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

NOV 5 1985

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: PP# 3F2818 and 2F2764. (RCB #1368 and #1369). Metalaxyl on Soybeans and Soybean Byproducts. Amendment of 7/18/85 for withdrawal of cotton soapstock. (No accession number).

FROM: Linda L. Kutney, Chemist
Tolerance Petition Section III
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

THRU: Philip V. Errico, Section Head
Tolerance Petition Section III
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

TO: Becky Cool/Henry Jacoby (PM-21)
Registration Division (TS-767C)

and

Robert D. Coberly, Team Leader
Toxicology Branch
Hazard Evaluation Division (TS-769)

The petitioner, Ciba Geigy, has revised Section F to withdraw the tolerance proposed for cotton soapstock. A tolerance of 2.0 ppm was proposed for metalaxyl in cotton soapstock with a 1/26/83 amendment to PP# 2F2764.

Previous memoranda by Karl Arne, PP# 3F2818, written on 8/25/83 and earlier, stated that the petitioner should withdraw the proposed metalaxyl tolerance on cotton soapstock because no detectable residues were found in

CIBA-GEIGY Technical CGA-48988

References to General Chemistry Data Previously Submitted

Data	Date of Submission	EPA Accession No.	Page(s) or Tab
Basic Manufacturing Process	6/30/78	234427	4-5
Purity of Starting and Intermediate Materials Used in Manufacturing Process	6/30/78	234427	6
Source of Chemical	CIBA-GEIGY Corporation		
Quality Control Procedure Description	6/30/78	234427	14-33
Common Name	6/30/78	234427	1
Chemical Abstracts Name	6/30/78	234427	1
Trade Name	6/30/78	234427	1
Structural Formula	6/30/78	234427	1
Melting Point	6/30/78	234427	1
Boiling Point	6/30/78	234427	1
Vapor Pressure	6/30/78	234427	1
Density - Specific Gravity	6/30/78	234427	1
Hydrolysis Rate	6/30/78	234427	1
Solubility	6/30/78	234427	1
Dissociation Content	6/30/78	234427	2
Stability	6/30/78	234427	2
Physical State	6/30/78	234427	2
Color	6/30/78	234427	2

Data	Date of Submission	EPA Accession No.	Page(s) or Tab
Odor	6/30/78	234427	2
Complete Composition Including Impurities	6/30/78	234427	3
Analytical Methods for Principal Component(s) and Impurities in Technical Chemical	6/30/78	234427	14-24
2-Gram Sample Purified Analytical Standard	To be submitted upon request		
10-20 Gram Sample Batch	To be submitted upon request		

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References to General Chemistry Data Previously Submitted on Ridomil® 2E

Data	Date of Submission	EPA Accession No.	Page(s) or Tab
Miscibility	6-30-78	234427	11
pH	6-30-78	234427	11
Boiling Point	6-30-78	234427	11
Flash Point	6-30-78	234427	11
Density	6-30-78	234427	11
Viscosity	6-30-78	234427	11
Vapor Pressure	6-30-78	234427	11
Expensive Characteristics	6-30-78	234427	11
Corrosion Hazard	6-30-78	234427	11
Oxidizing/Reducing Capacity	6-30-78	234427	11
Storage Stability	6-30-78	234427	11
Confidential Formulation	6-30-78	234427	12
Basic Manufacturing Process	6-30-78	234427	13
Quality Control Procedures and Method of Analysis by GLC	6-30-78	234427	14-33

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References to General Chemistry Data Previously Submitted on Ridomil® 2E

Data	Date of Submission	EPA Accession No.	Page(s) or Tab
Miscibility	6-30-78	234427	11
pH	6-30-78	234427	11
Boiling Point	6-30-78	234427	11
Flash Point	6-30-78	234427	11
Density	6-30-78	234427	11
Viscosity	6-30-78	234427	11
Vapor Pressure	6-30-78	234427	11
Explosive Characteristics	6-30-78	234427	11
Corrosion Hazard	6-30-78	234427	11
Oxidizing/Reducing Capacity	6-30-78	234427	11
Storage Stability	6-30-78	234427	11
Confidential Formulation	6-30-78	234427	12
Basic Manufacturing Process	6-30-78	234427	13
Quality Control Procedures and Method of Analysis by GLC	6-30-78	234427	14-33

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SECTION B

AMOUNT, FREQUENCY, AND TIME OF APPLICATION OF THE PESTICIDE CHEMICAL

General

Ridomil® 2E is a fungicide whose spectrum of control is specific for the Oomycete class of fungi. Diseases incited by fungi in this class include potato late blight, tobacco blue mold, tobacco black shank, downy mildew of cole crops, leafy vegetables, onions, cucurbits, pineapple heart rot, Phytophthora root and stem rot, late blight and fruit rot of tomatoes, and damping off in seedlings. As such, Ridomil 2E can be used as a foliar spray, soil application, or as a seed treatment.

Ridomil 2E may be applied at rates up to 3 lbs. ai/A alone or in tank mixtures with labeled rates of chlorothalonil, maneb, mancozeb, or captafol.

Rotational Crops

If replanting is necessary following a soil application, tobacco may be replanted immediately. Tomatoes may be replanted immediately provided that no more than 2 lbs. ai per acre of Ridomil was applied to the soil. Do not make a second application of Ridomil. Wheat or any crop on this label may be planted during the fall following application of Ridomil. Other small grain cover crops may also be planted during the fall following application provided they are plowed down and not used for food or feed. Corn, soybeans, root crops, or any crop on this label may be planted the year following treatment. Other crops may be planted 18 months following application.

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September 20, 1982

SECTION C

FULL REPORTS OF INVESTIGATIONS MADE WITH RESPECT TO THE SAFETY OF THE PESTICIDE CHEMICAL

The following pages reference toxicology data previously submitted by CIBA-GEIGY on:

CIBA-GEIGY Technical Metalaxyl
Ridomil® 2E Fungicide

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September 20, 1982

CIBA-GEIGY TECHNICAL CGA-48988

References to Toxicology Data Previously Submitted

Data	Date of Submission	EPA Accession No.	Page(s) or Tab No.
Toxicology Summary	6/30/78	234428	2 - 7
Acute Oral LD_{50} in the Rat of Technical CGA-48988	6/30/78	234428	8 - 10
Acute Dermal LD_{50} in the Rabbit of Technical CGA-48988	6/30/78	234428	11 - 13
Acute Dermal LD_{50} in the Rat of Technical CGA-48988	6/30/78	234428	14 - 16
Skin Irritation in the Rabbit After Single Application of Technical CGA-48988	6/30/78	234428	17 - 20
Eye Irritation in the Rabbit of Technical CGA-48988	6/30/78	234428	21 - 24
Skin Sensitizing (Contact Allergenic) Effect in Guinea Pigs of Technical CGA-48988	6/30/78	234428	25 - 31
3-Months Dietary Study in Rats with Compound CGA-48988	6/30/78	234428	32 - 258
CGA-48988 91-Day Dietary Toxicity Study in Beagle Dogs	6/30/78	234428	259 - 393
Reproduction Study CGA-48988 Technical - Rat - Seq. II	6/30/78	234428	394 - 438
Salmonella/Mammalian - Microsome Mutagenicity Test with CGA-48988	6/30/78	234428	439 - 446
Dominant Lethal Study - CGA-48988 Technical - Mouse (Test for Cytotoxic or Mutagenic Effects on Male Germinal Cells)	6/30/78	234428	447 - 502

