Data Evaluation Report on the terrestrial field dissipation of BAS 510 F

PMRA Submission Number {.....} EPA MRID Number 45405218

Data Requirement: PMRA DATA CODE:
EPA DP Barcode: D278387
OECD Data Point:
EPA Guideline: 164-1

Test material: BAS 510 .. F

End Use Product name: Not specified
Formulation type: Wettable granule

Concentration of a.i.: 69.6%

Active ingredient
Common name:
Chemical name:
IUPAC: 2-Chloro-*N*-(4'-chlorobiphenyl-2-yl)-nicotinamide.
CAS name: 2-Chloro-*N*-(4-chloro[1,1-biphenyl]-2-yl)-3-pyridinecarboxamide.
CAS No: 188425-85-6.
Synonyms: Nicobifen, ~~BAS 516 02 F~~
SMILES string:

Primary Reviewer: Dan Hunt
Dynamac Corporation

Signature: Dan Hunt
Date: 1/14/02

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Company Code:
Active Code:
Use Site Category:
EPA PC Code: 128008

CITATION: Oliver, G., M. Saha, and S. Jackson. 2001. 1999 Field dissipation of BAS 510..F in orchard/vineyard use patterns. BASF Study No. 47616. BASF Reg. Doc. No. 2000/5277. Unpublished study performed by AgriScope, LLC, Athens, GA, Research For Hire, Porterville, CA, ACDS Research, Inc., Williamson, NY, and BASF Corporation, Research Triangle Park, NC, and sponsored by BASF Corporation, Research Triangle Park, NC. Study initiated March 8, 1999 and completed January 4, 2001.

EXECUTIVE SUMMARY:

Soil dissipation/accumulation of BAS 510 F under US field conditions was conducted in a peach orchard in Georgia, an almond orchard in California, and a grape vineyard in New York (ecoregions were not reported). Pesticide applications were made directly to the bare soil in between the orchard/vineyard rows at all three test sites (bareground plots) and to the orchard canopy at the Georgia and California test sites (cropped plots). The experiment was carried out in accordance with the US EPA Pesticide Assessment Guidelines Subdivision N, 164-1 and in compliance with the US EPA FIFRA (40 CFR, Part 160) GLP standard. In the designated plots, BAS 510 F was either broadcast onto the bareground plots or airblast onto the cropped plots six times (7-day interval) at target rates of 0.26 kg a.i/ha (applications 1-3) and 0.40 kg a.i./ha (applications 4-6) in 1.5 x 50-60 m sampling plots. The applied rate corresponds to 100% of the proposed label rate. Rainfall was supplemented with irrigation to reach the 10- or 30-year average rainfall. The treated plots were 3.0-6.7 m apart, and the control plots were >35 m away from the nearest treated plot at each field site.

The application rate was verified for applications 1, 3 and 6 in the treated bareground plots at each test site. Prior to each designated application, fifteen Petri dishes with soil were placed in the plots to confirm the application rate. The mean recoveries from the field application monitors placed in the bareground plots were 96.4-103.9%, 102.2-106.1% and 76.0-82.5% of the target for the Georgia, California and New York bareground plots, respectively (data are reported as ranges of the mean recoveries from applications 1, 3 and 6). The application rate was not verified for the cropped plots using application monitors. Field spiking of the samples was done by fortifying control soil from each test site with BAS 510 F at approximately 0.55 µg/g. The mean recoveries of BAS 510 F from the field spiked samples (across all fortification events) were 85 ± 8.1%, 91 ± 8.7%, and 95 ± 7.5% of the applied for the samples fortified at the Georgia, California, and New York field sites, respectively.

Soil samples were taken prior to and following all six applications, at 1, 2, 3, and 5 days following the first application, and at approximately 1, 2, 3, 5, 7, 10, 14, 21, 30, 60, 90, 120, 180, 270, and 360 days following the sixth application to a depth of 0-120 cm. The soil samples were extracted by shaking with methanol followed by methanol:water (50:50, v:v), diluted with water with 0.1% formic acid and 4 mM ammonium formate and analyzed for BAS 510 F and the degradate 2-chloronicotinic acid by HPLC-MS/MS. The LOQ for BAS 510 F and 2-chloronicotinic acid in soil was 0.010 mg/kg.

At the Georgia site, the maximum measured concentration in the bareground plot following the sixth application (day 0) was 0.28 mg a.i./kg soil (after adjusting for the concentration present immediately prior to the sixth application), which is 78% of the applied rate. Following the sixth application, BAS 510 F dissipated from a maximum of 1.36 mg a.i./kg soil at day 0 (0-7.5 cm depth) to 0.76-0.90 mg a.i./kg soil by 30-181 days, 0.60 mg a.i./kg soil by 271 days, and 0.31 mg a.i./kg soil by 360 days posttreatment (the last sampling interval). BAS 510 F was primarily detected in the top (0-7.5 cm) soil layer and was detected at a maximum depth of 15-30 cm. In the cropped plot, BAS 510 F was detected in the 0-7.5 cm depth at 0.31 mg a.i./kg soil following the sixth application, was variable from 0.17 to 0.32 mg a.i./kg soil from 1 to 271 days, and was

0.11 mg a.i./kg soil at 360 days (the last sampling interval). BAS 510 F was primarily detected in the top (0-7.5 cm) soil layer and was detected at a maximum depth of 7.5-15 cm. No transformation products were detected in either test plot.

Under field conditions at the Georgia site, BAS 510 F had a DT50 value of 264 days and a DT75 value of >360 days in the bareground plot, and a DT50 value of 282 days and a DT75 value of >360 days in the cropped plot. At the end of the 360 day period, the total carryover of residues of BAS 510 F was 18.5% and 6.2% of the total applied amount, respectively, in the bareground and cropped plots.

At the California site, the maximum measured concentration in the bareground plot following the sixth application (day 1) was 0.44 mg a.i./kg soil (after adjusting for the concentration present immediately prior to the sixth application), which is 122% of the applied rate. Following the sixth application, BAS 510 F dissipated from a maximum of 1.16 mg a.i./kg soil at day 0 (0-7.5 cm depth) to 0.68 mg a.i./kg soil by 30 days, 0.39-0.43 mg a.i./kg soil by 91-181 days, and 0.28 mg a.i./kg soil by 360 days (the last sampling interval). BAS 510 F was primarily detected in the top (0-7.5 and 7.5-15 cm) soil layers and was detected at a maximum depth of 30-45 cm. In the cropped plot, BAS 510 F was detected in the 0-7.5 cm depth at 0.48-0.49 mg a.i./kg soil at 0-1 days following the sixth application, decreased to 0.34-0.42 mg a.i./kg soil by 7-30 days, and was 0.23-0.30 mg a.i./kg soil from 60 to 360 days posttreatment (the last sampling interval). BAS 510 F was primarily detected in the top (0-7.5 cm) soil layer and was detected at a maximum depth of 15-30 cm (one sampling interval). No transformation products were detected in either test plot.

Under field conditions at the California site, BAS 510 F had a DT50 value of 150 days and a DT75 value of >360 days in the bareground plot, and a DT50 and DT75 value of >360 days each in the cropped plot. At the end of the 360 day period, the total carryover of residues of BAS 510 F was 20.2% and 16.9% of the total applied amount, respectively, in the bareground and cropped plots.

At the New York site, the maximum measured concentration in the bareground plot following the sixth application (day 1) was 0.36 mg a.i./kg soil (after adjusting for the concentration present immediately prior to the sixth application), which is 100% of the applied rate. Following the sixth application, BAS 510 F was variable from 0.93 to 1.15 mg a.i./kg soil from 0 to 60 days (0-7.5 cm depth) and was 0.43-0.66 mg a.i./kg soil from 90 to 364 days (the end of the study period) with the exception of 0.94 mg a.i./kg soil at 273 days. BAS 510 F was primarily detected in the top (0-7.5 cm) soil layer and was detected at a maximum depth of 7.5-15 cm. No transformation products were detected in the test plot.

Under field conditions at the New York site, BAS 510 F had a DT50 value of 356 days and a DT75 value of >360 days in the bareground plot. At the end of the 364 day period, the total carryover of residues of BAS 510 F was 33.1% of the total applied amount.

The major routes of dissipation of BAS 510 F under terrestrial field conditions at Georgia, California, and New York could not be determined from the data provided in this report. There were no major transformation products and leaching was minimal. Volatilization, runoff, and

plant uptake were not measured. Based on laboratory studies that demonstrated that the transformation of BAS 510 F resulted primarily from bound residue and CO_2 formation, it is assumed that these were also the predominant dissipation processes in the field. It is noted, however, that the degradate 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)-nicotinamide (M510F49; BAS No. 391572), which was detected as a major degradate in at least one aerobic metabolism study (MRID 45405210; IL. silt loam soil), was not monitored in these field studies. The compound was also detected as a major degradate in other terrestrial dissipation studies (MRID 45405219). Although half-lives/DT50 values were affected by the data variability observed at all sites/plots, the reported values generally appear to be representative of the observed dissipation.

RESULTS SYNOPSIS

Location/soil type: Oconee County, Georgia/Cecil sandy loam soil series
DT50: 264 days (bareground plot) and 282 days (cropped plot)
DT75: >360 days (both plots)
Major transformation products detected: None
Dissipation routes: Could not be definitively determined

Location/soil type: Tulare County, California/Cajon sandy loam soil series
DT50: 150 days (bareground plot) and >360 days (cropped plot)
DT75: >360 days (both plots)
Major transformation products detected: None
Dissipation routes: Could not be definitively determined

Location/soil type: Wayne County, New York/Oakville loamy sand soil series
DT50: 356 days
DT75: >360 days
Major transformation products detected: None
Dissipation routes: Could not be definitively determined

Study Acceptability: This study is classified as supplemental, but cannot be used to satisfy the guideline data requirement for a terrestrial field dissipation study. A major degradate [2-hydroxy-N-(4'-chlorobiphenyl-2-yl)-nicotinamide (M510F49; BAS No. 391572)] from an aerobic soil metabolism study was not monitored.

