

US EPA ARCHIVE DOCUMENT



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAR 7 1991

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

EFGWB # 91-0165,-0164
CHEMICAL BC # 109702
DP BARCODE # 158026,158096
CASE # 2130
ACTION CODE 603

MEMORANDUM

SUBJECT: Review of Phase IV Package for the List B chemical **Cypermethrin**

FROM: Bruce F. Kitchens, Chemist *Bruce Kitchens*
Environmental Chemistry Review Section #3
Environmental Fate and Ground Water Branch/EFED (H7507C)

THRU: Akiva Abramovitch, Chief *Akiva Abramovitch*
Environmental Chemistry Review Section #3
Environmental Fate and Ground Water Branch/EFED (H7507C)

Hank Jacoby, Chief *Hank Jacoby*
Environmental Fate and Ground Water Branch
Environmental Fate and Effects Division (H7507C)

TO: Amy Rispin, Chief
Science Analysis and Coordination Staff
Environmental Fate and Effects Division (H7507C)

The use patterns as outlined in the IUIS report of 11/19/90 are as follows: Terrestrial Food Crop, Terrestrial Food+Feed Crop, Terrestrial Non-Food Crop, Terrestrial Non-Food+Outdoor, Greenhouse Food Crop, Greenhouse Non-Food Crop, Outdoor Residential, Indoor Food, Indoor Non-Food, Indoor Medical, and Indoor Residential. Cypermethrin is used as an insecticide.

The environmental fate data requirements for the aforementioned use patterns are as follows:

- 161-1 Hydrolysis
- 161-2 Photolysis in Water
- 161-3 Photolysis on Soil
- 162-1 Aerobic Soil Metabolism
- 162-2 Anaerobic Soil Metabolism
- 163-1 Leaching & Adsorption/Desorption
- 164-1 Terrestrial Field Dissipation
- 165-1 Confined Rotational Crop

165-2 Field Rotational Crop
165-4 Accumulation in Fish
201-1 Droplet Size Spectrum
202-1 Field Spray Drift Evaluation

The following data requirements are held in reserve pending results of tiered studies or the receipt of and evaluation of additional data:

164-5 Long Term Soil Dissipation
165-5 Accumulation in Aquatic Non-Target Organisms
166-1 Ground Water small-prospective
166-2 Ground Water small-retrospective
166-3 Ground Water large-retrospective
167-1 Field Runoff
167-2 Surface Water Monitoring

It must be noted that the IUIS report failed to address the cis-trans isomer ratio in technical cypermethrin.

In attached correspondence, the registrant requests waivers of the following data requirements.

161-4 Photolysis in Air
163-2 Lab Volatility
163-3 Field Volatility
164-5 Long Term Soil Dissipation
165-5 Accumulation in Aquatic Non-Target Organisms
166-1 Ground Water Small-prospective
166-2 Ground Water Small-retrospective
166-3 Ground Water-large retrospective

EFGWB will waive the Photolysis in Air, Lab Volatility, and Field Volatility data requirements since the reported vapor pressure is 1×10^{-7} Pa @ 20°C.

In the Phase 3 response the registrant indicates that new studies will be submitted for the Hydrolysis, Photolysis in Water, Photolysis on Soil, Aerobic Soil Metabolism, Anaerobic Soil Metabolism, Leaching & Adsorption/Desorption, Terrestrial Field Dissipation, and Confined Crop Rotation data requirements. A new fish accumulation study is also needed. New field crop rotation data may also have to be submitted pending evaluation of the confined crop rotation study.

Four summaries and one new study were submitted in this package. The following are Phase 3 summaries: Cypermethrin Field Crop Rotation Study MRID # 98000, The Accumulation and Elimination of WL 43467 by the Rainbow Trout MRID # 90061, The Accumulation, Distribution and Elimination of Ripcord by Rainbow Trout Using a Continuous-Flow Procedure MRID # 90062, and The Description of Beginning Materials and Manufacturing Process and Discussion of the Formation of Impurities for Cypermethrin Technical MRID # 86966. The Hydrolysis of FMC 42497, FMC 45724, and FMC 30980 Insecticides, MRID # 416627-01, is a new study and is reviewed in this package.

