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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RAB2/HED (7509C)

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DP Barcode: D278386

Petition: 1F06313

Citation: 45405113 Versoi, P.; Abdel-Baky, S. (2000) The Magnitude of BAS 510 F Residues in Carrots: Final Report: Lab Project Number: 63896: 2000/5208: 99180 (FL/3). Unpublished study prepared by BASF Corporation. 50 pages.

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.

Executive Summary

BASF Corporation has submitted field trial data on carrots. Eight carrot trials were conducted in Regions 3 (one trial in Florida), 5 (one trial in Minnesota), 6 (one trial in Texas), 10 (four trials in California) and 11 (one trial in Idaho). The number and location of field trials satisfy the US EPA's data requirement with respect to the geographic representation of residue data for carrots. Based on the number of trials, the proposed use pattern and the results obtained, the missing trials from geographical zones applicable to Canada will not be required by the PMRA.

At each test location, the 70% WG formulation of BAS 510 F was applied as a foliar spray either three times at approximately 0.34 lb ai/A/application (0.38 kg ai/ha/application) or six times at approximately 0.17 lb ai/A/application (0.19 kg ai/ha), with 6- to 8-day re-treatment intervals, for a total rate of 1.02-1.07 lb ai/A for both application methods. Mature samples were collected at a 0-day post-treatment interval. In one carrot field trial, additional samples were collected at 5, 9, 15, and 20 days following treatment in order to evaluate residue decline.

Residues of BAS 510 F in/on carrots were quantitated using a validated LC/MS/MS method (D9908), the data collection method for plant commodities. Acceptable concurrent method validation data for carrots were included in the submission. Storage stability data (refer to the DER for MRID 45405109) are available to support the 211 day (6.9 month) storage interval for the samples in this study.

At the applied total rate of 1.02-1.07 lb ai/A (1.14-1.20 kg ai/ha), the range of BAS 510 F residues in/on treated mature carrot samples was <0.05-0.38 ppm. The residue decline data for carrots indicated that BAS 510 F residues did not increase at longer post-treatment intervals.

Residue data from the current submission are acceptable to fulfill US EPA crop field trial data requirements for carrots. In addition, the residue data from this current submission for carrots, in conjunction with the submission of satisfactory residue data for radish roots (see DER of MRID 45623402), are acceptable to fulfill crop field trial data requirements for the root vegetable, except sugar beet, crop subgroup (Crop Subgroup 1B).

GLP Compliance

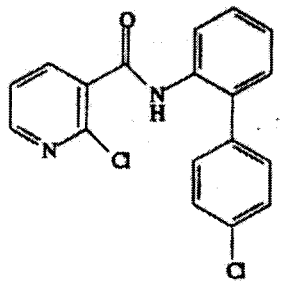
Signed and dated GLP, Quality Assurance, and Data Confidentiality statements were provided. No GLP deviations were reported which would impact the study results or their interpretation.

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
Chemical Structure:	



BAS 510 F

1.2. Trial Locations

TABLE B.1.2. Trial Numbers and Geographical Locations

Crop	Carrots			
NAFTA Growing Regions	Submitted		Requested	
	Canada	U.S.	Canada	U.S.
1				
1A	0		1	
2				
3		1		1
4				
5	1	1	2	1
5A				
5B	0		2	
6		1		1
7				
7A				
8				
9				
10		4		4
11		1		1
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
Total Trials	1	8	5	8

Table 1.2.2. Crop and Field Trial Information.

EPA Region	Location (County, State, Year)	Crop, Variety	Formulation	Application Timing	Application Rate (lb ai/A) [kg ai/ha]	Re-treatment Intervals (days)	Number of Applications	Application Method/ Application Volume (GPA)	Total Application Rate (lb ai/A) [kg ai/ha]	Tank Mix Adjuvants	Harvest Procedures
3	Hamilton, FL, 1999	Carrot, Choctaw	70% WG	~9" long, 0.5-0.75" diameter	0.168-0.180 [0.188-0.202]	7	6	Foliar spray/ 25.1-33.1	1.04 [1.17]	Latron CS-7 (0.18%, v:v)	Carrots (with tops removed) harvested 0 days after last application (DALA).
				~9" long, 0.5-0.75" diameter							
				~9" long, 0.5-0.75" diameter							
				0.5-1" diameter							
				0.75-1.25" diameter							
				0.75-1.25" diameter							
5	Freeborn, MN, 1999	Carrot, Dundee	70% WG	Vegetative	0.340-0.350 [0.381-0.392]	6-7	3	Foliar spray/ 17.0-17.8	1.03 [1.15]	Induce (0.25%, v:v)	Carrots (with tops removed) harvested 0 days DALA.
6	Uvalde, TX, 1999	Carrot, Mercury	70% WG	0.75-1" root diameter	0.170-0.176 [0.190-0.197]	6-7	6	Foliar spray/ 22.0-22.8	1.03 [1.15]	Induce (0.25%, v:v)	Carrots (with tops removed) harvested 0 days DALA.
10	Tulare, CA, 1999	Carrot, Danvers Half Long	70% WG	5-7" roots	0.337-0.343 [0.377-0.384]	7	3	Foliar spray/ 30.0-30.6	1.02 [1.14]	Latron B-1956 (4oz/100gal)	Carrots (with tops removed) harvested 0 days DALA.
				6" roots							
				Mature							
10	Tulare, CA, 1999	Carrot, Danvers Half Long	70% WG	5-7" roots	0.338-0.392 [0.379-0.439]	7-8	3	Foliar spray/ 30.0-30.4	1.07 [1.20]	Latron B-1956 (4oz/100gal)	Carrots (with tops removed) harvested 0 days DALA.