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: The study was conducted according to U.S. EPA Pesticide Assessment Guidelines Subdivision N, 164-1. Deviations from EPA Subdivision N 164-1 are:

Patterns of formation and decline of the degradates could not be determined. This does not affect the validity of the study.

COMPLIANCE: The study was conducted in compliance with U.S. EPA FIFRA (40 CFR Part 160) Good Laboratory Practice standards. Signed and dated GLP Compliance and No Data Confidentiality statements were provided.

A. MATERIALS:

1. Test Material BAS 510 F

Chemical Structure of the active ingredient(s):

Description: Wettable granule

Storage conditions of test chemicals: Storage conditions ranged from 6.1 to 32.2°C from receipt of the test substance until last use (all sites).

Physico-chemical properties of the active ingredient(s): BAS 510 F

Parameter	Values	Comments
Water solubility	4.63 mg/L	Temperature not reported
Vapour pressure/volatility		
UV absorption		
pKa		
K_{ow}/log K_{ow}		
Stability of Compound at room temperature		

Data obtained from Appendix C, p. 152 of the study report.

2. Test site: The test sites were located in Georgia, California, and New York (p. 12). The Georgia test site was located near Watkinsville, in Oconee County, and is representative of the southeastern growing region where the product will be sold. The California test site was located near Poplar, in Tulare County, and is representative of irrigated agricultural conditions and the western region, which is the largest orchard/vineyard market. The New York test site was located near North Rose, in Wayne County, and represents a large northeastern growing area under rain-fed agriculture. The Georgia test plots had previously been treated with Surflan, Lorsban, Captan, Imidan, Benlate, Sulfur 90, Simazine, and Gramoxone Extra in the previous three years; the California test plots had previously been treated with Omite 30W, Guthion 50%, Supracide 2E, Roundup Extra, Diazinon 50W, Bal Stop WP, Rovral, Wide Spread, Captan 50W, Benlate 50DF, and Manex in the previous three years; and the New York test plots had previously been treated with Roundup and Weedar 64 in the previous three years (Appendix B, Tables X-XII, pp. 84-86, 96, 106).

Table 1: Geographic location, site description and climatic data at the study site(s).

Details		Georgia	California	New York
Geographic coordinates	Latitude	Not available	Not available	Not available
	Longitude	Not available	Not available	Not available
	Province/State	Oconee County, GA	Tulare County, CA	Wayne County, NY
	Country	US	US	US
	Ecoregion	Not available	Not available	Not available
Slope Gradient		0.25%	<0.5%	1%
Depth to ground water (m)		4.3	77.7	> 3.0
Distance from weather station used for climatic measurements		On-site	5 miles	On-site
Indicate whether the meterological conditions before starting or during the study were within 30 year normal levels (Yes/No). If no, provide details.		Precipitation plus irrigation equalled 140% of the historical average.	Precipitation plus irrigation equalled 207% of the historical average.	Precipitation plus irrigation equalled 154% of the historical average.
Other details, if any				

Data obtained from Tables VII-IX, pp. 44-46, and Appendix B, pp. 82-84, 96, 106, in the study report.

Table 2: Site usage and management history for the previous three years.

Use	Year	Georgia	California	New York
Crops grown	Previous year	Peaches	Almonds	Not available
	2 years previous	Peaches	Almonds	Not available
	3 years previous	Not available	Almonds	Not available
Pesticides used	Previous year	Simazine, Imidan, Sulfur 90, and Captan	Diazinon 50W, Bal Stop WP, Rovral, Wide Spread, Captan 50W, Benlate 50DF, Manex, Guthion 50WP, and Omite 30W	Roundup and Weedar 64
	2 years previous	Simazine, Benlate, Captan, Imidan, Sulfur 90, Gramoxone Extra,	Omite 30W, Guthion 50%, Supracide 2E, and Roundup Extra	Roundup
	3 years previous	Surflan, Lorsban, Captan, Imidan, Benlate, Sulfur 90	None	Roundup
Fertilizers used	Previous year	Not available	Not available	Not available

Use	Year	Georgia	California	New York
	2 years previous	Not available	Not available	Not available
	3 years previous	Not available	Not available	Not available
Cultivation methods, if provided (eg., Tillage)	Previous year	Not available	Not available	Not available
	2 years previous	Not available	Not available	Not available
	3 years previous	Not available	Not available	Not available
Other details, if any	Previous year			
	2 years previous			
	3 years previous			

Data obtained from Appendix B, Tables X-XII, pp. 84-86, 96, 106, in the study report.

3. Soils:

Table 3: Properties of the soil from Georgia.

Property	Depth (cm)							
	0-15	15-30	30-45	45-60	60-75	75-90	90-105	105-120
Textural classification	loamy sand	sandy loam	sandy clay loam			sandy clay	clay loam	sandy clay
% sand	80	70	54	52	54	48	44	46
% silt	14	14	16	14	12	14	18	16
% clay	6	16	30	34	34	38	38	38
pH (1:1 soil:water or other)	6.6	6.6	6.8	6.1	5.6	5.4	5.3	5.1
Total organic carbon (%)								
Total organic matter (%)	1.4	0.6	0.6	0.3	0.1	0.1	0.1	0.1
CEC (meq/100 g)	4.7	4.7	5.5	6.1	6.2	6.4	5.8	5.6
Bulk density (g/cm3)	0.97-1.34	1.11-1.56	0.70-1.38	0.95-1.34	1.15-1.40	0.93-1.25	1.09-1.34	0.98-1.44
Moisture at 1/3 atm (%)	10.3	13.2	21.8	26.4	24.3	28.6	30.4	29.8
Taxonomic classification (e.g., ferro-humic podzol)	Clayey, kaolinitic, thermic Typic Kanhapludults							
Soil mapping unit	Not provided (Cecil soil series)							
Others								

Data obtained from p. 12, and Table VII, p. 44 in the study report.

Table 4: Properties of the soil from California.

Property	Depth (cm)							
	0-15	15-30	30-45	45-60	60-75	75-90	90-105	105-120
Textural classification	sandy loam							
% sand	75	65	57	53	61	59	61	59
% silt	18	28	34	40	32	32	28	28
% clay	7	7	9	7	7	9	11	13
pH (1:1 soil:water or other)	7.0	7.9	7.9	8.0	8.0	8.1	8.2	8.4
Total organic carbon (%)								
Total organic matter (%)	1.7	0.7	0.7	0.5	0.4	0.4	0.3	0.3
CEC (meq/100 g)	11.5	10.8	12.0	12.6	11.9	13.2	14.0	15.0
Bulk density (g/cm3)	1.44-1.55	1.37-1.68	1.29-1.69	1.27-1.45	1.32-1.80	1.46-1.56	1.46-1.51	1.07-1.60
Moisture at 1/3 atm (%)	12.1	16.3	22.3	20.7	18.5	17.3	16.2	16.3
Taxonomic classification (e.g., ferro-humic podzol)	Mixed, thermic Typic Torripsamments							
Soil mapping unit	Not provided (Cajon soil series)							
Others								

Data obtained from p. 12, and Table VIII, p. 45 in the study report.

Table 5: Properties of the soil from New York.

Property	Depth (cm)							
	0-15	**15-30**	**30-45**	**45-60**	**60-75**	**75-90**	**90-105**	**105-120**
Textural classification	loamy sand			sand			sandy loam	
% sand	83	83	85	87	87	87	77	77
% silt	10	10	10	10	10	10	14	14
% clay	7	7	5	3	3	3	9	9
pH (1:1 soil:water or other)	6.1	5.4	5.2	5.3	5.3	5.2	5.2	5.3
Total organic carbon (%)								
Total organic matter (%)	4.6	2.6	1.2	0.7	0.4	0.2	0.2	0.1
CEC (meq/100 g)	11.0	8.4	6.6	4.5	3.6	3.2	4.5	3.8
Bulk density (g/cm3)	0.82-1.19	1.07-1.39	1.28-1.47	1.33-1.43	1.33-1.40	1.37-1.48	1.15-1.57	1.21-1.48
Moisture at 1/3 atm (%)	13.6	11.8	8.7	6.9	5.5	5.4	8.1	6.9
Taxonomic classification (e.g., ferro-humic podzol)	Mixed, mesic Typic Udipsamments							
Soil mapping unit	Not provided (Oakville soil series)							
Others								

Data obtained from p. 12, and Table IX, p. 46 in the study report.

B. EXPERIMENTAL DESIGN:

1. Experimental design:

Table 6: Experimental design.

