

Date Out EFB: MAR 19 1982

To: Jay Ellenberger
Product Manager 12
Registration Division (TS-767)

From: Dr. Willa Garner, Chief *WJ*
Review Section No. 1
Environmental Fate Branch
Hazard Evaluation Division (TS-769)

Attached please find the environmental fate review of:

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

Chemical: Guthion

Type Product: Insecticide

Product Name: GUTHION

Company Name: Mobay

Submission Purpose: Response to reviewer's comments regarding
deficiencies

ZBB Code: 3(c)(7)

ACTION CODE: 336

Date In: 2/17/82

EFB # 194-197

Date Completed: MAR 19 1982

TAIS (level II)

Days

63

2

Deferrals To:

 Ecological Effects Branch

 Residue Chemistry Branch

 Toxicology Branch

1. INTRODUCTION

1.1 The registrant, Mobay Chemical Corporation, is asking EFB to reconsider the acceptability of the catfish accumulation study and the 180-day rotational crop restriction on root crops.

1.2 Refer to the EFB evaluations of 3125-102, -123, -25, and -193 dated October 6, 1976 and November 20, 1980 the RD letter of February 17, 1981 and the letters from Mobay dated October 19, 1981 and January 29, 1982.

2. DISCUSSION

2.1 The previously reviewed catfish bioaccumulation study (see the October 6, 1976 EFB evaluation, section 3.11.1) is a continuous exposure study where the catfish were exposed to ¹⁴C-Guthion in the absence of soil. Bioaccumulation peaked at 139X on day 4 of exposure but averaged about 60X during days 7-28 of exposure. About 90% of the residues present on the last day of exposure were released during 2 weeks of depuration. Although this study would not be considered a static catfish study (exposed to soil aged residues of Guthion), it does satisfy the requirement for a continuous exposure fish accumulation study. Since a static catfish study is not required at this time, the fish accumulation requirement is satisfied. ←

2.2 The rotational crop data in question was reviewed in the November 20, 1980 evaluation. The relevant data involves root crops only. Guthion, in a cold study, was applied at 1, 2, 4 or 8 lb ai/A and aged for 30, 60, 90 or 120 days. Colorimetric analysis showed significant residues but the control root crop data indicated interfering compounds (probably naturally occurring) to be present at such high levels as to make the difference between Guthion residues and interferences indistinguishable. (No interference was seen in the grain and leafy vegetable colorimetric analyses.) Confirmatory GC analysis of the root crop samples showed no parent Guthion or azinphosmethyl oxygen analog residues to be present. Analysis was not conducted for other degradation products of Guthion.

3. RECOMMENDATIONS

3.1 The catfish accumulation study satisfies the requirement for a continuous exposure accumulation study. A static study is not needed at this time.

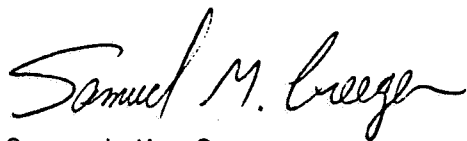
3.2 Adequate data was not submitted to justify dropping or lowering the 180-day rotational crop restriction for root crops. It is agreed that the colorimetric method is not adequate due to interfering compounds, but the confirmatory GC method used involved analysis only for parent Guthion and/or azinphosmethyl oxygen analog residues. The presence of other degradation products containing the benzazimide moiety without the organophosphorus group (which have been shown to form due to hydrolysis, photolysis and degradation in soil) has not been shown to be absent in the analyzed root crop. Also, according

to Report #48668 of accession #224703 (reviewed in the October 6, 1976 EFB evaluation), benzazimide and an unknown compound are the only 2 compounds shown to be taken up (albeit at low levels) by rotational wheat in a ^{14}C study. No Guthion or oxygen analog were detected. Therefore, to support lowering or deleting the 180-day rotational crop restriction on root crops, 1 of the following 3 options must be satisfactorily addressed:

(1) Conduct new rotational crop studies on root crops where the root crops are analyzed for Guthion, Guthion oxygen analog and those Guthion degradation products containing the benzazimide moiety such as mercaptomethyl benzazimide, hydroxymethyl benzazimide, methylbenzazimide and benzazimide. It is recommended that protocol be submitted for review before initiating the study.

(2) Reanalyze the root crop samples for the benzazimide products in the study in accession # 099214 (tab numbers 67116-67179 and 67271).

(3) Submit a detailed rationale explaining why the benzazimide products would not be expected to be taken up by rotational root crops at detectable levels under use conditions.



Samuel M. Creeger
March 18, 1982
Section #1/EFB
Hazard Evaluation Division

January 29, 1982

Mr. Jay S. Ellenberger
Product Manager (12)
Environmental Protection Agency
Registration Division (TS-767)
Crystal Mall #2
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Subject: ^oGUTHION for use in or on Sorghum and Corn
EPA Reg. Nos. 3125-25, -102, -123, -193

Dear Mr. Ellenberger:

Your February 17, 1981 letter (copy enclosed) forwarded to Mobay the Agency's comments following their environmental chemistry review of the data submitted on January 23, 1980.

The first item dealt with the apparent inadequacy of the fish accumulation study to which we responded on October 19, 1981 (copy enclosed). To date we have had no response from you on this letter.

