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EEB REVIEW

Chemical: Acephate (Orthene 75S)

100 Submission Purpose and Label Information

100.1 Submission Purpose and Pesticide Use

The registrant (Chevron Chemical Company) proposes to amend the Orthene 75S label to add use on macadamia nuts for thrips control. This use is currently registered under Section 24(c). No new data were submitted with this request.

100.2 Formulation Information

Active Ingredient:

Acephate	75%
Inert Ingredients.	25%

100.3 Application Methods, Directions, Rates

Application rate is 2/3 to 1-1/3 lb Orthene 75S (0.5 to 1.0 lb ai) per acre. Apply in sufficient water for thorough coverage. Begin applications when insects first appear (usually during peak flowering period) and repeat as necessary to maintain control. Use the higher rate with heavier insect infestations.

Application is restricted to certified applicators and day spraying only, with mandatory intensive searches for bats prior to spraying and mandatory subsequent flushing of all bats prior to application of Orthene. If bats remain in the area, Orthene may not be applied.

100.4 Target Organisms

Target organisms are thrips. Species are not identified.

100.5 Precautionary Labeling

This pesticide is toxic to birds. Applications may adversely affect birds in rangeland treatment areas. Do not apply directly to water or wetlands. Cover or soil-incorporate spills. This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if bees are visiting the treatment area.

Also see Sec 100.3, above, for restrictions specific to macadamia nuts.

101 Hazard Assessment

101.1 Discussion

Acephate is currently registered for use on numerous vegetable, fruit, and field crops, as well as ornamentals and noncrop areas. Registered rates range from 0.1 to 5 lb ai per acre, with multiple applications often allowed.

The proposed label amendment would allow foliar application of Orthene 75S to macadamia nuts. This use is currently registered under a 24(c).

101.2 Likelihood of Adverse Effects on Nontarget Organisms

Terrestrial Organisms

Acephate is considered to be no more than slightly toxic to birds on a dietary basis (mallard LC50 > 5000 ppm; bobwhite LC50 = 1280 ppm). On an acute oral basis, acephate is moderately toxic, with LD50 values of 140 mg/kg for ring-necked pheasant and 234 mg/kg for mallard. These values do not indicate a potential for significant avian hazard via use of acephate.

EEB's concern, however, is with methamidophos, a degradate of acephate which is highly toxic to birds. Calculations by Balcomb (1984, Acephate Registration Standard), indicate a significant potential for hazard to birds at 1 lb acephate ai per acre.

On the basis of his calculations, Balcomb imposed several data requirements on acephate-methamidophos. Although the registrant has submitted data to address these requirements, review of the data has not been completed. EEB will defer the development of a final avian hazard assessment at this time, pending review and validation of the methamidophos residue data. (For a complete discussion of the acephate-methamidophos hazard to birds, please see the Supplement to Acephate Registration Standard, R. Balcomb, Dec. 26, 1984).

Available data on toxicity to mammals were outlined by Rostker (EEB review out 5/21/84, proposed conditional registration of Orthene on macadamia nuts). She concluded as follows:

"While EEB has no information on mammalian presence in macadamia orchards, any in the area will risk at least chronic and sub-lethal hazard from use of acephate. The effects on the population are unknown to date."

In the same review, Rostker developed a detailed analysis of potential hazard to the Hawaiian Hoary Bat, an endangered species. This matter will be discussed under Sec. 101.3, Endangered Species Considerations.

Acephate is known to be highly toxic to bees, as indicated under Environmental Hazards on the Orthene label. Use as proposed (daytime application only, to protect the endangered bat; bloom application, due to pest situation) will result in significant potential for exposure and hazard to honey bees.

I discussed this situation with Mr. Ken Teramoto of USDA/ARS in Honolulu. According to Mr. Teramoto, macadamia nectar is prized by beekeepers who produce high quality honey. These beekeepers place their hives in the macadamia orchards during bloom. This factor adds support to the idea that a bee hazard situation exists.

Aquatic Organisms

Aquatic organism testing indicates that acephate is relatively nontoxic to freshwater fish (LC50 values generally greater than 100 ppm), and no more than moderately toxic to aquatic invertebrates (LC50 values range from 1.3 to >1000 ppm). Hazard to nontarget aquatic organisms is not anticipated from the proposed use.

101.3 Endangered Species Considerations

As noted above, the proposed use on macadamia nuts generates concern for one endangered species: the Hawaiian Hoary Bat. This matter was reviewed in detail by Rostker. As a result of her review, EEB initiated formal Section 7 consultation with the Office of Endangered Species in May, 1984.

OES provided a response to EEB's consultation request in August, 1984. In its biological opinion, OES stated its belief that the registration of Orthene for use on macadamia nut orchards was likely to jeopardize the continued existence of the Hawaiian Hoary Bat. OES also provided measures and restrictions which it believed would remove the jeopardy determination.

In a memo dated September 12, 1984, EEB (Rostker) evaluated the OES response and the proposed restrictions on Orthene use. EEB did not agree with the OES recommendation for night application; otherwise, EEB generally concurred with the stipulations outlined by OES.

Application restrictions to protect the endangered bat were outlined in a letter from William Miller to Chevron Chemical Company, dated September 25, 1984. EEB believes that these restrictions are still valid, and that no changes are necessary at this time.

101.4 Adequacy of Toxicity Data

The existing database is adequate to assess hazards to nontargets under the proposed amendment, with the exception of hazard to birds from methamidophos residues.

101.5 Adequacy of Labeling

Labeling restrictions outlined in the September 25, 1984 letter are adequate.

103 Conclusions

EEB has reviewed the proposed label amendment to expand use of Orthene to include application to macadamia nuts. Proposed use should not present a hazard to nontarget aquatic organisms. Birds and small mammals associated with macadamia nut orchards may be at risk from the proposed use. Use as directed (daytime application during bloom), presents a significant hazard to honey bees. The labeling restrictions outlined above, as provided by OES and amended by EEB, should adequately protect the endangered Hawaiian Hoary Bat. The proposed use should not result in exposure of any other endangered species.

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