

US EPA ARCHIVE DOCUMENT

Date Out: EFB:

June 19, 1981

To: Product Manager 21 Jacoby  
TS-767

From Dr. Willa Garner <sup>WJ</sup>  
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: \_\_\_\_\_ Add use on cottonseed, soybeans, wheat, and certain  
vegetable crops. \_\_\_\_\_

ZBB Code: \_\_\_\_\_ 3(c)(7) \_\_\_\_\_

ACTION CODE: \_\_\_\_\_ 330 \_\_\_\_\_

Date in: \_\_\_\_\_ 4/28/81 \_\_\_\_\_

EFB # \_\_\_\_\_ 828 \_\_\_\_\_

Date Completed: \_\_\_\_\_ June 19, 1981 \_\_\_\_\_

TAIS (level II) Days

Deferrals To:

63

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\_\_\_\_\_ Ecological Effects Branch

\_\_\_\_\_ Residue Chemistry Branch

X \_\_\_\_\_ Toxicology Branch

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1. INTRODUCTION

- 1.1 Ridomil (Giby-Geigy) fungicide has the active ingredient metalaxyl, or N-(2,6-dimethylphenyl)-N-methoxyacetyl) alanine methylester, or Ciba-Geigy's nomemencature CGA 48988. The structure of metalaxyl is given on page 2.
- 1.2 An adequate GC method of analysis exists for metalaxyl (reviewed in 2/26/79 memo. S. Creeger to Product Manager Wilson) and its acid metabolite (see pg 2 for structure).
- 1.3 The purpose of the present submission of environmental fate data is to support admendments to the present approved label to include use on:

field crops

wheat  
cotton  
soybeans

vegetable crops

broccoli	onions
cabbage	potatoes
cauliflower	spinach
cucumbers	tomatoes
lettuce	melons

In addition to uses on the above crops, the registrant petitions for use of Ridomil (metalaxyl) in tank mixtures with each of following (separately): Bravo, Difolitan, and Dithane M-45. The chemical structures of the active ingredients of these pesticides are presented on page 2. The uses of Bravo, Difolitan, or Dithane in conjunction with Ridomil are for the purpose of increasing the pesticidal spectrum of Ridomil.

- 1.4 Current registered uses of the fungicide Ridomil are for tobbaoco, nonbearing citrus, ornamentals, and turf.
- 1.5 The environmental fate of Ridomil has been reviewed by S. Creeger 2/26/79. The environmental fate was summarized in that memo as follows:

Environmental Profile

Under conditions likely to be found in the environment, 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 acid product, CGA-62826, being the principle product, which in turn will break down to non-extractable material and CO<sub>2</sub>. Under anaerobic soil conditions Ridomil also will break down, but with a halflife of about 9 weeks with CGA-62826 again being the major product but persisting longer than under aerobic conditions. Ridomil is stable in sterile soil, indicating soil microbes contribute to its breakdown under non-sterile conditions.

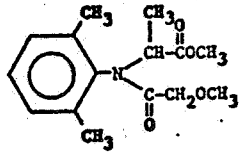
Ridomil and its aged soil residues are highly mobile via leaching in sandy soils low in organic matter but loss of Ridomil due to volatilization is not expected. Also, soil adsorption of Ridomil is minor, as supported by its high leachability.

Under field conditions, the fate of Ridomil in soil is similar to that under lab conditions as described above except for the shorter halflife of two weeks under field conditions.

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Common Names, Structures and Nomenclatures for Ridomil®, Bravo®, Difolatan® and Dithane® M-45.

