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OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

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MEMORANDUM

SUBJECT: Azinphos-Methyl (ALISS)
PC #58001

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In the course of reviewing a confined rotational crop study (#41393601) and updating the status of environmental fate data requirements for AZINPHOS-METHYL, I noticed that no apparent attention has been given in any of the studies to the formation of degradates/metabolites containing the organophosphate moiety alone. These degradates can form by cleavage of the -S-P-C- bridge at the P-S or the P-C bonds. That this can be the case is substantiated by the numerous degradates/ metabolites containing solely the benzazimide and/or the phenyl moiety that have been identified in all of the laboratory degradation studies, whose formation necessarily involve cleavage of the -S-P-C- bridge. Among the organophosphate degradates that may form are anionic species such as O,O'-dimethyldithiophosphate, O,O'-dimethyl phosphate, and O,O'-dimethylthiophosphate. These species would have potential to leach to ground water.

The reason the degradates containing only a benzazimide or the phenyl moiety have been identified is that all radiolabeled studies were conducted

by radiolabeling the phenyl ring, but no studies were conducted by radiolabeling the carbons associated with organophosphate moiety. Nor there were apparent attempts to use analytical methodology (such as ^{31}P Nuclear Magnetic Resonance) to identify any of the organophosphate degradates that could form.

In the review of the Accumulation in Confined Rotational Crops (EFGWB #0919; Copy attached) the Branch has requested from the registrant to address the issue of formation/fate/transport of degradates/metabolites containing only the organophosphate moiety. It is possible that the registrant has the information available, but have not submitted it to the Agency. In case that the information is not available at the present time, the registrant should be required to submit data showing the formation/fate/transport of degradates containing the organophosphate moiety.

163-1 Mobility in Soil Data Requirement

The Branch has Freundlich sorption constants for parent azinphos-methyl only in three soils, instead of the four soils required by the guidelines. Therefore, a batch-equilibrium adsorption/desorption study conducted with an agricultural sand soil of <1% organic matter content must be conducted.

The "aged" part of the requirement was addressed by a soil column leaching study (one soil only). The Branch currently prefers that the "aged" part of the 163-1 requirement be fulfilled by submission of batch-equilibrium adsorption/desorption studies conducted separately with each major degrade/metabolite.

164-1 Terrestrial Field Dissipation

Studies conducted on turf will be required if registration for uses on turf are still supported by the registrant.

As indicated in TABLE A, the series of terrestrial field dissipation presently available do not fulfill present guideline requirements. Therefore, new studies are required conducted following the recommendations given in SOP #540/09-90-073 (NTIS #PB90-208935). Submission and approval of protocols prior to starting the studies is highly recommended. Studies must be conducted with each formulation and the maximum application rate recommended for each of the formulation.

Ground and/or Surface Water Monitoring Studies

The Ground Water Monitoring studies are RESERVED and will be trigger by the results of the new terrestrial field dissipation studies. The Branch also reserves the need for Surface Water Monitoring/Run-off studies.

TABLE A. AZINPHOS-METHYL: Status of Environmental Fate Data Requirements

Data Requirement	MRID #	Acceptability	Status of Requirement
161-1 Hydrolysis	00029899	Yes Science Chapter, 6/26/86	Fulfilled ¹
161-2 Photodegradation in Water	40297001	Yes 12/11/87; EFGWB #70971	Fulfilled ¹
161-3 Photodegradation on Soil	40297002	Yes 12/11/87; EFGWB #70971	Fulfilled ¹
161-4 Photodegradation in Air			Reserved ²
162-1 Aerobic Soil Metabolism	00029900	Yes Science Chapter, 6/26/86	Fulfilled ¹
162-2 Anaerobic Soil Metabolism	00029900	Yes Science Chapter, 6/26/86	Fulfilled ¹
162-1 Anaerobic Aquatic Metabolism	-	Waived 3/1/88; EFGWB #80294	Waived
162-4 Aerobic Aquatic Metabolism			Not Applicable

¹ The registrant has been requested (EFGWB #91-0915) to address the formation/fate/transport of degradates containing solely an organophosphate moiety.

² These studies are RESERVED pending final evaluation of the vapor pressure determination study.

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TABLE A. AZINPHOS-METHYL: Status of Environmental Fate Data Requirements

Data Requirement	MRID #	Acceptability	Status of Data Requirement
163-1 Mobility in Soil (Soil Column Leaching; Adsorption/Desorption)	00029885 00029887	These studies appear in the Science Chapter as acceptable and to fulfill data requirements. However, under current requirements these studies would not fulfill requirements. Batch-equilibrium adsorption desorption studies with parent azinphos-methyl in an agricultural sand (<1% OM) and with each major degradate (four soils) are still required.	
163-2 Volatility from Soil (Lab.)			Reserved ²
163-3 Volatility from Soil (Field)			Reserved ²
164-1 Terrestrial Field Dissipation	00144667 00144669 00144673	A series of terrestrial field dissipation studies (at 4 lb ai/A) were reviewed at the for the Registration Standard and found acceptable to fulfill data requirements. However, <u>under current guidelines these studies would not be acceptable</u> (depth of sampling 12-inches instead of the minimum 36-inches currently required). All the studies were conducted in the late seventies. <u>New studies are required.</u>	
164-2 Aquatic (sediment) Field Dissipation			Not Applicable
164-3 Forestry Dissipation			Waived
164-4 Dissip. Combination/Tank Mixes	3//1/88; EFGWB #80294		Not currently imposed
164-5 Terrestrial Field Dissipation (Long-term)			Reserved

TABLE A: AZINPHOS-METHYL: Status of Environmental Fate Data Requirements

Data Requirement	MRID #	Acceptability	Status of Data Requirement
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Accumulation Studies:

165-1 In Confined Rotational Crops	41393601 Submitted 2/28/90	Reviewed 12/20/91 and found not acceptable at the time. Acceptability depends on satisfactory additional information. EFGWB #91-0915	
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165-2 Rotational Crops (Field)	Reserved
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165-3 In Irrigated Crops	Waiver Request 04/05/88	This waiver request had not been seen by EFGWB. However, in the 1986 Registration Standard the Branch indicated that the 165-3 requirement could be waived if the labels of products containing AZINPHOS-METHYL carry a statement prohibiting use of water leaving treated fields for purposes of irrigating other crops. If the waiver request is based on the recommended label statement, then the 165-3 requirement may be waived.	
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165-4 In Fish	00112146	Acceptable Science Chapter, 6/26/86	Fulfilled
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165-5 In Aquatic Non-Target Organisms		Waived 3/1/88; EFGWB #80294	Waived
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TABLE A AZINPHOS-METHYL: Status of Environmental Fate Data Requirements

Data Requirements	MRID #	Acceptability	Status of Data Requirement
<u>Other Studies</u>			
Ground and/or Surface Water Monitoring Studies			Reserved (See accompanying memorandum).

SPRAY DRIFT STUDIES

201-1 Droplet Size Spectrum In a review dated 6/19/87, the submitted drift studies (Accession #073605) were considered unacceptable at the time, but it was indicated that the studies could be upgraded by submission of additional data. There are no records in EFGWB files that the additional data has been received.

202-1 Drift Field Evaluation.....