Date Out: EFB: MAR 11 1981

To: Product Manager 21 Jacoby
TS-767

From: Dr. Willa Garner III
Chief, Review Section No. 1
Environmental Fate Branch

Attached please find the environmental fate review of:

Reg./File No.: 100-607

Chemical: Metalaxyl

Type Product: Fungicide

Product Name: Ridomil

Company Name: Ciba-Geigy

Submission Purpose: Conditional registration follow-up - 5th groundwater monitoring study

ZBB Code: other-condit. reg. followup

ACTION CODE: 571

Date in: 2/23/81

EFB #: 770

Date Completed: MAR 11 1981

TAIS (level II)	Days
80	5

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

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1.0 INTRODUCTION

1.1 Purpose

Ciba-Geigy submitted the 5th ground water monitoring study, requesting conditional registration of Metalaxyl (Ridomil), a fungicide, intended for National use on citrus [File No. 100-607, submitted on 2/2/81]. Water and soil residue data submitted were from Metalaxyl - treated tobacco fields in Suwanee County, Florida and the tobacco experimental farm in Maryland.

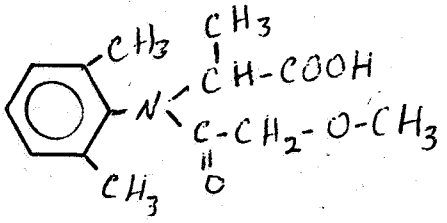
1.2 Background

Metalaxyl (Ridomil 2E) is currently registered for use on tobacco under Section 3(c)(7) [EPA Reg. No. 100-607]. Registered use pattern on tobacco is preplant incorporated using ground equipment and a maximum dosage of 3.0 Lbs ai/A/Y. A state registration under Section 24-c is currently approved for control of foot-rot and root-rot on non-bearing citrus in Florida at a maxiumum dosage of 4 lbs ai/A/Y, surface applied [SLN Fla 8000-32]. State registration was granted on conditions that soil and ground water be monitored for contamination by metalaxyl residues. On 1/12/81 EFB concurred with the addition of the use on non-bearing citrus in Florida to the registered label. Finally, metalaxyl is currently under experimental use permit to test its effectiveness against late potato blight using a maximum dosage of 2.63 lbs ai/A/Y, ground or aerially applied.

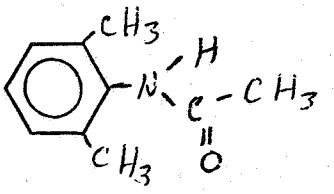
1.3 Environmental Profile

Data in our files show that, under actual use conditions, Ridomil will be stable to hydrolysis and soil surface photolysis. In soil, under aerobic conditions, Ridomil can be expected to degrade with a halflife of about 7 weeks with the production of the acid product CGA-62826(a) as a major degradate and CGA-42447 (b) as a minor degradate. Under anaerobic soil conditions, Ridomil breaks down, but with a halflife of about 9 weeks with (a) again as the major product, however, persisting longer than under aerobic conditions. Ridomil is stable in sterile soil, indicating soil microbes contributing to its breakdown under non-sterile conditions.

Ridomil and its aged soil residues are highly mobile via leaching in sandy soils low in organic matter but loss of Ridomil due to volatilization is not expected. Also, soil adsorption of Ridomil is minor, as supported by its high leachability.



(a) CGA - 62826
N-(2,6-dimethylphenyl)-N-methoxyacetyl - alanine



(b) CGA-42447
2,6-dimethy-acetanilide

1.4 Groundwater Monitoring

EFB review of the 4th interim groundwater monitoring study on 1/12/81 had shown no metalaxyl or acid degradate in any water (< 0.001 ppm) or soil samples (< 0.05 ppm) at day 154 after application.

Studies were conducted in tobacco-growing areas of Suwannee County, Florida and the Tobacco Experiment farm in Maryland. At the conclusions of the review, the following recommendations were made:

1. Terminate the monitoring study in Suwannee County, Florida.
2. Change sampling intervals from 15 to 30 days at the Maryland site.
3. Terminate all monitoring studies after 2 years if the data indicate no potential for groundwater contamination.
4. Not to exempt the company from generating additional groundwater monitoring data for any pending or proposed new uses of Ridomil until after the results of the Indian River study have been submitted and reviewed.

1.5 Previous Reviews

Fla - 8000-32	10/8/80
100-EUP-1, 8G 2121	12/1/80
100-607	1/12/81

plus several correspondence on groundwater monitoring .