Details		**Georgia**	**California**	**New York**
Duration of study		395 days (360 days following the last application)	395 days (360 days following the last application)	399 days (364 days following the last application)
Uncropped (bare) or cropped		Bare and cropped	Bare and cropped	Bare
Control used (Yes/No)		Yes	Yes	Yes
No. of replications	Controls	3	3	3
	Treatments	3 for both the bareground and cropped plots	3 for both the bareground and cropped plots	3

Details		Georgia	California	New York
Plot size (L x W m)	Control	1.5 x 15.2 m	1.5 x 13.7 m	1.5 x 12.2 m
	Treatment	1.5 x 51.7 m	1.5 x 60.1 m	1.5 x 60.1 m
Distance between control plot and treated plot		>35 m from the nearest treated plot	>152 m from the nearest treated plot	75.6 m
Distance between treated plots		6.7 m, 46 m between the bare and cropped plots	Not specified, 30.4 m between the bare and cropped plots	3.0 m
Application rate(s) used (g a.i/ha)		260 g a.i/ha (applications 1-3) and 400 g a.i./ha (applications 4-6)	260 g a.i/ha (applications 1-3) and 400 g a.i./ha (applications 4-6)	260 g a.i/ha (applications 1-3) and 400 g a.i./ha (applications 4-6)
Was the maximum label rate per ha used in study? (Yes/No)		Yes	Yes	Yes
Number of applications		6	6	6
Application Date(s) (dd mm yyyy)		3/7/1999, 10/7/1999, 17/7/1999, 24/7/1999, 31/7/1999, and 7/8/1999	11/5/1999, 18/5/1999, 25/5/1999, 1/6/1999, 8/6/1999, and 15/6/1999	16/6/1999, 23/6/1999, 30/6/1999, 7/7/1999, 14/7/1999, and 21/7/1999
For multiple applications, application rate at Day 0 and at each application time (mg a.i./kg soil) (assuming 7.5 cm depth and bulk density of 1.5 g/cm3)		0.23 and 0.36 mg/kg for applications 1-3 and 4-6, respectively	0.23 and 0.36 mg/kg for applications 1-3 and 4-6, respectively	0.23 and 0.36 mg/kg for applications 1-3 and 4-6, respectively
Application method (eg., spraying, broadcast etc.)		Broadcast (bare plots) and airblast (cropped plots)	Broadcast (bare plots) and airblast (cropped plots)	Broadcast
Type of spray equipment, if used		Tractor-mounted flat broadcast boom sprayer with flat fan nozzles or airblast sprayer with cone nozzles	Tractor-mounted flat broadcast boom sprayer with flat fan nozzles or airblast sprayer with cone nozzles	Tractor-mounted flat broadcast boom sprayer with flat fan nozzles
Total volume of spray solution applied/plot **OR** total amount broadcasted/plot		40 gal/A and 200 gal/A for broadcast and airblast applications, respectively	40 gal/A and 200 gal/A for broadcast and airblast applications, respectively	40 gal/A
Identification and volume of carrier (e.g., water), if used		Water	Water	Water

Details		Georgia	California	New York
Name and concentration of co-solvents, adjuvants and/or surfactants, if used		None	None	None
Indicate whether the following monthly reports were submitted:				
Average minimum and maximum precipitation		Yes	Yes	Yes
Average minimum and maximum air temperature		Yes	Yes	Yes
Average minimum and maximum soil temperature		No	No	No
Average annual frost-free periods		No	No	No
Indicate whether the Pan evaporation data were submitted		No	No	No
Meteorological conditions during applications 1-6, respectively	Cloud cover	Bareground plot: 60%, 70%, 100%, hazy, 5/hazy, and hazy. Cropped plot: 50%, 60%, 95%, hazy, 10%, and hazy.	Bareground and cropped plots: 0%, 25%, 0%, 10%, 0%, and 10%.	5-10%, 5-10%, 5-10%, 0%, 0%, and 30-60%.
	Temperature (°C)	Bareground plot: 30.6, 31.7, 29.4, 31.7, 30.6, and 24.4. Cropped plot: 30.0, 31.1, 28.3, 26.7, 25.6, and 29.4.	Bareground plot: 18.3, 17.2, 20.6, 18.3, 15.6, and 21.1. Cropped plot: 21.1, 17.2, 20.6, 18.9, 15.6, and 22.2.	10.6, 17.2, 13.3, 17.8, 17.2, and 15.6.
	Humidity	Bareground plot: 52%, 70%, 60%, 66%, 62%, and 74%. Cropped plot: 60%, 69%, 72%, 92%, 84%, and 62%.	Bareground plot: 48%, 60%, 52%, 54%, 50%, and 58%. Cropped plot: 42%, 60%, 50%, 50%, 50%, and 58%.	91%, 84%, 92%, 72%, 70%, and 93%.
	Sunlight (hr)	Not available	Not available	Not available
Pesticides used during study: name of product/a.i concentration: amount applied: application method:		The test plots were treated 5 times with Roundup (0.5 lb a.i./A), 3 times with Gramoxone (0.5 lb a.i./A) and Imidan (1.4 lb a.i./A), 2 times with Blazer (0.125 lb a.i./A) and Captan (2.5-3.0 lb a.i./A), and once each with Simazine (2.0 lb a.i./A) and Bravo (1.2 lb a.i./A).	The test plots were treated 12 times with Roundup (1% solution).	The test plots were treated 3 times with Gramoxone 2.5 AS (0.93 lb a.i./A), 2 times with Princep 4L (1.0 lb a.i./A), and once with Karmex 80DF (0.8 lb a.i./A).

Details	Georgia	California	New York
Supplemental irrigation used (Yes/No) If yes, provide the following details: No. of irrigation: Interval between irrigation: Amount of water added each time: Method of irrigation:	Yes, via sprinkler. The test plots received a total of 37.7 inches from irrigation (0.70-5.10 inches of water per month except during the month of Jan 2000 when the plots were not irrigated).	Yes, via sprinkler. The test plots received a total of 81.0 inches from irrigation (1.08-19.44 inches of water per month except during the months of Jan and March 2000 when the plots were not irrigated).	Yes, via sprinkler. The test plots received a total of 16.1 inches from irrigation, most during the initial 3 months of the study period.
Indicate whether water received through rainfall + irrigation equals the 30 year average rainfall (Yes/No)	Yes	Yes	Yes
Were the application concentrations verified? (Briefly describe in Section 2*, if used)	Yes	Yes	Yes
Were field spikes used? (Briefly describe in Section 3¶, if used)	Yes	Yes	Yes
Good agricultural practices followed (Yes or No)	Yes	Yes	Yes
Indicate if any abnormal climatic events occurred during the study (eg., drought, heavy rainfall, flooding, storm etc.)	No	The test plot received less than 1 inch of natural precipitation through the initial 8 months of the study period.	No
If cropped plots are used, provide the following details: Plant - Common name/variety: Details of planting: Crop maintenance (eg., fertilizers used):	The test site is a peach orchard (Red Haven or Garnett Beauty varieties). 10-10-10 N-P-K fertilizer (300 lb/A) was applied on December 12, 1999.	The test site is an established almond orchard (variety not reported). Urea fertilizer (10 lb/A) was applied on May 3, 1999.	The test site was planted with grapes (Dechannac variety) on May 28, 1999. 10-10-10 N-P-K fertilizer (300 lb/A) was applied on May 3, 1999.
Volatilization included in the study (Yes/No) (if included, describe in Section 4§)	No	No	No
Leaching included in the study (Yes/No) (if included, describe in Section 5‖)	Yes	Yes	Yes
Runoff included in the study (Yes/No) (if included, describe in Section 6¥)	No	No	No

Data obtained from Tables VII-IX, pp. 44-46, Appendix B, pp. 66-115, in the study report.

* **2. Application Verification**: The application rate was verified for applications 1, 3 and 6 at each test site using fifteen petri dishes (100 mm) that were placed in the treated bareground plots prior to each designated application (p. 13). Each petri dish contained approximately 10 g of sieved soil from an untreated portion of the test site. The petri dishes were collected and composited (three dishes per composite) immediately following each application. The application rate was not verified for the cropped plots using application monitors.

¶ **3. Field Spiking:** Samples (20 ± 1 g) of sieved (1 mm) control soil collected from each test site were fortified with 11 µg BAS 510 F solution on the sampling intervals targeting 0, 3, 7, 14, 30, 60, and 360 days following the last application (p. 14; Appendix B, p. 80). The field fortified samples were analyzed at about the same time as the corresponding soil core samples (p. 26). Field spiked samples were not prepared for the degradate, 2-chloronicotinic acid.

§ **4. Volatilization:** Volatilization was not measured.

¡ **5. Leaching:** Fifteen cores were taken from the treated plots prior to and following all six applications, at 1, 2, 3, and 5 days following the first application, and at approximately 1, 2, 3, 5, 7, 10, 14, 21, 30, 60, 90, 120, 180, 270, and 360 days following the sixth application to a depth of 120 cm to determine the mobility of the test substance in the soil profile (p. 13). In field Time Domain Reflectometry (TDR) units were used to determine if sufficient water was applied to the test plots and to determine if compound movement correlated to recharge events (p. 21).

¥ **6. Runoff:** Runoff was not studied.

7. Supplementary Study: Two method validation studies (MRIDs 45405225 and 45405226) and two storage stability studies (MRIDs 45405223 and 45405224) were conducted and submitted.

MRID 45405225. BASF Method D0004 "The determination of residues of BAS 510 F and its metabolites 2-chloronicotinic acid and 1-(4-chlorophenyl)-2-aminobenzene in soil using LC-MS/MS" was validated using control soil from California, Indiana, New Jersey, and Alberta, and German 2.2 soil (Appendix E, pp. 85-96). Soil samples were fortified at 0.01, 0.1, and 1.0 ppm. The method was later modified (without change to the protocol) to include the degradate 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide and to remove 1-(4-chlorophenyl)-2-aminobenzene (BASF Method D0004/1), and was validated using control soil collected from Georgia, California, and Alberta, and German 2.2 soil.

MRID 45405226. BASF Method D0004/1 "The determination of residues of BAS 510 F and its metabolites 2-chloronicotinic acid and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide in soil using LC-MS/MS" was validated in an independent laboratory using a high clay content soil from Illinois (p. 8). Samples were fortified at 0.01 and 0.10 mg/kg.

MRID 45405224. A loamy sand soil from Germany was treated with diphenyl ring-labeled ^{14}C-BAS 510 F at a concentration of 0.930 mg/kg and stored frozen (-18 to -22°C) for up to 2 years prior to analysis (pp. 11-13). Samples were collected for analysis at 0, 30, 87, 181, 365, and 730 days posttreatment.