Table 1.2.2. Crop and Field Trial Information.

EPA Region	Location (County, State, Year)	Crop, Variety	Formulation	Application Timing	Application Rate (lb ai/A) [kg ai/ha]	Re-treatment Intervals (days)	Number of Applications	Application Method/ Application Volume (GPA)	Total Application Rate (lb ai/A) [kg ai/ha]	Tank Mix Adjuvants	Harvest Procedures
				4-6" roots							
				Mature							
10	Madera, CA, 1999 (decline study)	Carrot, Nance	70% WG	Small carrots	0.336-0.346 [0.377-0.388]	7	3	Foliar spray/ 29.9-30.5	1.02 [1.14]	Latron B-1956 (6oz/100gal)	Carrots (with tops removed) harvested 0, 5, 9, 15, and 20 days DALA.
				Medium carrots							
				Medium carrots							
10	Madera, CA, 1999	Carrot, Nantes	70% WG	Small carrots	0.336-0.340 [0.377-0.381]	7	3	Foliar spray/ 39.6-40.1	1.02 [1.14]	Latron B-1956 (6oz/100gal)	Carrots (with tops removed) harvested 0 days DALA.
				Small carrots							
				Mature carrots							
11	Jerome, ID, 1999	Carrot, Danvers Half Longs	70% WG	60% diameter	0.339-0.347 [0.380-0.389]	7	3	Foliar spray/ 13.2-14.3	1.03 [1.15]	LI 700 (0.25%, v:v)	Carrots (with tops removed) harvested 0 days DALA.
				70% diameter							
				Full-sized carrots							

1.3. Post-harvest Procedures

A single untreated and duplicate treated samples of carrots (tops removed) were harvested from each field trial. Specific harvesting procedures were not described; however, each sample consisted of at least 12 large carrots or 24 small carrots; sample weights were a minimum of 4.4 lbs (2.0 kg). Additional samples of carrots were collected from the California trial (Madera County) at various time intervals for residue decline samples. Samples were bagged and stored frozen (temperature not specified) on the day of harvest. Samples were shipped frozen within 0-37 days of harvest to BASF Agricultural Products Center (Research Triangle Park, NC) for analysis.

Table 1.3.1. Summary of Storage Conditions

Matrix	RAC	Storage Temperature (°C) (Analytical Laboratory)	Duration
Carrot	Root	< -10	84-211 days (2.8-6.9 months)

1.4. Analytical Methods

Samples of carrots were analyzed for residues of BAS 510 F using LC/MS/MS method D9908, the data collection method for plant commodities. Briefly, carrot samples were extracted with methanol:water (70:30, v:v) and filtered. An aliquot of the filtrate was cleaned up using C18 solid phase extraction. Residues were eluted with dichloromethane. The eluate was evaporated and residues were redissolved in ammonium formate:formic acid buffer for analysis by LC/MS/MS; refer to the DER for MRID 45405027 for a complete description of the quantitation procedures. The limit of detection (LOD) was 0.025 ppm, and the validated limit of quantitation (LOQ) was 0.050 ppm for the residues of BAS 510 F in/on carrots. Concurrent recoveries for a range of spiking levels are summarized in Table 2.1 below.

2. Results

Table 2.1. Summary of Concurrent Analytical Method Validation.

Crop Matrix	Fortification Level (ppm)	Recoveries (%)	Mean Recovery ± SD (%)
Carrot	0.050, 1.0	72, 80, 82, 87	80 ± 6

Table 2.2. Residue Data from Crop Field Trials in Carrots with BAS 510 F.

