Shaughnessy Number: 109901

Date Out of EFGWB: SEP 19 1989

TO: D. Stubbs/L. Pemberton
Product Manager 41
Registration Division (H7505C)

FROM: W. Martin Williams, Hydrologist
Ground-Water Technology Section
Environmental Fate & Ground-Water Branch/EFED (H7507C)

THRU: Henry Jacoby, Chief (Acting)
Environmental Fate & Ground-Water Branch/EFED (H7507C)

Attached, please find the EFGWB review of:

Reg./File #: 89-PR-03

Chemical Name: Triadimefon

Type Product: Fungicide

Company Name: Mobay Corporation

Purpose: Evaluate ground-water concerns for crisis exemption under FIFRA Section 18 for use on coffee in Puerto Rico.

Date Received: 3/3/89 ACTION CODE: 510

Date Completed: 9/15/89 EFGWB #(s): 90441

Monitoring study requested: ____ Total Review Time: 1 day

Monitoring study voluntarily: ____

Deferrals To: ____ Biological Effects Branch

____ Science Integration & Policy Staff, EFED

____ Non-Dietary Exposure Branch, HED

____ Dietary Exposure Branch, HED

____ Toxicology Branch, HED

United States Environmental Protection Agency
Office of Pesticide Programs
Washington, DC 20460

EPA Data Review Record

Confidential Business Information - Does not contain National Security Information (E.O. 12065)

Pack Number	Date Received
49117 EFED	3/17/89

1. Product Name: Bayleton 50% WP

Chemical Name: triadimefon

2. Identifying Number	3. Record Number	4. Action Code	5. MRID/ Accession Number	6. Study Guideline or Narrative
89-PR-03	241,439	510		

7. Reference No.	8. Date Rec'd (EPA)	9. Prod/Review Mgr/DCI	10. PM/RM Team No.	11. Date to HED/ EFED/RD/BEAD	12. Proj Return Date	13. Date Returned to RD/SRRD
	3/13/89	Stubbs/Pemberton	41	3/16/89	3/31/89	

Instructions

Please comment on groundwater concerns

This Section Applies to Review of Studies Only

14. Check Applicable Box
- [ ] Adverse 6(a)(2) Data (405)
- [ ] Special Review Data (870)
- [ ] Generic Data (Reregistration)(660)
- [ ] Product Specific Data (Reregistration)(655)

15. No. of Individual Studies Submitted

16. Have any of the above studies *(in whole or in part)* been previously submitted for review?
- [ ] Yes *(Please identify the study(ies))*
- [ ] No

17. Related Actions

18.	To	Type of Review
HED		Science Analysis & Coordination
		Toxicology/HFA
		Toxicology/IR
		Dietary Exposure
		Nondietary Exposure
EFED		Ecological Effects
	✓	Environmental Fate & Groundwater
SRRD		Special Review
		Reregistration
		Generic Chemical Support
RD		Insecticide-Rodenticide
		Fungicide-Herbicide
		Antimicrobial
		Product Chemistry
		Precautionary Labeling
BEAD		Economic Analysis
		Analytical Chemistry
		Biological Analysis

19. Reviews Also Sent to
- [ ] SAC
- [x] TOX/HFA
- [ ] TOX/IR
- [ ] DEB
- [ ] NDE
- [ ] PC
- [ ] PL
- [x] EA
- [ ] AC
- [x] BA
- [x] EEB
- [ ] EFGWB
- [ ] SR
- [ ] RER
- [ ] GSC
- [ ] IR
- [ ] FH
- [ ] AM

20. Data Review Criteria

A. Policy Note No. 31
- [ ] 1 = data which meet 6(a)(2) or meet 3(c)(2)(B) flagging criteria
- [ ] 2 = data of particular concern from registration standard
- [ ] 3 = data necessary to determine tiered testing requirements

B. Section 18
- [ ] 1 = data in support of section 3 in lieu of section 18

C. Inert Ingredients
- [ ] 1 = data in support of continued use of List 1 inert

- [ ] Confidential Statement of Formula (EPA Form 8570-4) Attached *(Trade Secrets)*
- [ ] Label Attached

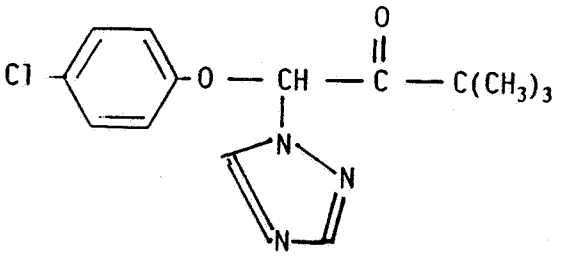
EPA Form 8570-17 (Rev. 11-88)
Previous editions are obsolete.

