Shaughnessy No.: 122101

Date Out of EAB: ~~5/18/89~~ 5/18/87 per conv. w/ B. Conerly

To: Robert Taylor
Product Manager 25
Registration Division (TS-767)

From: Emil Regelman, Supervisory Chemist
Review Section #3
Exposure Assessment Branch
Hazard Evaluation Division (TS-769)

Attached, please find the EAB review of...

Reg./File # : _____

Chemical Name: Propiconazole

Type Product : Fungicide

Product Name : Tilt, Banner

Company Name : Ciba-Geigy Corporation

Purpose : Addendum to an application for full registration.

Action Code(s): _____ EAB #(s) : _____

Date Received: _____ TAIS Code: _____

Date Completed: _____ Monitoring Submitted: _____

Total EAB Reviewing Time: _____ Monitoring Requested: _____

Deferrals to: _____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

1

1. CHEMICAL: Common name:

Propiconazole

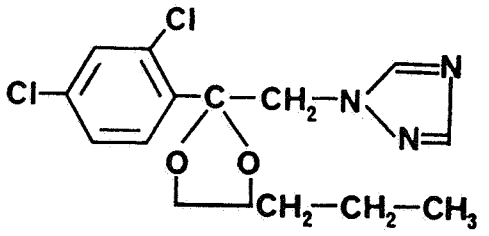
Chemical name:

1-[(2-[2,4-Dichlorophenyl]-4-propyl-1,3-dioxolan-2-yl)methyl]-1H-1,2,4-triazole

Trade name(s):

Tilt, CGA-64250, Desmel, Banner

Structure:



Formulations:

3.6 lb/gal EC

Physical/Chemical properties:

Physical state: Colorless, odorless viscous liquid
Water solubility: 110 ppm at 20°C
Boiling point: 180°C at 0.1 mm Hg
Vapor pressure: $\leq 3 \times 10^{-6}$ Torr at 20°C

2. TEST MATERIAL:

Tilt 3.6 EC (Study 1); Banner 1.125 EC (Study 2).

3. STUDY/ACTION TYPE:

Addendum to an application for full registration of propiconazole on pecans, rice, wheat, barley, and rye.

4. STUDY IDENTIFICATION:

The following studies are new submittals:

Honeycutt, R.C. 1982. Dislodgeable residues of CGA-64250 from fescue turf treated with Banner. Report No. EIR-82007. Prepared and submitted by Ciba-Geigy Corporation, Agricultural Division, Greensboro, NC.

2

Hosner, A.J. 1987. Dissipation of Tilt 3.6E in two Arkansas and two Texas rice fields, interim report. Reports 108-261 and 108-262. Prepared by Wildlife International, Easton, MD, and submitted by Ciba-Geigy Corporation, Greensboro, NC. Acc. No. 1.

5. REVIEWED BY:

Brinson Conerly
Chemist
EAB/HED/OPP

Signature:_____

Date:_____

6. APPROVED BY:

Emil Regelman
Supervisory Chemist
Review Section #3, EAB/HED/OPP

Signature:_____

Date: _____

7. CONCLUSIONS:

8. RECOMMENDATIONS:

9. BACKGROUND:

A. Introduction

Propiconazole has been previously reviewed by Dynamac (8/17/84) and EAB. Based on previous submissions, the following data requirements have been fulfilled and these conclusions drawn:

1. Hydrolysis: Stable to hydrolysis.
   N. Burkhard: Rate of hydrolysis of CGA-64250 under laboratory conditions. 1/30/80; Acc. No. 244269; reviewed: 6/17/81.

2. Water photodegradation: Rapid with sensitizers - $t_{1/2}$ <1 day.
   G. Miller: Photochemistry of CGA-64250. Acc. No. 244269; reviewed: 6/17/81.

3. Soil photodegradation: No degradation over 24 hour time period.
   N. Burkhard: Photolysis of CGA-64250 on soil surface under artificial sunlight conditions. 3/24/80; Acc. No. 244269; reviewed: 6/17/81.

4. Aerobic soil metabolism: $t_{1/2}$ = 10 weeks.
   A. Keller: Degradation of CGA-64250 (Tilt) in soil under aerobic, aerobic/anaerobic and sterile/aerobic conditions. 6/24/80; Acc. No. 244269; reviewed: 6/17/81.

5. Mobility studies:
   Adsorption/desorption: Tightly bound to soil.
   N. Burkhard: Adsorption and desorption of CGA-64250 in various soil types. 8/14/80; Acc. No. 244269; reviewed: 6/17/81.

   Soil column: Little propensity to leach.
   A. Keller: Leaching characteristics of aged ^{14}C-CGA-64250 in farm.

J. Gouth: Leaching model study with the fungicide CGA-64250 in farm standard soils. 8/27/78; Acc. No. 244269; reviewed: 6/17/81 and 10/14/81.

Aged leaching: Low leaching potential.
A. Keller: Leaching characteristics of aged ^{14}C-CGA-64250 residues in two standard soils. 11/14/79; Acc. No. 244269; reviewed: 6/17/81.

6. Field dissipation: Propiconazole (3.6 lb gal/EC), at 5 lb ai/A, degraded in silt loam (Illinois) and sandy loam (California) soils with a half-life of <1 month, from 6.8 to 2.8 ppm and from 1.8 to 0.29 ppm in the silt loam and sandy loam soils, respectively. 1,2,4-H-Triazole was ≤0.07 ppm at the Illinois site and ≤0.12 ppm at the California site at all sampling intervals.
R.C. Honeycutt. 1985a. Field dissipation studies on CGA-64250 (Tilt) (Columbia Co., NY). Report No. EIR-85028. Ciba-Geigy Corp., Greensboro, NC. Acc. No. 260799.
R.C. Honeycutt. 1985b. Field dissipation studies on CGA-64250 (Tilt) (Fresno, CA). Report No. EIR-85027. Ciba-Geigy Corp., Greensboro, NC. Acc. No. 260797.
R.C. Honeycutt. 1985c. Field dissipation studies on CGA-64250 (Tilt) (Geneso, IL). Report No. EIR-85025. Ciba-Geigy Corp., Greensboro, NC. Acc. No. 260798.
R.C. Honeycutt. 1985d. Field dissipation studies on CGA-64250 (Tilt) (Geneso, IL). Report No. EIR-85018. Ciba-Geigy Corp., Greensboro, NC. Acc. No. 260796.

7. Fish accumulation: In muscle tissue BCF 24x; depuration almost complete in 14 days.
EG and G, Bionomics Aquatic Toxicology Laboratory of Wareham, MA: Accumulation and elimination in ^{14}C-residues by bluegill sunfish (Lepomis macrochirus) exposed to ^{14}C-CGA-64250. December, 1980. Acc. No. 245708; reviewed: 10/14/81.

