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

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

MEMORANDUM

Date: July 2, 2003

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Date: July 16/03
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DP Barcode: D281841 and D297173

Petition No.: 1F06313

Citation: 45623411 Jordan, J. (2002) Field Rotational Study For BAS 510 F on Grasses, Alfalfa, and Clover As Livestock Feed Crops: Lab Project Number: 2002/5002063. Unpublished study prepared by BASF Corporation. 105 p.

Sponsor: BASF Corporation

Background

The information contained herein was compiled by Dynamac Corporation (20440 Century Boulevard, Suite 100, Germantown MD 20874), contractor, under the supervision of RAB2/HED. This DER has undergone secondary review by RAB2, and reflects current HED and Office of Pesticide Programs (OPP) policies. This DER has also been peer-reviewed by PMRA/Canada.

(1)

Executive Summary

BASF Corporation has submitted the results of extended field rotational crop trials conducted on the representative crops, grasses including bluegrass, Bermudagrass, bromegrass, ryegrass, and tall fescue of the Grass Forage, Fodder, and Hay Group (Crop Group 17) and on alfalfa and clover of the Non-grass Animal Feeds Group (Crop Group 18).

A total of 12 rotational crop field trials were conducted in Regions 1 through 12 (1 trial per region; CA, CO, FL, GA, LA, NE, NJ, OK, OR, and TX) on representative grasses of the Grass Forage, Fodder, and Hay Group (Crop Group 17). In addition, a total of 14 rotational crop field trials were conducted on the representative crops (alfalfa and clover) of the Non-grass Animal Feeds Group (Crop Group 18); seven trials were conducted in Regions 1 (1 trial; NJ), 5 (2 trials; MN and WI), 7 (1 trial; NE), 9 (1 trial; CO), 10 (1 trial; CA), and 11 (1 trial; OR) on alfalfa and seven trials (1 trial per region) were conducted in Regions 1 (NJ), 2 (VA), 4 (MS), 5 (MN), 6 (OK), 7 (NE), and 8 (TX) on clover. Geographical representation of data is adequate for the establishment of tolerances for inadvertent residues on the Grass Forage, Fodder, and Hay Group (Crop Group 17) as well as on the Non-grass Animal Feeds Group (Crop Group 18) based on a 3/14/01 ChemSAC meeting decision and subsequent e-mail recommendation. regarding a reduced number of field trials for Crop Group 18.

At each field trial, three sequential applications of the 70% wettable granule (WG) formulation were made to the bare soil surface. The first application was made at ~0.72 lb ai/A (0.81 kg ai/ha) followed by two applications at ~0.55 lb ai/A/application (0.62 kg ai/ha/application), with 5- to 9-day retreatment intervals, for a total rate of 1.77-1.89 lb ai/A (1.98-2.12 kg ai/ha). The rotational crop grasses (bluegrass, Bermuda grass, bromegrass, ryegrass, and tall fescue) and non-grasses (alfalfa and clover) were planted 12-15 days following the last application of the test formulation to the soil. The planted crops were allowed to grow and mature according to good agricultural practices. Samples of the rotational crop grasses (forage, hay, seed screenings, and straw), alfalfa (forage, hay, and seed), and clover (forage and hay) were collected at appropriate sampling intervals or at normal maturity. All collected samples were anlyzed for residues of BAS 510 F using LC/MS/MS Method D9908. Concurrent method recovery data indicate that the LC/MS/MS method is acceptable for data collection.

Residues of BAS 510 F in/on rotational crop commodities ranged: 0.07-1.93 ppm in/on grass forage, 0.182-7.11 ppm in/on grass hay, 0.062-0.102 ppm in/on grass seed screenings, 0.116-0.218 ppm in/on grass straw, <0.05-0.518 ppm in/on alfalfa forage (1st cutting), <0.05-0.505 ppm in/on alfalfa forage (2nd cutting), <0.05-0.069 ppm in/on alfalfa forage (3rd cutting), <0.05-1.59 ppm in/on alfalfa hay (1st cutting), <0.05-0.153 ppm in/on alfalfa hay (2nd cutting), <0.05-0.202 ppm in/on alfalfa hay (3rd cutting), <0.05 ppm in/on alfalfa seed, <0.05-0.573 ppm in/on clover forage, and <0.05-0.524 ppm in/on clover hay.