MRID 45405223. Soil samples (0-6 and 12-18 inch depths) were treated with BAS 510 F and the degradates 2-chloronicotinic acid (M510F47) and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide (M510F49) at a concentration of 0.1 ppm (p. 9). Samples fortified with BAS 510 F and 2-chloronicotinic acid were collected for analysis at day 0 and 1, 3, and 6 months posttreatment. Samples collected at day 0 and 1 month were extracted and analyzed according to BASF Method D0004 and samples collected at 3 and 6 months were extracted and analyzed according to BASF Method D0004/1.

8. Sampling:

Table 7: Soil sampling.

Details	Georgia	California	New York
Method of sampling (random or systematic)	Random	Random	Random
Sampling intervals	Prior to and following all six applications, at 1, 2, 3, and 5 days following the first application, and at 1, 2, 3, 5, 7, 10, 14, 21, 30, 60, 89, 118, 181, 271, and 360 days following the sixth application	Prior to and following all six applications, at 1, 2, 3, and 5 days following the first application, and at 1, 2, 3, 5, 7, 10, 14, 21, 30, 60, 91, 120, 181, 268, and 360 days following the sixth application	Prior to and following all six applications, at 1, 2, 3, and 5 days following the first application, and at 1, 2, 3, 5, 7, 10, 14, 21, 29, 61, 90, 120, 223, 273, and 364 days following the sixth application
Method of soil collection (eg., cores)	Cores	Cores	Cores
Sampling depth	120 cm	120 cm	120 cm
Number of cores collected per plot	15 (5 per replicate)	15 (5 per replicate)	15 (5 per replicate)
Number of segments per core	Nine	Nine	Nine
Length of soil segments	7.5 cm (0-15 cm depth) and 15 cm (15-120 cm depth)	7.5 cm (0-15 cm depth) and 15 cm (15-120 cm depth)	7.5 cm (0-15 cm depth) and 15 cm (15-120 cm depth)
Core diameter (Provide details if more than one width)	Minimum 4 inch diameter (0-15 cm depth samples) and 1.5-2.25 inch diameter (15-120 cm depth samples)	Minimum 4 inch diameter (0-15 cm depth samples) and 1.5-2.25 inch diameter (15-120 cm depth samples)	Minimum 4 inch diameter (0-15 cm depth samples) and 1.5-2.25 inch diameter (15-120 cm depth samples)
Method of sample processing, if any	Composited by depth and replicate, and homogenized prior to analysis	Composited by depth and replicate, and homogenized prior to analysis	Composited by depth and replicate, and homogenized prior to analysis
Storage conditions	Frozen	Frozen	Frozen
Storage length (days)	495 days	495 days	495 days

Data obtained from pp. 13, 16, 18, and Appendix B, pp. 76-78, in the study report.

9. Analytical Procedures: Soil samples were analyzed for BAS 510 F and the degradate 2-chloronicotinic acid (M510F47) using BASF Draft Analytical Method D0004 (p. 16). Soil samples were extracted by shaking with methanol followed by methanol:water (50:50, v:v). An aliquot of the extract was then diluted with a buffer solution (water with 0.1% formic acid and 4 mM ammonium formate) prior to HPLC-MS/MS analysis. The limit of quantitation for each analyte was 0.010 mg/kg (p. 17). Mean recoveries of BAS 510 F and 2-chloronicotinic acid from concurrent fortification samples (prepared at each test site) ranged from 96 to 104% and 94 to 101%, respectively, and indicated that the method was adequate (p. 17).

II. RESULTS AND DISCUSSION

1. APPLICATION MONITORS: The mean recoveries from the field application monitors placed in the bareground plots were 96.4-103.9%, 102.2-106.1% and 76.0-82.5% of the target for the Georgia, California and New York bareground plots, respectively (data are reported as ranges of the mean recoveries from applications 1, 3 and 6; Table I, p. 25). The application rate was not verified for the cropped plots using application monitors.

2. RECOVERY FROM FIELD SPIKES: The mean recoveries of BAS 510 F from the field spiked samples (across all fortification events) were 85 ± 8.1%, 91 ± 8.7%, and 95 ± 7.5% of the applied for the samples fortified at the Georgia, California, and New York field sites, respectively (Appendix E, p. 400). Field spiked samples were not prepared for the degradate, 2-chloronicotinic acid.

3. MASS ACCOUNTING: A mass balance was not determined.

Table 8. Concentration of BAS 510 F residues expressed as mg/kg soil, in the Georgia bareground plot.

Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	1	2	3	5	7	App2	7	App3	7	App4	7	App5	7	
Parent compound (BAS 510 F)	0-7.5	0.15	0.14	0.21	0.23	0.19	0.13	0.37	0.32	0.62	0.44	0.82	0.70	0.99	1.08	
	7.5-15	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.005	<0.01	<0.01	0.02	0.03	0.03	0.03	
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Transformation product (2-chloronicotinic acid)	0-7.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Total extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total non-extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total recovery	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App6	1	2	3	5	7	14	21	30	60	89	118	181	271	360
Parent compound (BAS 510 F)	0-7.5	1.36	1.21	0.93	1.18	1.29	0.89	0.93	1.21	0.76	0.83	0.78	0.90	0.84	0.60	0.31
	7.5-15	0.03	0.03	0.01	0.03	0.06	0.007	0.02	0.02	<0.01	0.01	0.003	0.04	0.03	0.09	0.02
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.005	0.04	0.003
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Transformation product (2-chloronicotinic acid)	0-7.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total non-extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total recovery	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Data obtained from Tables X-XI, pp. 48-49.

Reported values are registrant-calculated averages of three replicates. In instances where there was a non-detect in one or more of the replicates, the registrant used the value zero in place of each non-detect in their calculation to determine the mean, thus resulting in some mean values that are below the LOD (0.01 mg/kg).

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ND = Not determined

Table 9. Concentration of BAS 510 F residues expressed as mg/kg soil, in the Georgia cropped plot.

Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	1	2	3	5	7	App2	7	App3	7	App4	7	App5	7	
Parent compound (BAS 510 F)	0-7.5	0.09	0.04	0.07	0.06	0.05	0.03	0.07	0.11	0.11	0.08	0.22	0.12	0.17	0.21	
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.005	0.08	<0.01	<0.01	
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Transformation product (2-chloronicotinic acid)	0-7.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Total extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total non-extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total recovery	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App6	1	2	3	5	7	14	21	30	60	89	118	181	271	360
Parent compound (BAS 510 F)	0-7.5	0.31	0.21	0.26	0.19	0.31	0.22	0.18	0.32	0.18	0.17	0.18	0.25	0.17	0.18	0.11
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Transformation product (2-chloronicotinic acid)	0-7.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total non-extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total recovery	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Data obtained from Tables XII-XIII, pp. 50-51.

Reported values are registrant-calculated averages of three replicates. In instances where there was a non-detect in one or more of the replicates, the registrant used the value zero in place of each non-detect in their calculation to determine the mean, thus resulting in some mean values that are below the LOD (0.01 mg/kg).

ND = Not determined

Table 10. Concentration of BAS 510 F residues expressed as mg/kg soil, in the California bareground plot.

Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	1	2	3	5	7	App2	7	App3	7	App4	7	App5	7	
Parent compound (BAS 510 F)	0-7.5	0.15	0.22	0.17	0.17	0.15	0.17	0.37	0.32	0.51	0.41	0.60	0.50	0.87	0.72	
	7.5-15	0.01	<0.01	<0.01	0.02	0.005	0.02	<0.01	0.005	0.01	0.08	0.10	0.12	0.07	0.17	
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Transformation product (2-chloronicotinic acid)	0-7.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Total extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total non-extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total recovery	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App6	1	2	3	5	7	14	21	30	60	91	120	181	268	360
Parent compound (BAS 510 F)	0-7.5	1.11	1.16	1.00	1.14	1.10	1.04	1.11	0.92	0.68	0.26	0.41	0.43	0.39	0.31	0.28
	7.5-15	0.19	0.14	0.14	0.22	0.12	0.20	0.20	0.22	0.23	0.19	0.16	0.26	0.25	0.15	0.04
	15-30	0.02	<0.01	0.003	0.01	0.007	0.02	0.02	0.01	0.01	0.08	0.04	0.03	0.04	0.02	0.04
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.01	<0.01	<0.01	<0.01	0.007
Transformation product (2-chloronicotinic acid)	0-7.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total non-extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total recovery	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Data obtained from Tables XIV-XV, pp. 52-53.

Reported values are registrant-calculated averages of three replicates. In instances where there was a non-detect in one or more of the replicates, the registrant used the value zero in place of each non-detect in their calculation to determine the mean, thus resulting in some mean values that are below the LOD (0.01 mg/kg).

Table 11. Concentration of BAS 510 F residues expressed as mg/kg soil, in the California cropped plot.

Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	1	2	3	5	7	App2	7	App3	7	App4	7	App5	7	
Parent compound (BAS 510 F)	0-7.5	0.06	0.05	0.05	0.05	0.05	0.07	0.14	0.11	0.20	0.23	0.25	0.26	0.41	0.30	
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.005	0.006	<0.01	0.02	<0.01	
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Transformation product (2-chloronicotinic acid)	0-7.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Total extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total non-extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total recovery	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App6	1	2	3	5	7	14	21	30	60	91	120	181	268	360
Parent compound (BAS 510 F)	0-7.5	0.48	0.49	0.44	0.48	0.40	0.39	0.42	0.34	0.37	0.27	0.23	0.26	0.29	0.30	0.26
	7.5-15	0.03	0.02	0.01	0.03	0.01	0.02	0.02	0.05	0.04	0.03	0.07	0.07	0.02	0.07	0.04
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.003	<0.01
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Transformation product (2-chloronicotinic acid)	0-7.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total non-extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total recovery	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Data obtained from Tables XVI-XVII, pp. 54-55.

Reported values are registrant-calculated averages of three replicates. In instances where there was a non-detect in one or more of the replicates, the registrant used the value zero in place of each non-detect in their calculation to determine the mean, thus resulting in some mean values that are below the LOD (0.01 mg/kg).