According to a letter submitted by Ciba-Geigy to H. Jacoby with the data currently under review, EAB agreed (4/15/85) to make aerobic and anaerobic aquatic metabolism studies postregistration requirements. The company estimates the studies will be completed by September, 1986.

Propiconazole is registered (or registration has been applied for) for use on grasses grown for seed in the Pacific Northwest.

B. Directions for Use

Propiconazole is a broad spectrum foliar fungicide with systemic and eradicative properties. It is effective against Ascomycetes, Basidiomycetes, and Imperfects. Propiconazole is applied at 8-12 fluid oz/A to bearing pecans (6-9 fluid oz/A if trees are <30 feet in height); 4-5.5 fluid oz/A to nonbearing pecans; 4 fluid oz/A to wheat, barley, and rye; 6 fluid oz/A twice or 8-10 fluid oz/A once to rice; and 4-8 fluid oz/A to grasses grown for seed. Multiple

applications may be made to nonbearing pecans and grasses; applications are limited to six on bearing pecans, two on rice (depending on application rate), and one on wheat, barley and rye. Propiconazole may be applied using ground spray equipment or aircraft.

10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

See attached reviews of individual studies.

11. COMPLETION OF ONE-LINER:

12. CBI APPENDIX:

All data discussed here are considered company-confidential and must be treated as such.

DYNAMAC
CORPORATION

PROPICONAZOLE

Initial Draft Report

Task 1: Review and Evaluation of Individual Studies

Task 2: Environmental Fate and Exposure Assessment

Contract No. 68-02-4250

MAY 15, 1987

Submitted to:
Environmental Protection Agency
Arlington, VA 22202

Submitted by:
Dynamac Corporation
The Dynamac Building
11140 Rockville Pike
Rockville, MD 20852

6

PROPICONAZOLE

Table of Contents

INTRODUCTION

Propiconazole is a broad spectrum foliar fungicide with systemic and eradicative properties. It is effective against Ascomycetes, Basidiomycetes, and Imperfects. Propiconazole is applied at 8-12 fluid oz/A to bearing pecans (6-9 fluid oz/A if trees are <30 feet in height); 4-5.5 fluid oz/A to nonbearing pecans; 4 fluid oz/A to wheat, barley, and rye; 6 fluid oz/A twice or 8-10 fluid oz/A once to rice; and 4-8 fluid oz/A to grasses grown for seed. Multiple applications may be made to nonbearing pecans and grasses; applications are limited to six on bearing pecans, two on rice (depending on application rate), and one on wheat, barley and rye. Propiconazole may be applied using ground spray equipment or aircraft.

CASE -- PROPICONAZOLE STUDY 1 PM --

CHEM 122101 Propiconazole

BRANCH EAB DISC --

FORMULATION 12 - EMULSIFIABLE CONCENTRATE (EC)

FICHE/MASTER ID No MRID CONTENT CAT 01

Hosner, A.J. 1987. Dissipation of Tilt 3.6E in two Arkansas and two Texas rice fields, interim report. Reports 108-261 and 108-262. Prepared by Wildlife International, Easton, MD, and submitted by Ciba-Geigy Corporation, Greensboro, NC. Acc. No. 1.

SUBST. CLASS = S.

DIRECT RVW TIME = 15 (MH) START-DATE END DATE

REVIEWED BY: K. Patten
TITLE: Staff Scientist
ORG: Dynamac Corp., Rockville, MD
TEL: 468-2500

APPROVED BY: B. Conerly
TITLE: Chemist
ORG: EAB/HED/OPP
TEL: 557-5456

SIGNATURE: DATE:

CONCLUSIONS:

Field Dissipation - Aquatic and Aquatic Impact

1. This study is scientifically valid.

2. Propiconazole (Tilt 3.6E, 41.8% EC), at 0.169 and 0.675 lb ai/A, dissipated with half-lives of <5 days in water from basin (stationary)-irrigated rice plots in Arkansas and <1 day in water from flow-through-irrigated rice plots in Texas. The maximum concentration of propiconazole in the irrigation water was measured immediately after treatment and was 61.0 ppb in the 0.169 lb ai/A treatment and 214 ppb in the 0.675 lb ai/A treatment. Propiconazole was 1.2-46.0 ppb in the irrigation water 13-14 days posttreatment (last reported sampling interval). In irrigation water discharged from the plots, the maximum concentrations (16.0-143.0 ppb) were recorded during the first discharge following treatment. In general, the concentration of propiconazole in the water decreased as the distance from the discharge gate increased.

3. This study does not fulfill EPA Data Requirements for Registering Pesticides because the formation and decline of degradates were not addressed and soil data were not reported.

MATERIALS AND METHODS:

Propiconazole (Tilt 3.6E, 41.8% EC, Ciba-Geigy Corporation) was sprayed by aircraft (3-20 feet above the canopy) at either 0.169 or 0.675 lb ai/A on flooded field plots of rice located in Arkansas and Texas in August-September, 1986 (Table 1). The plots were resprayed at the same rate 14 days after the initial treatment. Each treated plot was paired with a control plot located a distance of 0.5-2 miles from the treated plots and associated with a separate irrigation system. In Arkansas, the plots were irrigated from wells on the site using basin irrigation techniques; irrigation water remained stationary on the plots until drained ~45 days after the second propiconazole application (additional water was added as needed). In Texas, the plots were irrigated with water from the Colorado River via lateral canals using flow-through irrigation techniques; fresh water was continually added and drained from the plots until the plots were finally drained at ~28 days post-treatment. The application rate to the fields was confirmed by measuring spray deposition on 9-cm filter paper discs located throughout the plots at a height of 0.25 m. The discs were removed from the fields within 3 hours of application and frozen until analysis. Sixty water/soil sampling stations were set up within each plot. Each station was 25-50 feet distant from every other station. Stations were also set up in the discharge ditch 0, 50, and 100 yards below the discharge gate. The plots were sampled at 0, 1, 5, 7, and 13 days following the first treatment and at 0, 1, 5, 7, and 14 days following the second treatment (the registrant reported that samples will be taken at intervals up to 360 days posttreatment). Flood water (three 1.3-L samples) and soil (10/station, 0- to 10-inch depth) samples were taken from three stations at each sampling interval. The drainage ditches in Arkansas were sampled when unintentional overflow occurred due to rainfall and when the fields were drained. The drainage ditches in Texas were sampled at the same intervals as the fields since water flowed continually through the ditches. All samples were frozen until analysis.

Each deposition filter was extracted with hexane:ethyl acetate (90:10) by shaking for 10-12 minutes. The extracts were analyzed by GC with N/P flame ionization detection. Water samples were mixed with a saturated sodium chloride solution and filtered through reversed phase C-8 Bond Elut cartridges. The propiconazole adsorbed to the cartridges was then eluted with ethyl acetate, and the ethyl acetate was filtered through anhydrous sodium sulfate, dried, and redissolved in hexane. The hexane was then filtered through a Florisil Sep-Pak column with hexane, 5% acetone:hexane, and 25% acetone:hexane. The 25% acetone:hexane eluate was dried, and the residues were redissolved in methanol and analyzed using HPLC. Recovery from water samples fortified with propiconazole at 1.0 and 10.0 ppb ranged from 61 to 98%. The detection limit was 1.0 ppb.