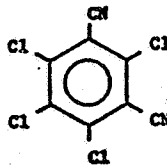
I Ridomil



Metalaxyl

N-(2,6-Dimethylphenyl)-N-(methoxyacetyl)-alanine methyl ester

II Bravo

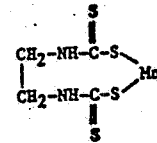


Chlorothalonil

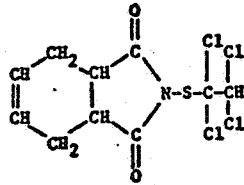
2,4,5,6-Tetrachloroisophthalonitrile

IV

Dithane M-45



III Difolatan



Captafol

cis-N-(1,1,2,2-Tetrachloroethylthio)-4-cyclohexene-1,2-dicarboximide

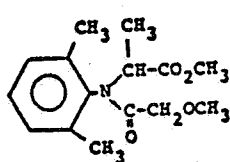
Maneb + Zinc ion

Contains 16% manganese, 2% zinc and 62% ethylenebis(dithiocarbamate) ion/manganese ethylenebis(dithiocarbamate) plus zinc ion

Maneb

Manganous ethylenebis(dithiocarbamate)

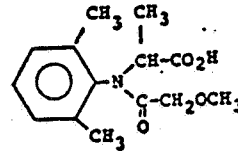
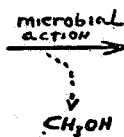
Principal Environmental Reaction of the active ingredient of Ridomil



metalaxyl

CGA-48988

(Leiby-Geigy nomenclature)



acid metabolite

CGA-62826

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- 1.6 A complete set of environmental fate data has been submitted by the registrant in accordance with 1978 guidelines. These data were reviewed by EFB (memo 2/26/79) and it was concluded that:

The following data requirements have been met and will support additional uses of Ridomil:

- hydrolysis
- photolysis (soil surface)
- aerobic soil metabolism
- anaerobic soil metabolism
- effects by microbes
- leaching and aged leaching
- adsorption/desorption
- field dissipation

### Directions for Use

- 2.0 The proposed uses for Ridomil are listed crop-by-crop on pages 4 and 5. The maximum amount of Ridomil which can be applied per acre is given in the right-hand column on page 6.

### 3.0 Discussion of Data

- 3.1 Two sites were chosen in Washington and New York states to test the potential for persistence soil residues of metalaxyl + chlorthalonil, metalaxyl + captafol, and metalaxyl + mancozeb (tank mixture applications) to either component of the tank mixes applied alone. The amounts applied per acre were:

<u>Compound</u>	<u>Amount applied per acre (lbs a.i./acre)</u>
1. Metalaxyl	1.75
Bravo (a.i. chlorthalonil)	7.88
2. Metalaxyl	1.75
Difolatan (a.i. captafol)	1.05
3. Metalaxyl	1.75
Dithane M-45 (a.i. Zn + Maneb)	11.2

The amounts of a.i. applied were the same when applied alone as when applied from tank mixes.

Soil samples were collected from the 0-6 inch layer. Times of collection were approximately 0, 1, 2, 4, 10, 12 months following application. The soil characteristics in Washington are those mainly of sandy loam soil and in New York those of gravelly loam.

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RIDOMIL 2E  
DIRECTIONS FOR USE

Cole Crops (Cabbage, Broccoli and Cauliflower)

Downy Mildew (Peronospora spp.)

Apply 1 pt. Ridomil 2E per acre in 50-100 gals. water starting when conditions are favorable for disease development and continue at 14-day intervals throughout the season. Use a spreader-sticker at rates recommended on the product labels.

Note: Do not apply more than 4 pts. Ridomil 2E per acre per season or make the last application within 7 days of harvest.

Cotton

Seed Rots and Seedling Diseases of Cotton (Pythium spp. and Phytophthora spp. only)

Apply Ridomil 2E as a seed treatment, at the rate of 1-2 fluid ounces per 100 lbs. seed.

Cucumbers and Melons

Downy mildew (Peronospora cubensis)

Apply 1 pt. Ridomil 2E per acre in 50-100 gals water per acre starting when the plants are in the two-leaf stage and continue at 14-day intervals throughout the season.

Note: Do not apply more than 8 pts. Ridomil 2E per acre per season or make the last application within 5 days of harvest.

Leafy Vegetables (Head lettuce, spinach)

Downy Mildew (Bremia lactucae and Peronospora effusa)

Apply 1 pt. Ridomil 2E per acre in 50-100 gals. of water starting when conditions are favorable for disease development and continue at 14-day intervals throughout the season.

