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Date Out EFB NOV 20 1980

To: Product Manager 12 Jay Ellenberger
TS-767

From: Dr. Willa Garner Samuel M. Creape (Acting Chief)
Chief, Review Section No. 1
Environmental Fate Branch

Attached please find the environmental fate review of:

Reg./File No.: 3125-102, 123, 25, 193

Chemical: Azinphosmethyl

Type Product: Insecticide

Product Name: Guthion 2S, 2L, 25% WP, 50% WP

Company Name: Mobay

Submission Purpose: Environmental Chemistry Data

ZBB Code: ~~7B2E~~ ?

ACTION CODE: 332 ? (old code #)

Date in: 2/3/80

EFB # 384, 385, 386

Date Completed: NOV 20 1980

Time (days) 8

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

1.0 INTRODUCTION

1.1 PURPOSE

Mobay Chemical Corporation re-submitted an application requesting amended registration of azinphosmethyl (Guthion), an insecticide, allowing expanded use site, revision in currently registered use sites, adding a preharvest grazing restriction, and adding a rotational crop statement [PP 5F1547 and PP 5F1548, submitted on 1/28/80]. In the previous application of 6/16/76, under PP 5F1546, the company submitted several environmental chemistry studies which did not meet the 1975 or current (78) operating guidelines. In most cases, these studies were deficient and unacceptable (review of 10/6/76 and EPA letter of 12/22/76 to Mobay Company).

Azinphosmethyl is currently registered for insect control on a wide ~~variety~~ variety of fruit, vegetable, nut, melon, and field crops as well as ornamentals, forest and shade trees. Azinphosmethyl formulations involved in the petitions and amendments requested are outlined below:

[A] Guthion 2S and Guthion 2L [Reg. Nos. 3125-123 and 3125-102 respectively]:

1. Expand use site to include field and popcorn and sorghum.

2. Expand use site to include use to pasture grasses in states east of the Mississippi river.

3. Revise currently registered use site to alfalfa and clover to include use to mixed stands with grasses in states east of the Mississippi river.

4. Add a pre-harvest grazing restriction prohibiting grazing within 14 days of harvest, if last dosage was 0.375 Lb ai/A, or within 16 days of harvest, if last dosage was 0.5 Lb ai/A.

5. Add the following rotational crop statement: "Treated areas may be replanted with any crop specified on the label as soon as practical after last application. All other crops must not be planted within 30 days of last application".

[B] Guthion 25% WP and Guthion 50% WP [Reg. Nos. 3125-25 and 3125-193]:

1. Expand use site to include use to pasture grasses in states east of the Mississippi River.

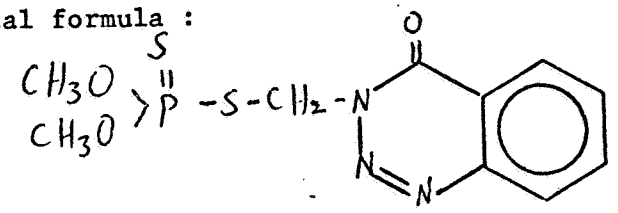
2. Revise currently registered use site to alfalfa and clover to include use to mixed stands with grasses in states east of the Mississippi River.

3. Add a pre-harvest grazing restriction prohibiting grazing within 14 days of harvest if last dosage was 0.375 lb ai/A, or to within 16 days of harvest, if last dosage was 0.5 lb ai/A nor within 28 days of harvest, if last dosage was 0.5 lb ai/A.

1.2. Chemical

Common name : azinphosmethyl
Trade name : Guthion
Formulations : 50 WP, 25 WP, 2S, 2L
Chemical name : O,O - Dimethyl S- [(4-oxo-1,2,3-benzotriazin-3 (4 H)-yl)methyl] phosphorodithioate - 25% WP, 50% WP, 2 lbs ai/gal for the 2S and 2L formulations.