White - Data Coordinator
Yellow - Data Review Section
Pink - PM/RM/DCI
Green - Return with completed review

APPLICATION FOR EXEMPTION UNDER FIFRA SECTION 18

1. CHEMICAL:

Chemical name: 1-(4-chlorophonoxy-3,3-dimethyl-1-(1H-1,2,4-trizol-1-yl)-2-butanone
Common name: Triadimefon (Bayleton)
Structure:



2. TEST MATERIAL:

Not Applicable.

3. STUDY/ACTION TYPE:

Review of application for specific exemption in accordance with FIFRA Section 18 to control coffee rust Hemileia vastatrix on coffee in Puerto Rico.

4. STUDY IDENTIFICATION:

Letter with attachment dated February 27, 1989 to Mr. Donald Stubbs, EPA/OPP/RD from Juan Bauza Salas, Secretary of Agriculture, Puerto Rico.

Identifying No.:	89-PR-03
Action Code:	510
Record Number:	241,439
Date Sent to EFED:	3/16/89

5. REVIEWED BY:

W. Martin Williams Signature: _____
Hydrologist
OPP/EFED/EFGWB/Ground-Water Technology Section Date: 9/16/89

6. APPROVED BY:

Patrick W. Holden Signature: _____
Section Head
OPP/EFED/EFGWB/Ground-Water Technology Section Date: 9/19/89

7. CONCLUSIONS:

1) Baytan, the biological degradation product of Bayleton, has the potential to leach and persist in ground water that is used for drinking water. If leached beyond the root zone, the persistence of Baytan is considerably longer than the 8-9 month aerobic soil metabolism half-life.

2) Repeated applications can result in a build-up of residues in soil and ground water.

2) No persistent chemical is desired outside of its target area - regardless of toxicity. As such, actions to prevent migration into less microbial active environments should be implemented should the subject Specific Exemption be granted.

8. RECOMMENDATIONS:

1) The subject Specific Exemption should not be granted annually to avoid build-up of residues in soil and ground water.

2) Advisory label statements cautioning users should be included in the protocol should the subject Specific Exemption be granted as proposed below:

"This chemical can travel (seep or leach) to ground water that is used for drinking water.

Users are advised to be careful in mixing and handling this chemical to avoid spills.

This product must not be mixed/loaded, or used within 50 feet of sink holes or wells, including abandoned wells and drainage wells."

Do not use in hydrogeologically vulnerable conditions defined as having very permeable (sandy) soils, ground water less than 30 feet, and/or soil conditions conducive to preferential flow conditions (e.g., karst terrain).

Do not over irrigate. Avoid use during periods of heavy rain."

9. BACKGROUND:

Bayleton is a systemic fungicide used against powdery mildew affecting deciduous fruit, cereals and vegetables; azalea petal blight; rust diseases of cereals and coffee; seed grasses and pine; and pineapple disease on sugarcane and pineapple. Formulations include: wettable powder, emulsifiable concentrate, suspension concentrate, and paste.

This Specific Exemption is for use against "Coffee rust" (Hemileia vastatrix) on coffee in Puerto Rico.

10. DISCUSSION:

A total of 60,000 acres are proposed to be treated under the subject Specific Exemption. A maximum of four ground applications at a rate of 3.55 ounces a.i. per acre with a 30 day pre-harvest interval will be made. A maximum 14.2 oz a.i. per acre per year and a maximum total of 53,250 lbs of active ingredient are stated in the protocol.

Bayleton is moderately mobile but relatively non-persistent in the environment as shown in Table 1. The major mode of degradation is aerobic and anaerobic soil metabolism. The only significant products of metabolism are carbon dioxide and Baytan (EAB #5024). Baytan is a separately registered pesticide (Shaughnessy #127201) and is slightly more mobile in the environment than Bayleton and considerably more persistent (also shown in Table 1). Based on the relatively rapid oxidation of parent triadimefon, Baytan is the compound of potential concern.