Note: Do not apply more than 4 pts. Ridomil 2E per acre per season or make the last application within 7 days of harvest.

Onions - Dry Bulb and Green

Downy Mildew (Peronospora destructor)

Apply 1 pt. Ridomil 2E in 50-100 gals. water per acre starting when conditions are favorable for disease development and continue at 14-day intervals throughout the season. Use a spreader-sticker at rates recommended on the product labels.

Note: Green Onions - Do not apply more than 3 pts. Ridomil 2E per acre per season or make the last applications within 5 days of harvest.

Dry Bulb Onions - Do not apply more than 5 pts. Ridomil per acre per season or make the last applications within 21 days of harvest.

Potatoes

Late Blight (leaf blight and tuber rot)

Apply Ridomil 2E as a tank mix with Dichane M-45, Manzate 200, Bravo 6F or Difolatan 4F on a 14-day schedule starting when plants are six inches high or when conditions are favorable for late blight development and continue at 14-day intervals throughout the season. Use 1/2-1 pt. Ridomil and the lowest recommended rates of the protectant fungicides in a minimum of 50 gallons of water per acre for ground applications and a minimum of 3 gallons of water per acre for aerial application.

Note: Ridomil does not control early blight (Alternaria solani). When conditions are favorable for early blight, additional applications of a protectant fungicide must be made according to their use directions.

Early and Late Blight (leaf blight and tuber rot)

Apply 1/4-1/2 pt. Ridomil in a tank mix with recommended rates of Dichane M-45, Manzate 200, Bravo 6F or Difolatan 4F. Start applications when plants are six inches high or when either disease first appears and continue at 7-10 day intervals. Use the higher rates of the fungicides as disease pressure increases. Use a minimum of 50 gallons water per acre for ground applications and a minimum of 3 gallons water per acre for aerial applications.

Do not apply more than 9 pts. Ridomil 2E per acre per season nor make the last application within 7 days of harvest. Observe all precautions and restrictions that appear on labels of other products that are applied with Ridomil.

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RIDOMIL 2E

DIRECTIONS FOR USE

Soybeans

Pythium Damping Off and Seedling Phytophthora Root and Stem Rot

Broadcast 6 pt. Ridomil 2E per acre or apply 1 pt. Ridomil per 13,000 linear feet of row in a 7-inch band over the row at planting.

Note: In fields heavily infested with Phytophthora, Ridomil 2E may not provide full season control.

Wheat

Pythium Seedling Diseases

Apply 1-2 qts. Ridomil 2E per acre as a broadcast soil surface application at or before seeding.

Tomatoes

Late Blight (Phytophthora infestans)

Apply Ridomil 2E as a tank mix with Bravo 6F as a foliar spray on a 14-day schedule starting when plants are six inches high or when conditions are favorable for disease development and continue at 14-day intervals throughout the season. Use 3/4-1 pt. Ridomil plus the lowest recommended rates of Bravo 6F in a minimum of 50 gallons of water per acre. Under heavy disease pressure, use the higher rate of Ridomil.

Note: Ridomil does not control early blight (Alternaria solani). When conditions are favorable for early blight, additional applications of a protectant fungicide that controls early blight must be applied according to their use directions.

Early and Late Blight

Apply Ridomil 2E as a tank mix with Bravo 6F as a foliar spray on a 7-10 day schedule. Start applications when plants are six inches high or when conditions are favorable for disease development and continue throughout the season. Use 1/2-1 pt. Ridomil 2E with rates of Bravo 6F recommended for early blight control in a minimum of 50 gallons of water per acre.

Seedling Damping Off (Pythium spp.)

Apply 4 pts. Ridomil 2E per acre immediately before or after planting in 20-50 gallons of water. Lightly incorporate with mechanical equipment if application is made prior to planting or with sprinkler irrigation if applied after planting.

For banded applications, calculate the amount of Ridomil 2E needed as follows:

$$\frac{\text{Band width in inches} \times \text{Broadcast Rate per acre}}{\text{Row width in inches}} = \text{Amount needed per acre}$$

Fruit Rot (Pythium spp. and Phytophthora spp.)