Chemical formula :



1.3 Previous Reviews

3125 - 25; 102; 123; 199	5F1546 10/6/76
3125 - 123	5/27/75
3125 - 25	6/9/75
Answer to letter dated	2/25/71
3125-123;25;102:123;193	1/21/72
3125-25;102	4/11/75
3125-123 5F1548	5/14/75
OF0984	5/5/71, 7/15 /70
OF0869	10/21/70, 9/23/69
OF0539	2/1/68
OF0762	10/17/68
OF0653	10/27/67
OF0582	11/22/67
3125 - 132	5/10/66
3125 - 132, 167	5/27/66

2.0 USE DIRECTIONS

[A] Guthion 2L or 2S

1. Sorghum: For control of sorghum midge, apply 0.25 lb ai/A of ULV; or 0.25 - 0.375 lb ai/A conventional or low volume diluted in sufficient water for complete coverage but not less than 2 gallons per acre. Use ground or aerial equipment. Make the first application when 30 to 50% of the heads have begun to bloom and when there is an average of 1 or more adult midges per head. A second application should be made 3 to 5 days later. A third application may be needed in late planted sorghum. Do not apply more than 3 times per season nor within 28 days of harvest. Do not graze or use treated forage for feed or food purposes.

2. Corn (Field and popcorn): For control of corn rootworm (Northern and Western adults); apply 0.125 to 0.25 Lb ai/A. For control of sugarcane borer, European corn borer, Southwestern corn borer; apply 0.5 to 1.0 Lb ai/A. Apply specified dosage per acre in aerial or ground equipment, calibrated to deliver not less than one gallon of total volume of spray solution per acre. Apply a maximum of 3.0 Lbs ai/A/year during any one crop season. Dry corn and/or dry forage may be fed 45 days following the last application. Grazing or ensiling green forage is prohibited. Do not hand detassel or rouge seed corn after any application.

3. Alfalfa and Clover (including mixed stands with grasses, in states east of the Mississippi River): For control of alfalfa weevil, apply 0.25-0.75 lb ai/A. For control of leafhopper mites, apply 0.25 - 0.5 lb ai/A. For control of Egyptian alfalfa weevil, apply 0.375 - 0.75 lb ai/A. For control of alfalfa plant bug, fleahopper, grasshoppers, Lygus bugs, or spittlebug, apply 0.5 - 0.75 lb ai/A of Guthion 2 L or 2 S. Apply specified dosage per acre using a minimum of 10 gallons of water per acre when applying with ground equipment, and a minimum of 5 gallons per acre to aerial applications for alfalfa weevils and at least 1 gallon per acre for the other insects listed. It may be necessary to use 20 to 25 gallons of water per acre on heavy growth for control of alfalfa weevil or Egyptian alfalfa weevil with ground equipment.

   Apply twice per cutting at the 0.25 Lb ai/A rate at intervals of 10 to 11 days. Do not apply more than twice per cutting at the 0.25 Lb ai/A rate. Apply only once per cutting at rates above 0.25 Lb ai/A.

   Do not apply within 14 days of harvest or grazing at the rates of 0.25 to 0.375 Lb ai/A or within 16 days at the rate of 0.5 Lb ai/A. Do not apply rates above 0.5 Lb ai/A within 21 days of harvest or grazing.

4. Pasture Grasses (states east of Mississippi River): For control of grasshoppers, or meadow spittlebugs (adults), apply 0.5 - 0.75 Lb ai/A. Apply specified dosage per acre by air or ground equipment in sufficient water for complete coverage but not less than 1 gallon per acre. Do not apply more than once per cutting. Do not graze or harvest within 16 days of application at the 0.5 Lb ai/A rate or 21 days at rates above 0.5 Lb ai/A.

5. Rotational Crops: Treated areas may be replanted with any crop specified on the label as soon as practical after last application. All other crops must not be planted within 30 days of last application.

[B] Guthion 25% WP or 50% WP

1. Alfalfa and Clover (including mixed stands with grasses in states east of the Mississippi River): For control of leaf hoppers, or mites, apply 0.25 - 0.5 Lb ai/A. For control of alfalfa weevil, or Egyptian alfalfa weevil, apply 0.375 - 0.75 Lb ai/A. For control of alfalfa plant bug, fleahopper, grasshoppers, lygus bugs, or spittlebug, apply 0.5 - 0.75 Lb ai/A.