Residue data from the current submissions are considered acceptable to fulfill registration requirement for extensive field rotational crop studies. Based on the submitted data, HED

concludes that inadvertent residues of BAS 510 F are expected to be quantifiable in/on representative commodities of Crop Groups 17 and 18 at plantback intervals of 12-15 days. HED will rely on the maximum residues of representative commodities of Crop Groups 17 and 18 when making recommendations for appropriate crop group tolerance levels.

GLP Compliance

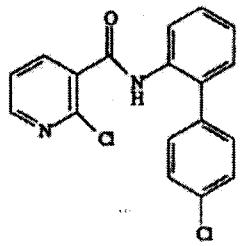
Signed and dated GLP, Quality Assurance, and Data Confidentiality statements were provided. No deviations from regulatory requirements were cited.

1. Materials and Methods

1.1. Test Substance

Active Ingredient

Common Name:	Nicobifen (ISO, proposed)
IUPAC Name:	2-Chloro-N-(4'-chlorobiphenyl-2-yl)nicotinamide
CAS Name:	3-Pyridinecarboxamide, 2-chloro-N-(4'chloro[1,1'-biphenyl]-2-yl)-
CAS Number:	188425-85-6
Company Name:	BAS 510 F
Other Synonyms:	BASF Registry No. 300355
Structure:	



1.2. Trial Information

Table 1.2.1. Summary of Rotational Crop Trial Numbers and Geographic Location.

Crop	Growing Region													Total Number of Trials
	1	2	3	4	5	6	7	8	9	10	11	12	13	
Grasses [1]														
Submitted	1	1	1	1	1	1	1	1	1	1	1	1	-	12
Requested [2]	1	1	1	1	1	1	1	1	1	1	1	1	-	12
Non-grass animal feeds (representative crops are alfalfa and clover)														
Alfalfa														
Submitted	1	-	-	-	2	-	1	-	1	1	1	-	-	7
Requested [2]	1	-	-	-	2	-	1	-	1	1	1	-	-	7
Clover														
Submitted	1	1	-	1	1	1	1	1	-	-	-	-	-	7
Requested [2]	1	1	-	1	1	1	1	1	-	-	-	-	-	7

[1] Including bluegrass, ryegrass, bromegrass, tall fescue, and Bermudagrass.

[2] OPPTS 860.1900 requires that the same number of trials for primary tolerances be conducted on crops for which rotational crop tolerances would be required; number and location of trials as per OPPTS 860.1500.

[2] Recommendation for numbers/locations of rotational crop trials for crop group 18 (non-grass animal feeds) based on Chem SAC meeting decision and subsequent e-mail correspondence from R. Loranger to T. Wofford and L. Sears on 3/15/01. Two treated samples per site were deemed adequate for alfalfa and clover.

