



Department of Pesticide Regulation



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MEMORANDUM

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TO: Dr. Marylou Verder-Carlos
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FROM: John Sanders, Ph.D., Environmental Program Manager II *[Original signed by J. Sanders]*
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SUBJECT: AZINPHOS-METHYL MITIGATION

In June 2005, the Department of Pesticide Regulation (DPR) management issued a risk management directive for azinphos-methyl (AZM), identifying occupational exposures that were of concern. Mitigation action was to be based on the need to limit acute and short-term exposures below 75 micrograms/kilograms (ug/kg), seasonal exposures below 25 ug/kg/day, and chronic exposures below 1.5 ug/kg/day. Using margins of exposure (MOEs) from DPR's Risk Characterization Document as benchmarks, the concerns were for short-term, seasonal and chronic exposure of peach, nectarine, orange and apple thinner and harvesters (Table 1). The purpose of this memorandum is to review the U. S. Environmental Protection Agency's (U.S. EPA) actions on AZM, and to determine if additional mitigation measures need to be developed beyond what U.S. EPA has proposed.

Table 1
DPR Azinphosmethyl Margins of Exposure (MOE) for Activities of Concern

Work Task	Exposure			
	Acute ¹	Short-term ¹	Seasonal ²	Chronic ²
Harvester-peach/nectarine	9	8	7	8
Harvester-apple			10	10
Thinner-peach/nectarine	10	8	7	8
Thinner-apple			13	13

¹target MOE>10

²target MOE>30

U.S. Environmental Protection Agency Actions

The U.S. Environmental Protection Agency (U.S. EPA) completed their Interim Reregistration Eligibility Decision of azinphos-methyl (AZM) in October 2001. The following year, AZM registrants signed a Memorandum of Agreement with U.S. EPA, dividing AZM uses into three groups (Table 2). Group 1 contained 23 crops with little use. U.S. EPA issued a cancellation order for Group 1 uses on December 2005, with crop uses to be deleted from product labels immediately. Group 2 contained



seven uses that were phased out in September 2006. Group 3 is comprised of 10 uses which have time-limited registrations

Table 2
AZM Uses As Categorized by Group

Group 1	Group 2	Group 3
Alfalfa	Caneberries	Almonds
Beans	Cotton	Apples and crabapples
Birdsfoot trefoil	Cranberries	Blueberries (lowbush and highbush)
Broccoli	Nectarines	Brussels sprouts (application to soil at transplant only)
Cabbage	Peaches	Sweet cherries
Cauliflower	Potatoes	Tart cherries
Celery	Southern pine seed orchards	Nursery stock
Citrus		Parsley
Clover		Pears
Cucumbers		Pistachios
Eggplant		Walnuts
Filberts		
Grapes		
Melons		
Onions (green and dry bulb)		
Pecans		
Peppers		
Plums and dried plums		
Quince		
Spinach		
Strawberries		
Tomatoes		

In November 2006, U.S. EPA issued their final decision for the remaining 10 uses of AZM. Based on grower impact assessment, EPA determined that extending the restricted entry interval (REI) on these crops would not be feasible. Further, EPA chose not to require additional worker protection measures (e.g. additional clothing or gloves) because of the possibility of heat stress and other factors associated with fieldwork. AZM use on Brussels sprouts and nursery stock was terminated as of September 2008; use on almonds, walnuts, and pistachios were phased out in 2009; and use on apples/crabapples, blueberries, cherries, pears and parsley will be terminated on September 30, 2012. All distribution, sale and use will be prohibited as of that date, except the sale or distribution of AZM products for the purposes of proper disposal, reformulation, relabeling, or export. These activities may continue until such stocks are depleted.

In the interim, U.S. EPA developed graduated rate reductions for each of the remaining AZM uses during the phase out period. Registrants have conditionally agreed to put U.S. EPA's final decision in place by amending all pending applications for continued registration and by requesting voluntary cancellation of their registrations.