Apply 4-8 pts. Ridomil 2E per acre of tomatoes as a soil surface application under the vines 6-8 weeks before harvest. Follow as soon as possible with an irrigation.

Note: Do not apply more than 12 pts. Ridomil 2E per acre per season. Observe all precautions and restrictions that appear on the Bravo 6F label.

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Ridomil Application

<u>Crop</u>	<u>Treatment Schedule</u>	<u>Maximal Annual Amount of Ridomil Applied per Acre</u>
Cole crops	1 pt @ 14 day intervals; throughout growing season	<u>volume of 2E lbs. Ridomil</u> 4 pts = 1 lbs.
Cotton	seed treatment	2 oz/100 lbs seed
Cucumbers & melons	1 pt @ 14 day intervals throughout growing season	8 pts = 2 lbs.
Head Lettuce & Spinach	1 pt @ 14 day intervals throughout growing season	4 pts = 1 lbs.
green onions	1 pt @ 14 day intervals throughout growing season	3 pts = 0.75 lbs.
dry bulb onions	1 pt @ 14 day intervals throughout growing season	5 pts = 1.25 lbs.
potatoes	1 pt @ early blight - 7-10 day intervals 1 pt @ late blight - 14 day intervals 1 treatment at planting	9 pts = 2.25 lbs. 6 pts = 1 lbs.
wheat	at or before seeding	4 pts = 1 lb
Tomatoes	early blight - 7-10 day intervals late blight - 14 day intervals	12 pts = 3 lbs

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3.2 Conditions in the test area sites were:

Soil Characteristics and Rainfall Data for  
Ridomil® Tank Mix Soil Dissipation Studies

<u>Location</u>	<u>Soil Characteristics</u>	<u>Date of Application</u>	<u>Sample Date</u>	<u>Interval (Days)</u>	<u>Cumulative Rainfall (inches)</u>
Washington	Soil Texture: Sandy Loam pH: 6.6 OM: 1.2% CEC: 17.6	5/6/77	5/6/77	0	0.02
			6/6/77	31	1.12
			7/6/77	61	1.12
			9/5/77	122	1.98
			3/3/78	301	10.38
			5/5/78	364	13.06
New York	Soil Texture: Hoosic Gravelly Loam pH: 6.9 OM: 2.1% CEC: 8.1	6/20/77	6/20/77	0	0.15
			7/20/77	30	1.75
			8/19/77	60	4.65
			10/18/77	120	18.65
			3/30/78	283	31.65
			6/12/78	357	43.90

It is noted that the Washington site had low organic matter and 0.3 the cumulative rainfall of the New York site.

3.3 The Summary of the residues from tank mix applications are given on pages 8, 9, and 10.

It is concluded that each of the chemicals dissipate from soil independently in a complex (not simple first order kinetics) manner whether applied from tank mixtures or alone. Furthermore, the kinetics of disappearance from the 0-6 inch layer of soil are the same for each of fungicides whether applied from tank mixtures or alone. There are differences in initial amounts in soils in Washington and New York which are not accounted for by the accumulative rainfall given in section 3.2. The differences are seen to be due to the differences of the soil composition between the two sites. The residue loss curves are parallel when comparing one particular fungicide between two sites indicating the same mechanisms are operative in dissipation of residues from the soils in the two sites. The principal point is that each fungicide demonstrates the same residue loss curve in each respective site whether applied alone or from tank mixtures.

3.4 From the maximal annual amount of Ridomil applied to the soils of crops listed in section 1.3 and the total acres of each crop planted in the U.S., the realistic maximum amount of Ridomil in U.S. soils can be calculated. If it is assumed that 10% of crops are treated then the realistic upper limit can be calculated. This amount of Ridomil is a potential source of U.S. ground water contamination. See page 11 for these calculations. The total realistic amount of Ridomil which could be applied to U.S. soils is 16,600,000 lbs. from 10% of the cropland soils for which there are petitioned uses for Ridomil.