Table 1.2.2. Rotational Crop Trial Information

Location (County, State, Year)	EPA Region	Formulation	Applic. Rate (lb ai/A) [1] [hg ai/ha]	Tank Mix Adjuvants	Rotated Crop; Variety	PBI (days)	Harvest Procedures	
							matrix	DAP[2]
Grasses								
Hall, NE, 2001	7	70% WG	0.724 + 0.548 + 0.557 = 1.83 [2.05]	None	Bluegrass; Nu-Blue	13	forage	97
							hay	97
Hood River, OR, 2001	11	70% WG	0.73 + 0.578 + 0.56 = 1.87 [2.09]	None	Ryegrass; Duster	14	forage	70
							hay	70
							seed screenings	132
							straw	132
Benton, OR, 2001	12	70% WG	0.728 + 0.569 + 0.5592 = 1.86 [2.08]	None	Ryegrass; Ribeye	14	forage	46
							hay	46
							seed screenings	110
							straw	110
Tift, GA, 2001	2	70% WG	0.714 + 0.553 + 0.56 = 1.83 [2.05]	None	Bermuda grass; Tift 85	15	forage	52
							hay	52
Olachua, FL, 2001	3	70% WG	0.724 + 0.553 + 0.57 = 1.85 [2.07]	None	Bermuda grass; Tift 85	12	forage	46
							hay	46
Rio Grande, CO, 2001	9	70% WG	0.7 + 0.542 + 0.5517 = 1.79 [2.01]	None	Bromegrass; Regar Meadow	14	forage	107
							hay	107
York, NE, 2001	5	70% WG	0.722 + 0.55 + 0.551 = 1.82 [2.04]	None	Bromegrass; Lincoln	14	forage	99
							hay	99
Hunterdon, NJ, 2001	1	70% WG	0.739 + 0.573 + 0.573 = 1.89 [2.11]	None	Tall Fescue; Kentucky 31	14	forage	80
							hay	80

Table 1.2.2. Rotational Crop Trial Information								
Location (County, State, Year)	EPA Region	Formulation	Applic. Rate (lb ai/A) [1] [hg ai/ha]	Tank Mix Adjuvants	Rotated Crop; Variety	PBI (days)	Harvest Procedures	
							matrix	DAP[2]
St. Landry, LA, 2001	4	70% WG	0.726 + 0.551 + 0.557 = 1.83 [2.05]	None	Bermudagrass	13	forage	102
							hay	102
Caddo, OK, 2001	6	70% WG	0.72 + 0.55 + 0.55 = 1.82 [2.04]	None	Ryegrass; Marshall	14	forage	53
							hay	53
Armstrong, TX, 2001	8	70% WG	0.73 + 0.56 + 0.56 = 1.85 [2.07]	None	Tall fescue; Kentucky 31	14	forage	167
							hay	172
Fresno, CA, 2001	10	70% WG	0.753 + 0.543 + 0.55 = 1.85 [2.07]	None	Bermudagrass; Pasto Rico	14	forage	42
							hay	48
Non-grasses								
Pepin, WI, 2001	5	70% WG	0.74 + 0.55 + 0.55 = 1.84 [2.06]	None	Alfalfa; Empire	14	1st cut forage	74
							2nd cut forage	132
							1st cut hay	74
							2nd cut hay	132
Wilkin, MN, 2001	5	70% WG	0.7262 + 0.552 + 0.5536 = 1.83 [2.05]	None	Alfalfa; Pioneer 54V54	13	1st cut forage	46
							2nd cut forage	110
							1st cut hay	46
							2nd cut hay	110
Hall, NE, 2001	7	70% WG	0.724 + 0.546 + 0.55 = 1.82 [2.04]	None	Alfalfa; Multi-Queen	13	1st cut forage	52
							2nd cut forage	72
							3rd cut forage	104
							1st cut hay	52

Table 1.2.2. Rotational Crop Trial Information

Location (County, State, Year)	EPA Region	Formulation	Applic. Rate (lb ai/A) [1] [hg ai/ha]	Tank Mix Adjuvants	Rotated Crop; Variety	PBI (days)	Harvest Procedures	
							matrix	DAP[2]
							2nd cut hay	72
							3rd cut hay	104
Fresno, CA, 2001	10	70% WG	0.712 + 0.54 + 0.55 = 1.80 [2.02]	None	Alfalfa; Golden West	14	1st cut forage	57
							2nd cut forage	77
							3rd cut forage	113
							1st cut hay	57
							2nd cut hay	77
							3rd cut hay	113
Hunterdon, NJ, 2001	1	70% WG	0.736 + 0.569 + 0.578 = 1.88 [2.11]	None	Alfalfa; Persist	14	1st cut forage	73
							2nd cut forage	124
							1st cut hay	73
							2nd cut hay	124
Hood River, OR, 2001	11	70% WG	0.73 + 0.54 + 0.56 = 1.83 [2.05]	None	Alfalfa; Blazer	14	1st cut forage	92
							2nd cut forage	120
							3rd cut forage	167
							1st cut hay	92
							2nd cut hay	120
							3rd cut hay	167
							seed	178
Rio Grande, CO, 2001	9	70% WG	0.7 + 0.535 + 0.538 = 1.77 [1.98]	None	Alfalfa; Focus	14	1st cut forage	57
							2nd cut forage	103