ND = Not determined

Table 12. Concentration of BAS 510 F residues expressed as mg/kg soil, in the New York bareground plot.

Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	1	2	3	5	7	App2	7	App3	7	App4	7	App5	7	
Parent compound (BAS 510 F)	0-7.5	0.29	0.23	0.17	0.12	0.17	0.17	0.63	0.32	0.58	0.51	0.57	0.69	0.96	0.75	
	7.5-15	<0.01	<0.01	0.02	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.10	0.04	<0.01	0.03	
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Transformation product (2-chloronicotinic acid)	0-7.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Total extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total non-extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total recovery	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App6	1	2	3	5	7	14	21	29	60	90	120	223	273	364
Parent compound (BAS 510 F)	0-7.5	0.98	1.11	1.04	0.94	0.98	1.15	0.93	1.03	1.04	1.03	0.66	0.43	0.65	0.94	0.59
	7.5-15	0.04	0.05	0.06	0.02	0.05	0.03	<0.01	<0.01	0.008	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Transformation product (2-chloronicotinic acid)	0-7.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	15-30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total non-extractable residues (if determined)	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total recovery	0-7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7.5-15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	15-30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Data obtained from Tables XVIII-XIX, pp. 56-57.

Reported values are registrant-calculated averages of three replicates. In instances where there was a non-detect in one or more of the replicates, the registrant used the value zero in place of each non-detect in their calculation to determine the mean, thus resulting in some mean values that are below the LOD (0.01 mg/kg).

ND = Not determined

4. PARENT COMPOUND: In the Georgia bareground plot, the maximum measured concentration following the sixth application (day 0) was 0.28 mg a.i./kg soil (after adjusting for the concentration present immediately prior to the sixth application), which is 78% of the applied rate (Table II, p. 25). BAS 510 F was detected in the 0-7.5 cm depth at 0.13-0.23 mg a.i./kg soil from 0 to 7 days following the first application, was 0.37 mg a.i./kg soil following the second application, 0.62 mg a.i./kg soil following the third application, 0.82 mg a.i./kg soil following the fourth application, 0.99 mg a.i./kg soil following the fifth application, and 1.08 mg a.i./kg soil at 7 days following the fifth application (just prior to the sixth and final application; Table X, p. 48). Following the sixth application, BAS 510 F was detected in the 0-7.5 cm depth at 1.36 mg a.i./kg soil at day 0, was variable from 0.89 to 1.29 mg a.i./kg soil from 1 to 21 days, decreased to 0.76-0.90 mg a.i./kg soil by 30-181 days and 0.60 mg a.i./kg soil by 271 days, and was 0.31 mg a.i./kg soil at 360 days (the last sampling interval). BAS 510 F was detected in the 7.5-15 cm depth throughout most of the study period, but was not detected above 0.09 mg a.i./kg soil (271 days). BAS 510 F was detected in the 15-30 cm depth at 0.003-0.04 mg a.i./kg soil from 181 to 360 days following the last application and was not detected below that depth.

In the Georgia cropped plot, BAS 510 F was detected in the 0-7.5 cm depth at 0.07-0.22 mg a.i./kg soil following each of the first five applications, was 0.31 mg a.i./kg soil following the sixth application, was variable from 0.17 to 0.32 mg a.i./kg soil from 1 to 271 days, and was 0.11 mg a.i./kg soil at 360 days posttreatment (the last sampling interval; Table XII, p. 50). BAS 510 F was only detected in the 7.5-15 cm depth twice, at 0.005 and 0.08 mg a.i./kg soil immediately following the fourth application and at 7 days following the fourth application, and was not detected below that depth.

In the California bareground plot, the maximum measured concentration following the sixth application (day 1) was 0.44 mg a.i./kg soil (after adjusting for the concentration present immediately prior to the sixth application), which is 122% of the applied rate (Table II, p. 25). BAS 510 F was detected in the 0-7.5 cm depth at 0.15-0.22 mg a.i./kg soil from 0 to 7 days following the first application, was 0.37 mg a.i./kg soil following the second application, 0.51 mg a.i./kg soil following the third application, 0.60 mg a.i./kg soil following the fourth application, 0.87 mg a.i./kg soil following the fifth application, and 0.72 mg a.i./kg soil at 7 days following the fifth application (just prior to the sixth and final application; Table XIV, p. 52). Following the sixth application, BAS 510 F was detected in the 0-7.5 cm depth at a maximum of 1.16 mg a.i./kg soil at 1 day, was 1.00-1.14 mg a.i./kg soil from 2 to 14 days, decreased to 0.68 mg a.i./kg soil by 30 days and 0.39-0.43 mg a.i./kg soil by 91-181 days, and was 0.28 mg a.i./kg soil at 360 days (the last sampling interval). BAS 510 F was detected in the 7.5-15 cm depth from 0.12 to 0.26 mg a.i./kg soil from 0 to 268 days following the sixth application and decreased to 0.04 mg a.i./kg soil by 360 days following the last application. BAS 510 F was detected in the 15-30 cm depth throughout the study period following the sixth application, but was not detected above 0.08 mg a.i./kg soil (60 days). BAS 510 F was detected sporadically (at 60, 91, and 360 days posttreatment of the last application) in the 30-45 cm depth at a maximum of 0.02 mg a.i./kg soil.

In the California cropped plot, BAS 510 F was detected in the 0-7.5 cm depth at 0.06 mg a.i./kg soil following the first application, increased to 0.41 mg a.i./kg soil following the fifth application, was a maximum of 0.49 mg a.i./kg soil at 1 day following the sixth application, decreased to 0.34-0.42 mg a.i./kg soil by 7-30 days, and was 0.23-0.30 mg a.i./kg soil from 60 to

360 days posttreatment (the last sampling interval; Table XVI, p. 54). BAS 510 F was detected in the 7.5-15 cm depth throughout the study period following the sixth application, but was not detected above 0.07 mg a.i./kg soil (91, 120, and 268 days). BAS 510 F was only detected once in the 15-30 cm depth, at 0.003 mg a.i./kg soil at 268 days and was not detected below that depth.

In the New York bareground plot, the maximum measured concentration following the sixth application (day 1) was 0.36 mg a.i./kg soil (after adjusting for the concentration present immediately prior to the sixth application), which is 100% of the applied rate (Table II, p. 25). BAS 510 F was detected in the 0-7.5 cm depth at 0.29 mg a.i./kg soil following the first application, was 0.63 mg a.i./kg soil following the second application, 0.58 mg a.i./kg soil following the third application, 0.57 mg a.i./kg soil following the fourth application, 0.96 mg a.i./kg soil following the fifth application, and 0.75 mg a.i./kg soil at 7 days following the fifth application (just prior to the sixth and final application; Table XVIII, p. 56). Following the sixth application, BAS 510 F was detected in the 0-7.5 cm depth at 0.98 mg a.i./kg soil at day 0, was 0.94-1.11 mg a.i./kg soil from 1 to 5 days, was a maximum of 1.15 mg a.i./kg soil at 7 days, was 0.93-1.04 mg a.i./kg soil from 14 to 60 days, and was 0.43-0.66 mg a.i./kg soil from 90 to 364 days (the end of the study period) with the exception of 0.94 mg a.i./kg soil at 273 days. BAS 510 F was detected sporadically in the 7.5-15 cm depth where it was a maximum of 0.10 mg a.i./kg soil, and was not detected below that depth.

The 50% dissipation times (DT50) of BAS 510 F in soil under terrestrial field conditions using non-linear regression (using the Gustafson/Holden equation) were (pp. 18-21, Table III, p. 26, Figures 4-8, pp. 27-29):

Georgia bareground plot	DT50 = 264 days	DT75 = >360 days
Georgia cropped plot	DT50 = 282 days	DT75 = >360 days
California bareground plot	DT50 = 150 days	DT75 = >360 days
California cropped plot	DT50 = >360 days	DT75 = >360 days
New York bareground plot	DT50 = 356 days	DT75 = >360 days

The dissipation pattern was not clearly defined at any site or plot. Although half-lives/DT50 values were affected by the data variability observed at all sites/plots, the reported values generally appear to be representative of the observed dissipation.

5. TRANSFORMATION PRODUCTS: The only transformation product analyzed for, 2-chloronicotinic acid, was not detected in the bareground or cropped plots at any of the test sites.

Tale 13: Chemical names and CAS numbers for the transformation products of BAS 510 F.

Applicant's Code Name	CAS Number	CAS and/or IUPAC Chemical Name(s)	Chemical formula	Molecular weight	SMILES string
CNA		2-chloronicotinic acid	$C_6H_4ClNO_2$	157.56	

6. EXTRACTABLE AND NON-EXTRACTABLE RESIDUES: Non-extractable residues were not measured.

Table 14: Dissipation routes of BAS 510 F under field conditions.

Route of dissipation	% of applied amount (at the end of study period)		
	Georgia test site	California test site	New York test site
Accumulation (residues) in soil/ carry over[1]	18.5% and 6.2% for the bareground and cropped plots, respectively.	20.2% and 16.9% for the bareground and cropped plots, respectively.	33.1%
Transformation (% of transformation products)	0%	0%	0%
Leaching, if measured	Did not leach beyond 30 cm.	Did not leach beyond 45 cm.	Did not leach beyond 15 cm.
Volatilization, if measured	Not measured	Not measured	Not measured
Plant uptake, if measured	Not measured	Not measured	N/A
Runoff, if measured	Not measured	Not measured	Not measured
Total			

[1] Accumulation in soil was calculated by the reviewer by dividing the total parent BAS 510 F residues at the end of the study period by the total application rate (1.78 lb a.i./A).