HED should be contacted regarding the toxicity of Bayleton and Baytan in drinking water. Preliminary information indicates that neither Bayleton nor Baytan have significant chronic health risks in drinking water. Reference Doses (RfDs) are on the order 0.025 and 0.038 mg/kg/day, respectively (HED/Toxicology Branch RfD Tracking Report February 1989).

Application rates of the subject Specific Exemption are relatively low (maximum of 3.55 oz a.i./acre). However, up to four repeat applications per year are in the protocol. Given the degradation rates of Baytan, leaching assessments must consider close to one pound active ingredient may be applied per acre per year. Given 8 to 9 month aerobic metabolism half-lives, this application rate and schedule is unlikely to result in significant residues in soil.

The major concern for this chemical is persistence of Baytan should the compound leach below the root zone and into ground water where anaerobic half-lives are significantly greater than 8-9 months. No persistent chemical is desired outside of its target area - regardless of toxicity. As such, actions to prevent migration into less microbial active environments should be implemented for all uses (see Section 8, "Recommendations").

TABLE 1
LEACHING ASSESSMENT FOR TRIADIMEFON

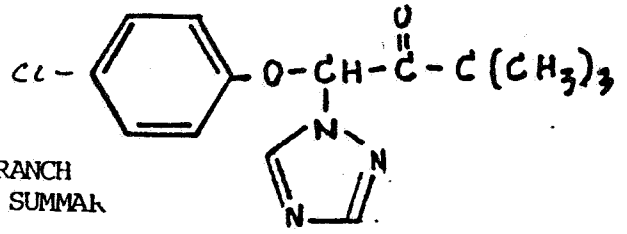
Property	Bayleton[1]	Baytan[2]	Guidelines[3]
Adsorption Partition Coefficient	3.5 - 9.3	0.5 - 3.7	<5.0, <1.0 or 2.0
Solubility (ppm)	70 @ 20° C	49 - 95° C >30 ppm	
Hydrolysis half-life	relatively stable	stable	>25 weeks
Photolysis half-life	stable soil <1 day aqueous	stable soil 36 hr aqueous	>1 week
Aerobic Soil half-life	6-18 days	8-9 months	>2-3 weeks
Anaerobic Soil half-life	15 days	>>8-9 months	>2-3 weeks

[1]EFGWB Pesticide Environmental Fate One Line Summary, 6/22/89.

[2]EFGWB Pesticide Environmental Fate One Line Summary, 1/27/84.

[3]Cohen, S.Z., S.M. Creeger, R.F. Carsel, and C.G. Enfiel, "Potential Pesticide Contamination of Groundwater from Agricultural Uses, in Treatment and Disposal of Pesticide Wastes", ACS Symposium Series #259, R.F. Krueger and J.N. Seiber, ed., American Chemical Society, Washington, D.C., 1984.

5



ENVIRONMENTAL FATE & GROUND WATER BRANCH
PESTICIDE ENVIRONMENTAL FATE ONE LINE SUMMAR

Common Name: TRIADIMEFON
Chem. Name : 1-(4-CHLOROPHENOXY)-3,3-DIMETHYL-1-(1H-1,2,4-TRIAZOL-1-YL)-
: 2-BUTANONE
Synonym : BAYLETON; AMIRAL
Shaugh. # : 109901
Type Pest. : FUNGICIDE (SYSTEMIC)
Formulation: WP; EC; SUSP. CONCENTRATE; PASTE; DRY FLOWABLE
Uses : AGAINST POWDERY MILDEW AFFECTING DECIDUOUS FRUIT, CEREALS
: AND VEGETABLES; RUST DISEASES OF CEREALS, COFFEE, SEED
: GRASSES; DISEASES ON SUGARCANE, PINEAPPLE, ORNAMENTALS

Date: 06/22/89
CAS Number: 43121-43-3

Empir. Form: $C_{12}H_{14}ClN_3O_2$
Mol. Weight: 267.5
Solub.(ppm): 70 @ 20 C

VP (Torr): <E-6
Log Kow : 2.99
Henry's :

Hydrolysis (161-1)
pH 5:[ ]
pH 7:[ ]
pH 9:[ ] 95% REMAINS AFTER 28 WKS
pH 3:[ ] 97% " " " "
pH 6:[ ] 95% " " " "
pH :[ ]

Photolysis (161-2, -3, -4)
Air :[ ]
Soil :[*] STABLE
Water:[ ] 10-12 HOURS
:[ ]
:[ ]
:[ ]