Location (County, State, Year)	Crop Variety	Commodity	Formulation	Total Rate (lbs ai/A) [kg ai/ha]	PHI (days)	BAS 510 F residues (ppm)
Hamilton, FL, 1999	Choctaw	Root	70% WG	1.04 [1.17]	0	0.158, 0.214
Freeborn, MN, 1999	Dundee	Root	70% WG	1.03 [1.15]	0	0.112, 0.236
Uvalde, TX, 1999	Mercury	Root	70% WG	1.03 [1.15]	0	0.113, 0.132
Tulare, CA, 1999	Danvers Half Long	Root	70% WG	1.02 [1.14]	0	<0.050, <0.050
Tulare, CA, 1999	Danvers Half Long	Root	70% WG	1.07 [1.20]	0	0.051, 0.066
Madera, CA, 1999 (decline study)	Nance	Root	70% WG	1.02 [1.14]	0	0.157, 0.171
					5	0.124, 0.133
					9	0.137, 0.150
					15	0.137, 0.182
					20	0.106, 0.193
Madera, CA, 1999	Nantes	Root	70% WG	1.02 [1.14]	0	0.294, 0.381
Jerome, ID, 1999	Danvers Half Longs	Root	70% WG	1.03 [1.15]	0	0.241, 0.312

Table 2.3. Summary of Residue Data from Crop Field Trials in Carrots with BAS 510 F.

Commodity	Total Application Rate (lb ai/A)	PHI (days)	Residue Levels (ppm)				
			Minimum	Maximum	HAFT	Mean [median]	Std. Dev.
Carrot	1.02-1.07	0	<0.050	0.381	0.338	0.172 [0.145]	0.109

3. Discussion

3.1. Methods

Carrots were harvested on the day (0-day PHI) of the last of either three foliar spray applications of the 70% WG formulation at approximately 0.34 lb ai/A/application (0.38 kg ai/ha) or six foliar spray applications of the 70% WG formulation at approximately 0.17 lb ai/A/application (0.19 kg

8

ai/ha), with a 6- to 8-day re-treatment interval, for a total rate of 1.02-1.07 lb ai/A (1.14-1.20 kg ai/ha) for both application methods. Applications were made using ground equipment in a spray volume of 13.2-40.1 gal/A (147.8-449.1 L/ha) of water with a spray adjuvant added. In one trial (Madera County, CA), additional carrot samples were collected at 5, 9, 15, and 20 days following treatment to evaluate residue decline. It was noted that the 70% BAS 510 F WG formulation used in the field trials also contained another experimental active ingredient (BAS 500 F; pyraclostrobin) as part of the tank-mix; data for the BAS 500 F active ingredient were submitted separately and are not reviewed herein.

Eight carrot trials were conducted in Regions 3 (one trial), 5 (one trial), 6 (one trial), 10 (four trials), and 11 (one trial). For the EPA, the number and location of field trials conducted for carrots are in accordance with the guidance requirements (US EPA Residue Test Chemistry Guidelines, OPPTS 860.1500, Tables 1 and 5). Based on the number of trials, the proposed use pattern and the results obtained, the missing trials from geographical zones applicable to Canada will not be required by the PMRA.

Residues of BAS 510 F in/on carrots were quantitated using LC/MS/MS method D9908, the data collection method for plant commodities. Acceptable concurrent method validation data for carrots were included in the submission.

The maximum storage interval from harvest to analysis was 211 days (6.9 months) for carrots. Adequate storage stability data in five diverse matrices (refer to the DER for MRID 45405109) are available to support the storage conditions and intervals of samples from the submitted carrot field trials.

3.2. Results

Residues of BAS 510 F were <0.050-0.381 ppm in/on carrot samples harvested on the day of the last of either three foliar spray applications of the 70% WG formulation at 0.336-0.392 lb ai/A/application (0.376-0.439 kg ai/ha/application) with a 6- to 8-day re-treatment interval or six foliar spray applications of the 70% WG formulation at 0.168-0.180 lb ai/A/application (0.188-0.202 kg ai/ha/application) with a 6- to 7-day re-treatment interval, for a total rate of 1.02-1.07 lb ai/A (1.14-1.20 kg ai/ha) for both application methods. Apparent residues of BAS 510 F were less than the method LOQ (<0.050 ppm) in/on eight samples of untreated carrots. The residue decline data for carrots indicated that BAS 510 F residues generally do not decrease at longer post-treatment intervals.

Aside from above-normal temperatures at the Florida and Idaho trial sites, and below-normal rainfall at the Florida, Texas and Idaho trial sites and two of the California trial sites, no

abnormal weather, environmental conditions or agricultural practices were noted during the carrot field trials. Irrigation was employed to supplement rainfall at all of the carrot field trials except the trial in Minnesota.

Residue data from the current submission are acceptable to fulfill crop field trial data requirements for carrots. In addition, residue data from the current submission for carrots (in conjunction with submission of satisfactory residue data for radishes; see DER for MRID 45623402) are acceptable to fulfill crop field trial data requirements for the root vegetable, except sugar beet, crop subgroup (Crop Subgroup 1B).

4. Deficiencies

None.

5. References

45672101 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 Ago Research. 24 pages.