   Apply specified dosage per acre using a minimum of 10 gallons of water per acre. It may be necessary to use 20 to 25 gallons of water per acre on heavy growth for control of alfalfa weevil or Egyptian alfalfa weevil with ground equipment.

   Do not apply within 14 days of harvest or grazing at the rates of 0.25 to 0.375 Lb ai/A, or within 16 days at the rate of 0.5 Lb ai/A. Do not apply rates above 0.5 Lb ai/A within 21 days of harvest or grazing. Do not apply more than once per cutting at any rate.

2. Pasture Grasses (states east of the Mississippi River): For control of grasshoppers, or meadow spittlebugs (adult), apply 0.5-0.75 lb ai/A. Apply specified dosage per acre using a minimum of 10 gallons of water per acre. Do not apply more than once per cutting. Do not graze or harvest within 16 days of application at the 0.5 lb. ai/A or 21 days at rates above 0.5 lb ai/A.

3.0 DISCUSSION OF DATA

Environmental Chemistry data submitted were contained in two volumes under PP 5F 1547, 5F1548, 6H5139, dated 1/28/80.

[A] Accession No. 099214 entitled: "Addition No. 1, February 28, 1979. To Brochure entitled: Guthion - The effects on the environment; environmental chemistry, dated June 1, 1976".

[B] Accession No. 099216 entitled: "Addition No. 2, September 7, 1979. To Brochure entitled: "Guthion - The effects on the environment; environmental chemistry, dated June 1, 1976.

Data submitted were reviewed by Enviro Control, Inc., a contractor from Rockville, Maryland; on 7/7/80. The 115 page review was entitled: "Task 1 R: Review of Guthion, Contract No. 68-01-5830, submitted to EPA. by Enviro Control, Inc., One Central Plaza, 11300 Rockville Pike, Rockville, Maryland 20852".

3.1 Evaluation of Enviro Control, Inc. Review

Data submitted by Mobay Chemical Corporation were either new and/or supplementary to previously submitted data. Several of these studies were irrelevant to Environmental Chemistry data requirements. Enviro Control, Inc. reviewed the submitted data, however, for decision making the review, need be completed by EPA staff for the following reasons:

1. No attempt was made to relate the reviews to Environmental Chemistry data requirements.

2. No attempt was made to give a background information describing the status of the chemical (registration status?), and the purpose of the review.

3. No attempt was made to relate these studies with previous reviews (contractors are not allowed to use our files).

4. No attempt was made to identify irrelevant studies.

5. In most cases, the review covered individual studies and not a group of studies relevant to one set of data requirement. For example, several reports were submitted on soil persistence to satisfy soil field dissipation data requirement. Each of these studies were reviewed individually followed by a conclusion. Enviro Control, did not give a general conclusion as to whether data requirement was satisfied or not.
6. Some studies pertinent to data requirement were not reviewed; e.g. photodegradation of Guthion on a soil surface, Report No. 67979.

7. Studies relevant to one set of data requirement were reviewed in different sections of the report, e.g., soil field dissipation study was reported in pages 9-11; 12-14; and 78-111.

8. Some of the conclusions were irrelevant to the objectives of the study. For example, in the conclusions appearing in pages 5 and 56, emphasis were given to instrumental sensitivity.

In our analysis, however, I will list first, environmental chemistry data required to elucidate the fate of azinphosmethyl in the environment. Second, each title of data required will be listed followed by a summary and a conclusion indicating as to whether the data was satisfied or not. A reference will be made if the data was satisfied by the recent submission reviewed by Enviro Control, by previous submissions or, by our own review. Also, references will be made to any additional studies reviewed by Eviro Control, however, not required by present operating guidelines. In the end, a final summary will be given to each completed study, followed by our own recommendations.