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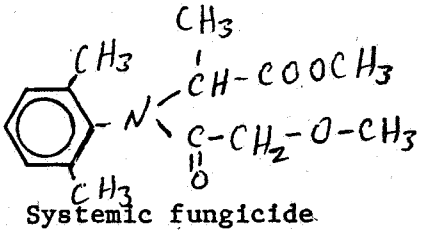
1.6 Chemical:

Common name : Metalaxyl
Trade name : Ridomil 2E
Chemical formula : N-(2,6-dimethylphenyl-N-methoxyacetyl)alanine methyl ester - 2 lbs ai/gal.

Structural formula :



Type : Systemic fungicide

2.0 USE DIRECTIONS

Ciba-Geigy did not submit a label for the proposed National use of Ridomil on citrus. Currently registered use in the state of Florida [24-C; SLN Fla 8000-32], allows use of Ridomil for control of foot-rot and root-rot on non-bearing citrus, at a maximum dosage of 4 Lbs ai/A/y, surface applied.

3.0 DISCUSSION OF DATA

The 5th interim groundwater monitoring study was submitted in volume 1 of 1, on 2/6/81, filed under accession No. 244386. No additional environmental chemistry data were submitted.

3.1 Florida Tobacco Farm

Ridomil dosage : 2 lbs ai/A
Date of application : 4/10/80
Soil characteristics : fine sand
Cumulative rainfall : 33.3" [1.7" rain fell two days after application].

[A] Soil Residue Analysis

Sampling [days after treatment - DAT]: 0, 26, 55, 85, 119, 154
Sampling depth (inches): 0-6, 6-12, 12-16, 16-20, 20-24, 24-30, 30-36, 36-40, 40-42.
Results: Ridomil and/or its acid degradate [CGA 62826] in ppm.
(a) 0 DAT: Ridomil residues were in the upper 6" layer of soil in amounts varying from 0.66-1.25 ppm.

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(b) 26 DAT: Ridomil residues were detected in soil samples to a depth of 2 feet in amounts varying from 0.059-0.242 ppm. None was detected below 2 feet deep.

(c) 85 DAT: of 24 samples analyzed, the following contained Ridomil residues: 0-6", 0.67 ppm
6-12", 0.136 ppm

(d) 119 DAT: all samples were negative, i.e., below the detectable level of 0.05 ppm

[B] Well Water Analysis

Sampling [days after treatment - DAT]: 26, 55, 85, 119, 154, 186, 227.

Number of wells analyzed: four including one control.

Results: In all 40 samples analyzed, Ridomil residues were below the detectable level of 0.001 ppm.

3.2 Maryland Tobacco Farm

Ridomil dosage	:	2 lbs ai/A
Date of application	:	5/29/80 & 7/29/80
Soil characteristics	:	NA
Cumulative rainfall	:	20.12"

[A] Soil Residue Analysis

Sampling [days after treatment - DAT]: 0, 15, 30, 33, 44, 49, 61, 76, 91, 106, 121, 135.

Sampling depth (inches): 0-6, 6-12, 12-18, 18-24, 24-30, 30-36, 36-42, 42-48.

Results: Ridomil residues in ppm:

(a) Pretreatment: No Ridomil residues were detected in the upper 6" of soil.

(b) 0 DAT: Ridomil residues were in the upper 6" layer of soil in amounts varying from 0.0025-6.08 ppm.

(c) 15 DAT: 4 samples in the upper 6" of soil contained 2.35, 0.867, 0.091, and 0.075 ppm. 20 other samples, each contained < 0.05 ppm, comparable to control samples, to a depth of 48".

(d) 30 DAT: 3 samples in the upper 6" of soil contained 0.32, 0.26, and 0.16 ppm. 21 other samples, each contained <0.05 ppm, comparable to control samples, to a depth of 48".

(e) 44 DAT: 2 samples in the upper 6" of soil contained 1.299 and 0.724 ppm. One sample in the 6-12" level contained 0.133 ppm. 21 other samples contained < 0.05 ppm to a depth of 48".

(f) 49 DAT: 2 samples in the upper 6" of soil contained 0.849 and 0.423 ppm. 22 other samples taken to a depth of 48", each contained 0.05 ppm.

(g) 61 DAT: 24 samples to a depth of 48", each contained < 0.05 ppm, i.e., comparable to non-treated samples.

(h) 76 DAT: 2 samples in the upper 6" of soil contained 0.19 and 0.16 ppm. 22 other samples taken to a depth of 48", each contained < 0.05 ppm.

(i) 91 DAT: 2 samples in the upper 6" of soil contained 1.18 and 0.36 ppm. One sample in the 6-12" level contained 0.15 ppm; one sample in the 24-30 level contained 0.09 ppm, One sample in the 30-36" level contained 0.06 ppm, and 20 other samples taken to a depth of 48", each contained < 0.05 ppm.