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Ridomil plus Bravo

Ridomil® 50W Plus Bravo 75W Tank Mix Soil Dissipation - Washington

Report No.	Rate (Lbs. ai/A)	Date of Application	Sample Date	Interval (Days)	Residue (ppm)	
					Metalaxyl	Chlorothalonil
AG-A 4802 I-III 2nd Rpt. B	1.75 Ridomil (alone)	5/6/77	5/6/77	0	7.4	
			6/6/77	31	0.81	
			7/6/77	61	0.13	
			9/5/77	122	0.28	
			3/3/78	301	0.12	
AG-A 4902 I-III	7.88 Bravo (alone)	5/6/77	5/6/77	0		26
			6/6/77	31		2.3
			7/6/77	61		1.5
			9/5/77	122		0.93
			3/3/78	301		0.24
5/5/78	364		0.09			
AG-A 4802 I-III 2nd Rpt. B and AG-A 4802 I-III	1.75 Ridomil 7.88 Bravo (tank mix)	5/6/77	5/6/77	0	5.8	17
			6/6/77	31	0.63	3.8
			7/6/77	61	0.16	1.7
			9/5/77	122	0.27	2.0
			3/3/78	301	0.14	0.24
5/5/78	364		0.08			

Ridomil® 50W Plus Bravo 6F Tank Mix Soil Dissipation - New York

Report No.	Rate (Lbs. ai/A)	Date of Application	Sample Date	Interval (Days)	Residue (ppm)	
					Metalaxyl	Chlorothalonil
AG-A 4813 I-IV	1.75 Ridomil (alone)	6/20/77	6/20/77	0	0.69	
			7/20/77	30	0.17	
			8/19/77	60	0.38	
			10/18/77	120	0.23	
			3/30/78	283	0.12	
AG-A 4815 I-V	7.88 Bravo (alone)	6/20/77	6/20/77	0		4.1
			7/20/77	30		3.0
			8/19/77	60		3.4
			10/18/77	120		2.9
			3/30/78	283		0.51
6/12/78	357		0.10			
AG-A 4815 I-V 2nd Rpt. and AG-A 4815 I-V	1.75 Ridomil 7.88 Bravo (tank mix)	6/20/77	6/20/77	0	0.60	3.9
			7/20/77	30	0.48	3.3
			8/19/77	60	0.27	2.4
			10/18/77	120	0.11	3.3
			3/30/78	283	0.08	0.16
6/12/78	357	0.06	0.31			

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Ridomil plus Difolatan

Ridomil• 50W Plus Difolatan 4F Tank Mix Soil Dissipation - Washington

Report No.	Rate (Lbs. ai/A)	Date of Application	Sample Date	Interval (Days)	Residue (ppm)	
					Metalaxyl	Captafol
AG-A 4803 I,II 2nd Rpt. A	1.75 Ridomil (alone)	5/6/77	5/6/77	0	7.3	
			6/6/77	31	1.2	
			7/6/77	61	0.15	
			9/5/77	122	0.25	
AG-A 4803 I,IIA	10.5 Difolatan (alone)	5/6/77	5/6/77	0		16
			6/6/77	31		0.27
			7/6/77	61		<0.10
			9/5/77	122		<0.10
AG-A 4803 I,II 2nd Rpt. A and AG-A 4803 I,IIA	1.75 Ridomil 10.5 Difolatan (tank mix)	5/6/77	5/6/77	0	5.2	11
			6/6/77	31	1.2	0.92
			7/6/77	61	0.33	<0.10
			9/5/77	122	0.31	<0.10