At this time no acceptable confined rotational crop study has been submitted. The field crop rotation study will be reviewed upon submission of an acceptable confined crop rotation study. Cypermethrin Field Crop Rotation Study, MRID 98000, was previously reviewed on 5/14/82 EFGWB # 82-270 and accepted without a confined rotational crop study. However, the study does not adequately meet current Guidelines since soil residues were not identified. In defending the field accumulation in rotational crop data the registrant claims that the confined rotational crop data to be submitted will indicate that there is virtually no evidence of uptake in rotational crops. In the event that acceptable confined crop rotation data will not show accumulation in rotated crops a new field study will not be required.

The Accumulation and Elimination of WL 43467 by the Rainbow Trout (*Salmo gairdneri*), MRID # 90061, is a static study. This type of bioaccumulation in fish study does not follow the Agency guidelines and thus was not reviewed.

The Accumulation, Distribution, and Elimination of Ripcord by the Rainbow Trout using a continuous-flow procedure, MRID # 90062, was previously reviewed on 4/29/82 EFGWB # 82-130, -131 and accepted. However, as indicated in the registrant's summary report the study does not meet current guidelines and has several serious deficiencies such as (1) the pesticide concentration in the water was not constant, (2) no control group was run, and (3) fish was not appropriately analyzed for edible vs. viscera.

DATA EVALUATION REPORT

Shaughnessy No.109702

Common Name: (+)-alpha-cyano-(3-phenoxyphenyl) methyl(+)-cis, trans-3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate

Chemical Name: Cypermethrin

Formulation: WP,EC,Soluble Conc.,RTU Liquid

Data Requirement:161-1

Allsup, T.L. November 1976. Hydrolysis of FMC 45497, FMC 45724, and FMC 30980 Insecticides. Report No. W-0131. FMC Corporation, Agricultural Chemicals Division, Richmond, CA. 94804. MRID # 416627-01.

Reviewed by: Bruce Kitchens
Title: Chemist
Organization: OPP/EPA/EFED/EFGBW
Telephone: 557-4355

Signature: Bruce Kitchens

Date: MAR 5 1991

Approved by: Akiva Abramovitch
Title: Supervisory Chemist
Organization: OPP/EPA/EFED/EFGBW
Telephone: 557-1975

Signature: Akiva Abramovitch

Date: MAR 5 1991

CONCLUSIONS:

The hydrolysis data of FMC 45497, FMC 45724, and FMC 30980 Insecticide does not satisfy the hydrolysis data requirement (161-1). Data are needed for pH 5, 7, and 9. This study has several deficiencies which are detailed below.

1. Study was conducted at pHs 3, 6, and 9 instead of the recommended pHs 5, 7, and 9.
2. An insufficient number of data points were taken to establish the degradation curve.
3. Identification of degradation products was made only by TLC.
4. Evidence of sterility of the buffer solutions was not reported.
5. Material balance not reported.
6. Half-lives were not reported for all pH 3 samples.
7. The initial concentration of 0.005 ppm does not seem adequate enough to track decline of the parent compound or formation and decline of degradates.

At pH 3, FMC 45497 (cis-cypermethrin), FMC 45724 (trans-cypermethrin), and FMC 30980 (48% cis-52% trans-cypermethrin) were stable to hydrolysis @ 25°C after 28 days. No half-lives were reported.

At pH 6, cis-cypermethrin, trans-cypermethrin, and cis-trans cypermethrin were stable to moderately susceptible to hydrolysis @ 25°C. Cis-cypermethrin was stable to hydrolysis. At 28 days, 52% of Trans-cypermethrin remained undegraded while 38.5% of cis-trans cypermethrin remained undegraded. Half-lives of 26 days and 40 days were reported for trans-cypermethrin and cis-trans cypermethrin, respectively.

At pH 9, cis-cypermethrin, trans-cypermethrin, and cis-trans cypermethrin were hydrolyzed rapidly @ 25°C. At 96 hours, 51% cis-cypermethrin remained undegraded. At 48 hours, 59% of trans-cypermethrin remained undegraded. At 72 hours, 60% of cis-trans cypermethrin remained undegraded.

The major degradates were cis DCVA (cis-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid) and trans DCVA (trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid). The major degradates did not form in amounts greater than 10%. Unidentified polar products formed in minor amounts.

