in aquatic organisms is low, its BCF is 3 (calculated from a Kow of 0.78).

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