REPORTED RESULTS:

Meteorological and irrigation data are presented in Figures 1-4. Based on the spray deposition data, actual treatment rates averaged 0.068 and 0.101 lb ai/A for the first and second treatments at Walnut Ridge, Arkansas; 0.388 and 0.541 lb ai/A at Lanoke County, Arkansas; 0.100 and

0.124 lb ai/A at Matagorda County, Texas (0.169 lb ai/A theoretical); and 0.288 and 0.423 lb ai/A at Matagordo County, Texas (0.675 lb ai/A theoretical).

In general, propiconazole dissipated with a half-life of <5 days at the Arkansas sites and <1 day at the Texas sites (calculated half-lives ranged from 3.05 to 16.25 days) at both treatment rates (Table 2). By day 13-14 following treatment, the concentration of propiconazole in irrigation water was ~48 and 74% lower in the Texas plots treated at 0.169 and 0.675 lb ai/A, respectively, than in the comparable Arkansas plots.

At Walnut Ridge, Arkansas, the maximum concentration (51.5 ppb) of propiconazole was recorded at the discharge gate (0 yards) 1 day after the first treatment at 0.169 lb ai/A, when the plots overflowed (Figure 5). Discharge samples taken during scheduled drainage ~45 days after the second treatment were <1.0 ppb (detection limit), except for one 1.3 ppb measurement. Values were always lower at the 50- and 100-yard stations than at the 0-yard station. At Lanoke County, Arkansas, the maximum concentration (86.0 ppb) of propiconazole was recorded at the discharge gate 5 days after the first treatment at 0.675 lb ai/A, when the plots overflowed (Figure 5). Discharge samples taken during the scheduled drainage contained <11.6 ppb of propiconazole.

At the Texas sites, the maximum concentrations (16.0 and 24.0 ppb at 0.169 and 0.169 + 0.169 lb ai/A, respectively, and 75.0 and 143.0 ppb at 0.675 and 0.675 + 0.675 lb ai/A, respectively) in the irrigation water were recorded immediately after treatment at the discharge gate (Figure 5). In general, values were lower at the 50- and 100-yard stations than at the discharge gate.

DISCUSSION:

1. The formation and decline of degradates were not addressed. Only propiconazole was measured.

2. No soil data were reported. According to the registrants, the soil was sampled frequently, and plans are to continue sampling until 360 days posttreatment (August-September, 1987). It is probable, since this is an interim report, that the soil has not yet been analyzed.

//

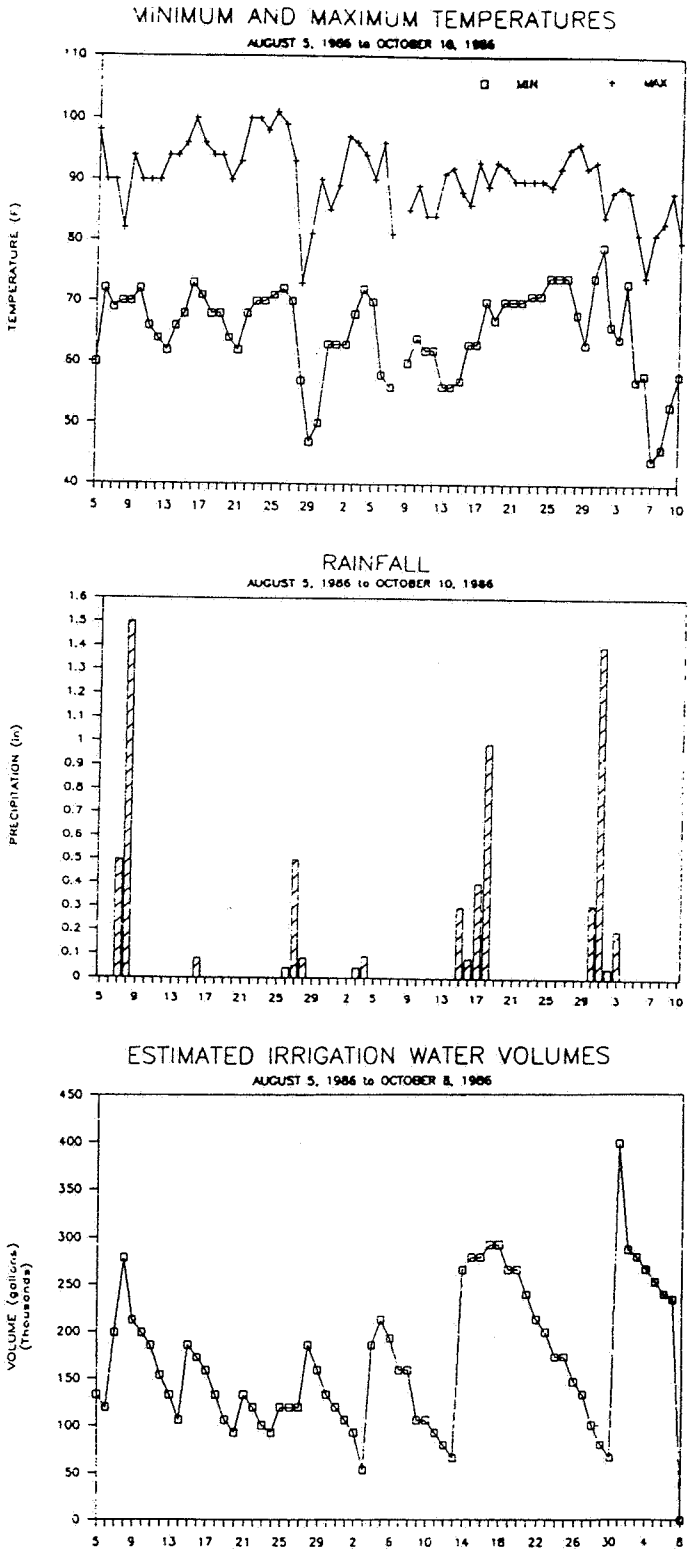


Figure 1. Meteorological and irrigation data from Walnut Ridge, Arkansas (0.169 lb ai/A/treatment).