MOBILITY STUDIES (163-1)

Soil Partition (Kd)

	s	s	c	CEC	%OM	K
1.[ ]						
2.[ ]	46	36	18	27.6	3	9.3
3.[ ]	4	53	43	28.6	2.1	3.5
4.[ ]	92	7	1	26.6	3.7	5.9
5.[ ]						
6.[ ]						

Rf Factors

	%s, s, c	%OM	Rf
1.[ ]			
2.[ ]	91 1 1	0.8	0.27
3.[ ]	74 14 13	2.8	0.16
4.[ ]	56 21 23	0.6	0.20
5.[ ]	18 57 25	5.1	0.26
6.[ ]	0 41 59	0.5	0.20

METABOLISM STUDIES (162-1,2,3,4)

Aerobic Soil (162-1)

		%s, s, c		%OC	T1/2
1.[ ]	SOIL				
2.[ ]	SiCl	0	66 34	2.4	6 DA
3.[ ]	SL	74	16 10	17.1	18 "
4.[ ]					
5.[ ]					
6.[ ]					
7.[ ]					

Anaerobic Soil (162-2)
1.[ ] SiCl 15 DAYS (STERILE CONDITIONS INHIBIT BREAKDOWN)
2.[ ]
3.[ ]
4.[ ]
5.[ ]
6.[ ]
7.[ ]

Aerobic Aquatic (162-4)
1.[ ]
2.[ ]
3.[ ]
4.[ ]

Anaerobic Aquatic (162-3)
1.[ ]
2.[ ]
3.[ ]
4.[ ]

[*] - Acceptable Study. [#] = Supplemental Study

6

Common Name: TRIADIMEFON Date: 06/22/89

VOLATILITY STUDIES (163-2,3)

[ ] Laboratory.
[ ] Field:

DISSIPATION STUDIES (164-1,2,3,5)

Terrestrial Field (164-1)

1.[ ] SOIL	% s, s, c		%OM		0-6"		6-12"	
2.[ ] FLA.SAND	88	9 3	7.6	TRIAD.	5.5	MOS.	8.7	MOS
3.[ ]				KWG	6.0	"	6.5	"
4.[ ] CA LOAM	55	35 10	0.5	TRIAD	4.5	"	17	"
5.[ ]				KWG	24	"		
6.[ ] OR LOAM	41	45 14	4.5	TRIAD	8.0	"	23	"

Aquatic (164-2)
1.[ ]
2.[ ]
3.[ ]
4.[ ]
5.[ ]
6.[ ]

Forestry (164-3)
1.[ ]
2.[ ]

Other (164-5)
1.[ ]
2.[ ]

ACCUMULATION STUDIES (165-1,2,3,4,5)

Confined Rotational Crops (165-1)
1.[ ]
2.[ ]

Field Rotational Crops (165-2)
1.[ ] 1 YR ROTATION FOR SMALL GRAINS, BLACK-EYED PEAS.
2.[ ] 1 MONTH ROTATION FOR RADISHES.

Irrigated Crops (165-3)
1.[ ]
2.[ ]

Fish (165-4)
1.[ ] CHANNEL CATFISH, 6.5-7.6 EDIBLE
2.[ ]

Non-Target Organisms (165-5)
1.[*] CLOVER PLANTS STUNTED @ 50 PPM; NITROGEN FIXATION
2.[ ] BY CLOVER APPARENT AT 10 PPM.

Common Name: **TRIADIMEFON** Date: 06/22/89

GROUND WATER STUDIES (158.75)

1.[ ]
2.[ ]
3.[ ]

DEGRADATION PRODUCTS

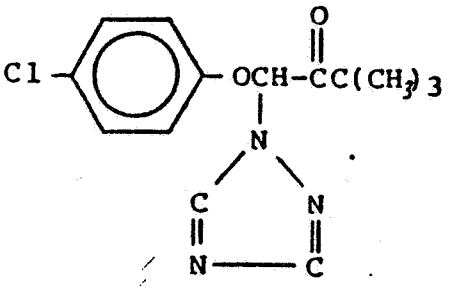
1. BAYTAN / KWG (HALF-LIFE IN SOIL = 9-12 MONTHS)
2. TRIAZOLE
3. HYDROXY TRIAZOLE
4.
5.
6.
7.
8.
9.
10.

COMMENTS

AGED RESIDUES ARE MODERATELY MOBILE AND HAVE THE POTENTIAL TO LEACH INTO GROUND WATER.

