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Reregistration Eligibility Decision for Cypermethrin (revised 01/14/08)

List B

Case No. 2130

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Cypermethrin is a combination of 8 stereoisomers with percentage compositions ranging from 11-14%, and very low volatility and water solubility. Zeta-cypermethrin is an enriched enantiomer of cypermethrin consisting of the 4 stereo isomers with an “S” configuration at the cyano bearing carbon at 24% each, and 4 insecticidally less active stereo isomers at a concentration of 1% each. Since the analytical method does not distinguish cypermethrin from zeta-cypermethrin, and the toxicological endpoints are the same, the Agency’s human health risk assessment and environmental fate assessment considered both cypermethrin and zeta-cypermethrin.

C. Use Profiles

Type of Pesticide: Insecticide

Summary of Use: Cypermethrin is registered for agricultural use as a foliar application on food and feed crops including cotton, pecans, peanuts, broccoli and other Brassicas, and sweet corn. Cypermethrin can be applied to livestock in eartags, and to horses. Cypermethrin is also registered for use on industrial, commercial, and residential sites. It is registered for outdoor use as a soil residual termiticide and to control insect pests such as ants in and on structures, impervious surfaces (in perimeter and crack and crevice treatments) and lawns. Cypermethrin can also be applied indoors to control ants, cockroaches, fleas, and other insects.

Target Organisms: Cypermethrin is registered for control of a wide range of pests.

Mode of Action: It is likely that the toxic action of pyrethroids is primarily due to their blocking action on some aspect of the synaptic function of the nerve axon.

Tolerances: There are 23 cypermethrin tolerances established under 40 CFR §180.418(a)(1) for pecans, bulb onions, cottonseed, head and stem brassica, green onions, head lettuce, leafy brassica and for the milk, fat, meat, and meat byproducts of cattle, goats, hogs, horses, and sheep.

Use Classification: Agricultural products are restricted use. Residential, commercial, and industrial products are general use (can be purchased and applied by professional applicators or by residential applicators).

Formulation Types: Cypermethrin is formulated as an emulsifiable concentrate (EC), a soluble concentrate/liquid (SC/L), and a wettable powder (WP). Cypermethrin is compatible with a number of insecticides and fungicides, and has been formulated in products with two or more active ingredients.

estuarine/marine fish, the lowest toxicity values reported were an LC₅₀ of 0.39 µg a.i./L (rainbow trout), and an LC₅₀ of 0.95 µg a.i./L (sheepshead minnow), indicating that these organisms all have a similar susceptibility to cypermethrin. For freshwater invertebrates the lowest toxicity values reported were an LC₅₀ of 0.0036 µg a.i./L (waterflea) and for estuarine/marine invertebrates an LC₅₀ of 0.00475 µg ai/L (mysid shrimp), approximately 100 times lower than the toxicity values reported for fish. These results indicate that freshwater and estuarine/marine invertebrates are substantially more sensitive than other types of aquatic organisms to cypermethrin toxicity, and that they are expected to be at greatest risk for acute effects (death).

The available experimental LC₅₀ value for benthic amphipods is expressed in terms of sediment concentration of cypermethrin (LC₅₀ = 3.6 µg a.i./kg sediment). To assess risk to benthic organisms in terms of pore water, a surrogate benthic organism LC₅₀ value for pore water (0.00257 µg a.i./L pore water) was derived using the sediment LC₅₀ value and the average K_{oc} value (141,700) for cypermethrin. In oysters, cypermethrin is categorized as highly toxic (370 µg a.i./L).

Cypermethrin formulations are also very highly toxic, with LC₅₀ values that are similar to those reported for technical grade cypermethrin.

Table 4. Cypermethrin (Technical Grade) Acute Toxicity Reference Values for Aquatic Organisms.					
Exposure Scenario	Species	Exposure Duration	Toxicity Reference Value (µg a.i./L)	Effects	Reference
Freshwater Fish	rainbow trout	96 hours	LC ₅₀ = 0.39 µg a.i./L	Morbidity	MRID 44546027
Freshwater Invertebrates	amiphod	48 hours	LC ₅₀ = 0.0036 µg a.i./L	Morbidity	MRID 44423501
Benthic Organisms	amphipod	10 days	<u>sediment value</u> (experimental data): LC ₅₀ = 3.6 µg a.i./kg sediment <u>pore water value</u> (derived data): LC ₅₀ = 0.00257 µg a.i./L pore water	Morbidity and Growth	MRID 44074406

Labeling Changes Summary Table 16

In order to be eligible for reregistration, amend all product labels to incorporate the risk mitigation measures outlined in Section IV. The following table describes how language on the labels should be amended.