7. VOLATILIZATION: The concentration of applied BAS 510 F lost through volatilization was not determined.

8. PLANT UPTAKE: The concentration of applied BAS 510 F dissipated through plant uptake was not determined for the cropped plots in either Georgia or California.

9. LEACHING: BAS 510 F did not leach below 30 cm in the bareground plots in Georgia and New York, and was detected sporadically (at 60, 91, and 360 days posttreatment of the last application) in the 30-45 cm soil depth of the California bareground plot (Tables X, XIV, and XVIII, pp. 48, 52, and 56). Maximum concentrations of BAS 510 F in the bareground plots (all three test sites) ranged from 1.15-1.36 mg a.i./kg soil in the 0-7.5 cm depth, 0.09-0.26 mg a.i./kg soil in the 7.5-15 cm depth, and 0.02-0.06 mg a.i./kg soil in the 15-30 cm depth. Compound movement in the bareground plots was correlated to soil water recharge events (Figures 10-12, pp. 33-35). Maximum concentrations of BAS 510 F in the Georgia and California cropped plots were 0.32-0.49 mg a.i./kg soil in the 0-7.5 cm depth and 0.07-0.08 mg a.i./kg soil in the 7.5-15 cm depth; BAS 510 F was only detected below the 15 cm depth once, at 0.003 mg a.i./kg soil at 268 days posttreatment in the California plot (Tables XII and XVI, pp. 50 and 54). The only transformation product analyzed for, 2-chloronicotinic acid, was not detected in the bareground or cropped plots at any of the test sites.

10. RUNOFF: Runoff was not studied.

11. RESIDUE CARRYOVER: DT75 values were >360 days for all test plots (bareground and cropped; Table III, p. 26). After approximately 360 days, 18.5%, 20.2%, and 33.1% of the total applied parent compound (2.16 mg/kg, based on the registrant-calculated concentration for a

single application, reported as 0.36 mg/kg; Table II, p. 25) was detected in the bareground plots at Georgia, California, and New York, respectively, and has the potential to carryover into the following season. Carryover from the Georgia and California cropped plots was 6.2% and 16.9% of the total applied parent compound, respectively. No transformation products were detected during the study.

12. SUPPLEMENTARY STUDY RESULTS: Based on data reported in the method validation study **MRID 45405225**, using BASF Method D0004, mean recoveries of BAS 510 F were 96%, 97%, and 94% for the 0.01, 0.1, and 1.0 ppm fortifications, respectively; and mean recoveries of 2-chloronicotinic acid were 92%, 88%, and 87% for the 0.01, 0.1, and 1.0 ppm fortifications, respectively (Appendix E, Table VIII, p. 106). Using BASF Method D0004/1, mean recoveries of BAS 510 F were 96%, 95%, and 94% for the 0.01, 0.1, and 1.0 ppm fortifications, respectively; and mean recoveries of 2-chloronicotinic acid were 93%, 96%, and 88% for the 0.01, 0.1, and 1.0 ppm fortifications, respectively (Table III, p. 28). Results were not reported for 1-(4-chlorophenyl)-2-aminobenzene and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide because they do not pertain to the study currently under review. Based on data reported in the independent method validation study **MRID 45405226**, using BASF Method D0004/1, mean recoveries of BAS 510 F were 82% and 95% for the 0.01 and 0.10 mg/kg fortifications, respectively; and mean recoveries of 2-chloronicotinic acid were 91% and 94% for the 0.01 and 0.10 mg/kg fortifications, respectively (Table 1, p. 16). Results were not reported for 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide because they do not pertain to the study currently under review.

Based on data reported in the storage stability study **MRID 45405224**, diphenyl ring-labeled ^{14}C-BAS 510 F was stable in soil treated at a concentration of 0.930 mg/kg and stored frozen for up to 2 years. Mean recoveries (from duplicate replicates) ranged from 98.5% to 106.9% throughout the storage period (Table 2, p. 19). Based on data reported in the storage stability study **MRID 45405223**, BAS 510 F and 2-chloronicotinic acid were stable in soil treated at 0.1 ppm and stored frozen for up to 6 months. Recoveries of both compounds ranged from 88% to 105% throughout the storage period (Tables I.A-I.B, pp. 23-24). Results were not reported for 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide because they do not pertain to the study currently under review.

III. STUDY DEFICIENCIES: A major degradate from an aerobic soil metabolism study (MRID 45405210), which was also detected as a major degradate in other field dissipation studies (MRID 45405218), was not monitored in the current study. Additionally, data variability was observed at all sites/plots.

IV. REVIEWER'S COMMENTS:

1. The major routes of dissipation of BAS 510 F under terrestrial field conditions at the three test sites could not be determined from the data provided in this report. There were no major transformation products and leaching was minimal. Volatilization, runoff, and plant uptake were not measured. Based on laboratory studies that demonstrated that the transformation of BAS 510 F resulted primarily from bound residue and CO_2 formation, it is assumed that these were also the predominant dissipation processes in the field. It is noted, however, that the degradate 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)-nicotinamide (M510F49; BAS No. 391572), which was detected as a major degradate in at least one aerobic metabolism study (MRID 45405210; IL. silt loam soil), was not monitored in these field studies. The compound was detected as a major degradate in other terrestrial dissipation studies (MRID 45405219).

2. The registrant-calculated DT50s of BAS 510 F in the bareground plots (264, 150, and 356 days, respectively, for the Georgia, California, and New York sites) were comparable to the observed half-lives and the calculated half-lives (231, 157, and 462 days, respectively; r^2 values were 0.62, 0.57, and 0.23, respectively). The calculated half-lives were determined using linear regression (all available data). The reviewer notes that the registrant-calculated half-lives were calculated based on the total residue concentration per sampling period (all soil depths) and that the calculated half-lives reported in this review were calculated based on only the top 0-7.5 cm soil depth. Although half-lives/DT50 values were affected by the data variability observed at all sites/plots, the reported values generally appear to be representative of the observed dissipation.

3. The study authors stated that the degradation of BAS 510 F is primarily a function of soil microbial activity, and accurately predicted half-life values (within a variance of 12 days) using a model based on the accumulation of soil heat units (p. 22). Results were reported in Table IV (p. 31) and shown graphically in Figure 9 (p. 30).

4. Evapotranspiration data were reported for each test location in place of pan evaporation data.

5. BAS 510 F chemical name 2-chloro-*N*-(4'-chlorobiphenyl-2-yl)-nicotinamide, as presented in the study report, was identified as the IUPAC name by the Compendium of Pesticide Common Names (http://www.hclrss.demon.co.uk/nicobifen.html). The CAS name 2-chloro-*N*-(4-chloro[1,1-biphenyl]-2-yl)-3-pyridinecarboxamide was also obtained from the Compendium of Pesticide Common Names. The following BAS 510 F synonyms were obtained from USEPA/OPP Chemical Databases (http://www.cdpr.ca.gov/cgi-bin/epa/chemidetriris.pl?pccode=128008 and (http://www.cdpr.ca.gov/cgi-bin/mon/bycode.pl?p_chemcode=5790): 2-chloro-*N*-(4'-chlorobiphenyl-2-yl)-nicotinamide, nicobifen, and BAS 516 02 F.

V. REFERENCES:

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RIN-0333-06

MRID No. 45405218

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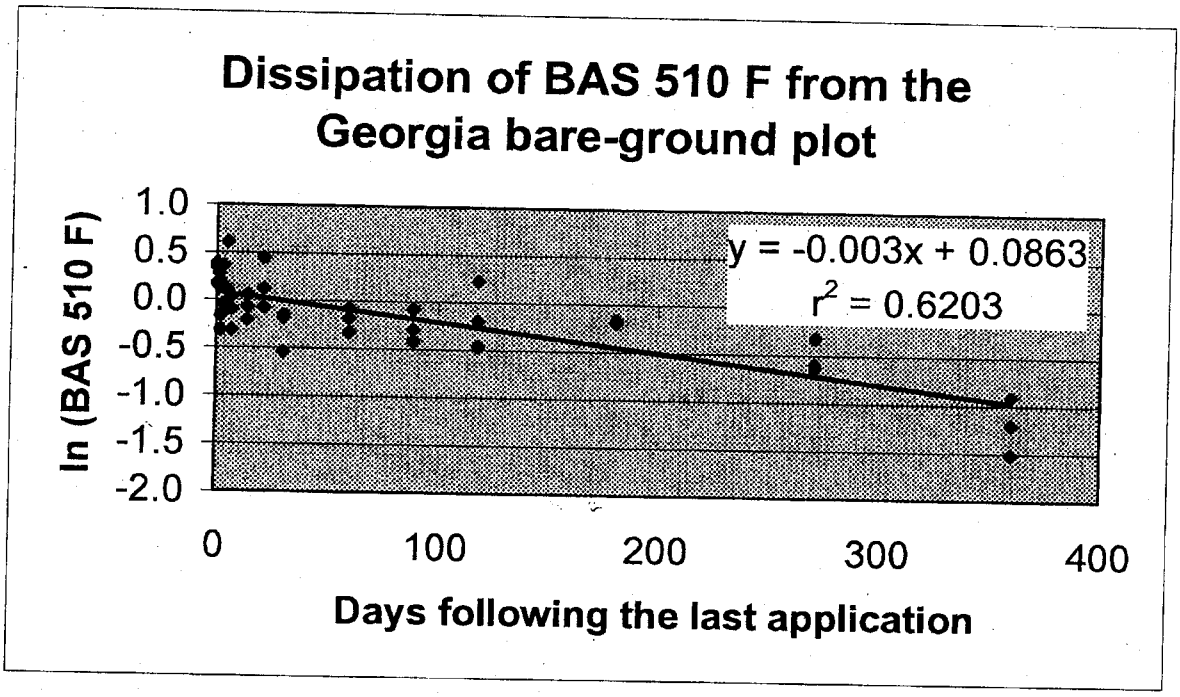
Chemical Name	BAS 510 F	**Georgia Bare-ground Plot**
PC Code	128008	
MRID	45405218	**Half-life (days) = 231.0**
Guideline No.	164-1	