(j) 106 DAT: One sample in the upper 6" contained 3.3 ppm; one in the 6-12" level contained 0.15 ppm; one in the 12-18" level contained 0.13 ppm; and 21 other samples taken to a depth of 48", each contained 0.06 ppm which was equivalent to the non-treated samples.

(k) 121 DAT: 2 samples in the upper 6" of soil contained 2.8 and 0.67 ppm; one in the 6-12" level contained 2.18 ppm; one in the 12-18" level contained 3.71 ppm; and 20 other samples taken to a depth of 48", each contained < 0.05 ppm.

(l) 135 DAT: 2 samples in the upper 6" of soil contained 0.37 and 0.3 ppm; one in the 6-12" level contained 0.08 ppm; and 21 other samples taken to a depth of 48", each contained < 0.05 ppm.

[B] Well Water Analysis

Sampling [days after treatment - DAT]: Pretreatment, 0, 15, 30, 33, 44, 49, 51, 61, 76, 91, 106, 121, and 135.

Number of wells analyzed: 7 including one control. Depth to water levels in wells was recorded as follows:

Well #	Depth Range
1	5'5" 9'8"
2	4'5" 9'2"
3	4'10" 9'
4	4'4" 8'8"
5	3'5" 7'5"
6	3'10" 7'4"
control	dry 20" 2"

Well #7 is located on the top of a 5-10% sloping area, all other wells are located at the bottom.

Results

The following 14 samples showed Ridomil residues above the detectable level of 0.001 ppm:

Well #	DAT	ppm	DAT	ppm	DAT	ppm
2	0	0.004	15	0.068	30	0.002
3	0	0.034	15	0.236	30	0.002
4	0	0.043				
5	0	0.017				
6	0	0.015				
control	0	0.007				

Note: No analysis were made for the acid degradate of Ridomil (CGA-62826] in all soil and water samples from Maryland.

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4.2 SUMMARY OF RESULTS

4.1 Suwanne County, Florida

Soil Residues: Ridomil residues exceeding the minimum detectable level of 0.05 ppm were: 0.242 ppm were detected in the 18-24" soil layer, 26 days after treatment; and 0.136 ppm in the 6-12" soil layer after 85 days of treatment [these data were previously reported in the November 13, 1980 report].

Water Residues: Ridomil residues of all samples analyzed were consistently below the detectable level of 0.001 ppm.

4.2 Tobacco Experimental Farm, Maryland

Ridomil residues exceeding the minimum detectable level of 0.05 ppm, were: 0.13 ppm were detected in the 6-12" soil layer, 44 days after treatment; 0.15 ppm after 91, 106, and 121 days after treatment; and 0.08 ppm, 135 days after treatment. In the 12-18" soil layer, Ridomil residues averaged 0.13 ppm, 106 days after treatment; and 3.71 ppm, 121 days after treatment. In the 24-30" soil layer, Ridomil residues averaged 0.09 ppm, 91 days after treatment. Finally, in the 30-36" soil layer, Ridomil residues averaged 0.06 ppm, 91 days after treatment. Most of Ridomil residues remained in the top 6" soil layer in amounts varying from 0.19 - 6.08 ppm throughout the whole sampling period of 135 days after treatment.

Water Residues:

Ridomil residues exceeding the minimum detectable level of 0.001 ppm in wells 4-10 feet deep were: 0.004 to 0.043 ppm on day of treatment; 0.068 ppm in well 2, 15 days after treatment; 0.236 ppm in well 3, 15 days after treatment; and 0.002 ppm in wells 2 and 3, 30 days after treatment.

5.0 CONCLUSIONS

There are several weaknesses in the monitoring study for Metalaxyl in groundwater and soil residues which are:

(a) The experimental dosage for monitoring in the tobacco-growing areas was 2 lbs ai/A; whereas, this dosage should have been comparable to the currently registered dosage of 3 lbs ai/A.

(b) The average 1980 rainfall in Maryland was substantially less then the normal average for the area (60%).

(c) The experimental design did not include analysis for the acid degradate of Metalaxyl (CGA-62826) in Maryland soils and water specimens. It will take about two years of consecutive applications to detect such degradates in groundwater.

(d) Reporting was deficient in the followings: use pattern, distance from treated area to wells, soil characteristics, and recharge rate.

6.0 RECOMMENDATIONS

We do not concur with the proposed Federal registration of Metalaxyl to citrus. We recommend that further groundwater and soil residue monitoring should continue in the Tobacco Experimental Farm in Maryland as well as those currently underway in the Indian River [see monitoring deficiencies listed in the above conclusion section (5:0)].

Note to PM:

In addition to the monitoring study, Ciba-Geigy must comply with environmental chemistry data gaps for metalaxyl which are (a) Effects of Ridomil on soil microorganisms, and (b) Fish accumulation study.

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