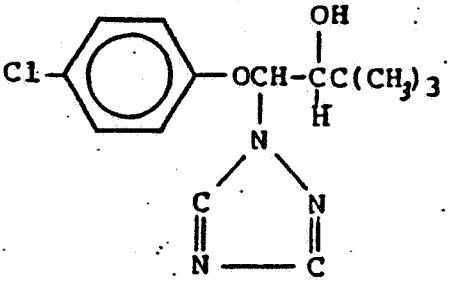
THE DEGRADATE, KWG 0519, HAS A HALF-LIFE OF 9-12 MONTHS IN SOI

References:
Writer : J. HANNAN



BAYLETON

[TRIADIMEFON]



KWG 0519

[BAYTAN]

FILE COPY Date: 1/27/84
Initials: NKW

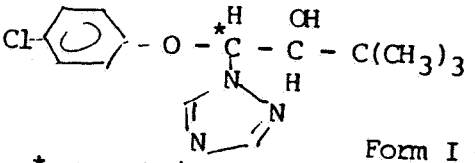
EXPOSURE ASSESSMENT BRANCH ONE LINER

EAB FILE NO: 127201

TYPE PESTICIDE: Fungicide

COMMON NAME: Baytan

STRUCTURE:



CHEMICAL NAME: 1-(4-chlorophenoxy)-3,3-dimethyl-1-(H-1,2,4-triazole-1-yl)-2-butanol

* asymetric carbon = Form II- L
Form I - D

CHEMICAL PROPERTIES:

Molecular Weight	Aqueous Solubility	Vapor Pressure
	Form I 95 ppm Form II 49 ppm	

Partition Coefficients:

Octanol/Water (K_{ow})
Form I 794
Form II 1305

Soil Adsorption

Mobility Class: 2

Soil Type:	% Soil O.M.	Coefficients K	Coefficients K_{oc}	TLC R_f
Kansas loam	3.0	5.26		
Hagerstown Silty Clay	2.1	2.37		
Florida Sand	3.7	4.05		
Kansas silty clay	0.5			0.16
Oregon sandy loam	2.3			0.58

Hydrolysis		Photolysis	Degradation	
pH	Half-Life	Half-Life	Lab Half-Life	Field Half-Life
4.5	stable	Soil: stable	Soil Aerobic: 8-9 months	Soil:
7.1	stable	Water: 36 hr	Anaerobic: >>8-9 mos.	
9.2	stable	photo-sensitzd: 17 hr. (acetone)	Aquatic Aerobic:	Aquatic:
			Anaerobic:	

FISH BIOACCUMULATION FACTORS

Species	Tissue: Edible	Tissue: Viscera	Whole Fish	Depuration Half-Life
	X	X	X	

FOUND IN GROUND WATER? ESTABLISHED REENTRY INTERVAL ROTATIONAL CROP RESTRICTIONS

COMMENTS: for seed treatment, field dissipation, rotational crop and fish acc. were waived.

REFERENCES: files

10

FILE COPY

Data Requirement	Terrestrial Satisfied	Aquatic Satisfied	Comments
HYDROLYSIS	6/22/83		
PHOTODEGRADATION			
soil	1/27/84		
water	1/27/84		
SOIL METABOLISM			
aerobic	6/22/83		
anaerobic			
LEACHING			
column	6/22/83		
batch	1/27/84		
TLC	6/22/84		
FIELD DISSIPATION			
soil			waived for seed treatment 6/22/83
water			
forest			
ROTATIONAL CROP			waived for seed treatment 6/22/83
IRRIGATED CROP			
FISH ACCUMULATION			waived for seed treatment 6/22/83
AQUATIC NON-TARGET			

BAYTAN

89-PR-03

3

Commonwealth of Puerto Rico
DEPARTMENT OF AGRICULTURE
P.O.Box 10163
Santurce, Puerto Rico, 00908

February 27, 1989

Mr. Don Stubbs
Emergency Response &
Minor Use Section
U.S. Environmental Protection Agency
Pesticide Registration Division (TS-767C)
401 "M" Street S.W.
Washington, D.C. 20460

Dear Mr. Stubbs:

Enclosed is our petition for a Section 18 Emergency Exemption to allow the use of Bayleton for the control of "Coffee rust" (Hemileia vastatrix) on coffee. The petition includes information and data regarding our problem in the island.