CIBA-GEIGY TECHNICAL CGA-48988

References to Toxicology Data Previously Submitted
(Continued)

Data	Date of Submission	EPA Accession No.	Page(s) or Tab No.
Reproduction Study - Rabbit CGA-48988 Technical, Segment II (Test for Teratogenic or Embryotoxic Effects)	4/15/81	070012	7 - 49
CGA-48988: Toxicity and Oncogenicity in Dietary Administration to Rats for Two Years	4/15/81	070012 070013 070014	50 - 505 1 - 605 1 - 547
Effect of CGA-48988 on Reproduction Function of Multiple Generations in the Rat	4/15/81	070015	1 - 353
Six-Month Chronic Oral Toxicity Study with CGA-48988 Technical in Beagle Dogs	4/15/81	070016	1 - 387
Revised Section C - Toxicity and Oncogenicity in Dietary Administration to Rats for Two Years	8/13/81 and 4/13/82	070767	1 - 448
Revised Section C - Toxicity and Oncogenicity in Dietary Administration to Rats for Two Years	8/13/81 and 4/13/82	070768	449 - 1052
Revised Section C - Toxicity and Oncogenicity in Dietary Administration to Rats for Two Years	8/13/81 and 4/13/82	070769	1053 - 1598

CIBA-GEIGY TECHNICAL CGA-48988

References to Toxicology Data Previously Submitted
(Continued)

Data	Date of Submission	EPA Accession No.	Page(s) or Tab No.
CGA-48988: Oncogenicity in Dietary Administration to Mice for Two Years	6/10/82	274660	6-828
Test for Non-Disjunction on Saccharomyces Cerevisiae D61 with CGA-48988	6/10/82	274661	829-835
Saccharomyces Cerevisiae D/7 Mammalian - Microsome Mutagenicity Test In Vitro with CGA-48988	6/10/82	274661	836-851
Mutagenicity Test on Saccharomyces Cerevisiae MP-1 In Vitro with CGA-48988	6/10/82	274661	852-858
Nucleus Anomaly Test in Somatic Interphase Nuclei - CGA-48988 - Chinese Hamster	6/10/82	274661	859-865
L5178Y/$TK^{+/-}$ Mouse Lymphoma Mutagenicity Test - CGA-48988	6/10/82	274661	866-876
Autoradiographic DNA Repair Test on Rat Hepatocytes - CGA-48988	6/10/82	274661	877-885
Subchronic Inhalation Study in Rats, CGA-48988 Treated Cigarettes	6/10/82	274661	886-1101
Addendum and Corrections to Subchronic Inhalation Study in Rats - CGA-48988	8/10/82	-	11, 12, 24-27, 33, 36-39, 212-245

GH:bw

August 10, 1982

REFERENCES TO PREVIOUSLY SUBMITTED TOXICOLOGY DATA WHICH SUPPORTS THE SAFETY OF RIDOMIL® 2E FUNGICIDE

Data	Date of Submission	EPA Accession No.	Page(s) or Tab No.
Toxicology Summary	6/30/78	234429	2 - 5
Acute Oral Toxicity in Male and Female Albino Rats - CGA-48988 2EC Final Report	6/30/78	234429	6 - 18
Acute Dermal Toxicity Study in Rabbits - CGA-48988 2EC Final Report	6/30/78	234429	19 - 29
Acute Eye Irritation Study in Rabbits - CGA-48988 2EC Final Report	6/30/78	234429	30 - 46
Primary Skin Irritation Study in Rabbits - CGA-48988 2EC Final Report	6/30/78	234429	47 - 53
Acute Inhalation Toxicity Study in Rats - CGA-48988 2EC Final Report	6/30/78	234429	54 - 64
Acute Intraperitoneal LD_{50} in the Rat of Technical CGA-48988	6/30/78	234429	65 - 67
Subchronic 21-Day Dermal Toxicity in Albino Rabbits of Technical Metalaxyl	1/12/81	244182	1 - 15

GH:bw/0411

June 9, 1981

SECTION E

PRACTICAL METHODS FOR REMOVING RESIDUES THAT EXCEED ANY PROPOSED TOLERANCES

The data presented in Section D of this pesticide petition indicate that the residue tolerances proposed in Section F will not be exceeded when Ridomil® 2E is used in accordance with the amount, frequency, and time of application proposed in Section B.

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September 20, 1982

SECTION F

PROPOSED PESTICIDE TOLERANCES

We hereby request tolerances for combined residues of the fungicide, metalaxyl [N-(2,6-dimethylphenyl)-N-(methoxyacetyl) alanine methyl ester] and its metabolites containing the 2,6-dimethylaniline moiety, each expressed as metalaxyl, in or on the raw agricultural commodities soybeans at 0.5 ppm, soybean forage at 7.0 ppm, soybean fodder at 7.0 ppm, wheat grain at 0.2 ppm, wheat forage at 2.0 ppm, and wheat straw at 2.0 ppm.

PROPOSED FOOD ADDITIVE TOLERANCES

We hereby request food additive tolerances for combined residues of the fungicide, metalaxyl [N-(2,6-dimethylphenyl)-N-(methoxyacetyl) alanine methyl ester] and its metabolites containing the 2,6-dimethylaniline moiety, each expressed as metalaxyl, in or on the raw agricultural commodities soybean hulls at 1.0 ppm, soybean meal at 1.0 ppm, soybean soapstock at 1.0 ppm, and wheat milling fractions at 1.0 ppm.

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September 20, 1982

SECTION G

REASONABLE GROUNDS IN SUPPORT OF THIS PETITION

METALAXYL - ROTATIONAL SOYBEANS AND ROTATIONAL WHEAT

Metalaxyl [N-(2,6-dimethylphenyl)-N-(methoxyacetyl) alanine methyl ester] is the common name approved for the active ingredient in Ridomil® 2E fungicide (EPA Reg. No. 100-607). Ridomil 2E is an emulsifiable concentrate formulation containing 2 lbs. active ingredient per gallon. An application to amend the registration of Ridomil 2E to permit rotation to wheat and soybeans following application of Ridomil has been submitted simultaneously with this petition.

Ridomil 2E is registered for control of blue mold and black shank of tobacco, Phytophthora foot rot and root rot of citrus, and Phytophthora root rot of conifers.

Currently, no tolerances for metalaxyl in agricultural commodities have been established. However, tolerances are currently pending in cucumbers, cotton, melons, onions, potatoes, tomatoes, milk, eggs, and meat of cattle, goats, hogs, horses, poultry and sheep (P.P. No. 1F2500), in avocados (P.P. No. 1F2531), in hops (P.P. No. 1F2537), in forage grasses, forage legumes, grain crops, seed and pod vegetables, and peanuts (P.P. No. 2F2695), in squash (P.P. No. 2F2732), and in pineapples (P.P. No. 2F2743).

Section B of this petition proposes a rotational crop statement which permits rotation to wheat in the fall and rotation to soybeans the year following application of Ridomil 2E. Current labeling permits rotation to small grains in the fall, but stipulates that they may not be used for food or feed. Rotation to soybeans is currently not permitted until 18 months after application of Ridomil 2E.