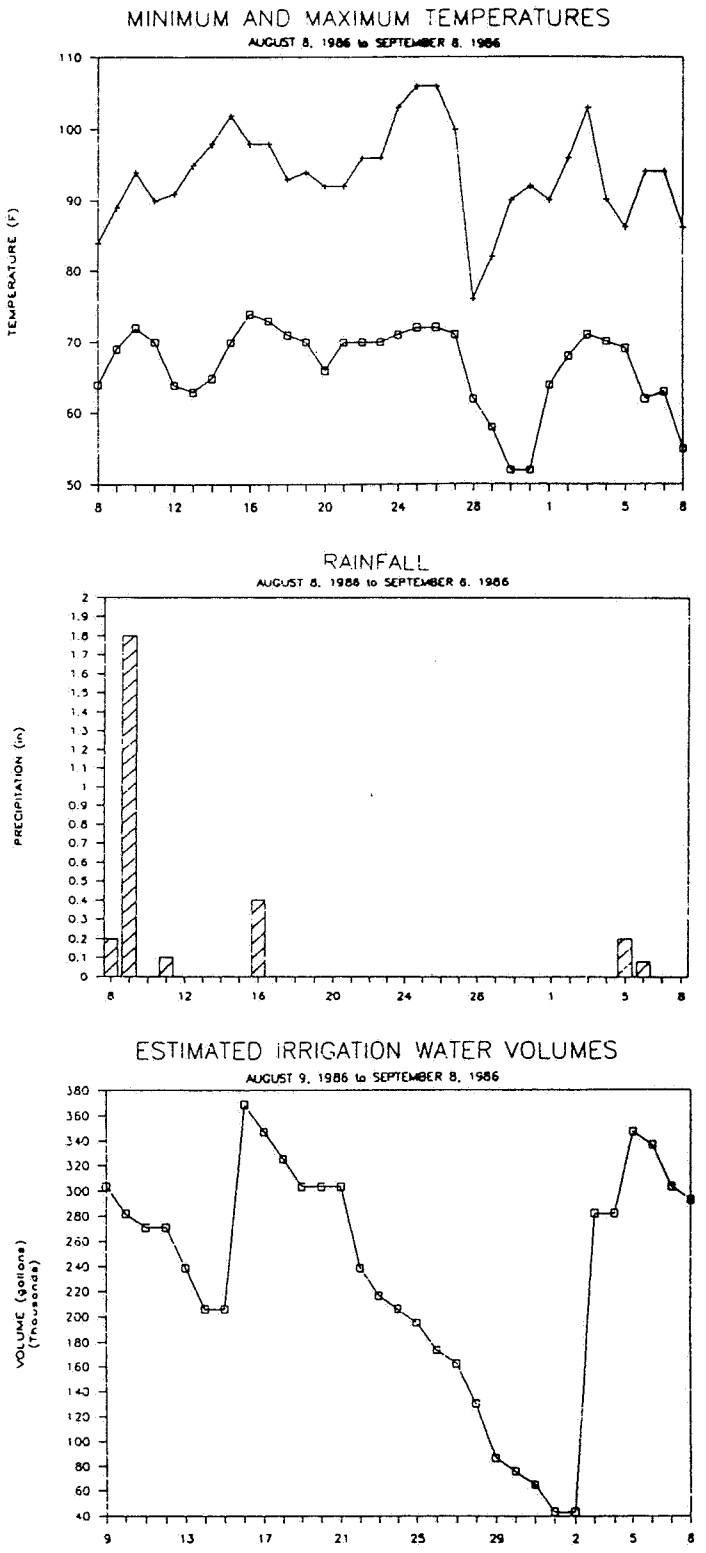


Figure 2. Meteorological and irrigation data from Lanoke County, Arkansas (0.675 lb ai/A/treatment).

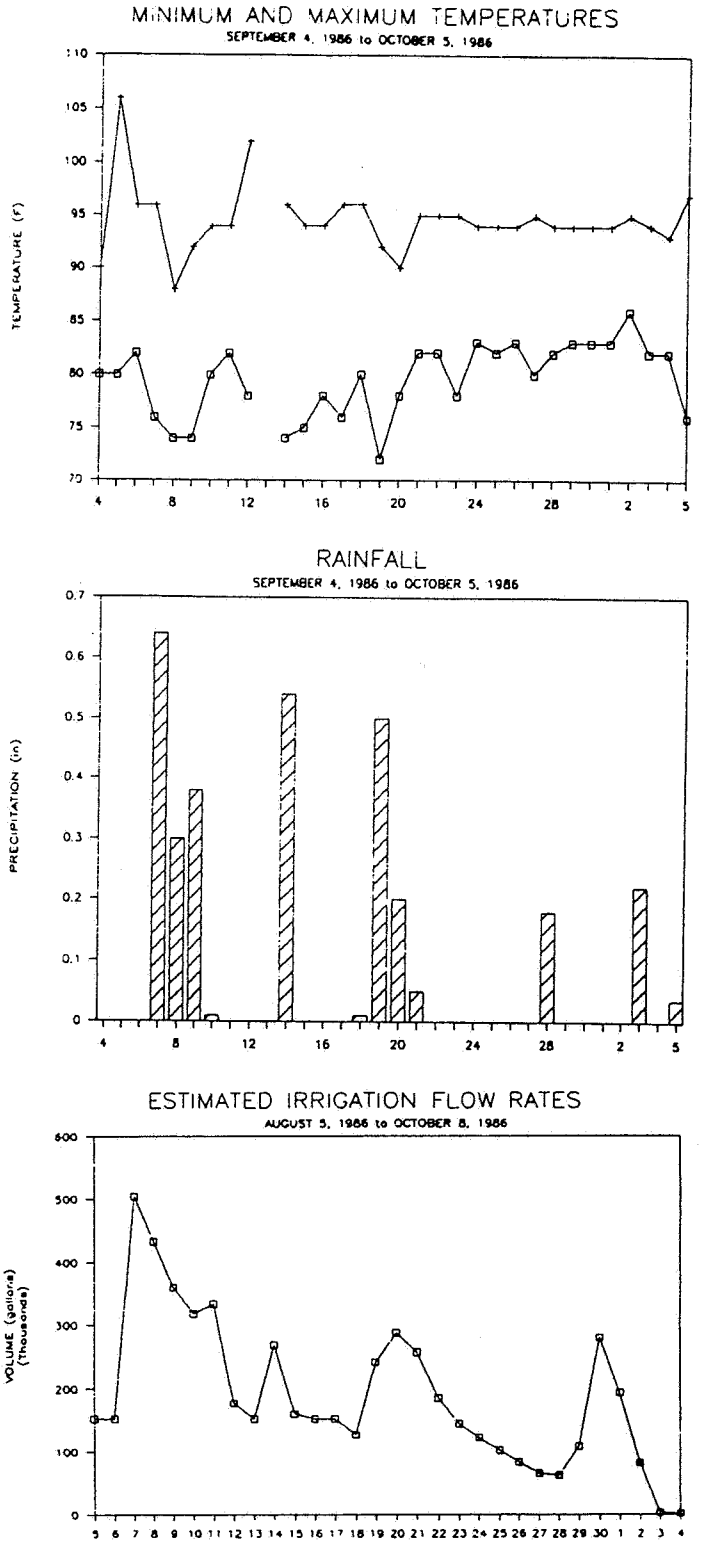


Figure 3. Meteorological and irrigation data from Matagorda County, Texas (0.169 lb ai/A/treatment).