TEST MATERIAL:

The following test ¹⁴C materials were used in this study:

- 1) cis-cypermethrin (+) alpha-cyano-3-phenoxybenzyl (+)-cis-2,2-dimethyl-3-(2,2-dichlorovinyl) cyclopropane-1-carboxylate (FMC 45497-acid-¹⁴C), S.A. 54.8mCi/mmol and a radiochemical purity of 100%.
- 2) trans-cypermethrin (+) alpha-cyano-3-phenoxybenzyl (+)-trans-2,2-dimethyl-3-(2,2-dichlorovinyl) cyclopropane-1-carboxylate (FMC 45724-acid-¹⁴C), S.A. 54.8mCi/mmol and a radiochemical purity of 100%.
- 3) cis-trans-cypermethrin (+) alpha-cyano-3-phenoxybenzyl (+)-48% cis-52% trans-2,2-dimethyl-3-(2,2-dichlorovinyl) cyclopropane-1-carboxylate (FMC 30980-acid-¹⁴C), S.A. 54.8mCi/mmol and a radiochemical purity of 100%.

Each of the test materials was labeled at the carbonyl carbon.

Standards used in this study were FMC 45497, FMC 45724, FMC 30980, cis-3-(2,2-dichlorovinyl) 2,2-dimethylcyclopropane carboxylic acid (cis DCVA), and trans-3-(2,2-dichlorovinyl) 2,2-dimethylcyclopropane carboxylic acid (trans DCVA).

TEST METHODOLOGY:

Hydrolysis of cis-cypermethrin (FMC 45497), trans-cypermethrin (FMC 45724), and cis-trans (FMC 30980) was carried out at pH's 3, 6, and 9 at three different temperatures 25, 35, and 45°C. All samples were fortified at 0.005 ppm. Subsamples of pH 3 and pH 6 buffer solutions were taken at 14 and 28 days. Subsamples of the pH 9 buffer solutions maintained at 25°C were taken at the following intervals: Cis-

cypermethrin 24, 72, and 96 hours; trans-cypermethrin 4, 8, 24, and 48 hours; and cis-trans cypermethrin 4, 8, 24, 48, 72 hours.

Analytical Methodology:

Extraction:

A 20 ml aliquot of each sample was extracted with dichloromethane. The pH 6 and pH 9 samples were adjusted to approximately pH 3 prior to extraction. The dichloromethane extracts were concentrated to approximately 300 ul prior to TLC analysis.

Thin-Layer Analysis:

The concentrated extracts were spotted on silica gel TLC plates were developed two-dimensionally. Extracts were co-chromatographed with FMC 30980. The radioactive distribution was determined by exposure of the TLC plates to x-ray film. The radioactivity was quantified by scraping radioactive areas from the plate followed by direct liquid scintillation counting.

Light conditions during the study were not reported. Sterility conditions; storage conditions or any measures taken to trap volatiles were not reported for the study.

REPORTED RESULTS:

At pH 3, FMC 45497 (cis-cypermethrin), FMC 45724 (trans-cypermethrin), and FMC 30980 (48% cis-52% trans-cypermethrin) were stable to hydrolysis @ 25°C after 28 days. No half-lives were reported.

At pH 6, cis-cypermethrin, trans-cypermethrin, and cis-trans cypermethrin were stable to moderately susceptible to hydrolysis @ 25°C. Cis-cypermethrin was stable to hydrolysis. At 28 days, 52% of Trans-cypermethrin remained undegraded while 38.5% of cis-trans cypermethrin remained undegraded. Half-lives of 26 days and 40 days were reported for trans-cypermethrin and cis-trans cypermethrin, respectively.

At pH 9, cis-cypermethrin, trans-cypermethrin, and cis-trans cypermethrin were hydrolyzed rapidly @ 25°C. At 96 hours, 51% cis-cypermethrin remained undegraded. At 48 hours, 59% of trans-cypermethrin remained undegraded. At 72 hours, 60% of cis-trans cypermethrin remained undegraded.

The major degradates were cis-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid (cis DCVA) and trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylic acid (trans DCVA). The major degradates did not form in amounts greater than 10%. Unidentified polar products formed in minor amounts.