Table 16: Summary of Labeling Changes for Cypermethrin		
Description	Amended Labeling Language	Placement on Label
For all Manufacturing Use Products	<p>“Only for formulation into an <i>insecticide</i> for the following use(s) [fill blank only with those uses that are being supported by MP registrant].”</p> <p>“This product must not be formulated into end-use products that contain directions for use on sod farms, agricultural uncultivated areas, fencerows, hedgerows, or rights-of-way. These use sites must be removed from all end-use product labels and any special need registration must be canceled.</p> <p>“This product must not be formulated into wettable powder end use formulations unless they are packaged in water soluble bags.”</p> <p>“This product must not be formulated into end-use products that contain directions for use on both agricultural crops and for other uses, such as in and around residential, commercial and industrial sites or on farm animals. This product may only be formulated into end-use products that with directions for use for agricultural crop (WPS) uses only, or end-use products with directions for use for non-agricultural-crop (Non-WPS) uses only.”</p>	Directions for Use
One of these statements may be added to a label to allow reformulation of the product for a specific use or all additional uses supported by a formulator or user group	<p>“This product may be used to formulate products for specific use(s) not listed on the MP label if the formulator, user group, or grower has complied with U.S. EPA submission requirements regarding support of such use(s).”</p> <p>“This product may be used to formulate products for any additional use(s) not listed on the MP label if the formulator, user group, or grower has complied with U.S. EPA submission requirements regarding support of such use(s).”</p>	Directions for Use
Environmental Hazards Statements Required by the RED and Agency Label Policies	<p>“This pesticide is toxic to fish and aquatic invertebrates. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans, or other waters unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has</p>	Precautionary Statement

	been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the EPA.”	
End Use Products for WPS (agricultural) use ONLY		
Restricted Use Pesticide required for all products.	“RESTRICTED USE PESTICIDE Due to Toxicity to fish and aquatic invertebrates or retail sale to and use only by certified applicators or persons under the direct supervision and only for those uses covered by the certified applicator’s certification.”	Front Panel and Directions for Use
<p>Handler PPE Requirements Established by the RED¹ for Wettable Powder Formulations packaged into water soluble bags.</p> <p>Note: Wettable powder formulations must be packaged in Water Soluble Bags to be eligible for Reregistration. As an alternative, a dry flowable formulation may be developed.</p>	<p>“Personal Protective Equipment (PPE)”</p> <p>“Some materials that are chemical-resistant to this product are (<i>registrant inserts correct chemical-resistant material</i>). If you want more options, follow the instructions for category [<i>registrant inserts A,B,C,D,E,F,G,or H</i>] on an EPA chemical-resistance category selection chart.”</p> <p>“Mixers, loaders, applicators, and other handlers must wear:</p> <ul style="list-style-type: none"> > Long-sleeve shirt and long pants, > Shoes plus socks, and >In addition to the above, handlers using hand-held equipment must also wear chemical-resistant gloves.” <p>“See engineering controls for additional requirements.”</p>	Precautionary Statements under Hazards to Humans and Domestic Animals
<p>Handler PPE Requirements Established by the RED¹ for Liquid Concentrate and Dry Flowable formulations.</p>	<p>“Personal Protective Equipment (PPE)”</p> <p>“Some materials that are chemical-resistant to this product are (<i>registrant inserts correct chemical-resistant material</i>). If you want more options, follow the instructions for category [<i>registrant inserts A,B,C,D,E,F,G,or H</i>] on an EPA chemical-resistance category selection chart.”</p> <p>“Mixers, loaders, applicators, and other handlers must wear the following:</p> <ul style="list-style-type: none"> > Long-sleeve shirt and long pants, 	Precautionary Statement under Hazards to Humans and Domestic Animals