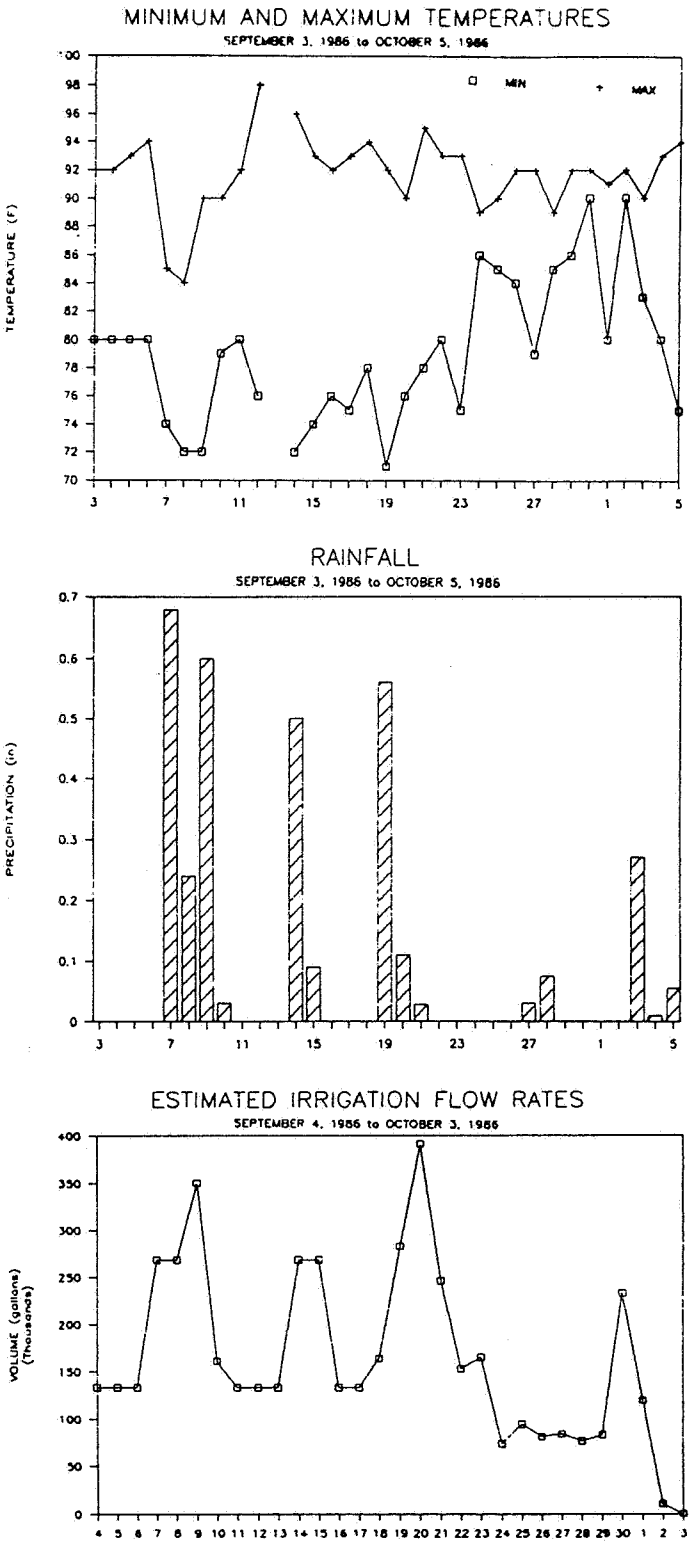


Figure 4. Meteorological and irrigation data from Matagorda County, Texas (0.675 lb ai/A/treatment).