Individual values for method recovery and recovery of radioactivity from TLC plates are listed in Appendices I-VI. The average method recoveries for FMC 45497, FMC 45724, and FMC 30980 were 87%, 88%, and 92%, respectively. The average TLC recoveries for FMC 45497, FMC 45724, and

FMC 30980 were 90%, 92%, and 90%, respectively.

DISCUSSION OF RESULTS:

The hydrolysis of FMC 45497, FMC 45724, and FMC 30980 Insecticide does not satisfy the data requirement, 161-1, for hydrolysis.

Hydrolysis studies need only to be conducted at one temperature, 25°C.

Hydrolysis of cypermethrin is accelerated with an increase in temperature and pH.

Both isomers (cis & trans) and the mixed isomer product of cypermethrin are relatively stable at pH 3 and 25°C (approximately 6% degradation).

The initial concentrations (0.005 ppm) of the starting materials does not appear to be adequate to track formation and decline of parent and degradates.

PHASE IV ENVIRONMENTAL FATE SUMMARY TABLE FOR Propoxur (Case # 2555)

Chemical Code: 109702 Reviewer: B. Kitchens
 Pesticide Type: Insecticide Date: 2/27/91

Uses (LUIS REPORT): Terrestrial Food Crop, Terrestrial Food+Feed, Terrestrial Non-Food, Terrestrial Non-Food+Outdoor, Greenhouse Food, Greenhouse Non-Food, Outdoor Residential, Indoor Food, Indoor Non-Food, Indoor Medical, Indoor Residential

Submitted Studies/Addendums	DER/Addendum Review/Summary Identification	DER/Addendum Review/Summary Conclusions	Additional Data/Info Required?
-----------------------------	--	---	--------------------------------

CHEMICAL/PHYSICAL DATA:

160-5. Chemical Identity 102991 NO¹

DEGRADATION-LAB:

161-1. Hydrolysis 41662701 DER(91-0164, -0165 1/15/91) DNS/NSalv/Supp YES²

Photodegradation:

161-2. In Water None DER(82-0130, -0131 4/29/82) DNS/NSal/Supp SWBSubmitted³

161-3 On soil None DER(82-0130, -0131 4/29/82) DNS/NSalv/Supp SWBSubmitted⁴

161-4. In Air None DER(82-0130, -0131 4/29/82) WAIVED⁵

METABOLISM-LAB:

161-1. Aerobic Soil None DER(82-0130, -0131 4/29/82) DNS/NSalv/Supp SWBSubmitted⁴

162-2. Anaerobic Soil None DER(81-0748 5/4/81) DNS/NSalv/NSupp SWBSubmitted⁴

162-3. Anaerob. Aquat. None DER(82-0130, -0131 4/29/82) DNS/NSalv/NSupp NA

162-4. Aerobic Aquatic None DER(82-0130, -0131 4/29/82) Satisfied NA

MOBILITY STUDIES:

163-1. Leaching and Ads. Des. None DER(82-0130, -0131 4/29/82) DNS/NSalv/NSupp SWBSubmitted⁴

163-2. Volatil.(Lab) None Volatil.(Lab) WAIVED⁵

163-3. Volatil.(Field) None Volatil.(Field) WAIVED⁵

PHASE IV ENVIRONMENTAL FATE SUMMARY TABLE (continued)

	Submitted Studies/Addendums	DER/Addendum Review/Summary Identification	DER/Addendum Review/Summary Conclusions	Additional Data/Info Required?
<u>DISSIPATION-FIELD:</u>				
164-1. Terrestr. (Soil)	None	DER(82-0130, -0131 4/29/82)	DNS/NSal/NSupp	SWBSubmitted ⁴ NA
164-2. Aquat. (Sediment)	None			NA
164-3. Forestry	None			NA
164-4. Combin./Tank Mix	None			RESERVED ⁶
164-5. Long Term Terr.	None			NA
164-5. Long Term Aqua.	None			RESERVED ⁶
<u>ACCUMULATION STUDIES:</u>				
165-1. Conf. Rot. Crops	None	DER(82-0130, -0131)	DNS/NSalv/Supp	SWBSubmitted ⁷
165-2. Field Rot. Crops	98000	Sum(MRID 92027049 1/15/91)	Reviewable	YES ⁸
165-3. Irrigated Crops	None			NA
165-4. Fish (Lab)	90062	SUM(92027051)	DNS/NSalv/Supp	YES ⁹
165-5. Organ.(Field)	None			RESERVED ¹⁰
<u>SPRAY DRIFT:</u>				
201-1. Droplet Spect.	None			YES ¹¹
202-1. Field Spray Drift Evaluation	None			YES ¹¹
<u>GROUNDWATER MONITORING:</u>				
166-1. Small Project.	None			RESERVED ¹²
166-2. Small Retrop.	None			RESERVED ¹²
166-3. Large Retrop.	None			RESERVED ¹²
<u>SURFACE WATER:</u>				
167-1. Field Runoff	None			RESERVED ¹²
167-2. Surface Water Monitoring	None			RESERVED ¹²