Metabolism in Plants, Animals and Soil

A detailed discussion of metalaxyl metabolism in plants, soil and animals may be found in Pesticide Petition 1F2500 (EPA Accession Nos. 070017, 070018, and 070836).

The results of a series of studies to determine the metabolic fate of metalaxyl in plants, indicates the same pathway in such diverse crops as potatoes, lettuce, grapes, and tobacco. Thus, it is expected that all crops will have the same metabolic pathway, differing only in the quantitative distribution of metabolites.

Results of soil studies show that a small amount of metalaxyl leaches in soil under field conditions. Metalaxyl degrades slowly as evidenced by parent metalaxyl constituting a high percentage of the total radioactivity in the soil at the time of potato harvest.

Metalaxyl is rapidly metabolized and effectively excreted in both rat and goat. Neither animal retained significant quantities of metalaxyl or its metabolites in the tissues or milk. Animal metabolism is similar to plant metabolism.

Environmental Chemistry and Environmental Safety

Previously submitted environmental chemistry studies are submitted by reference in support of this petition (EPA Accession Nos. 234431 and 234438).

Previously submitted environmental safety studies demonstrate that the use of metalaxyl as proposed in Section B on this petition would have no unreasonable adverse effects on fish and wildlife (EPA Accession Nos. 234439, 236854, and 244183).

Toxicology

Technical metalaxyl: The safety of the proposed tolerances in Section F of this petition is demonstrated in previously submitted toxicology studies referenced in Section C of this petition. Acute toxicology studies on technical metalaxyl including an oral LD_{50} study in rats, dermal LD_{5} studies in rabbits, and skin sensitization in guinea pigs can be found by referring to EPA Accession No. 234428. Additionally, in that volume are a three-month dietary toxicity study in rats, a 91-day dietary toxicity study in beagle dogs, a reproduction study in rats (Segment III), a mutagenicity assay with Salmonella, and a dominant lethal study in mice (test for cytotoxic or mutagenic effects on male germinal cells). Acute oral LD_{50} studies in rats and rabbits may also be found by referring to EPA Accession No. 234439.

A subchronic 21-day dermal toxicity study in albino rabbits can be found by referring to EPA Accession No. 244182. A reproduction study in the rabbit (Segment II) may be found in EPA Accession No. 070012. A two-year chronic feeding study in the rat may be found in EPA Accession Nos. 070012, 070013, and 070014.

A multigeneration reproduction study in the rat is in EPA Accession No. 070015. A six-month chronic feeding study in beagle dogs is in EPA Accession No. 070016.

A two-year oncogenicity study in mice can be found by referring to EPA Accession No. 274660. A subchronic inhalation study in rats, and several mutagenicity studies may be found in EPA Accession No. 274661.

Ridomil 2E: Acute toxicology studies on Ridomil 2E can be found by referring to EPA Accession No. 234429. These studies include an acute oral toxicity study in male and female albino rats, an acute dermal toxicity study in rabbits, an acute eye irritation study in rabbits, a primary skin irritation study in rabbits, an acute inhalation study in rats, and an acute intraperitoneal LD_{50} study in rats.

A no observable effect level (NOEL) of 50 ppm (2.5 mg/kg/day) can be established from the results of the rat two-year chronic feeding study with technical metalaxyl. Further, the previously identified toxicology studies establish that the rat is the most sensitive species. Using the traditional 100:1 safety factor and 50 ppm as the NOEL, the maximum permissible intake (MPI) can be calculated to be 1.5 mg/day/60 kg man (2.5 mg/kg/day ÷ 100 x 60 kg). The tolerances proposed within Section F of this petition plus pending tolerances result in a theoretical maximal residue contribution (TMRC) of 0.3833 mg/day/1.5 kg diet which represents only 25.56% of the MPI. The following table illustrates the calculation of TMRC based upon proposed tolerances and percent of man's diet for each commodity. The following proposed tolerances are not included in this table since they are not normally consumed directly by man: soybean forage and fodder, wheat forage and straw, soybean hulls, meal and soapstock, processed tomato products, tomato pomace, forage legumes, forage grasses, pineapple fodder and ryegrass, peanut hay and hulls, and dry hops. These items can and are being consumed by animals. The contribution of residues transferred to animals as a result of consumption of metalaxyl-containing feed is considered in the following calculations.

THEORETICAL MAXIMAL RESIDUE CONTRIBUTION (TMRC)

NO OBSERVABLE EFFECT LEVELS:
Rat - 2.5 mg/kg/day 2 Years 1981

SAFETY FACTOR: 100
ACCEPTABLE DAILY INTAKE (mg/kg/day): .025
MAXIMAL PERMISSIBLE INTAKE (mg/day) FOR 60 kg HUMAN: 1.5

PROPOSED/ANTICIPATED TOLERANCES

Crop	Tolerance	% Diet	TMRC mg/day/1.5 kg	% of MPI
Tomatoes	1.000	2.87	.04305	2.87
Onion (Dry Bulb)	3.000	.72	.03240	2.16
Onions; Green	10.000	.11	.01650	1.10
Potatoes	.500	5.43	.04073	2.72
Melons	1.000	2.00	.03000	2.00
Cottonseed	.100	.15	.00023	.02
Cucumbers; incl. Pickles	1.000	.73	.01095	.73
Liver	.400	.03	.00018	.01
Kidney	.400	.03	.00018	.01
Milk & Dairy Prod.	.020	28.62	.00859	.57
Eggs	.050	2.77	.00208	.14
Meat; incl. Poultry	.050	13.85	.01039	.69
Avocados	4.000	.03	.00180	.12
Hops	.200	.03	.00009	.01
Squash	1.000	.11	.00165	.11
Seed & Pod Veg.	.100	3.66	.00549	.37
Grain Crops	.100	13.79	.02069	1.38
Peanuts	.100	.36	.00054	.04
Pineapples	.100	.30	.00045	.03
Broccoli	1.000	.10	.00150	.10
Cabbage; Sauerkraut	1.000	.74	.01110	.74
Cauliflower	1.000	.07	.00105	.07
Lettuce	5.000	1.31	.09825	6.55
Spinach	10.000	.05	.00750	.50
Soybeans-R	.500	.92	.00690	.46
Wheat; Grain-R	.200	10.36	.03108	2.07
			TOTAL TMRC	.3833
			% MPI	25.56

Field Residue Studies

Soybeans: Eleven field residue trials were conducted with soybeans rotated after representative Ridomil uses in tobacco, potatoes, or wheat. In addition, five trials were conducted where Ridomil was applied preplant incorporated or preemergence to soybeans. The purpose of these applications to soybeans was twofold: (1) it is anticipated that tolerances will be requested in the near future for residues in soybeans resulting from direct application to this crop; and (2) these higher levels were used in order to assure the elucidation of any residue concentration by oil-seed processing.