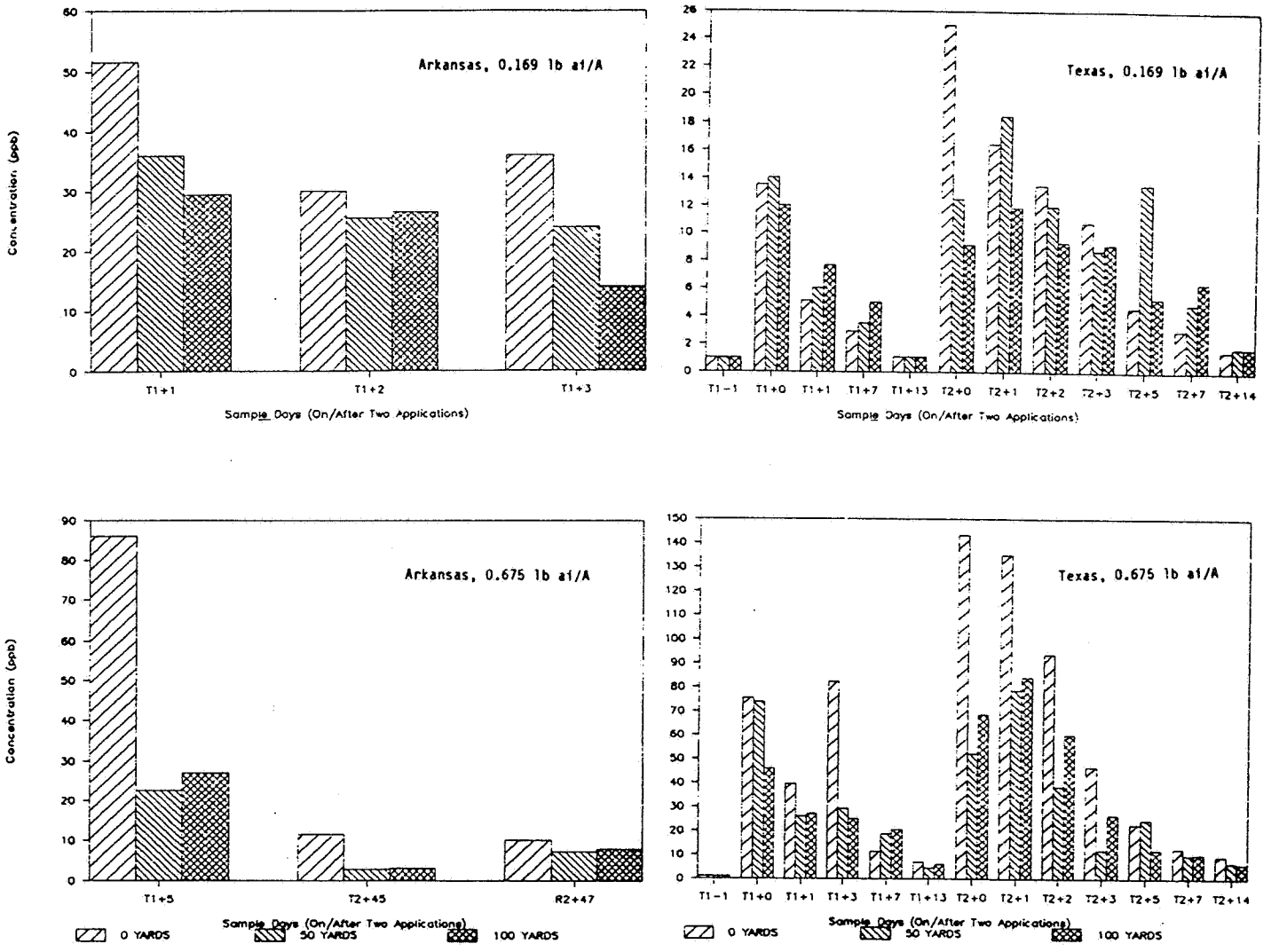


Figure 5. Propiconazole (ppb) in discharge water from irrigated rice plots in Arkansas and Texas that were treated with propiconazole (41.8% EC) at 0.169 or 0.675 lb ai/A.

Table 1. Field test data and soil characteristics.

Location	Treatment rate (lb ai/A)	Treatment dates	Plot size (acres)	Type of irrigation	Soil type	Sand	Silt	Clay	Organic matter	pH	CEC (meq/100 g)
						%					
Walnut Ridge, Arkansas	0.169	08/07/86, 08/21/86	2	Basin	Loam	33.2	48.8	18.0	1.1	5.2	6.4
Lanoke County, Arkansas	0.675	08/11/86, 08/25/86	1	Basin	Loam	45.0	35.0	20.0	3.2	5.7	6.9
Matagorda County, Texas	0.169	09/05/86, 09/20/86	1.5	Flow-through	Clay	26.0	30.4	43.6	2.7	8.1	28.6
Matagorda County, Texas	0.675	09/04/86, 09/18/86	2.3	Flow-through	Clay	30.0	26.4	43.6	4.6	8.0	28.6

Table 2. Propazine (ppb) in the irrigation water from rice fields in Arkansas and Texas that were treated with propiconazole (41.8% EC) at either 0.169 or 0.675 lb ai/A/treatment in 1986.[a]

Sampling interval (days)	Arkansas	Texas
	0.169 lb ai/A	
0	61.0	29.0
1	18.7	14.0
5	21.5	3.7
7	12.4	2.7
13	2.4	1.2
	0.169 + 0.169 lb ai/A	
0	33.0	47.5
1	36.5	27.0
5	13.1	8.1
7	29.5	6.0
14	5.3	2.8
	0.675 lb ai/A	
0	214.0	85.0
1	171.0	28.0
5	131.5	34.0
7	31.5	13.0
13	43.0	9.7
	0.675 + 0.675 lb ai/A	
0	102.5	116.0
1	122.0	137.5
5	44.0	30.5
7	56.0	8.9
14	46.5	13.0

[a] The Arkansas plots were basin-irrigated; the Texas plots were flow-through-irrigated.

CASE -- PROPICONAZOLE STUDY 2 PM --

CHEM 122101 Propiconazole

BRANCH EAB DISC --

FORMULATION 12 - EMULSIFIABLE CONCENTRATE (EC)

FICHE/MASTER ID No MRID CONTENT CAT 01

Honeycutt, R.C. 1982. Dislodgeable residues of CGA-64250 from fescue turf treated with Banner. Report No. EIR-82007. Prepared and submitted by Ciba-Geigy Corporation, Agricultural Division, Greensboro, NC. Acc. No. ?

SUBST. CLASS = S.

DIRECT RVW TIME = 8 (MH) START-DATE END DATE

REVIEWED BY: P. Perreault
TITLE: Staff Scientist
ORG: Dynamac Corp., Rockville, MD
TEL: 468-2500

APPROVED BY: J. Adams
TITLE: Chemist
ORG: EAB/HED/OPP
TEL: 557-7335

SIGNATURE: DATE:

CONCLUSIONS:

1. This study is scientifically valid.

2. Propiconazole (Banner, 1.125 EC) degraded with a half-life of 1-2 days on turf after one and four applications of propiconazole at 0.004 lb ai/100 square feet. Average dislodgeable residues of propiconazole on turf (based on the surface area for two sides of a blade of grass, which was determined by the registrant to be 128.3 cm^2/g) were 1.2 and 1.5 $\mu g/cm^2$ on day 0 after the first and fourth applications, respectively, and declined to 0.03 and 0.06 $\mu g/cm^2$, respectively, by day 7 after the first and fourth applications. Average fieldworker exposure rates, derived from dislodgeable residue data and Popendorf's correlation, were 17,000 and 23,000 µg/hour on day 0 after the first and fourth applications, respectively, and declined to 250 and 580 µg/hour, respectively, by day 7 after the first and fourth applications.

3. This study does not fulfill EPA Data Requirements for Registering Pesticides (Exposure:Reentry) because the registrant did not determine an Allowable Exposure Level (AEL) for propiconazole, nor was a reentry interval proposed. However, available toxicology data for propiconazole (acute oral LD_{50} = 1517 mg/kg, dermal LD_{50} > 4000 mg/kg) indicate that

the pesticide does not have acute toxicity properties corresponding to Toxicity Category I; therefore, reentry data are not required under 40 CFR 158.140 to support the registration of propiconazole.

MATERIALS AND METHODS:

Propiconazole (Banner, 1.125 EC, Ciba-Geigy Corporation) was applied using a two-gallon Sears hand-held sprayer, at 0.004 lb ai/100 square feet, to four plots (10 x 10 feet) of Kentucky 31 tall fescue turf located in Greensboro, NC. The pesticide was applied four times at one-week intervals beginning on July 14, 1982. Two additional turf plots, located 10 feet from the treated plots, served as controls. All plots were watered with the equivalent of one inch of rain seven times at 3- to 5-day intervals during the study, and the plots were mowed one day after the second, third, and fourth applications (Table 1). One turf sample was taken from each test and control plot on day 0 prior to treatment, and four replicate samples were taken from each treated plot on days 0, 1, 2, 5, and 7 following the first and fourth treatments. Each sample weighed 3 to 6 g and consisted of three clippings taken randomly from the plot using scissors.

Samples were shaken three times, for one minute each time, with 8 drops of Sur-Ten solution (1:50) in 200 mL water. The three washes were combined, extracted with methylene chloride, and the organic phase concentrated. The concentrated extracts were reconstituted with methanol:hexane and analyzed for leaf-dislodgeable residues using GC with electron capture detection. Recovery data were not provided.

REPORTED RESULTS:

Meteorological data recorded during the study are presented in Table 1.