Table 1.2.2. Rotational Crop Trial Information

Location (County, State, Year)	EPA Region	Formulation	Applic. Rate (lb ai/A) [1] [hg ai/ha]	Tank Mix Adjuvants	Rotated Crop; Variety	PBI (days)	Harvest Procedures	
							matrix	DAP[2]
							1st cut hay	57
							2nd cut hay	103
Wilkin, MN, 2001	5	70% WG	0.7256 + 0.551 + 0.5499 = 1.83 [2.05]	None	Red Clover; Marathon	13	forage	46
							hay	70
Hall, NE, 2001	7	70% WG	0.7167 + 0.553 + 0.553 = 1.82 [2.05]	None	Clover; UNS	13	forage	49
							hay	75
Hunterdon, NJ, 2001	1	70% WG	0.735 + 0.576 + 0.572 = 1.88 [2.11]	None	Clover; Plus Red	14	forage	60
							hay	90
Suffolk, VA, 2001	2	70% WG	0.733 + 0.56 + 0.563 = 1.86 [2.08]	None	Clover; Cinnamon Red	13	forage	75
							hay	110
MS, 2001	4	70% WG	0.72 + 0.558 + 0.55 = 1.83 [2.05]	None	Clover; Crimson	14	forage	52
							hay	63
Caddo, OK, 2001	6	70% WG	0.713 + 0.55 + 0.549 = 1.81 [2.03]	None	Clover, Overton	14	forage	72
							hay	127
Armstrong, TX, 2001	8	70% WG	0.73 + 0.56 + 0.55 = 1.84 [2.06]	None	Clover, Regal Ladino	14	forage	82
							hay	84

[1] Three sequential broadcast applications were made directly to the soil, with 6- to 9-day retreatment intervals. Applications were made using ground equipment in 10.4-36.76 gal/A (116.5-411.7 l/ha) of water.

[2] Represents the number of days after planting (DAP) rotational crop samples were harvested.

A single untreated and duplicate treated samples of the rotational crop commodities were collected at normal maturity. Grass forage and hay were harvested from each grass field trial; grass seed screenings and straw were collected at two of the 12 grass field trials. Two cuttings of alfalfa forage and hay were made at each alfalfa field trial, but a third cutting of alfalfa forage and hay was not possible at four of the seven trials because of the onset of winter; alfalfa seed was collected from one alfalfa field trial. Clover forage and hay were harvested from each clover field trial.

1.3. Post-harvest Procedures

All rotational crop samples were frozen (temperature not specified) on the day of harvest. Samples were then shipped frozen to BASF (Research Triangle Park, NC) for analysis. Samples were analyzed within 0-4 days of extraction.

Table 1.3.1. Summary of Storage Conditions at Analytical Facility

Matrix	RAC or Extract	Storage Temperature (°C)	Duration
Grass	Forage	<-10 C	32-194 days (1.1-6.4 months)
	Hay		46-191 days (1.5-6.3 months)
	Seed screenings		90-97 days (3.0-3.2 months)
	Straw		90-97 days (3.0-3.2 months)
Alfalfa	Forage		44-119 days (1.4-3.9 months)
	Hay		42-132 days (1.4-4.3 months)
	Seed		74 days (2.4 months)
Clover	Forage		52-178 days (1.7-5.9 months)
	Hay		13-159 days (0.4-5.2 months)