3.2 Environmental Chemistry Data Requirements

Under the present operating guidelines of 1978, environmental chemistry data required to elucidate the fate of azinphosmethyl (Guthion) in the environment, for the proposed uses, terrestrial/field-vegetable crops are:

3.2.1 Hydrolysis
3.2 2 Photodegration
3.2 3. Aerobic soil metabolism
3.2 4. Anaerobic soil metabolism
3.2 5. Effects of microorganisms on aziphosmethyl
3.2 6. Effects of aziphosmethyl on microorganisms
3.2.7. Leaching
3.2 8. Adsorption/desorption
3.2.9. Soil field dissipation
3.2.10. Rotational crop study
3.2.11. Fish accumulation study

3.3 Environmental Chemistry Data Analysis

3.3.1 Hydrolysis

Study was conducted according to the guidelines. Enviro Control, Inc. review is complete as shown in pages 65-70 of their 7/7/80 report.

3.3.2 Photodegradation

Study was conducted according to the guidelines. Report No. 67979 dealt with photodegradation of Guthion on soil surface. This report was not reviewed by Enviro Control, Inc. and is reviewed below. Report No. 67980 dealt with photodegradation in aqueous solution. Enviro Control review of this study was complete as reported in pages 59-64.

Report No. 67979 - Photodegradation of Guthion on a Soil Surface; by: Wilks, L.C., J.P. Wargo, and R.R. Gronberg, 1978 Methodology

Methodology

A stock solution of ring-labelled ^{14}C- azinphosmethyl was prepared by dissolving 0.5 m Ci in 5 ml methanol. A 1.0 ml aliquot of the stock solution was then diluted to 25 ml methanol. This diluted solution (8.3×10^6 dpm/ml; 42.8 ug/ml) was used to fortify the soil samples.

The soil used in this study was a sandy loam [% OM 1.4, sand 73% silt 18%, clay 10%, pH 7.9, CEC 4.6, bulk density in g/cc 1.5]. Glass plates (5 x 20) cm were coated with soil slurry. To each plate, a 0.3 ml aliquot of ^{14}C - Guthion solution (12.8 mg/0.3 ml) was applied. Light was provided by a 200 watt mercury lamp, placed 11 cm from the samples, for a period up to 240 hours (equivalent to 284 nm). Control plates were maintained in the dark. Temperature was maintained at 30°C. Sampling was conducted at 2, 4, 6, 8, 24, 27, 30, 48, 96, and 240 hours from irrdiation. [Note that page 4 containing extraction procedure, was missing]. Qualitative analysis ~~analysis~~ was performed by radioassay in LSC and by thin-layer chromatography (TLC) using silica gel and co-chromatography with authentic compounds. For quantitative analysis, matching spots were eluted in methanol and counted in LSC.

Test Results

The half-life for the photodegradation of ^{14}C- Guthion was determined to be approximately 220 hours (9.1 days).

The photoproduct composition of the extractable residue was determined for each sampling time. At 240 hours, the major identified photo-products were: benzazimide and/or hydroxybenzazimide (4% of the initial radioactivity), and Guthion oxygen analog (3% of the initial radioactivity).

Small amounts of methyl benzazimide and bis - (benzazimide - N - methyl) sulfide were also detected, but each of these represented only about 1% of the initial radioactivity. The origin material represented the majority of unindentified ^{14}C - residue in the extract; 8% of the initial radioactivity remained at the origin. At 240 hours, the bound residue comprised 25.6% of the initial radioactivity. According to the researchers, no volatilization losses occured during the 240 hour exposure period; (see Figure 1, page 114 of Enviro Control review for structural formulas).

3.3.3 and 3.3.4 Aerobic and Anaerobic Soil Metabolism
Study was conducted according to the guidelines. Enviro Control, Inc. review is complete as shown in pages 71-77 of their report.

3.3.5 Effects of Microorganism on Azinphosmethyl
Study was reviewed by Enviro Control, Inc. as shown in pages 42-44.

3.3.6 Effects of Azinphosmethyl on Microorganisms
Study was conducted according to the guidelines. Enviro Control, Inc. review is complete as shown in pages 31-41.