With this letter we will address the reviewers comments regarding the planting of rotational crops, and the request to revise the proposed rotational crop statement by adding a restriction prohibiting the planting of root crops within 180 days of application. The following is our response to the apparent residues of GUTHION in root crops reported in the data submitted in Accession Nos. 099214 and 099216 submitted on January 23, 1980.

Use of the colorimetric analysis procedure for GUTHION residues in root crops did generate data that could be misinterpreted to indicate that actual residues existed in root crops. The colorimetric analysis procedure is nonspecific, and in this instance, the presence of varying amounts of naturally occurring crop coextractives made utilization of any colorimetric data for root crops impossible. If no residues are observed using this procedure, it can justifiably be concluded that neither 1) the compound in question nor 2) interfering crop coextractives are present. If finite residues are observed, it is impossible to differentiate between 1) and 2). The reported root control values of 0.24 and 0.47 ppm apparent GUTHION indicate that interfering crop coextractives are present. Apparent residues from this source in treated samples can be incorrectly interpreted as actual residues of GUTHION. This is easily demonstrated in Table I below, which presents net residues for all treatment rates and plant-back intervals (PBI's).

TABLE I

"Apparent" GUTHION Net Residues (Ppm) by Colorimetric Analysis

<u>PBI (Days)</u>	<u>1# AI/A</u>	<u>2# AI/A</u>	<u>4# AI/A</u>	<u>8# AI/A</u>
30	2.22	0.55/0.96	—	—
90	0.72	0.63	0.64	0.53*
120	0.31	0.27	0.18	0.36, 0.55*
439	0.57	0.54	0.21	0.27

*Values cited by reviewer as indicative of GUTHION "residues" in roots.

Analyses of root crop controls and treated samples for GUTHION using specific gas chromatographic methodology removed the crop interferences, as indicated in Table II.

TABLE II

GUTHION Gross Residues (Ppm) by Gas Chromatographic Analysis

<u>PBI (Days)</u>	<u>1# AI/A</u>	<u>2# AI/A</u>	<u>4# AI/A</u>	<u>8# AI/A</u>
30	<0.01	<0.01	—	—
90	<0.01	<0.01	<0.01	<0.01
120	<0.01	<0.01	<0.01	<0.01
439	<0.01	<0.01	<0.01	<0.01

Pesticide residues, if present, would still appear in Table II; however, it is obvious that there are no pesticide residues at any PBI for any application rate. Both the colorimetric and gas chromatographic data were included in the reports presented in environmental chemistry data the subject of this review.

As no residues were found in root crops we believe the following rotational crop statment as initially proposed on January 23, 1980 is still valid and should be acceptable for registration.

ROTATIONAL CROPS

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

Yours very truly,

MOBAY CHEMICAL CORPORATION
AGRICULTURAL CHEMICALS DIVISION

G. Z. Brussell, 1881
G. Z. Brussell, Manager
Registrations
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Mobay
Chemical Corporation

Agricultural
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October 19, 1981

Mr. Jay Ellenberger
Product Manager (12)
Environmental Protection Agency
Registration Division (TS-767)
Crystal Mall #2
1921 Jefferson Davis Highway
Arlington, VA 22202

Subject: EPA Reg. Nos. 3125-25, 3125-102, 3125-123, 3125-193
GUTHION for Use in or on Sorghum and Corn

Dear Mr. Ellenberger:

Your February 17, 1981 letter forwarded to Mobay the Agency's comments following their environmental chemistry review of the data submitted on January 23, 1980.

While we will respond to the comments concerning rotational crops at a later date, we are commenting at this time on the fish accumulation study which the Agency found inadequate. The reasons the Agency cited for inadequacy were that the study (1) was conducted with no soil, and (2) showed rapid uptake and rapid excretion with low accumulation. We feel these conditions are all advantageous with respect to the compound and study, as it demonstrates a low potential for biomagnification. Never-the-less we would like your confirmation that since a fish accumulation study is no longer required this study will not have to be repeated.

Yours very truly,

MOBAY CHEMICAL CORPORATION
AGRICULTURAL CHEMICALS DIVISION

G. E. Brussell
G. E. Brussell, Manager
Registrations
Research & Development

GEB:SBS:bhd.

Feb 17, 1981

Mr. Glenn Brussell
Mobay Chemical Corporation
Agricultural Chemicals Division
1140 Connecticut Avenue
Suite C04
Washington, DC 20036

Dear Mr. Brussell:

Subject: EPA Registration Nos. 3125-25, 3125-102,
3125-123 and 3125-193
Guthion for use in/on Sorghum and Corn
Your submission of January 23, 1980

We have completed our environmental chemistry review of the subject amendments and found the fish accumulation study to be inadequate for the following reasons. Accordingly, the study must be repeated.

1. Study was conducted with no soil.
2. Fish showed low accumulation as a result of rapid uptake and rapid excretion.

Additionally, because of the residues noted at 8 lbs. active per acre in root crops (0.53 ppm - 90 days post application and 0.55 ppm - 120 days post application), the product labels must bear a restriction prohibiting the planting of root crops within 120 days of application. Revised labelling should be submitted within 9 months from the date of this letter.

If you have any questions concerning this letter, please contact me at (703) 557-7024.

Sincerely,

Jay Ellenberger
Product Manager-12
Insecticide-Rodenticide Branch
Registration Division (TS-767C)