We strongly endorse this petition and hope that it be granted.

We will appreciate your kind assistance in this important matter.

Sincerely yours,

Juan Bauzá Salas
Secretary of Agriculture

Enclosure

12

1. *Description of the emergency:*

As recently as a week ago, "coffee rust" (Hemileia vastatrix), was observed attacking coffee plants in Puerto Rico for the first time in Las Marías municipality. Within one week, the most dangerous disease of the coffee tree has been observed in six other municipalities, covering approximately 1/3 of the coffee production area in Puerto Rico. The disease causes tree defoliation and has a negative effect on yield. Just a few pustulas, and sometimes only one per leaf can cause defoliation. Reduction of the green leaf area necessary for photosynthesis growth pattern of trees. The danger of the disease spreading rapidly (spores are easily carried by wind, insects, vegetative material, rain and man) to the whole coffee region calls for an immediate and forceful eradicative and protective program.

The coffee growing region in P.R. covers 90,000 acres with an annual production of 300,000 cwt and an income of $52 millions. Estimates are that a severe attack of coffee rust could represent a loss of 30-40% of the production. Bayleton is known to be an effective fungicide against coffee leaf rust. It is imperative that this fungicide be used not only as an eradicative measure but also as a protective treatment.

2. *Description of the proposal control program:*

a. Pesticide proposed for use: Bayleton

Trademark-formulation-EPA registration number:
Bayleton 50% WP - EPA Reg. No. 3125-320

b. Sites to be treated:

Coffee trees in the central part of Puerto Rico
(Las Marías, Mayaguez, Maricao, Añasco, San Sebastián, Lares, Utuado, Ciales, Orocovis, Villalba, Juana Díaz, Ponce, Peñuelas, Guayanilla, Sabana Grande, San Germán, Adjuntas, Moca, Yauco, Jayuya, Aguada.)

c. Method of application:

Ground application (knapsack sprayer, motor blower) to foliar tissue.

d: Rate of application: 7.1 oz./A

e. Number of applications per acre: Maximum of four (4)

f. Total acreage proposed to be treated: 60,000 acres

g. Length of time the exemption will be required: One year (March 1989 - February 1990)

h. Preferred date for pesticide application to start: March 1989

i. Total quantity of active ingredient and product required: 53,250 lbs a.i; 106,500 lbs.

j. Preharvest interval: 30 days

k. Estimated level of residue expected: Import tolerance petition submitted by manufacturer for 0.1 ppm.

l. Applicable restrictions concerning proposal use: follow federal label restrictions

3. Alternate methods of control:

Copper fungicides effective only as protective treatment, provides fair control. No fungicides registered in Puerto Rico as eradicative treatment.

Other methods of control (mechanical) are recommended before the initiation of fungicides sprays to minimize those factors favorable to the development of the disease by using shade reduction and adequate running practices. At the moment there are not resistant varieties available in Puerto Rico.

4. Effectiveness of the proposed use:

Please refer to documents submitted to EPA by Mobay Corporation in support of a petition for an import tolerance of 0.1 ppm for residue of Bayleton and its metabolites containing chlorophenoxy and triazole moieties. Data was previously submitted to the Agency under PP 3E2938 and file on Accession No. 071770.

5. Discussion of residues for food uses:

Refer to documents submitted to EPA.

6. Discussion of risk information:

Refer to documents submitted to EPA.

7. Coordination with other affected state or Federal Agencies:

USDA, APHIS, PPQ

8. Repeat use of the proposed exemption:

Apply 7.1 oz/A of Bayleton 50% WP in sufficient water to throughly wet foliage. Make up to four applications per year with a 30 days pre-harvest interval. Do not apply more than 28.4 oz./A per year.

9. Economic data concerning the proposed exemption:

Coffee losses due to coffee rust in P.R.

	1989
Acres	90,000
Value	$52,000,000
% loss due to coffee fruit	33%
Total Value Lost	$17,000,000

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10. Name & address of manufacturer

Mobay Corporation
1587 Phoenix Blvd. #6
Atlanta, Georgia

11. Name & Address of Applicant

Agricultural Services Administration
P.O. Box 9200
Santurce, Puerto Rico 00908

12. Name & telephone number of contact individuals:

José T. Guzmán - 723-8534 (809)
Jorge Ballester - 829-7795 (809)
Alfonso L. Dávila - 724-1945 (809)