Propiconazole degraded with a half-life of 1 to 2 days on turf after the first and fourth applications of propiconazole at 0.004 lb ai/100 square feet. Average dislodgeable residues of propiconazole on turf (based on the surface area for two sides of a blade of grass, which was determined by the registrant to be 128.3 cm^2/g) were 1.2 and 1.5 $\mu g/cm^2$ on day 0 after the first and fourth applications, respectively, and declined to 0.03 and 0.06 $\mu g/cm^2$, respectively, by day 7 after the first and fourth applications (Table 2). Average fieldworker exposure rates, derived from dislodgeable residue data and Popendorf's correlation (Attachment 1) were 17,000 and 23,000 μg/hour on day 0 after the first and fourth applications, respectively, and declined to 250 and 580 μg/hour, respectively, by day 7 after the first and fourth applications.

DISCUSSION:

The registrant did not determine an Allowable Exposure Level (AEL) for propiconazole, nor was a reentry interval proposed. However, available toxicology data for propiconazole (acute oral LD_{50} = 1517 mg/kg, dermal LD_{50} > 4000 mg/kg) show that the pesticide does not have acute toxicity properties corresponding to Toxicity Category I; therefore, reentry data are not required under 40 CFR 158.140 to support the registration of propiconazole.

Table 1. Plot maintenance schedule and meteorological conditions during propiconazole dislodgeable residue study on turf (Greensboro, NC).

Date		Plot maintenance	Average daily temperature (°F)	Rainfall (inches)	Average windspeed (mph)	Relative humidity at 4:50 p.m. (%)
July	14	First treatment	77	Trace	4.9	85
	15		77	--	5.4	82
	16		78	--	5.2	70
	17		79	--	6.0	70
	18		79	--	6.0	66
	19	Water	80	--	5.0	67
	20		80	--	5.1	65
	21	Second treatment	79	--	6.6	59
	22	Mow	78	0.16	6.7	82
	23	Water	77	0.77	4.9	81
	24		77	--	6.0	72
	25		78	--	3.5	68
	26	Water	81	--	3.5	56
	27		81	--	3.6	59
	28	Third treatment	81	0.06	7.5	66
	29	Mow	73	Trace	4.3	77
	30	Water	78	0.56	7.6	82
	31		74	0.37	7.1	97
August	1		77	--	3.9	59
	2	Water	75	--	4.0	59
	3		76	--	3.1	65
	4	Fourth treatment	77	--	3.2	54
	5	Mow	79	Trace	5.5	68
	6	Water	78	--	4.7	59
	7		79	0.02	3.7	67
	8		80	0.04	7.3	63
	9	Water	79	0.12	7.5	94
	10		77	--	5.1	72
	11		77	0.05	5.5	69

Table 2. Average dislodgeable residues of and fieldworker exposure rates to propiconazole on turf treated with propiconazole at 0.004 lb ai/ 100 square feet (Greensboro, NC).[a]

Number of applications	Sampling interval (days)	Dislodgeable residues ($\mu g/cm^2$)[b]	Fieldworker exposure rates (μg/hour)[c]
--	0 Prior to treatment	<0.01[d]	--
1	0 Posttreatment	1.2	17,000
	1	0.7	9,500
	2	0.5	6,500
	5	0.03	250
	7	0.03	250
4	0 Prior to treatment[e]	0.08	800
	0 Posttreatment	1.5	23,000
	1	0.9	13,000
	2	0.4	5,000
	5	0.08	800
	7	0.06	580

[a] Average of sixteen replicate samples from four plots.

[b] Based on the surface area for two sides of a blade of grass, which was determined by the registrant to be 128.3 cm^2/g.

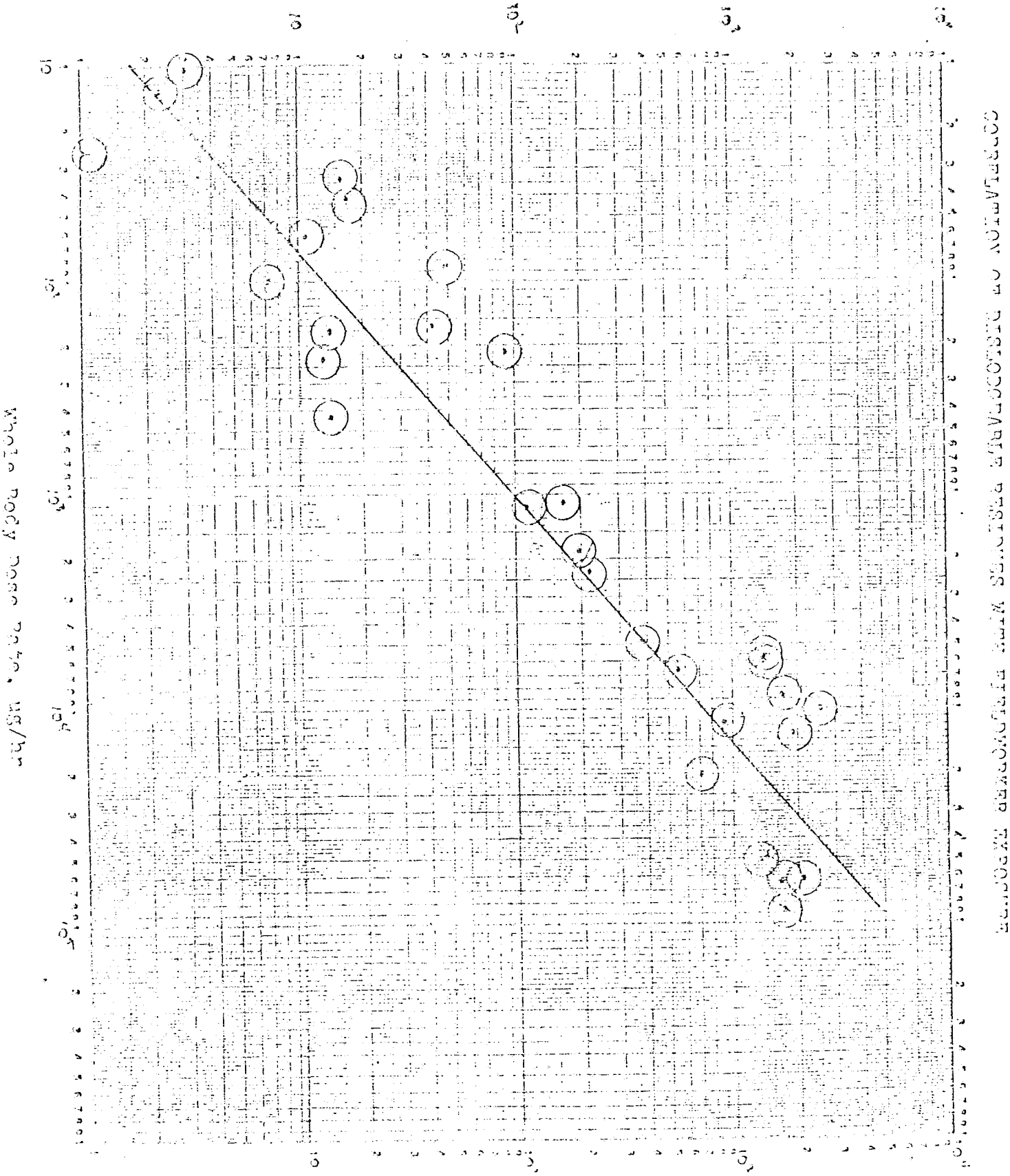
[c] Derived from average dislodgeable residue data for two sides of grass blades and Popendorf's correlation (Attachment 1).