1.4. Analytical Methods

Samples of rotational crop commodities were analyzed for residues of BAS 510 F using LC/MS/MS method D9908, the data collection method for plants. Briefly, samples were extracted with methanol:water:2N HCl (70:25:5, v:v:v) and filtered. An aliquot of the filtrate was cleaned up using liquid:liquid partitioning with saturated NaCl and cyclohexane. An aliquot of the cyclohexane phase was further cleaned up using silica gel solid phase extraction (SPE); residues are eluted from the silica gel SPE with 4% ethyl acetate in dichloromethane (DCM). The eluate is evaporated to dryness and dissolved in LC/MS/MS mobile phase for analysis. Refer to the DER for MRID 45405027 for a complete description of the quantitation procedures. The validated limit of quantitation (LOQ) was <0.05 ppm for residues of BAS 510 F in/on all rotated crop commodities. Concurrent recoveries obtained for each matrix are presented below in Table 2.1.

2. Results

Table 2.1. Summary of Concurrent Analytical Method Validation.

Crop Matrix	Fortification Level (ppm)	Recoveries (%)	Mean Recovery ± SD
Grass forage	0.05-2.0	73, 82, 84, 97, 104, 107	91 ± 14
Grass hay	0.05-10.0	41 (96) [1]; 76, 83, 83, 87, 108	87 ± 12
Grass seed	0.05, 1.0	70, 99	85
Grass straw	0.05, 1.0	92, 96	94
Alfalfa forage	0.05-2.0	75, 76, 82, 86, 87, 92, 100	85 ± 9
Alfalfa hay	0.05-2.0	72, 75, 78, 79, 79, 91	79 ± 6
Alfalfa seed	0.05, 1.0	82, 84	83
Clover forage	0.05-2.0	72, 77, 86, 90	81 ± 8
Clover hay	0.05-2.0	73, 74, 78, 91	79 ± 8

[1] The control sample (unfortified) for this fortification had chromatography interference. The recovery is 96% without correction for the control sample and 41% with correction. Since the control had interference, this recovery was not used in the calculation of the average recovery for grass hay.

Table 2.2. Residue Data from Rotational Crop Trials with BAS 510 F, 70% WG formulation, Applied to the Soil for a Total Rate of 1.77-1.89 lb ai/A.

Location (County, State, Year)	Crop; Variety	Commodity	Plant-Back Interval (days)	BAS 510 F Residues (ppm)
Grasses				
Hall, NE, 2001	Bluegrass; Nu-Blue	forage	13	0.538, 0.572
		hay	13	0.996, 1.14
Hood River, OR, 2001	Ryegrass; Duster	forage	14	0.1, 0.122
		hay	14	0.202, 0.252
		seed screenings	14	0.062, 0.072
		straw	14	0.176, 0.218
Benton, OR, 2001	Ryegrass; Ribeye	forage	14	0.07, 0.088
		hay	14	0.244, 0.27
		seed screenings	14	0.092, 0.102
		straw	14	0.116, 0.18
Tift, GA, 2001	Bermuda grass; Tift 85	forage	15	0.214, 0.22
		hay	15	0.516, 0.61
Olachua, FL, 2001	Bermuda grass; Tift 85	forage	12	0.414, 0.418
		hay	12	1.51, 1.71
Rio Grande, CO, 2001	Bromegrass; Regar Meadow	forage	14	1.76, 1.93
		hay	14	6.47, 7.11
York, NE, 2001	Bromegrass; Lincoln	forage	14	0.258, 0.292
		hay	14	0.62, 0.666
Hunterdon, NJ, 2001	Tall Fescue; Kentucky 31	forage	14	0.1, 0.212
		hay	14	0.364, 0.392
St. Landry, LA, 2001	Bermudagrass	forage	13	0.111, 0.124
		hay	13	0.182, 0.251
Caddo, OK, 2001	Ryegrass; Marshall	forage	14	1.03, 1.124
		hay	14	4.01, 4.49
Armstrong, TX, 2001	Tall fescue; Kentucky 31	forage	14	0.154, 0.222
		hay	14	0.465, 0.48
Fresno, CA, 2001	Bermudagrass; Pasto Rico	forage	14	0.342, 0.36
		hay	14	1.1, 1.27