Ridomil• 50W Plus Difolatan 4F Tank Mix Soil Dissipation - New York

Report No.	Rate (Lbs. ai/A)	Date of Application	Sample Date	Interval (Days)	Residue (ppm)	
					Metalaxyl	Captafol
AG-A 4813 I-IV	1.75 Ridomil (alone)	6/20/77	6/20/77	0	0.69	
			7/20/77	30	0.17	
			8/19/77	60	0.38	
			10/18/77	120	0.23	
			3/30/78	283	0.12	
AG-A 4813 I-III 2nd Rpt.	10.5 Difolatan (alone)	6/20/77	6/20/77	0		2.2
			7/20/77	30		1.7
			8/19/77	60		0.78
			10/18/77	120		0.21
AG-A 4813 I-IV and AG-A 4813 I-III 2nd Rpt.	1.75 Ridomil 10.5 Difolatan (tank mix)	6/20/77	6/20/77	0	0.49	1.8
			7/20/77	30	0.16	0.76
			8/19/77	60	0.30	0.19
			10/18/77	120	0.28	0.24
			3/30/78	283	0.21	

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Ridomil plus Dithane M-45

Ridomil® 50W Plus Dithane M-45 80W Tank Mix Soil Dissipation - Washington

Report No.	Rate (Lbs. ai/A)	Date of Application	Sample Date	Interval (Days)	Residue (ppm)	
					Metalaxvl	Mancozeb
AG-A 4801 I-III 2nd Rpt. A	1.75 Ridomil (alone)	5/6/77	5/6/77	0	5.3	
			6/6/77	31	0.68	
			7/6/77	61	0.31	
			9/5/77	122	0.24	
			3/3/78	301	0.13	
			5/5/78	364	0.10	
AG-A 4801 I,IIA	11.2 Dithane (alone)	5/6/77	5/6/77	0		12
			6/6/77	31		2.3
			7/6/77	61		1.2
			9/5/77	122		0.44
AG-A 4801 I-III 2nd Rpt. A and AG-A 4801 I,IIA	1.75 Ridomil 11.2 Dithane (tank mix)	5/6/77	5/6/77	0	4.6	10
			6/6/77	31	0.52	1.6
			7/6/77	61	0.23	0.42
			9/5/77	122	0.38	1.8
			3/3/78	301	0.17	-----
			5/5/78	364	0.29	-----

Ridomil® 50W Plus Dithane M-45 80W Tank Mix Soil Dissipation - New York

Report No.	Rate (Lbs. ai/A)	Date of Application	Sample Date	Interval (Days)	Residue (ppm)	
					Metalaxvl	Mancozeb
AG-A 4813 I-IV	1.75 Ridomil (alone)	6/20/77	6/20/77	0	0.69	
			7/20/77	30	0.17	
			8/19/77	60	0.38	
			10/18/77	120	0.23	
			3/30/78	283	0.12	
AG-A 4814 I-III	11.2 Dithane (alone)	6/20/77	6/20/77	0		5.0
			7/20/77	30		1.6
			8/19/77	60		-----
			10/18/77	120		1.1
AG-A 4814 I-V 2nd Rpt. and AG-A 4814 I-III	1.75 Ridomil 11.2 Dithane (tank mix)	6/20/77	6/20/77	0	0.60	3.2
			7/20/77	30	0.42	1.6
			8/19/77	60	0.19	3.6
			10/18/77	120	0.17	0.64
			3/30/78	283	0.07	-----
			6/12/78	357	0.05	-----

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MAXIMUM AMOUNT OF RIDOMIL REALISTICALLY POSSIBLE IN U.S. SOILS

<u>Crop</u>	<u>Maximum amount applied (lbs per Acre)</u>	<u>Total U.S. Acres Planted * (x 10<sup>-5</sup>)</u>	<u>Maximum amount of Ridomil in U.S. Soils</u>
1. Cole Crops (cabbage, cauliflower, & Broccoli)	1.0	0.21	21,000
2. Cotton	Seed treatment	13.4	non expected
3. Cucumbers & melons	2	0.072	14,400
4. Head Lettuce & spinach	1	0.26	26,000
5. Onions	1 (average)	0.12	12,000
6. Potatoes	2.25	1.39	312,750
7. Soybeans	1.5	64	9,600,000
8. Wheat	1.0	66	6,600,000
9. Tomatoes	3	0.13	39,000
SUM:			16,600,000 lbs.

\* 1978 statistics from Agr. Statistics 1979. It is assumed that 10% of the market share usage is a realistic upper limit of Ridomil usage in the U.S.