The maximum total residues of metalaxyl found in soybeans range from <0.05-0.35 ppm for rotational soybeans with PHI's of 335-522 days to 0.08-0.31 ppm for target crop soybeans with PHI's of 117-172 days. Likewise, the maximum total residues in soybean forage and fodder range from 0.06-1.4 ppm for rotational soybean forage and fodder with PHI's of 298-522 days to 0.66-6.1 ppm for target crop soybean forage and fodder with PHI's of 59-172 days. The maximum total residues in soybean hulls, meal, and soapstock was 0.34 ppm, 0.36 ppm, and 0.30 ppm, respectively. Based on these data, tolerances of 0.5 ppm in soybeans, 7.0 ppm in soybean forage and fodder, and 1.0 ppm in soybean hulls, meal, and soapstock are adequate to define the maximum metalaxyl residues in rotational soybeans. Although the rotational crop data, in itself, supports a somewhat lower tolerance in soybean forage and fodder, we believe it is reasonable to establish the tolerance as proposed, since a subsequent request for tolerances in the target crop, soybeans, would undoubtedly require any lower value to be raised.

Wheat: Eight field residue trials were conducted with wheat rotated after representative Ridomil applications in tobacco and potatoes. One trial was conducted with rye rotated after potatoes. In addition, six trials were conducted where Ridomil was applied preplant incorporated or preemergence to wheat. Three of these latter trials followed a previous Ridomil treatment to soybeans.

The maximum total residues of metalaxyl found in wheat grain was approximately the same for rotational and target crop wheat (<0.05-0.19 ppm) with PHI's ranging from 209-772 days. The maximum total residues in wheat forage and straw ranged from <0.05-1.0 ppm for rotational wheat forage and straw with PHI's of 68-772 days to <0.05-1.6 ppm for target crop wheat forage and straw with PHI's of 56-259 days. The maximum total residues in wheat milling products (grain, bran, shorts, red dog, and flour)

was 0.25 ppm. Based on these data, tolerances of 0.2 ppm in wheat grain, 2.0 ppm in wheat forage and straw, and 1.0 ppm in wheat milling fractions are adequate to define the maximum metalaxyl residues in rotational wheat.

Transfer of Residues from Rotational Soybeans and Rotational Wheat to the Milk and Tissues of Dairy Cows and to the Eggs and Tissues of Poultry

Residue data from dairy cow and chicken feeding studies were presented in P.P. No. 1F2500 (EPA Accession Nos. 070017, 070018, and 070021).

Cattle: Soybeans may comprise up to 40 percent of the diet of cattle. To determine the maximum potential transfer of residues, a theoretical diet was constructed using pending metalaxyl tolerances. If soybean fodder is fed at the proposed tolerance level (7.0 ppm), the maximum metalaxyl residue contributions from various Ridomil-treated commodities would be:

Soybean Fodder	40%	x	7.0 ppm	=	2.8
Lettuce	30%	x	5.0 ppm	=	1.5
Dry Tomato Pomace	25%	x	16.0 ppm	=	4.0
Wheat Hay	5%	x	2.0 ppm	=	0.1
	100%				8.4 ppm

A theoretical diet with maximum metalaxyl residues based on the proposed wheat tolerances would be:

Forage	70%	x	2.0 ppm	=	1.4
Straw	10%	x	2.0 ppm	=	0.2
Germ/Bran	20%	x	1.0 ppm	=	0.2
	100%				1.8 ppm

However, this is a lower dietary level than would result from the above diet, as proposed in the original submittal (P.P. No. 1F2500).

Using 8.4 ppm as a theoretical 1X feeding level, two dairy cow feeding studies were conducted, one at 0.18X, 0.89X and 1.8X, and one at a single dosage of 8.9X. Residues found in the three level feeding study were reported in the original submission for P.P. No. 1F2500 (EPA Accession No. 070018). Results of the high level feeding study were submitted as supplemental data to P.P. No. 1F2500 on May 10, 1982 (EPA Accession No. 070836).

No residues were found in perirenal or omental fat at any feeding level. Round and tenderloin contained no residues at the lower feeding levels and maxima of 0.17 and 0.09 ppm, respectively, at the highest feeding level. Milk contained no residues at the lower feeding levels and 0.02 ppm on all days at the highest feeding level. Sacrifice times were varied in the high level study to determine the clearance rate of kidney and liver residues. The data show that within 24 hours after dosing, residues declined significantly.

These data show that residue tolerances of 0.02 ppm in milk and 0.05 ppm in tissues, excluding liver and kidney, and 0.4 ppm in liver and kidney proposed in P.P. No. 1F2500, will adequately define the residues resulting from feeding metalaxyl treated crops.

Poultry: The diet of chickens may contain as much as 30, 20, and 10 percent soybean meal, seed, and hulls, respectively. Based on the feeding percentages described in Harris's Guide, a theoretical poultry diet that would maximize potential metalaxyl residue intake would be:

Soybean Meal	30%	x	1.0 ppm	=	0.300
Soybean Seed	20%	x	0.5 ppm	=	0.100
Wheat Germ/Bran	18%	x	1.0 ppm	=	0.180
Soybean Hulls	10%	x	1.0 ppm	=	0.100
Potato Meal	10%	x	4.0 ppm	=	0.400
Onion Refuse	5%	x	3.0 ppm	=	0.150
Wheat Grain	2%	x	0.2 ppm	=	0.004
Tomato Pulp	2%	x	1.0 ppm	=	0.020
Cauliflower	1%	x	1.0 ppm	=	0.010
Lettuce	1%	x	5.0 ppm	=	0.050
Melons	1%	x	0.5 ppm	=	0.005
	100%				1.32 ppm

Wheat grain and milling products can be used in pullet, layer and broiler feed. A theoretical diet with maximum metalaxyl residues based on the proposed tolerances for wheat would be, according to Harris's Guide:

Wheat Grain	50%	x	0.20 ppm	=	0.10
Wheat Germ/Bran	18%	x	1.0 ppm	=	0.18
Lettuce	1%	x	5.0 ppm	=	0.05
Onion Refuse	5%	x	3.0 ppm	=	0.15
Potato Meal	10%	x	4.0 ppm	=	0.40
Soybean Meal	16%	x	1.0 ppm	=	0.16
	100%				1.04 ppm

However, this is a lower dietary level than in the above theoretical diet.

Using 1.32 ppm as the theoretical 1X rate, the chicken feeding studies were conducted at 0.38X, 1.1X, and 3.8X. The proposed tolerances for rotational soybeans and their processing products, and rotational wheat and its milling products will not result in residues that exceed the tolerances of metalaxyl and its metabolites in eggs, meat, liver, or kidney of poultry, as proposed in P.P. No. 1F2500 (EPA Accession No. 070011).

Conclusions

Metalaxyl has been shown to be an effective fungicide to control diseases on a wide variety of crops.

Metabolism studies in several crops indicate similar pathways.

Metabolism studies in animals (rats and goats) show no tendency for tissue storage. These results were verified by three-level studies in poultry and dairy animals receiving exaggerated doses of metalaxyl in their diet.

Toxicology studies show that the use of metalaxyl as proposed in Section B of this petition should have no adverse effects on the user or on the public health.

Environmental chemistry studies show that solution hydrolysis and soil photolysis are not significant degradation mechanisms for metalaxyl. The studies demonstrate the importance of microbial activity in degradation.

Environmental safety studies demonstrate that the use of metalaxyl as proposed in pending labeling and in Section B would have no unreasonable adverse effect on fish and wildlife.