Location (County, State, Year)	Crop; Variety	Commodity	Plant-Back Interval (days)	BAS 510 F Residues (ppm)
Non-grasses				
Pepin, WI, 2001	Alfalfa; Empire	1st cut forage	14	0.054, 0.07
		2nd cut forage	14	<0.05[1], 0.054
		1st cut hay	14	0.128, 0.146
		2nd cut hay	14	0.135, 0.137
Wilkin, MN, 2001	Alfalfa; Pioneer 54V54	1st cut forage	13	<0.05, <0.05
		2nd cut forage	13	<0.05, <0.05
		1st cut hay	13	<0.05, <0.05
		2nd cut hay	13	<0.05, <0.05
Hall, NE, 2001	Alfalfa; Multi-Queen	1st cut forage	13	<0.05, <0.05
		2nd cut forage	13	<0.05, <0.05
		3rd cut forage	13	<0.05, <0.05
		1st cut hay	13	0.094, 0.124
		2nd cut hay	13	0.071, 0.079
		3rd cut hay	13	0.095, 0.095
Fresno, CA, 2001	Alfalfa; Golden West	1st cut forage	14	0.145, 0.186
		2nd cut forage	14	0.097, 0.1
		3rd cut forage	14	0.055, 0.069
		1st cut hay	14	0.448, 0.46
		2nd cut hay	14	0.372, 0.39
		3rd cut hay	14	0.191, 0.202
Hunterdon, NJ, 2001	Alfalfa; Persist	1st cut forage	14	<0.05, <0.05
		2nd cut forage	14	<0.05, <0.05
		1st cut hay	14	0.07, 0.078
		2nd cut hay	14	0.061, 0.074
Hood River, OR, 2001	Alfalfa; Blazer	1st cut forage	14	<0.05, <0.05
		2nd cut forage	14	<0.05, <0.05
		3rd cut forage	14	<0.05, <0.05
		1st cut hay	14	0.076, 0.096
		2nd cut hay	14	<0.05, <0.05
		3rd cut hay	14	<0.05, <0.05
		seed	14	<0.05, <0.05

Location (County, State, Year)	Crop; Variety	Commodity	Plant-Back Interval (days)	BAS 510 F Residues (ppm)
Rio Grande, CO, 2001	Alfalfa; Focus	1st cut forage	14	0.454, 0.518
		2nd cut forage	14	0.474, 0.505
		1st cut hay	14	1.33, 1.59
		2nd cut hay	14	1.3, 1.53
Wilkin, MN, 2001	Red Clover; Marathon	forage	13	<0.05, <0.05
		hay	13	<0.05, <0.05
Hall, NE, 2001	Clover; UNS	forage	13	0.096, 0.096
		hay	13	0.098, 0.1
Hunterdon, NJ, 2001	Clover; Plus Red	forage	14	0.1, 0.112
		hay	14	0.226, 0.244
Suffolk, VA, 2001	Clover; Cinnamon Red	forage	13	0.494, 0.573
		hay	13	0.43, 0.484
MS, 2001	Clover; Crimson	forage	14	0.14, 0.162
		hay	14	0.426, 0.524
Caddo, OK, 2001	Clover, Overton	forage	14	<0.05, <0.05
		hay	14	0.1, 0.101
Armstrong, TX, 2001	Clover, Regal Ladino	forage	14	0.05, 0.06
		hay	14	0.216, 0.232

[1] Residues of 0.238 ppm were detected with the initial analysis of this sample; residues were below the LOQ (<0.05 ppm) in the duplicate re-analysis of the sample and are reported herein.