Days posttreatment of the last application	BAS 510 F (mg/kg)	Ln (BAS 510 F)
0	1.47	0.385
0	1.19	0.174
0	1.42	0.351
1	1.15	0.140
1	1.16	0.148
1	1.33*	0.285
2	0.85	-0.163
2	0.73	-0.315
2	1.20	0.182
3	1.15	0.140
3	1.43	0.358
3	0.96	-0.041
5	1.11	0.104
5	1.84	0.610
5	0.92	-0.083
7	0.73	-0.315
7	1.04	0.039
7	0.91	-0.094
14	0.81	-0.211
14	1.06	0.058
14	0.93	-0.073
21	1.13	0.122
21	0.93	-0.073
21	1.57	0.451
30	0.83	-0.186
30	0.58	-0.545
30	0.86	-0.151
60	0.83	-0.186
60	0.93	-0.073
60	0.72	-0.329
89	0.66	-0.416
89	0.93	-0.073
89	0.74	-0.301
118	0.63	-0.462
118	1.26	0.231
118	0.82	-0.198
181	0.82	-0.198
181	0.85	-0.163
271	0.55	-0.598
271	0.73	-0.315
271	0.53	-0.635
360	0.30	-1.204
360	0.22	-1.514
360	0.40	-0.916

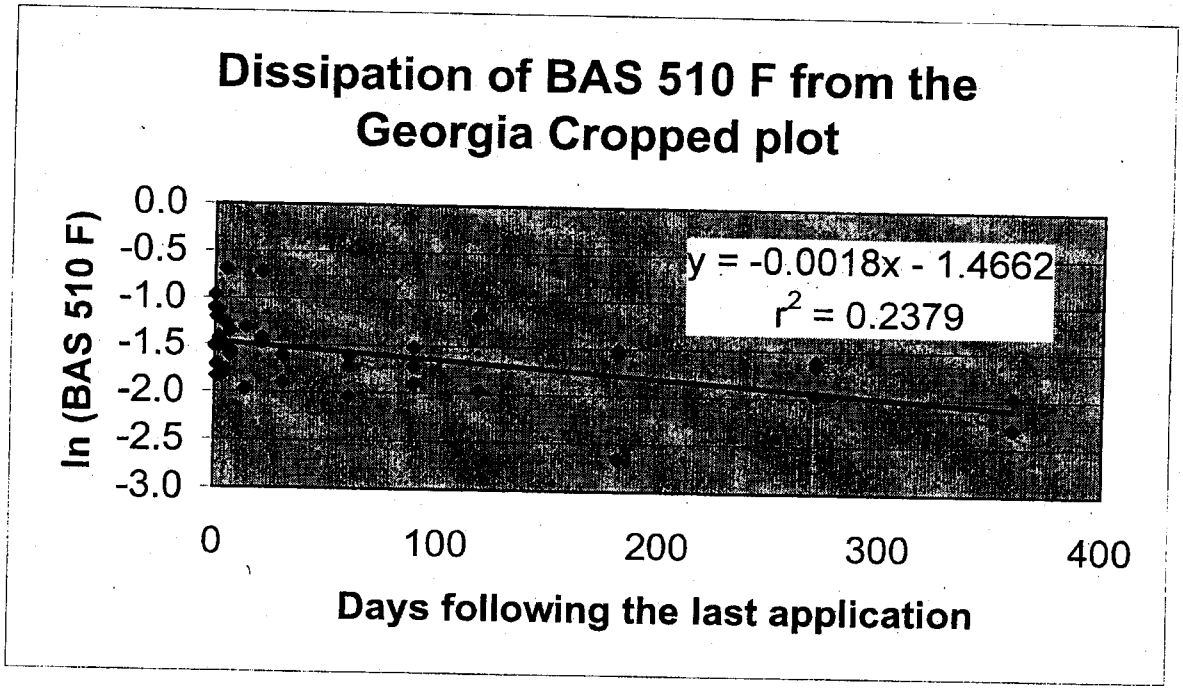
* Reviewer-calculated average of two replicates


Dissipation of BAS 510 F from the Georgia bare-ground plot
ln (BAS 510 F)
1.0
0.5
0.0
-0.5
-1.0
-1.5
-2.0
y = -0.003x + 0.0863
r2 = 0.6203
0
100
200
300
400
Days following the last application

Chemical Name	BAS 510 F	**Georgia Cropped Plot**
PC Code	128008	
MRID	45405218	**Half-life (days) = 385.1**
Guideline No.	164-1	

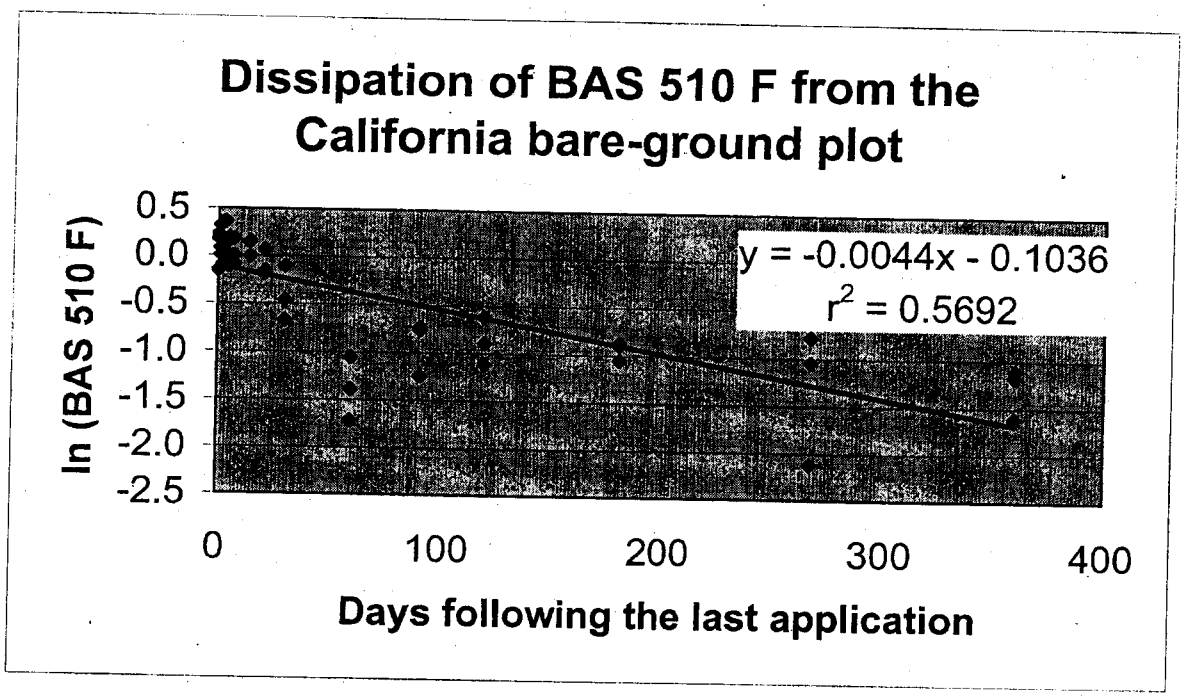
Days posttreatment of the last application	BAS 510 F (mg/kg)	Ln (BAS 510 F)
0	0.33	-1.109
0	0.22	-1.514
0	0.38	-0.968
1	0.30	-1.204
1	0.18	-1.715
1	0.16	-1.833
2	0.32	-1.139
2	0.24	-1.427
2	0.22	-1.514
3	0.23	-1.470
3	0.16	-1.833
3	0.17	-1.772
5	0.50*	-0.693
5	0.28*	-1.273
5	0.17*	-1.772
7	0.21	-1.561
7	0.20	-1.609
7	0.26	-1.347
14	0.14	-1.966
14	0.27	-1.309
14	0.14	-1.966
21	0.49*	-0.713
21	0.24	-1.427
21	0.23	-1.470
30	0.20	-1.609
30	0.20	-1.609
30	0.15	-1.897
60	0.20	-1.609
60	0.18	-1.715
60	0.13	-2.040
89	0.18	-1.715
89	0.22	-1.514
89	0.15	-1.897
118	0.31	-1.171
118	0.14	-1.966
118	0.30	-1.204
181	0.21	-1.561
181	0.07	-2.659
181	0.22	-1.514
271	0.19	-1.661
271	0.20	-1.609
271	0.14	-1.966
360	0.10	-2.303
360	0.14	-1.966
360	0.10	-2.303

* Reviewer-calculated average of two replicates


Dissipation of BAS 510 F from the Georgia Cropped plot
ln (BAS 510 F)
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
y = -0.0018x - 1.4662
r2 = 0.2379
0
100
200
300
400
Days following the last application

Chemical Name	BAS 510 F	**California Bare-ground Plot**
PC Code	128008	
MRID	45405218	**Half-life (days) =** **157.5**
Guideline No.	164-1	