[d] The detection limit was not specified.

[e] Day 21 after the first treatment.

Attachment 1

Foliar Dislodgeable Residue Levels, ng/cm^2



23

EXECUTIVE SUMMARY

The data summarized here are scientifically valid data that have been reviewed in this report but do not fulfill data requirements unless noted in the Recommendations section of this report.

Propiconazole (Tilt 3.6E, 41.8% EC), at 0.169 and 0.675 lb ai/A, dissipated with half-lives of <5 days in water from basin (stationary)-irrigated rice plots in Arkansas and <1 day in water from flow-through-irrigated rice plots in Texas. The maximum concentration of propiconazole in the irrigation water was measured immediately after treatment and was 61.0 ppb in the 0.169 lb ai/A treatment and 214 ppb in the 0.675 lb ai/A treatment. Propiconazole was 1.2-46.0 ppb in the irrigation water 13-14 days posttreatment (last reported sampling interval). In irrigation water discharged from the plots, the maximum concentrations (16.0-143.0 ppb) were recorded during the first discharge following treatment; in general, the concentration of propiconazole in the water decreased as the distance from the discharge gate increased.

Propiconazole (Banner, 1.125 EC) degraded with a half-life of 1 to 2 days on turf after both one and four applications of propiconazole at 0.004 lb ai/100 square feet. Average dislodgeable residues of propiconazole on turf (based on the surface area for two sides of a blade of grass, which was determined by the registrant to be 128.3 cm^2/g) were 1.2 and 1.5 $\mu g/cm^2$ on day 0 after the first and fourth applications, respectively, and declined to 0.03 and 0.06 $\mu g/cm^2$, respectively, by day 7 after the first and fourth applications. Average fieldworker exposure rates, derived from dislodgeable residue data and Popendorf's correlation, were 17,000 and 23,000 μg/hour on day 0 after the first and fourth applications, respectively, and declined to 250 and 580 μg/hour, respectively, by day 7 after the first and fourth applications.

RECOMMENDATIONS

Available data are insufficient to fully assess the environmental fate of to propiconazole. The submission of data relevant to full registration requirements (Subdivision N) for field and vegetable crop, orchard crop, and aquatic foodcrop use sites is summarized below:

Hydrolysis studies: Based on previously reviewed data, no additional data are required.

Photodegradation studies in water: Based on previously reviewed data, no additional data are required.

Photodegradation studies on soil: Based on previously reviewed data, no additional data are required.

Photodegradation studies in air: No data were reviewed, but the registrant has been advised that no data are required.[a]

Aerobic soil metabolism studies: Based on previously reviewed data, no additional data are required.

[a] Omitted from lists of data gaps previously submitted to the registrant.

Anaerobic soil metabolism studies: No data were reviewed. The requirement for anaerobic aquatic metabolism studies, which may be submitted in lieu of anaerobic soil metabolism studies, has been deferred by EPA until after registration is complete.

Anaerobic aquatic metabolism studies: This data requirement has been deferred by EPA until after registration is complete.

Aerobic aquatic metabolism studies: This data requirement has been deferred by EPA until after registration is complete.

Leaching and adsorption/desorption studies: Based on previously reviewed data, no additional data are required.

Laboratory volatility studies: No data were reviewed, but the registrant has been advised that no data are required.[a]

Field volatility studies: No data were reviewed, but the registrant has been advised that no data are required.[a]

Terrestrial field dissipation studies: Based on previously submitted data, no additional data are required.

Aquatic field dissipation studies: One study (Hosner, 1987) was reviewed and is scientifically valid. This study does not fulfill data requirements because the formation and decline of degradates were not addressed and soil data were not reported. All data are required.

Forestry dissipation studies: No data were reviewed; however, no data are required because propiconazole has no forestry use.

Dissipation studies for combination products and tank mix uses: No data were reviewed; however, no data are required because data requirements for combination products and tank mix uses are currently not being imposed.

Long term field dissipation studies: No data were reviewed, but the registrant has been advised that no data are required.

Confined accumulation studies on rotational crops: No data were reviewed, but all data are required.

Field accumulation studies on rotational crops: No data were reviewed, but all data are required.

Accumulation studies on irrigated crops: No data were reviewed, but the registrant has been advised that no data are required since the label currently prohibits use of treated water for irrigation of unregistered crops.

Laboratory studies of pesticide accumulation in fish: Based on previously reviewed data, no additional data are required.

[a] Omitted from lists of data gaps previously submitted to the registrant.

Field accumulation studies on aquatic nontarget organisms: No data were reviewed, but no data are required because propiconazole has no forestry, aquatic noncrop, or aquatic impact use.

Reentry studies: One study (Honeycutt, 1987) was reviewed and is scientifically valid. This study does not fulfill data requirements because the registrant did not determine an Allowable Exposure Level (AEL) for propiconazole, nor was a reentry interval proposed. However, available toxicology data for propiconazole (acute oral LD_{50} = 1517 ng/kg, dermal LD_{50} >4000 ng/kg) indicate that the pesticide does not have acute toxicity properties corresponding to Toxicity Category I; therefore, a reentry interval and supporting data are not required under 40 CFR 158.140 to support the registration of propiconazole.

REFERENCES

Honeycutt, R.C. 1982. Dislodgeable residues of CGA-64250 from fescue turf treated with Banner. Report No. EIR-82007. Prepared and submitted by Ciba-Geigy Corporation, Agricultural Division, Greensboro, NC.

Hosner, A.J. 1987. Dissipation of Tilt 3.6E in two Arkansas and two Texas rice fields, interim report. Reports 108-261 and 108-262. Prepared by Wildlife International, Easton, MD, and submitted by Ciba-Geigy Corporation, Greensboro, NC. Acc. No. 1.

The following study was not reviewed because it contains data not pertinent to current environmental fate data requirements:

Blattman, P. 1985. Behavior of ^{14}C-CGA-64250 on rice leaves. Report No. 4/84. Prepared by Ciba-Geigy, Ltd., Agricultural Division, Basle, Switzerland, and submitted by Ciba-Geigy Corporation, Agricultural Division, Greensboro, NC. (No MRID)