	<p>> Shoes and socks and >In addition to the above, handlers using hand-held equipment must also wear chemical-resistant gloves.”</p> <p>“See engineering controls for additional requirements.”</p>	
User Safety Requirements	<p>“Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables exist, use detergent and hot water. Keep and wash PPE separately from other laundry.</p> <p>If the product is a concentrate and pesticide handlers are required to wear coveralls, use the following statement in addition to the statement above.</p> <p>“Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product’s concentrate. Do not reuse them.”</p>	Precautionary Statements under: Hazards to Humans and Domestic Animals immediately following PPE Requirements
<p>Engineering controls for Wettable Powder Formulations, formulated into water soluble bags.</p> <p>Note: Wettable powder formulations must be packaged in Water Soluble Bags to be eligible for Reregistration. As an alternative, a dry flowable formulation may be developed.</p>	<p>“Engineering controls”</p> <p>“Water-soluble packets when used correctly qualify as a closed mixing/loading system under the Worker Protection Standard for Agricultural Pesticides [40 CFR 170.240(d)(4)]. Mixers and loaders using water-soluble packets must :</p> <ul style="list-style-type: none"> -wear the personal protective equipment required in the PPE section of this labeling for mixers and loaders, and -be provided, must have immediately available for use, and must wear in an emergency, such as a broken package, spill, or equipment breakdown a NIOSH-approved respirator with: <ul style="list-style-type: none"> -- a dust/mist filter with MSHA/NIOSH approval number prefix TC-21C <i>or</i> -- any N, R, P, or HE filter.” <p>Instruction to Registrant: Drop the “N” type prefilter from the respirator statement, if the pesticide product contains, or is used with, oil.</p> <p>“Pilots must use an enclosed cockpit that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(6)].”</p> <p>“Human flagging is prohibited. Flagging to support aerial application is limited</p>	Precautionary Statements under Hazards to Humans and Domestic Animals Immediately following the User Safety Requirements

	to use of the Global Positioning System (GPS) or mechanical flaggers.”	
Engineering controls for Liquids and Dry Flowables	<p>“Engineering controls”</p> <p>“Pilots must use an enclosed cockpit that meet the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(6)].”</p> <p>“Human flagging is prohibited. Flagging to support aerial application is limited to use of the Global Positioning System (GPS) or mechanical flaggers.”</p>	Precautionary Statements: Hazards to Humans and Domestic Animals Immediately following the User Safety Requirements
User Safety Recommendations	<p>“USER SAFETY RECOMMENDATIONS”</p> <p>“Users should wash hands with plenty of soap and water before eating, drinking, chewing gum, using tobacco, or using the toilet.”</p> <p>“Users should remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.”</p> <p>“Users should remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.”</p>	<p>Immediately following Engineering Controls</p> <p>(Must be placed in a box.)</p>
Environmental Hazards	<p>“This pesticide is toxic to fish, aquatic invertebrates, oysters and shrimp. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean water mark. Do not apply when weather conditions favor drift from treated areas. Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when disposing of equipment wash waters.”</p> <p>“This pesticide is highly toxic to bees exposed to direct treatment on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds while bees are actively visiting the treatment area.”</p>	Precautionary Statements immediately following the User Safety Recommendations
Restricted-Entry Interval for products with directions for use within scope of the Worker Protection Standard for Agricultural Pesticides	“Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.”	Place in the Direction for Use, In Agricultural Use Requirements Box

(WPS)		
Early Entry Personal Protective Equipment for products with directions for use within the scope of the WPS	<p>“PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:</p> <ul style="list-style-type: none"> * coveralls, * shoes plus socks * chemical-resistant gloves made of any waterproof material.” 	Place in the Directions for Use In Agricultural Use Requirements box, immediately following the REI
General Application Restrictions	<p>“Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.”</p>	Place in the Directions for Use directly above the Agricultural Use Box.
Buffer Zone Requirements	<p>“BUFFER ZONES”</p> <p>“Vegetative Buffer Strip Construct and maintain a minimum 10-foot-wide vegetative filter strip of grass or other permanent vegetation between the field edge and down gradient aquatic habitat (such as, but not limited to, lakes; reservoirs; rivers; permanent streams; marshes or natural ponds; estuaries; and commercial fish farm ponds).”</p> <p>“Only apply products containing (<i>name of pyrethroid</i>) onto fields where a maintained vegetative buffer strip of at least 10 feet exists between the field and down gradient aquatic habitat.”</p> <p>“For guidance, refer to the following publication for information on constructing and maintaining effective buffers: <i>Conservation Buffers to Reduce Pesticide Losses. Natural Resources Conservation Services. USDA, NRCS. 2000. Fort Worth, Texas. 21 pp.</i> http://www.in.csusda/v/technical/agronom/newconbuf.pdf”</p> <p>“Buffer Zone for Ground Application (groundboom, overhead chemigation, or airblast) Do not apply within 25 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, streams, marshes, ponds, estuaries, and commercial fish ponds).”</p> <p>“Buffer Zone for ULV Aerial Application Do not apply within 450 feet of aquatic habitats (such as, but not limited to,</p>	Place in Directions for Use under the heading “BUFFER ZONES”