3.3.7 Leaching
Study was conducted according to the guidelines. Enviro Control, Inc. review is complete as shown in pages 22-25 and 27-30 of their report.

3.3.8 Adsorption/Desorption Study
Study was conducted according to the guidelines. Enviro Control, Inc. review is complete as shown in pages 45-51.

3.3.9 Soil Field Dissipation
Study was conducted according to the guidelines. Enviro Control, Inc. review is complete as shown in pages 9-11; 12-14; and 78-111.

3.3.10 Rotational Crop Study
Study was conducted according to the guidelines. Enviro Control, Inc. review is complete as shown in pages 15-18 of their report.

According to Enviro Control review, approximately 50% of the data generated by Mobay were summarized as "not available/not analyzed". No data were submitted for carrots which was grown 30, 60, and 90 days post application. This was a crucial omission, because significant residues were found in other root crops. Test results had shown that residues approaching 1 ppm of azinphosmethyl in combination with its oxygen analog may accumulate in root crops planted up to 90 days after azinphosmethyl application. However, the potential residue hazard for rotational crops may be regarded as unlikely for grain and above ground leafy vegetable crops, (see summary table p. 17 in Enviro Control report).

3.3.11 Fish Accumulation Study

No data were submitted. Previously submitted data (PP 5F 1546, submitted on 6/16/76), however, were acceptable under old procedures but not under the 1975 guidelines. This was a catfish study with no soil. Fish showed low accumulation as a result of rapid uptake and rapid excretion.

4.0 NON - REQUIRED DATA REVIEWED BY ENVIRO CONTROL. INC.

The following are the titles of several studies not required by the guidelines, however, submitted by Mobay Chemical Company and reviewed by Enviro Control, Inc.

4.1 Colorimetric determination of Guthion residues in plant material. IV. Application to crops containing chlorophyll; p 1.

4.2 Determination of Baygon, Baytex, Bolstar, Croneton, Dasanit, Di-Syston, Dylox, Guthion, Hinosan, Mesurol, Metasyston-R, Monitor, Morestan, Nemaeur, and Systox residues in soils; p. 6.

4.3 Recovery of Guthion from soil (silty clay loam); p 7.

4.4 Recovery of Guthion from soil (sand); p. 8.

4.5 Determination of residues of DEF in soil by thermoionic emission gas chromatography; p. 20.

4.6 A gas chromatographic method for the determination of BAY-NTN-9306 and metabolites in soil; p. 21.

4.7 The stability of Guthion in silt loam soil under frozen storage; p. 26.

4.8 Recovery of Bolstar in soil; p. 34.

4.9 Recovery of DEF from soil; p. 35.

4.10 An analytical residue method for determination of Guthion, Guthion oxygen analog, and total guthion and metabolite residues in soils; p. 52.

4.11 Recovery of Guthion from soil (sandy loam and silt loam); p. 57.

4.12 Stability of Guthion and Guthion oxygen analog in soil; p. 58.

5.0 SUMMARY

5.1 Hydrolysis Study
Report No. 67983
Hydrolysis of Guthion-ring-UL-^{14}C was studied in aqueous buffers at three pH's (4,7,9), two temperatures (30, 40°C) and two concentrations (1, 10 ppm).

T-1/2 of Guthion at 30°C and pH 4,7,9 was 40, 24, and 2 days respectively. At 40°C and pH 4,7,9; T-1/2 was 19, 11, and 1 day respectively. No volatile degradation products were found. Benzazimide and/or hydroxymethyl benzazimide were identified as the major degradation products in each system. Mercaptomethyl benzazimide, bis-(benzazimide - N - methyl) sulfide, and water soluble metabolites were also found, non of which represent greater than 10% of the total radioactivity (See Figure 1, page 114 of Enviro Control review for structural formulas).