Table 2.3. Summary of Residue Data from Rotational Crop Trials with BAS 510 F Applied to the Soil.

Commodity	Total Applic. Rate (lb ai/A)	Plant-Back Interval (days)	Residue Levels (ppm)			
			Maximum	HAFT	Mean	Std. Dev.
Grass, forage	1.79-1.89	12-15	1.93	1.85	0.449	0.509
Grass, hay	1.79-1.89	12-15	7.11	6.79	1.472	1.973
Grass, seed screenings	1.86-1.87	14	0.102	0.097	0.082	0.018
Grass, straw	1.86-1.87	14	0.218	0.197	0.173	0.042
Alfalfa, forage (1st cutting)	1.77-1.88	13-14	0.518	0.486	0.131	0.157
Alfalfa, forage (2nd cutting)	1.77-1.88	13-14	0.505	0.490	0.120	0.158
Alfalfa, forage (3rd cutting)	1.80-1.83	13-14	0.069	0.062	0.054	0.008
Alfalfa, hay (1st cutting)	1.77-1.88	13-14	1.59	1.46	0.339	0.496
Alfalfa, hay (2nd cutting)	1.77-1.88	13-14	1.53	1.42	0.311	0.483
Alfalfa, hay (3rd cutting)	1.80-1.83	13-14	0.202	0.197	0.114	0.067
Alfalfa, seed	1.83	14	<0.05	<0.05	<0.05	0.0
Clover, forage	1.81-1.88	13-14	0.573	0.534	0.149	0.168
Clover, hay	1.81-1.88	13-14	0.524	0.475	0.234	0.167

Apparent residues in all untreated samples of grass (forage, hay, seed screenings, and straw), alfalfa (forage, hay, and seed), and clover (forage and hay) were below the method LOQ (<0.05 ppm).

3. Discussion

3.1. Methods

At each field trial, three sequential applications of the 70% WG formulation were made to the bare soil surface. The first application was made at ~0.72 lb ai/A (≈0.81 kg ai/ha) followed by two applications at ~0.55 lb ai/A/application, (≈0.62 kg ai/ha/application) with 5- to 9-day retreatment intervals, for a total rate of 1.77-1.89 lb ai/A (1.98-2.12 kg ai/ha). The rotational crop grasses (bluegrass, Bermuda grass, bromegrass, ryegrass, and tall fescue) and non-grasses (alfalfa and clover) were planted 12-15 days following the last application to the soil. Samples of the rotational crops grasses (forage, hay, seed screenings, and straw), alfalfa (forage, hay, and seed), and clover (forage and hay) were collected at normal maturity and analyzed for residues of

BAS 510 F using LC/MS/MS Method D9908. Concurrent method recovery data included in this submission indicate that the LC/MS/MS method is acceptable for data collection.

Recommendations for numbers/locations of rotational crop trials for crop group 18 (Non-grass Animal Feeds Group) are based on a Chem SAC meeting decision (3/14/01) and subsequent e-mail correspondence from R. Loranger to T. Wofford and L. Sears on 3/15/01. According to the Chem SAC meeting minutes, the Council concluded that a reduced number of field trials for crop group 18 is acceptable provided that: (i) the parent is the only residue of concern; (ii) the chemical is classified as a reduced risk chemical; (iii) all required regions are included for each crop or crop group (at least 1 trial per region); and (iv) four samples are analyzed per site instead of two. The email correspondence included a table with the number and locations of the field trials recommended for Crop Group 18 and indicated that two treated samples per site should be adequate for grasses, alfalfa, and clover.