In view of (1) the proposed rotational crop statement, (2) the residues found in or on the raw agricultural commodities following proposed use patterns, and (3) the toxicity as determined by the reports referenced in Section C, Section F of this petition proposes the establishment of residue tolerances in rotational soybeans at 0.5 ppm, soybean forage and fodder at 7.0 ppm, soybean hulls, meal and soapstock at 1.0 ppm, in rotational wheat grain at 0.2 ppm, wheat forage and straw at 2.0 ppm, and wheat milling fractions at 1.0 ppm.

It is concluded that the tolerances proposed in this petition are safe, will protect the public health, and are adequate to allow the safe use of the fungicide as proposed. It is further concluded that feeding of soybean crop material or oil-seed processing products, or of wheat crop material or milling products to livestock, including poultry, will not result in residues in tissues, liver, kidney, eggs, and milk in excess of the currently proposed tolerances when Ridomil is applied according to registered and pending use directions.

GH:bw

September 20, 1982

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

AUG 30 1983

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: [redacted]2F2764 Metalaxyl on soybeans and wheat.
Amendment of May 16, 1983.

FROM: K. H. Arne, Ph.D., Chemist
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

THRU: Charles L. Trichilo
Chief, Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

TO: Henry Jacoby, Product Manager Team No. 21
Registration Division (TS-767)

and

Toxicology Branch
Hazard Evaluation Division (TS-769)

In our review of this petition (memo of 4/6/83, K. Arne) we recommended against the proposed unintentional use tolerances on soybeans and wheat. For a favorable recommendation we required a revised Section F in which tolerances of 2 ppm were proposed for the forage and fodder of wheat and soybeans. With this amendment the petitioner has submitted a revised Section F in which the requested wheat fodder tolerance has been added but which has had deleted from it all soybean tolerances. This has been done because tolerances are pending for soybeans in conjunction with PP#3F2818 which will make the unintentional use tolerances unnecessary.

An International Residue Limit Status sheet is attached.

Recommendations:

Toxicological and EAB considerations permitting, we recommend for the proposed tolerances for combined residues of metalaxyl [N-(2,6-dimethylphenyl)-N-(methoxyacetyl)alanine,

methyl ester], and its metabolites containing the 2,6-dimethylaniline moiety, and N-[2-(hydroxymethyl)-6-methylphenyl]-N-(methoxyacetyl) alanine, methyl ester, each expressed as metalaxyl, as follows:

wheat grain	0.2 ppm
wheat forage	2.0 ppm
wheat fodder	2.0 ppm
wheat straw	2.0 ppm
wheat milling fractions	2.0 ppm

The soybean tolerances are no longer under consideration with this petition.

PM: The proposed wheat tolerances are for residues that result from unintentional use and should be, if established, distinguished in the Federal Register from other tolerances which imply a registered use (see FR Notice Vol. 46, p. 3018). For an example of such a tolerance see metolachlor, 40 CFR 180.368.

cc: R.F.
Circu
Reviewer
TOX
EEB
EAB
Petition No. 2F2764
FDA, Robert Thompson

DCR-11048:RCB-26:KarlArne:Rm810:CM#2:557-7377:6/21/83:efs

INTERNATIONAL RESIDUE LIMIT STATUS None

CHEMICAL 2

PETITION NO 2F2764

CCPR NO: metalaxyl
[N-(2,6-dimethylphenyl)-N-(methoxyacetyl) alanine methyl ester]

Codex Status

[ ] No Codex Proposal Step 6 or above

Residue (if Step 9): .

Crop(s) Limit (mg/kg)

Proposed U. S. Tolerances

Residue: Parent plus metabolites containing the 2,6-dimethylaniline moiety, and N-[2-(hydroxymethyl)-6-methyl-phenyl]-N-(methoxyacetyl) alanine methyl ester

Crop(s)	Tol. (ppm)
wheat grain	0.2
wheat forage	2.0
wheat fodder	2.0
wheat straw	2.0
wheat milling fractions	2.0

CANADIAN LIMIT

Residue:

Crop	Limit (ppm)

MEXICAN TOLERANCIA

Residue:

Crop	Tolerancia (ppm)

Notes:

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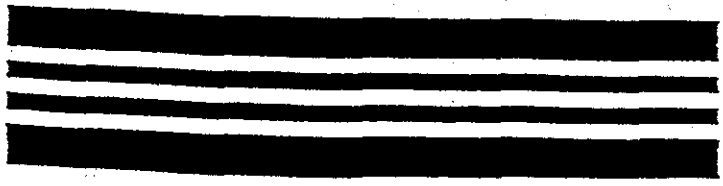

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 13 1983

MEMORANDUM

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

Subject: PP#2F2764/FAP#2H5369. Rotational crop tolerance for metalaxyl on soybeans and wheat. Amendment of January 26, 1983.

From: K. H. Arne, Ph.D., Chemist
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

Thru: Charles L. Trichilo, Chief
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

To: Henry Jacoby, Product Manager, Team No. 21
Registration Division (TS-767)

and

Toxicology Branch
Hazard Evaluation Divison (TS-769)

With this amendment the petitioner has submitted a revised Section F in which a feed additive tolerance of 2.0 ppm is proposed for cotton soapstock in addition to tolerances previously proposed for wheat and soybeans and their processed byproducts. A tolerance of 0.1 ppm for cottonseed was established with PP#1F2500 for residues resulting from a metalaxyl seed treatment. Later this use was amended to include an in-furrow treatment for cotton (see metalaxyl amended use file, memo of 10/14/82, L. Propst). The residue data submitted for both seed treatment and in-furrow use showed no detectable residues in cottonseed (<0.05 ppm). We therefore concluded that no feed additive tolerances were needed for the processed byproducts of cotton. The petitioners proposal for a 2.0 ppm tolerance is apparently based on a processing study, submitted with the above-mentioned amended use request, that shows considerably higher residues in soapstock than in cottonseed. This study had been earlier discounted by RCB because of discrepancies (see metalaxyl amended use file, memo of 10/14/82, L. Propst).

Conclusions and Recommendations

The tolerance proposal for cottonseed soapstock is unnecessary and should be withdrawn. If, in the future, a use for metalaxyl that results in detectable residues in cottonseed is proposed then a new processing study and appropriate feed additive tolerances will be needed.

This amendment does not affect the tolerances proposed for wheat, soybeans, and their byproducts which we have recently recommended against (memo of 4/6/83, K. Arne). The deficiencies stated in that review remain to be resolved.

TS-769:RCB:K.Arne:mch:CM#2:RM810:X77377:4/5/83
cc: R.F., Circu., K. Arne, Thompson, FDA, TOX, EEB, EFB, PP#2F2764/FAP#2H5369
RDI: R. Quick, 4/4/83; R. Schmitt, 4/5/83

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

APR 6 1983

MEMORANDUM

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

Subject: PP#2F2764/FAP#2H5369. Rotational crop tolerances for Metalaxyl on soybeans and wheat. Evaluation of Analytical Method and Residue Data.