5.2 Photodegradation
Report Nos. 67979 and 67980
The photodegradation of azinphosmethyl-ring-UL-^{14}C was studied in aqueous solution and in sandy loam soil under high intensity mercury lamp irradiation (284 nm). The half-life of azinphosmethyl was 9.4 hours in solution and 9.1 days in soil. Benzazimide and/or hydroxymethyl benzazimide, Guthion, anthranilic acid, and methyl benzazimide represented approximately 39,19,10, and 2% of the radiocarbon residue in the solution after 48 hours of irradiation.

In soils, after 10 days of irradiation, the major photoproducts were benzazimide and/or hydroxymethyl benzazimide (4%), Guthion oxygen analog (3%), methyl benzazimide (1%), and bis - (benzazimide - N - methyl) sulfide (1%). Approximately 26% of the radiocarbon was bound to the soil. The halflife of the parent was 9.1 days.

No volatile degradation products were formed in either soil or aqueous solution. For structural formulas, see p. 114 of Enviro Control report.

5.3 and Aerobic and Anaerobic Soil Metabolism
Report No. 68030

5.4 The metabolism of azinphosmethyl-ring-UL - ^{14}C fortified at 2 ppm was investigated in sandy loam soil under aerobic, anaerobic, and sterile conditions.

Under aerobic conditions azinphosmethyl T-1/2 was 44 days and represented 10% of the total residue 140 days post-treatment. T-1/2 of azinphosmethyl under anaerobic conditions, following 30 days incubation in aerobic soil, was 68 days. T-1/2 in sterile soil was 355 days.

Guthion oxygen analog, mercaptomethyl benzazimide, benzazimide, and/or hydroxymethyl benzazimide, and bis - methyl benzazimide sulfide residues were found as degradation products in the aerobic systems. Each represented less than 6% of the total residue through 365 days. These residues reached a plateau and declined in concentration after 186 days after treatment. Degradation products identified in the anaerobic and sterile soil systems were among those found in the aerobic system.

Material balance was 103% through 365 days. Volatile degradation products accounted for about 4% of the applied activity. Approximately, 73% of the radiocarbon residue was not extractable from the soil 365 days after treatment.

5.5 Effects of Microorganisms on Azinphosmethyl
Report No. 66624

In the soil metabolism study, the differences in T-1/2 of azinphosmethyl in sterile versus non sterile soil was 355 days compared to 41 days, respectively. This difference in degradation rate was most likely due to the effects of soil microorganisms. Analysis of the sandy loam soil for microbial populations by family, showed that the non-sterile soil was active and contained a distribution of organisms generally found in agricultural soils (see a list of organisms in p. 43 of Enviro Control report).

5.6 Effects of Azinphosmethyl on Microorganisms
Report Nos. 54433, 65613 abd 66401

Studies on isolated species of soil microorganisms (bacteria, actinomycetes, and fungi) representative of common, beneficial, soil-inhabiting species, has shown that at recommended field rates equivalent to 2 ppm or less, Guthion residues had no significant effect on populations.

In a study on the effect on nitrogen fixing bacteria, no significant change in nitrogen-fixing ability of soybean nodules was observed between control and 2 ppm azinphosmethyl-irrigated plants. No significant differences were found in shoot length, plant fresh weight, or nodule fresh weight.

Azinphosmethyl had little to no effect on inhibition of nitrification or denitrification in loamy sandy fortified at 2 or 20 ppm. ←

5.7 Leaching
Report Nos. 48466 and 51016

Leaching study using six soil types and soil thin-layer chromatography showed that azinphosmethyl is of "Low" mobility, the second lowest of five categories describing relative mobility in soil. Azinphosmethyl was most mobile in silty clay soil (R_f 0.24) and least mobile in sandy clay loam soil (R_f 0.11).

The relatively low mobility of azinphosmethyl residues may be due in part to the relatively high adsorption of these residues in soils.