KEY:

- 1) Addendum(EFGWB#/Date) = placed in the second column to indicate that a review (having the indicated EFGWB# and date) of the addendum identified by MRID# in the first column/same row is in the file.
- 2) DER(EFGWB#/Date) = placed in the second column to indicate that a data evaluation record for the study identified by MRID# in the first column/same row is in the file attached to a review with the indicated EFGWB# and date.
- 3) DNS/Salv./Supp. = placed in the third column to indicate that the study or addendum identified by MRID# in the first column/same row does not satisfy (DNS) the data requirement, but could possibly be salvageable (Salv.) to do so with the submission of additional information or limited data. The results of the study can be used for supplemental information (Supp.).
- 4) DNS/Salv./NSupp. = placed in the third column to indicate that the study or addendum identified by MRID# in the first column/same row does not satisfy (DNS) the data requirement, but could possibly be salvageable (Salv.) to do so with the submission of additional information or limited data. The results of the study should not be used for supplemental information (NSupp.).
- 5) DNS/NSalv./Supp. = placed in the third column to indicate that the study or addendum identified by MRID# in the first column/same row does not satisfy (DNS) the data requirement, does not appear to be salvageable (NSalv.) to do so with the submission of additional information or limited data. The results of the study can be used for supplemental information (Supp.).
- 6) DNS/NSalv./NSupp. = placed in the third column to indicate that the study or addendum identified by MRID# in the first column/same row does not satisfy (DNS) the data requirement, and does not appear to be salvageable (NSalv.) to do so with the submission of additional information or limited data. The results of the study should not be used for supplemental information (NSupp.).
- 7) DNPS/Salv./Supp. = placed in the third column to indicate that the study or addendum identified by MRID# in the first column/same row does not partially satisfy (DNPS) the data requirement, but could possibly be salvageable (Salv.) to do so with the submission of additional information or limited data. The results of the study can be used for supplemental information (Supp.).
- 8) DNPS/Salv./NSupp. = placed in the third column to indicate that the study or addendum identified by MRID# in the first column/same row does not partially satisfy (DNPS) the data requirement, but could possibly be salvageable (Salv.) to do so with the submission of additional information or limited data. The results of the study should not be used for supplemental information (NSupp.).
- 9) DNPS/NSalv./Supp. = placed in the third column to indicate that the study or addendum identified by MRID# in the first column/same row does not partially satisfy (DNPS) the data requirement and does not appear to be salvageable (NSalv.) to do so with the submission of additional information or limited data. The results of the study can be used for supplemental information (Supp.).