From: Karl H. Arne, Ph.D., Chemist KH. Arne
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

Thru: Charles L. Trichilo, Chief
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

To: Henry Jacoby, Product Manager Team No. 21
Registration Division (TS-767)

and

Toxicology Branch
Hazard Evaluation Division (TS-769)

Ciba-Geigy proposes the following tolerance for residues of metalaxyl (which include the parent, N-(2,6-dimethylphenyl)-N-(methoxyacetyl) alanine, methyl ester and metabolites containing the 2,6-dimethyl-aniline moiety) that result from planting wheat and soybeans in rotation to treated crops.

soybeans	0.5 ppm
soybean forage	7.0 ppm
soybean fodder	7.0 ppm
soybean meal	1.0 ppm
soybean hulls	1.0 ppm
soybean soapstock	1.0 ppm
wheat grain	0.2 ppm
wheat straw	2.0 ppm
wheat forage	2.0 ppm
wheat milling fractions	1.0 ppm

Tolerances were proposed for soybeans and wheat with PP# 1F2500, but for uses involving direct application to those crops. Tolerances for soybeans for residues resulting from an intended use are also presently proposed with PP#3F2818 at the same levels as above.

Numerous tolerances have been established on a variety of crops at levels ranging from 0.1 to 10 ppm. Meat, milk, poultry and egg tolerances have also been established.

A petition (PP#2F2743) to establish a tolerance for metalaxyl on pineapples is also pending but a few deficiencies remain outstanding. RCB has also recommended favorably for tolerances for leafy vegetables (PP#2F2762) and for hops (1F2537).

Conclusions

1. The metabolism of metalaxyl is understood. In both plants and animals the residue of concern consists of parent plus metabolites containing the 2,6-dimethylaniline moiety (to include N-[2-hydroxymethyl-6-methylphenyl]-N-[methoxyacetyl] alanine, methyl ester (CGA-94689)). The preceding parenthetical expression should be included in the expression of a tolerance.

2. Adequate analytical methods are available for enforcement purposes.

3a. The tolerance proposed for soybeans, 0.5 ppm, will not be exceeded as a result of the proposed use.

3b. The tolerances proposed for soybean forage and fodder, both at 7.0 ppm, are too high. A tolerance of 2 ppm would be adequate for these items and should be proposed.

3c. The tolerances proposed for soybean hulls, meal, and soapstock will not be exceeded as a result of the proposed use.

3d. The tolerance proposed for wheat grain (0.2 ppm), wheat forage (2.0 ppm), wheat straw (2.0 ppm), and wheat milling fractions (1.0 ppm) will not be exceeded as a result of the proposed use. The tolerance for wheat forage should be expressed as "wheat forage and fodder".

4. Established tolerances for meat, milk, poultry, and eggs will accommodate any expected secondary residues that result from the proposed use.

4b. The established tolerance for chicken kidneys is unnecessary and should be deleted.

5. An International Residue Limit Status Sheet is attached. There are no Codex tolerances for metalaxyl.

Recommendation

We recommend against the proposed tolerances. For a favorable recommendation the petitioner should submit a revised Section F in which tolerances of 2.0 ppm are proposed for soybean forage and fodder. Also, a tolerance should be proposed for wheat, forage and fodder, at 2 ppm.

PM: The proposed use here does not involve application of metalaxyl to soybeans and wheat but the planting of these crops in rotation to metalaxyl treated crops. Thus the tolerances proposed are "rotational" and should be, if established, distinguished in the Federal Register from other pesticide tolerances which imply a registered use (see FR Notice Vol. 46, p. 3018). For an example of such a tolerance see metolachlor, 40 CFR 180.368.

Also, the expression of a tolerance for metalaxyl should be expressed as given in conclusion 1.

Should the soybean tolerances proposed with PP#3F2818 be established, the soybean "unintentional use" tolerance proposed with this petition will be unnecessary and should be removed from consideration. If tolerances for an intentional use are established unintentional use tolerances would be needed only if the unintentional use requires higher tolerances.

The tolerance established for chicken kidney with PP# 1F2500 is unnecessary and should be deleted.

Detailed Considerations

Manufacturing Process and formulation

The manufacturing process for metalaxyl was discussed in our review of PP#1F2500 (memo of 3/9/82, P. Errico). The resulting product is about 90% pure; the impurities in the technical material are not expected to present a residue problem (see PP#8G2121, memo of 3/29/79, G. Makhijani).

Ridomil 2E is an emulsifiable concentrate that contains 25.1% metalaxyl (2 lb. a.i./gal); the inerts are cleared under Section 180.1001.

Proposed Use

No use is proposed for Ridomil on growing wheat or soybeans. The petitioner proposes the following rotational crop restrictions:

"If replanting is necessary following a soil application, tobacco may be replanted immediately. Tomatoes may be replanted immediately provided no more than 2 lb. a.i. per acre of Ridomil was applied to the soil. Do not make a second application of Ridomil. Wheat or any crop on this label may be planted during the fall after application of Ridomil. Other small grain crops may also be planted during the fall following application provided they are plowed under and not used for food or feed. Corn, soybeans, root crops, or any crop on this label may be planted the year following treatment. Other crops may be planted 18 months following treatment."

Wheat and soybeans could be planted in rotation without the proposed tolerances but wheat could not be used for feed or forage and an 18 month interval would be required before soybeans could be planted.

There are a number of tolerances established for Ridomil and several others are pending (see introduction). These uses call for applications of up to 3 lb. a.i./A/season alone or in tank mixes with labeled rates of chlorothalonil, maneb, mancozeb, or captofol.

Nature of the residue

Based on plant metabolism sduties on potatoes, grapes (PP#s 8G2121 and 1F2500) and lettuce (PP#2F2762, see memo of 1/82) we have concluded that the residue of concern in plants consists of metalaxyl plus metabolites containing the 2,6-dimethylaniline moiety (to include N-[2-hydroxymethyl-6-methylphenyl)-N-[2-methoxyacetyl] alanine, methyl ester). We extend this conclusion to include wheat and soybeans.

Metabolism studies on goats, rats (PP#8G2121, see memo of 3/29/79, G. Makhijani) and cows (PP#1F2500, see memo of 7/16/82, P. Errico) have been previously submitted. Based on these studies we have concluded that the nature of the residue in meat and milk is adequately understood and that the residue of concern consists of metalaxyl plus metabolites containing the 2,6-dimethylaniline moiety (to include N-[2-hydroxymethyl-6-methylphenyl]-N-[methoxyacetyl] alanine, methyl ester). We reiterate this conclusion here.

No poultry metabolism studies are available. We have previously considered the nature of the residue in poultry and eggs to be adequately understood by translation of the above cited animal metabolism studies. Normally, poulty metabolism studies are required but because the submitted studies show residues to be transitory in liver and kidney and low in other tissues we are not requiring additional studies. The nature of the residue in poultry is adequately understood.