5.8 Adsorption/Desorption Study
Report No. 66848

Adsorption of azinphosmethyl - ring -UL - ^{14}C from aqueous solution by sandy loam, silt loam and silty clay soils was studied over a range of concentrations from 0.13 to 13 ppm. The amount of azinphosmethyl adsorbed ranged from 52 to 89%. Freundlich adsorption constants for sandy loam, silt loam and silty clay were 7.6, 16.75, and 9.85 respectively. Total azinphosmethyl residues desorbed from the soils ranged from 32 to 68%.

5.9 Soil Field Dissipation
Report Nos. 67803 - 67810; 54987 - 54994; 65615, 67186, 67239, 66286, and 67115.

The dissipation of azinphosmethyl in field soil was studied in four agricultural use areas; Oregon, Indiana, Texas, and Florida. Azinphosmethyl was applied to bare soil surfaces and incorporated to a depth of approximately 6 inches. Soils were measured for residues at several intervals post application at 0-6 inch and 6-12 inch depth following an application rate of 4 Lbs ai/A. Soil samples were analyzed for azinphosmethyl and metabolites.

It was shown that azinphosmethyl dissipated rapidly with less than 0.1 ppm present 30 days post application. The half-life of azinphosmethyl was shown to be no greater than 14 days in each test. Guthion - analog was not dectected (0.01 ppm) at any interval following application in any test. Soil dissipation of azinphosmethyl alone and in a combination with Bolstar 6 or DEF 6 were studied under greenhouse conditions. These pesticide formulations were applied to silt loam and sandy loam soils at recommended rates. Soils were sampled periodically for six months. The results showed that the persistence of

azinphosmethyl in combination with Bolstar 6 or DEF 6 in soils was not significantly different than when applied alone. Residues of Bolstar or DEF alone or in combinations with azinphosmethyl were also not significantly different during the test intervals (see pages 78-111 of Enviro Control report for more details).

5.10 Rotational Crop Study
Report No. 67116 - 67179 and 67271

Mature grain, vegetable, and root rotational crops planted in field plots previously treated with azinphosmethyl, were analyzed for Guthion oxygen analog residue. Rates equivalent to 1,2,4, and 8 Lbs ai/A of azinphosmethyl were used. Maximum label rate per acre per year is 4 Lbs ai/A. Crops representing grain, pod-vegetable, leafy-vegetable, and root crop groups were planted 30, 60, 90, and 120 days after application. Samples were collected at each interval and analyzed for azinphosmethyl and its oxygen analog.

Test results showed no residues (<0.1 ppm) of azinphosmethyl or azinphosmethyl oxygen analog were detected in grain, pod-vegetable, or leafy-vegetable crop groups planted 30 days following applications of up to and including 8 Lbs ai/A. On the other hand, root crops showed significant residues of azinphosmethyl and azinphosmethyl oxygen analog determined at 2.18 ppm, 30 days post application of 1 lb ai/A and at 0.72 ppm, 90 days post application of 1 lb ai/A. No residues (<0.1 ppm) were detected in root crops 120 days post application of maximum label dosage of 4 lbs. ai/A. However, at 8 Lbs. ai/A, signficant residues were found in root crops; i.e., 0.53 ppm, 90 days post application and 0.55 ppm, 120 days post application.

6.0 ENVIRONMENTAL CHEMISTRY DATA GAPS

With the exception of the fish accumulation study, all environmental chemistry data required to elucidate the fate of azinphosmethyl in the environment, had been satisifed.

The fish accumulation study submitted on 6/16/76 under PP 5F 1546 is inadequate and does not meet current operating guidelines. For acceptable protocol to conduct the required studies, consult the guidelines published in the Federal Register Vol. 43 (132) - Monday, July 10, 1978.

7.0 LABEL COMMENTS

All formulations of azinphosmethyl labels must bear a rotational crop statement restricting planting root crops within 180 days of application.

8.0 RECOMMENDATIONS

Amended registration of azinphosmethyl (Guthion) as proposed will be accepted after complying with environmental chemistry data gaps and label comments as shown above under 6.0 and 7.0.

Sami Malak

Sami Malak, Ph.D.,
Review Section #1
Environmental Fate Branch
Hazard Evaluation Division