Apples, pears, cherries, parsley, and blueberries are the only crops that remain in Group 3. Cultural practices involved in the production of parsley suggest that exposure is of minimal concern. AZM use on blueberries is not allowed in California. For apples and pears, U.S. EPA has adopted the following mitigation:

- Use will be cancelled as of September 30, 2012;
- Aerial application is prohibited;
- Seasonal application rate reductions were put into place beginning in 2007. The 2011-12 maximum application rate per year for apples and pears is 1.5 pounds active ingredient per acre (lbs a.i. /A). In July 2009, U.S. EPA received a request from a registrant to alter the application rate reductions for apples, with the maximum application rate remaining at 2 lbs a.i./A through the end of the phaseout period. U.S. EPA denied this request on March 5, 2010. The 2011-12 maximum application rate per year for cherries is 0.75 lbs a.i./A.
- Require a 60-foot buffer zones for permanent water bodies;
- Require a 60-foot zone for houses and occupied buildings. EPA required the following wording to all labels, "Do not apply this product within 60 feet of (1) buildings occupied by humans for residential, commercial, or business purposes, including, but not limited to, homes, farmworker housing, or other residential buildings, schools, daycare centers, nursing homes, hospitals, and (2) outdoor recreational areas such as school grounds, athletic fields, and parks. Non-residential agricultural buildings, including barns, livestock facilities, sheds, and outhouses are not included in this;
- Registrants were required to develop a post-application worker stewardship program, designed to educate post-application workers on how to reduce their exposure to all pesticides, including an AZM-specific component.
- A sliding scale for "pick your own" harvesting REI was put in place for apples, ranging from 33 days for lower application rates to 44 days for the highest application rate. "Pick your own" harvesting is prohibited on pears and cherries if AZM was applied.

In December 2008, EPA issued a proposal to revoke the tolerance for azinphos-methyl, and provided a 60-day comment period which invited public comment. In September 2009, U.S EPA announced that they would not revoke tolerances for residues of azinphos-methyl on a number of commodities, including apples, pears, and cherries. This decision was based on comments which expressed a need to retain specific tolerances for importation purposes into the United States.

AZM-related Illnesses in California

Between 1995 and 2008, California's Pesticide Illness and Surveillance Program (PISP) database reported 18 illness/injury cases that were definitely, probably, or possibly related to AZM use. Two cases involved exposure during mixing, loading and application activities to apples; one case resulted in an eye injury and the second worker developed nausea, vomiting and a headache. Two cases involved exposure during applications to almonds. One of these cases resulted in a blistered rash on the applicator's forearms. The second case resulted in eye irritation and tearing. Exposure to both of these workers occurred after they removed their personal protective equipment. The other 14 cases were the result of exposure during activities other than mixing, loading or applying AZM. Nine of these cases were due to offsite drift of the pesticide; four of these incidents resulted in persons experiencing dizziness and nausea. Five cases were the result of working in previously treated orchards; the persons involved in these incidents all reported skin effects.

Assessment of Need for Additional Mitigation Measures

Use of AZM in California has declined steadily. In 2000, a total of 185,054 lbs a.i. was applied to 32 different crops/sites. In 2010, a total of 1,619 lbs a.i. of AZM was applied to three different crops/sites. 2010 applications were to apples, pears, and cherries, with 1,055 pounds (65%) applied to apples. All uses will be cancelled as of September 30, 2012. Because current use is negligible, and all uses will be cancelled within the year, I recommend that DPR consider the AZM mitigation complete.

References:

Department of Pesticide Regulation (DPR). 2011. Pesticide use report annual 2009 indexed by chemical. CalPip Data Server, DPR.

United States Environmental Protection Agency, 2006. Final Decisions for the Remaining Uses of Azinphos-methyl. November 16, 2006.

United States Environmental Protection Agency, 2008. Azinphos-methyl; Product Cancellation Order and Amendments to Terminate Uses. Federal Register: February 20, 2008 (Volume 73, Number 34). <http://www.epa.gov/fedrgstr/EPA-PEST/2008/February/Day-20/p3112.htm>.

United States Environmental Protection Agency, 2010. Review of a Label Amendment Request for Azinphos-methyl, including Public Comments. Memorandum from Scientists of Biological Analysis Branch. March 5, 2010.