A total of 12 rotational crop field trials were conducted in Regions 1 through 12 (1 trial per region; CA, CO, FL, GA, LA, NE, NJ, OK, OR, and TX) on representative grasses of the Grass Forage, Fodder, and Hay Group (Crop Group 17). A total of 14 rotational crop field trials were conducted on the representative crops (alfalfa and clover) of the Non-grass Animal Feeds Group (Crop Group 18); seven trials were conducted in Regions 1 (1 trial; NJ), 5 (2 trials; MN and WI), 7 (1 trial; NE), 9 (1 trial; CO), 10 (1 trial; CA), and 11 (1 trial; OR) on alfalfa and seven trials (1 trial per region) were conducted in Regions 1 (NJ), 2 (VA), 4 (MS), 5 (MN), 6 (OK), 7 (NE), and 8 (TX) on clover. The geographical representation is adequate for the Grass Forage, Fodder, and Hay Group (Crop Group 17) according to OPPTS 860.1500 and 1900, and for the Non-grass Animal Feeds Group (Crop Group 18) based on the 3/14/01 ChemSAC meeting decision and subsequent e-mail recommendation.

The maximum storage intervals for rotational crop samples from the submitted extended rotational crop study, from harvest to analysis were 194 days (6.4 months) for grass forage, 191 days (6.3 months) for grass hay, 97 days (3.2 months) for grass seed screenings and straw, 119 days (3.9 months) for alfalfa forage, 132 days (4.3 months) for alfalfa hay, 74 days (2.4 months) for alfalfa seed, 178 days (5.9 months) for clover forage), and 159 days (5.2 months) for clover hay. Adequate storage stability data (refer to the 860.1380 DER for MRID 45405109) are available which demonstrate that residues of BAS 510F are stable for up to 12 months in/on various crop commodities including wheat grain, forage, and straw. The available storage stability data support the storage conditions and intervals of the rotated grass, alfalfa, and clover samples.

3.2. Results

In grass rotational crops planted 12-15 days following the last application of the 70% WG formulation to bare soil, residues of BAS 510 F were 0.07-1.93 ppm in/on grass forage, 0.182-7.11 ppm in/on grass hay, 0.062-0.102 ppm in/on grass seed screenings, and 0.116-0.218 ppm in/on grass straw. In alfalfa rotational crops planted 13-14 days following the last

application to bare soil, residues of BAS 510 F were <0.05-0.518 ppm in/on alfalfa forage (1st cutting), <0.05-0.505 ppm in/on alfalfa forage (2nd cutting), <0.05-0.069 ppm in/on alfalfa forage (3rd cutting), <0.05-1.59 ppm in/on alfalfa hay (1st cutting), <0.05-0.153 ppm in/on alfalfa hay (2nd cutting), <0.05-0.202 ppm in/on alfalfa hay (3rd cutting), and <0.05 ppm in/on alfalfa seed. In clover rotational crops planted 13-14 days following the last application to bare soil, residues of BAS 510 F were <0.05-0.573 ppm in/on clover forage and <0.05-0.524 ppm in/on clover hay.

Weather conditions were reported as normal temperatures at all trials, with variable rainfall; no unusual conditions were reported. Irrigation was provided in most field trials. The soil at the trial sites was silt loam, sandy loam, silty clay loam, clay loam, loamy sand, sand, and loam. Information was provided pertaining to soil composition, pH, OM and percent water holding; no unusual characteristics were reported.

4. Deficiencies

None

5. References

DP Barcode: None
Subject: Minutes of 3/14/01 ChemSAC meeting
From: HED Chemistry Science Advisory Council
To: HED Chemistry Interest Group
Dated: 5/16/01
MRIDs: None

DP Barcode: None; E-mail correspondence
Subject: Summary of Residue Program (by EPA Region) to Obtain Rotational Crop Tolerances for BAS 510 F.
From: R. Loranger
To: T. Wofford and L. Sears of BASF Corporation
Dated: 3/15/01
MRIDs: None

MRID: 45672101
Subject: Wofford, J.; et al (2002) A Summary of Weather Conditions for BAS 510 F Field Residue Studies Conducted from 1999-2001 Data: BASF Registration Document Number: 2002/5002878. Unpublished study prepared by BASF Agro Research. 24 p.