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4.0 Conclusions

- 4.1 Bravo, Difolaten, and Dithane M-45 do not alter the surface soil (0-6 inches) dissipation of metalaxyl, and conversely, metaloxyl does not alter the surface soil dissipation of Bravo, Difolatan and Dithane M-45.
- 4.2 From the review of Ridomil of 2/26/79, EFB finds the environmental fate data requirements have been adequately satisfied in accordance with the 1978 guidelines. EFB defers to TOX as to relevance of the necessity of the same data on the principle acid metabolite of metalaxyl (CGB62826).

4.3 Ridomil is highly mobile in soils especially in sandy soils of low organic matter content (see EFB Ridomil File for numerous reviews on this topic).

4.4 Because of the soil mobility Ridomil has been monitored at Suwanee County, Florida, Indian River, Florida, and a tobacco site in Maryland. The Indian River and Maryland sites are still being monitored for soil and well water contamination of Ridomil. EFB has concluded that these studies should be continued (S. Malak, 5/26/81). *TH...  
...  
...*

4.5 No metalaxyl, or the acid metabolite, were found in Suwanee County Florida in soil or well water. No metalaxyl (acid metabolite not determined) was found in Maryland soil or well water (memo., J. Reinert 1/12/81). The results from the worst case site at Indian River, Florida are forthcoming and have not been reviewed yet. *...*

To date, EFB has seen no evidence to preclude registration of Ridomil on the crops listed in section 1.3 on the basis of actual field and water measurement of Ridomil. EFB continues to express reasonable concern of the mobility of Ridomil in soils especially in sandy, low organic content soils. Although the aforementioned studies have not shown Ridomil contamination of well water to date, it is conceivable that (given enough time) Ridomil would finally contaminate well waters. This being a distinct possibility, the final decision as to the permanent registration of Ridomil will depend on the results, and review of those results, of the Indian River soil and water studies.

4.6 Carry-over to rotational crops is not seen to be a problem. With a  $t_{1/2} = 2$  wks. (field dissipation studies) there would be negligible carry-over. With a  $t_{1/2} = 9$  wks (anaerobic studies, the longest  $t_{1/2}$ ) the carry-over would be only 1.8%. Therefore, carry-over to rotational crops will be inconsequential.

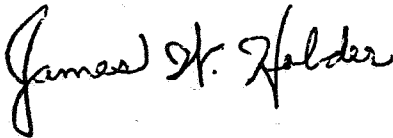
4.7 Considerable amounts of Ridomil could enter the cropland soils in the U.S. [see section 3.4]. If it is assumed that Ridomil will be used on only 10% of the crops for which registration is sought, then  $16.6 \times 10^6$  lbs Ridomil could be applied to U.S. soils. Because of the number of crops, and especially large acreage field crops such as soybeans and wheat, the need for fully understanding the leaching of Ridomil and any possible contamination of ground water thereby, is clear.

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## 5.0 Recommendations

- 5.1 Bravo, Difolatan, and Dithane M-45 do not alter metalaxyl environmental fate, and therefore are recommended to be individually used in tank mix combinations with Ridomil pending a final decision on whether Ridomil itself leaches into well water.
- 5.2 EFB recommends that the permanent registration of Ridomil uses on the soils of the crops listed in section 1.3 be contingent on the results of the Indian River, Florida studies and a final review of all leaching studies submitted to the Agency to date including the Indian River studies.
- 5.3 While these studies are being conducted, EFB recommends for conditional registration of Ridomil on the cropland soils listed in section 1.3. Upon completion of these studies Ridomil should be reconsidered for permanent registration.
- 5.4 EFB defers to TOX as to the importance of the acid metabolite of metalaxyl (CGA-62826) and the necessity of constructing an environmental fate profile for the acid metabolite CGA-62826.

EFB observes that the acid metabolite CGA-62826 should be more water soluble than the parent compound and therefore may be a stronger leacher than the parent compound unless the acid metabolite binds to soil constituents stronger than the parent compound.



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