Analytical Methodology

A "total residue" method has recently undergone a successful method tryout (see PP#1F2500, memo of 12/28/82, K. Arne) and is discussed in detail in our review of PP#1F2500 (memo of 3/9/82, P. Errico). Variations of this method are used for crops (Ciba-Geigy method AG-348), oil seed fractions (AG-350), meat, milk, and eggs (AG-349) and tobacco (AG-330). In summary, the residue is extracted, hydrolyzed to the dimethylaniline moiety, then derivatized with trichloroacetyl chloride. Cleanup is by column chromatography; determination is by gas chromatography using a alkali flame ionization detector in the nitrogen specific mode. This method is varied to accommodate specific substrates. Applied to the subject crops the following check and recovery values were obtained.

		recovery		
plant part	check (ppm)	fort. (ppm)	range (%)	avg. (%)
wheat				
forage	<.05-0.07	0.05-1.0	47-85	66
grain	<0.05-0.18	0.05-0.5	48-95	67
straw	<0.05-0.28	0.1-2.0	47-81	68
bran	<0.05	0.1-0.2	49-77	63
shorts	<0.05-0.14	0.05-0.5	66-133	105
red dog	<0.05-0.09	0.5	37-63	47
flour	<0.05-0.07	0.05-0.2	46-105	76

		recovery		
plant part	check (ppm)	fort. (ppm)	range (%)	avg. (%)
soybeans				
forage	<0.05-0.16	0.1-1.0	53-116	75
fodder	<0.05-1.1	0.2-2.0	53-130	82
beans	<0.05-0.35	0.05-0.8	46-120	68
hulls	<0.05	0.05-0.8	42-130	88
meal	<0.05	0.05-0.8	38-90	61
soapstock	<0.1	0.05-0.5	52-108	73
crude oil	<0.05	0.05-0.1	47-65	56
refined oil	<0.05	0.5	38	-

These methods are suitable for enforcement. A few of the residue experiments incorporated gas chromatography-mass spectrometry in the determinative step. This is acceptable for residue determination and would be suitable as a back-up enforcement method.

Residue Data

Wheat

Residue experiments were carried out in Kentucky, Georgia, North Carolina, New York, Iowa, Pennsylvania, Washington, and Michigan. Wheat was planted in rotation to either potatoes or tobacco. The tobacco had received one preplant incorporated application of 3.0 or 6.0 lb. a.i./A. The potatoes had received six foliar treatments of either 0.5 (1X) or 1.0 (2X) lb. a.i./A. The following table summarizes results of residue experiments.

	rate		
plant part	lb. a.i./A (no.)	PHI (days)	residue (ppm)
forage	0.5(6)	68-711	<0.05-1.0
"	1.0(6)	68-711	0.05-1.5
"	3.0(1)	175-720	<0.05-0.51
"	6.0(1)	175-720	0.06-1.1
straw	0.5(6)	294-711	0.13-0.56
"	1.0(6)	336-711	1.1-1.4
"	3.0(1)	370-772	<0.05-0.52
"	1.0(6)	370-772	<0.05-1.0
grain	0.5(6)	294-711	<0.05-0.19
"	1.0(6)	336-711	0.15-0.44
"	3.0(1)	370-772	<0.05-0.11
"	6.0(1)	370-772	<0.05-0.11

Useful residue data slso available in PP#1F2500. When wheat treated at-plant with Ridomil was grown in rotation with soybeans treated at-plant with metalaxyl, the following results were reported:

Rate (wheat) lbs. a.i./A	Rate (soybeans) lb. a.i./A	Days	Residues (ppm)
forage 1	2	61-175	<0.05-1.3
forage 2	4	61-175	0.07-1.7
straw 1	2	209-246	0.14-0.48
straw 2	4	246	0.24-0.54
grain 1	2	209-246	<0.05-0.1
grain 2	4	246	0.06-0.08

Additional data representing intentional at-plant applications to wheat are available. Wheat was treated at-plant with one application of metalaxyl at either 1 lb. a.i./A or 2 lbs. a.i./A. The following results were reported:

Plant Part	Rate lbs. a.i./A	PHI Days	residue (ppm)
forage	1	56-160	0.06-1.6
forage	2	56-124	0.98-2.8
straw	1	222-259	0.05-1.2
straw	2	222	1.3
grain	1	222-259	<0.05-0.18
grain	2	222	0.08

The residue experiments reported in PP# 1F2500 are not representative of the presently proposed use but lend support to the proposed tolerances. We conclude that the proposed tolerances for wheat grain (0.2 ppm), wheat forage (2.0 ppm), and wheat straw (2.0 ppm) are adequate.

A wheat processing study has been submitted with this petition. Grain carrying residues of <0.05 or 0.09 ppm was processed into bran, shorts (includes germ, fine bran, and a small amount of flour), red dog (crude flour), and flour. The shorts and red dog were determined by both FID and GC/MS. The results are tabulated below:

residue (ppm)

grain (FID)	bran (FID)	shorts (FID)	shorts (GC/MS)	red dog (FID)	red dog (GC/MS)	flour (FID)
0.09	0.05	0.15	0.21	0.17	0.14	0.13
<0.05	0.09	0.1	0.15	0.12	0.12	0.14
0.09	0.09	0.21	0.35	0.25	0.18	<0.05

Useful residue data slso available in PP#1F2500. When wheat treated at-plant with Ridomil was grown in rotation with soybeans treated at-plant with metalaxyl, the following results were reported:

	Rate (wheat) lbs. a.i./A	Rate (soybeans) lb. a.i./A	Days	Residues (ppm)
forage	1	2	61-175	<0.05-1.3
forage	2	4	61-175	0.07-1.7
straw	1	2	209-246	0.14-0.48
straw	2	4	246	0.24-0.54
grain	1	2	209-246	<0.05-0.1
grain	2	4	246	0.06-0.08

Additional data representing intentional at-plant applications to wheat are available. Wheat was treated at-plant with one application of metalaxyl at either 1 lb. a.i./A or 2 lbs. a.i./A. The following results were reported:

Plant Part	Rate lbs. a.i./A	PHI Days	residue (ppm)
forage	1	56-160	0.06-1.6
forage	2	56-124	0.98-2.8
straw	1	222-259	0.05-1.2
straw	2	222	1.3
grain	1	222-259	<0.05-0.18
grain	2	222	0.08

The residue experiments reported in PP# 1F2500 are not representative of the presently proposed use but lend support to the proposed tolerances. We conclude that the proposed tolerances for wheat grain (0.2 ppm), wheat forage (2.0 ppm), and wheat straw (2.0 ppm) are adequate.

A wheat processing study has been submitted with this petition. Grain carrying residues of <0.05 or 0.09 ppm was processed into bran, shorts (includes germ, fine bran, and a small amount of flour), red dog (crude flour), and flour. The shorts and red dog were determined by both FID and GC/MS. The results are tabulated below:

residue (ppm)

grain	bran	shorts		red dog		flour
(FID)	(FID)	(FID)	(GC/MS)	(FID)	(GC/MS)	(FID)
0.09	0.05	0.15	0.21	0.17	0.14	0.13
<0.05	0.09	0.1	0.15	0.12	0.12	0.14
0.09	0.09	0.21	0.35	0.25	0.18	<0.05

This study shows that residues may concentrate by a factor of up to 4X in the milling fractions of wheat; this has the potential of producing residues of up to 0.8 ppm in milling fractions. The petitioner has proposed a food additive tolerance of 1.0 ppm which we consider to be adequate.