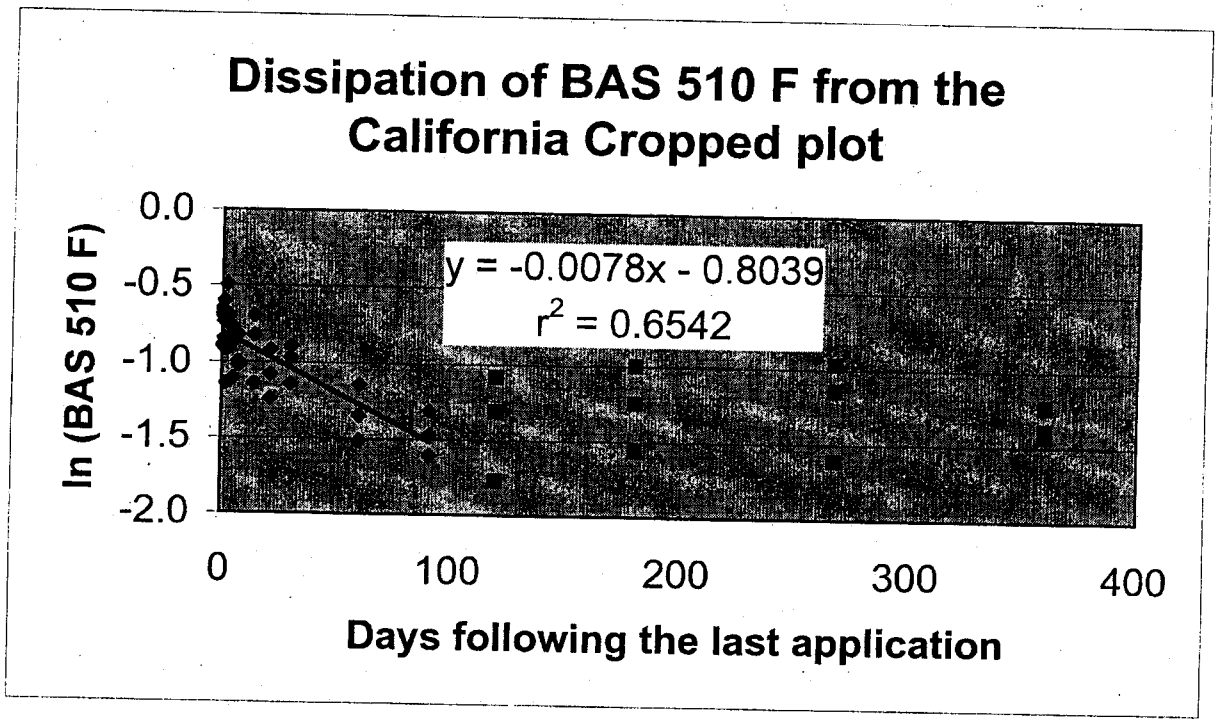
Days posttreatment of the last application	BAS 510 F (mg/kg)	Ln (BAS 510 F)
0	0.86	-0.151
0	1.26	0.231
0	1.20	0.182
1	1.01	0.010
1	1.09	0.086
1	1.38	0.322
2	1.00	0.000
2	1.08	0.077
2	0.92	-0.083
3	0.96	-0.041
3	1.01	0.010
3	1.44	0.365
5	0.90	-0.105
5	1.21	0.191
5	1.19	0.174
7	0.92	-0.083
7	1.00	0.000
7	1.20	0.182
14	1.16	0.148
14	1.00	0.000
14	1.17	0.157
21	0.83	-0.186
21	1.07	0.068
21	0.86	-0.151
30	0.51	-0.673
30	0.90	-0.105
30	0.63	-0.462
60	0.35	-1.050
60	0.25	-1.386
60	0.18	-1.715
91	0.47	-0.755
91	0.29	-1.238
91	0.48	-0.734
120	0.33	-1.109
120	0.41	-0.892
120	0.54	-0.616
181	0.35	-1.050
181	0.42	-0.868
181	0.41	-0.892
268	0.12	-2.120
268	0.35	-1.050
268	0.46	-0.777
360	0.31	-1.171
360	0.20	-1.609
360	0.33	-1.109


Dissipation of BAS 510 F from the California bare-ground plot
ln (BAS 510 F)
0.5
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
y = -0.0044x - 0.1036
r2 = 0.5692
0
100
200
300
400
Days following the last application

Chemical Name	BAS 510 F	**California Cropped Plot**
PC Code	128008	
MRID	45405218	**Half-life (days) = 88.9**
Guideline No.	164-1	*** Half-life calcualted using 0-91 day data**

Days posttreatment of the last application	BAS 510 F (mg/kg)	Ln (BAS 510 F)
0	0.50	-0.693
0	0.52	-0.654
0	0.41	-0.892
1	0.55	-0.598
1	0.48	-0.734
1	0.43	-0.844
2	0.32	-1.139
2	0.61*	-0.494
2	0.40	-0.916
3	0.50	-0.693
3	0.47	-0.755
3	0.47	-0.755
5	0.42	-0.868
5	0.46	-0.777
5	0.33	-1.109
7	0.37	-0.994
7	0.44	-0.821
7	0.36	-1.022
14	0.44	-0.821
14	0.50	-0.693
14	0.32	-1.139
21	0.29	-1.238
21	0.40	-0.916
21	0.34	-1.079
30	0.38	-0.968
30	0.32	-1.139
30	0.41	-0.892
60	0.22	-1.514
60	0.26	-1.347
60	0.32	-1.139
91	0.20	-1.609
91	0.23	-1.470
91	0.27	-1.309
120	0.34	-1.079
120	0.17	-1.772
120	0.27	-1.309
181	0.21	-1.561
181	0.29	-1.238
181	0.37	-0.994
268	0.20	-1.609
268	0.38	-0.968
268	0.32	-1.139
360	0.25	-1.386
360	0.29	-1.238
360	0.24	-1.427

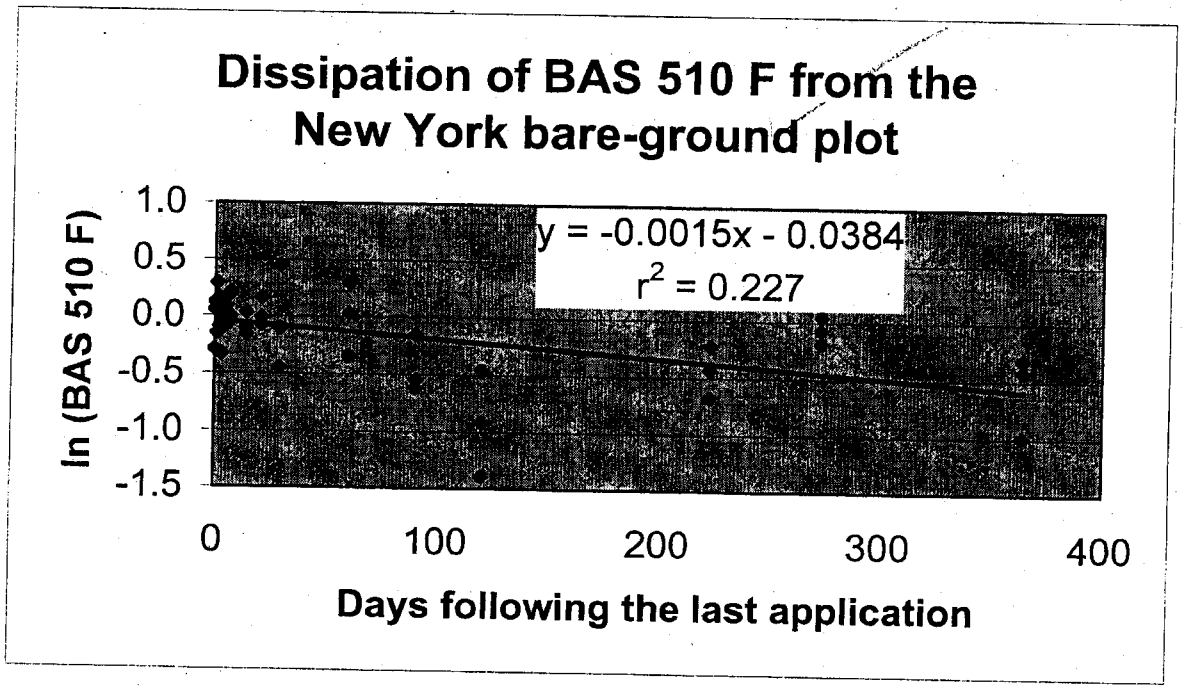
* Reviewer-calculated average of two replicates


Dissipation of BAS 510 F from the California Cropped plot
ln (BAS 510 F)
0.0
-0.5
-1.0
-1.5
-2.0
y = -0.0078x - 0.8039
r2 = 0.6542
0
100
200
300
400
Days following the last application

Chemical Name	BAS 510 F	**New York Bare-ground Plot**
PC Code	128008	
MRID	45405218	**Half-life (days) = 462.1**
Guideline No.	164-1	

Days posttreatment of the last application	BAS 510 F (mg/kg)	Ln (BAS 510 F)
0	1.13	0.122
0	1.06	0.058
0	0.75	-0.288
1	1.34	0.293
1	1.13	0.122
1	0.86	-0.151
2	0.91	-0.094
2	1.03	0.030
2	1.17	0.157
3	0.72	-0.329
3	1.02	0.020
3	1.07	0.068
5	0.94	-0.062
5	1.09	0.086
5	0.92	-0.083
7	1.24	0.215
7	1.00	0.000
7	1.22	0.199
14	0.85	-0.163
14	1.03	0.030
14	0.90	-0.105
21	0.99	-0.010
21	1.18	0.166
21	0.93	-0.073
29	0.90*	-0.105
29	0.64*	-0.446
29	1.57	0.451
60	1.35	0.300
60	0.71*	-0.342
60	1.03	0.030
90	0.54	-0.616
90	0.86	-0.151
90	0.58	-0.545
120	0.63	-0.462
120	0.40	-0.916
120	0.25*	-1.386
223	0.80	-0.223
223	0.51	-0.673
223	0.65	-0.431
273	0.83	-0.186
273	0.93	-0.073
273	1.05	0.049
364	0.73	-0.315
364	0.37	-0.994
364	0.66	-0.416

* Reviewer-calculated average of two replicates


Dissipation of BAS 510 F from the New York bare-ground plot
y = -0.0015x - 0.0384
r2 = 0.227
ln (BAS 510 F)
1.0
0.5
0.0
-0.5
-1.0
-1.5
0
100
200
300
400
Days following the last application