- 10) DNPS/NSalv./NSupp. = placed in the third column to indicate that the study or addendum identified by MRID# in the first column/same row does not partially satisfy (DNPS) the data requirement, and does not appear to be salvageable (NSalv.) to do so with the submission of additional information or limited data. The results of the study should not be used for supplemental information (NSupp.)
- 11) Dropped Uses (codes) = placed in the second column to indicate that there are no DERs or summaries available for the study identified by MRID# in the first column/same row, but that the registrant has indicated in their Phase III response that all uses for which the data requirement is applicable will be dropped. Verify through the LUIS report that the uses have been dropped.
- 12) MRID#/MRID#A = placed in the first column to indicate that the study and addendum (A) whose MRID#s immediately precede and succeed the "/", respectively, are coupled. If a MRID# was not assigned to the addendum, substitute the date of submission for the MRID# followed by an "A" to indicate that its an addendum. If neither a MRID# or submission date is available, but the addendum was submitted as part of the Phase III response, substitute "Phase IIIA" for "MRID#A".
- 13) NA = placed in last (4th) column to indicate that the data requirement is not applicable to the uses listed in the LUIS report.
- 14) No = placed in the final (4th) column to indicate that no additional information or data is needed to completely satisfy an applicable data requirement. Identify in a footnote any studies that individually only partially satisfied the data requirement, but combined completely satisfies the data requirement. If the data requirement is not applicable to any of the uses listed in the LUIS report, use the "NA" designation defined above instead of "No".
- 15) No Information = placed in the second column to indicate that no DER or summary is available for the study identified by MRID# in the first column/same row, and that the registrant has not indicated in their Phase III response that they will submit another study or will drop uses to make the data requirement not applicable.
- 16) None = placed in the first column to indicate that the registrant did not list any studies or addendums in their Phase II and/or III responses for the given data requirement. In addition, EFGWB has no record of any studies or study/addendum combinations satisfying or partially satisfying the data requirement.
- 17) Not Reviewable = placed in the third column to indicate that based upon a review of the summary identified by MRID# in the second column/same row, EFGWB concludes that the study identified by MRID# in the first column/same row will not satisfy or partially satisfy the data requirement and appears not to be salvageable to do so. Therefore, the study should not be reviewed.
- 18) Reviewable = placed in the third column to indicate that based upon a review of the summary identified by MRID# in the second column/same row, EFGWB concludes that the study identified by MRID# in the first column/same row may possibly satisfy or partially satisfy the data requirement, or could possibly be salvageable to do so. Therefore, the study should be reviewed.

- 19) Reserved = placed in the final (4th) column to indicate that the data requirement is being held in reserve. Indicate in a footnote what information is needed to decide whether or not to impose the data requirement.
- 20) SIREview = placed in the final (4th) column to indicate that one or more studies is currently in review.
- 21) Study Withdrawn = placed in the second column to indicate that there are no DERs or summaries available for the study identified by MRID# in the first column/same row, but that the registrant has indicated in their Phase III response that another study will be submitted.
- 22) Summary(MRID#) = placed in the second column to indicate that a DER is not available for the study identified by MRID# in the first column/same row, but that a study summary with the indicated MRID# was submitted as part of the Phase III response. If a summary is submitted for a study which also has a DER, identify the DER in the second column instead of the summary. (Note that the MRID# of the summary is not the same as the MRID# of the study it summarizes).
- 23) SWBSubmitted = placed in the final (4th) column to indicate that one or more studies will be submitted by the registrant as indicated in their Phase III response.
- 24) Waived = placed in the final (4th) column to indicate that the data requirement has been waived. Identify the reason for the waiver and the EFGWB#/date of EFGWB's waiver recommendation in a footnote.
- 25) Yes = placed in the final (4th) column to indicate that additional information and/or data are needed to satisfy the data requirement. Specify in a footnote what additional information and/or data are needed.

FOOTNOTES:

- At this time no further data need be submitted to EFGWB. The following product chemistry data are noted below:

M.W.	416.3
Empirical Formula	C ₂₂ H ₁₉ O ₃ NCl ₂
Vapor Pressure	1 x 10 ⁻⁷ Pa @ 20°C (by extrapolation)
Kow log ₁₀	6.6
pK _a	Not Available
Solubility	4 ppb
- The submitted study was performed at pHs 3, 6, and 9 instead of the recommended pHs.
- Study was not conducted at the most stable pH as determined from the hydrolysis study.
- Registrant's Phase III response indicates that a new study will be submitted.
- Waived because vapor pressure is 1 x 10⁻⁷ Pa @ 20°C.
- Reserved pending results of terrestrial soil dissipation.

7. Soils not analyzed for degradates. Registrant is submitting a new study as stated in their Phase III response.
8. After review of the summary EFGWB concludes that this study is not acceptable because soil samples were not taken during the study. However, if the confined study to submitted is acceptable and show no accumulation in rotational crops, a field study will not be required.
9. Water concentration during small fish portion of study did not reach equilibrium and small fish were not analyzed for edible, visera, and whole fish portions.
10. Reserved pending results of tiered study.
11. Registrant is participating in the Spray Drift Task Force and will submit data when study is completed.
12. Studies reserved pending receipt of and evaluation of additional data.