Soybeans

Residue experiments in which soybeans were planted in rotation to treated tobacco (North Carolina, Georgia, and Kentucky), potatoes (Iowa, Michigan, New York, Pennsylvania, and Washington), and wheat (California and Maryland) have been submitted. The results are summarized in the following table.

plant part	rate lb. a.i./A (no.)	PHI (days)	residue (ppm)
forage	0.5(6)	307-351	0.18-0.83
"	1.0(6)	326	2.7
"	3.0(1)	399-481	0.29-0.45
"	6.0(1)	399-481	0.25-1.3
"	1.0(1)	298	0.32-0.34
"	2.0(1)	298	1.3
fodder	3.0(1)	301-522	0.15-1.4
"	6.0(1)	501-522	0.33-0.54
"	0.5(6)	335-426	0.10-0.46
"	1.0(1)	375-386	0.06-0.22
"	2.0(1)	375-386	0.08-0.5
beans	0.5(6)	335-426	<0.05-0.08
"	3.0(1)	501-522	<0.05-0.35
"	6.0(1)	501-522	0.07-0.49
"	1.0(1)	375-386	<0.05-0.07
"	2.0(1)	375-386	<0.05

The petitioner has proposed a tolerances of 0.5 ppm for soybeans, 7.0 ppm for soybean forage, and 7.0 ppm for soybean fodder. The proposed tolerance for soybeans is appropriate but since the highest residue found in forage and fodder is 2.7 ppm as the result of a 2X application we consider the 7.0 ppm tolerance level to be too high. Tolerances of 2 ppm would be adequate for soybean forage and fodder and should be proposed.

Additional residue data, apparently the basis of the petitioners 7 ppm proposal for forage and fodder, is available in PP#1F2500. However, these data represent preplant or peemergent application soybeans and, compared to the rotational crop use now proposed, relatively short PHI's. We therefore discount these data, which show residues as hgh as 6.3 ppm in soybean forage and fodder.

A soybean processing study, orginally submitted with PP#1F2500 was resubmitted with the present petition. Beans carrying residues of 0.23 and 0.30 ppm were processed into hulls, meal, soapstick, crude oil, and refined oil. The following residues (ppm)were found:

beans	hulls	meal	soapstock	crude oil	refined oil
0.23	0.34	0.36	0.30	<0.05	<0.05
0.30	0.36	0.39	0.56	<0.05	<0.05

This concentration into the processed byproducts of soybeans by a factor of ca. 2X is possible. The petitioner has proposed tolerances of 1.0 ppm for soybean hulls, soybean soapstock, and soybean meal. We consider this tolerance level to be adequate.

Meat, Milk, Poultry, and Eggs

Soybeans, soybean meal, hulls, soapstock, forage, wheat grain, forage, straw, and milling fractions can be used a livestock feed items. The following feed items would provide a diet highest in potential for secondary residues of metalaxyl in beef cattle.

	% of diet	tolerance	ppm in diet
lettuce	30	10	3
tomato pomace	25	20	5
soybean or wheat forage	25	2	0.5
soybeans	20	0.5	.1
			8.6

For dairy cows, such a diet would be as follows:

	% of diet	tolerance	ppm in diet
Lettuce	20	10	2
tomato pomace	25	20	5
wheat forage	55	2	1.1
			8.1

Feeding studies for metalaxyl in lactating cows were last discussed in our review of (PP#2F2762, memo of 1/6/83, K. Arne). At that time we concluded that metalaxyl in the diet of beef and dairy cattle at levels of 8 and 7 ppm, respectively, would not cause proposed tolerances for meat and milk to be exceeded. As the uses proposed in the petition only slightly increase the potential for metalaxyl in feed items we conclude that the proposed (as suggested; see PP#2F2762) meat and milk tolerances are adequate.

The following feed items would provide a diet highest in potential for secondary residues of metalaxyl in poultry and eggs.

	% in diet	tolerance	ppm in diet
wheat grain	20%	0.2	0.04
soybean meal	30%	1.0	.3
soybeans	50%	0.5	.25
			.6

Poultry feeding sudies were sbmitted with PP#1F2500 and are summarized below:

Hens were fed metalaxyl at levels of 0, 0.5, 1.5, and 5.0 ppm in their feed ad libitum for 28 days. Three birds from each feeding level were sacrificed for tissue analysis on the 7th, 14th, 21st, and 28th day of the test. Eggs were analyzed on samples taken on days 7 through 28 of study. Feed containing metalaxyl was made up weekly and analysis verifies the stability of the test material over the period.

Eggs, skin, fat, breast and thigh analyzed for "total residues" of metalaxyl (to include it metabolites containing the 2,6-dimethyl-aniline moiety) sampled on days 7, 14, 21 and 28 of the study showed <0.05 ppm at the 0, 1.5, and 5.0 ppm metalaxyl feeding level. "Total residues" of metalaxyl were reported as <0.1 ppm for liver samples taken at 7, 14, 21 and 28 days and at the 0, 1.5, and 5 ppm metalaxyl feeding level.

Based on these studies we do not expect the proposed tolerances for poultry tissue and eggs (both at 0.05 ppm) and liver (0.4 ppm) to be exceeded.

Other Considerations

Tolerances for soybeans for residues reslting from an intentional use are proposed with PP#3F2818, all at the same level as proposed in this petition. Establishment of the tolerances proposed with PP#3F2818 will obviate the need for unintentional use tolerances (establishment of both unintentional and intentional use tolerances would be required only if the tolerances required for the unintentional use are higher).

TS-769:RCB:K.Arne:mch:CM#2:RM810:X77377:3/31/83
cc: R.F., Circu., K. Arne, Thompson, FDA, TOX, EEB, EFB, PP#2F2764/FAP#2H5369
RDI: R. Quick, 3/30/83; R. Schmitt, 3/30/83

INTERNATIONAL RESIDUE LIMIT STATUS

CHEMICAL metalaxyl

PETITION NO. 2F2764/2H5369

CCPR NO. none

REVIEWER: K. Arne

Codex Status

Proposed U. S. Tolerances

| X | No Codex Proposal
Step 6 or above

Residue (if step 9): _____

Residue: metalaxyl & metabolites containing the 2,6 dimethylaniline moiety

Crop(s)	Limit (mg/kg)

Crop(s)	Tol. (ppm)
soybeans	0.5
soybean forage	7.0
soybean fodder	7.0
soybean hulls	1.0
soybean soapstock	1.0
soybean meal	1.0

CANADIAN LIMIT

Residue: _____

Crop	Limit (ppm)
none (on soybeans)	

MEXICAN TOLERANCIA

Residue: _____

Crop	Tolerancia (ppm)
none	

INTERNATIONAL RESIDUE LIMIT STATUS

CHEMICAL metalaxyl

PETITION NO. 2F2764/2H5369

CCPR NO. none

REVIEWER: K. Arne

Codex Status

Proposed U. S. Tolerances

	No Codex Proposal
X	Step 6 or above

Residue (if Step 9):

Residue: metalaxyl & metabolites containing the 2,6 dimethylaniline moiety

Crop(s)	Limit (mg/kg)

Crop(s)	Tol. (ppm)
wheat grain	0.2
wheat forage	2.0
wheat straw	2.0
wheat milling fractions	2.0

CANADIAN LIMIT

Residue:

Crop	Limit (ppm)

MEXICAN TOLERANCIA

Residue:

Crop	Tolerancia (ppm)
none	

13544

R086722

Chemical:	**Metalaxyl**
PC Code:	**113501**
HED File Code	**11500 Petition Files Chemistry**
Memo Date:	**12/29/2003**
File ID:	**00000000**
Accession Number:	***412-05-1000***

HED Records Reference Center
08/26/2004