

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

PMRA Submission Number {.....}

EPA MRID Number 45405219

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

Concentration of a.i.: 69.6%

Formulation type: Wettable granule

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

QC Reviewer: Joan Harlin
Dynamac Corporation

Signature: *Joan L. Harlin*
Date: 1/14/02

Secondary Reviewer: Cheryl Sutton
EPA

Signature: *Cheryl Sutton*
Date: 1/1/02

Company Code:

Active Code:

Use Site Category:

EPA PC Code: 128008

CITATION: Jackson, S., M. Saha, J. McDonell and G. Oliver. 1999. Field dissipation of BAS 510..F in turf use patterns. BASF Study No. 46626. BASF Reg. Doc. No. 2001/5000833. Unpublished study performed by Crop Management Strategies, Inc., Hereford, PA, Alvey Ag Research, Carlyle, IL, South Texas Ag Research, Brookshire, TX, and BASF Corporation, Research Triangle Park, NC, and sponsored by BASF Corporation, Research Triangle Park, NC. Study initiated March 8, 1999 and completed February 9, 2001.



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EXECUTIVE SUMMARY:

Soil dissipation/accumulation of BAS 510 F under US field conditions was conducted in bareground and turf plots in New Jersey, Illinois, and Texas (ecoregions were not reported). 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. For each test plot, BAS 510 F was broadcast six times (14-day interval) at target rates of 0.30 kg a.i./ha (applications 1-3) and 0.39 kg a.i./ha (applications 4-6) in 5.0 x 24.3 m, 5.0 x 30.4 m, or 3.3 x 32.8 m sampling plots. The applied rate corresponds to 100% of the proposed label rate. Rainfall was supplemented with irrigation to reach the 10- or 15-year average rainfall. The treated plots were 1.5-6.1 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 82-98%, 91-125% and 76-88% of the target for the New Jersey, Illinois and Texas 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 turf 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 89 ± 9.3%, 82 ± 9.8%, and 106 ± 12.1% of the applied for the samples fortified at the New Jersey, Illinois, and Texas field sites, respectively.

Soil samples were taken prior to and following all six applications, at 1, 2, 3, 5, 7, and 9 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 degradates 2-chloronicotinic acid (MF51047) and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide (M510F49) by HPLC-MS/MS. The LOQ for each analyte in soil was 0.010 mg/kg.

At the New Jersey site, the maximum measured concentration in the bareground plot following the sixth application (day 1) was 0.21 mg a.i./kg soil (after adjusting for the concentration present immediately prior to the sixth application), which is 60% of the applied rate. Following the sixth application, BAS 510 F dissipated from a maximum of 0.92 mg a.i./kg soil at 1 day (0-7.5 cm depth) to 0.44-0.46 mg a.i./kg soil by 92-216 days, was 0.66 mg a.i./kg soil at 274 days, and was 0.27 mg a.i./kg soil at 359 days (the last sampling interval). BAS 510 F was primarily detected in the top (0-15 cm) soil layer and was detected at a maximum depth of 30-45 cm. The only transformation product detected in the bareground plot was 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide (M510F49), with a maximum concentration of 0.01 mg/kg soil (0.5% of the applied amount) observed at 1 day following the sixth application in the 0-7.5 cm soil layer. In the turf plot, BAS 510 F was detected in the 0-7.5 cm depth at 1.91 mg a.i./kg soil following the

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sixth application, was variable from 0.48 to 1.47 mg a.i./kg soil from 1 to 63 days, and then decreased to 0.42 mg a.i./kg soil by 216 days, 0.29 mg a.i./kg soil by 274 days, and 0.21 mg a.i./kg soil by 359 days posttreatment (the last sampling interval). BAS 510 F was only detected in the top (0-15 cm) soil layer. The transformation products detected in the turf plot were 2-chloronicotinic acid and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide (M510F49), with maximum concentrations of 0.04 mg/kg and 0.02 mg/kg (2.2% and 1.1% of the applied amount, respectively) observed following the sixth application in the 0-7.5 cm soil layer.

Under field conditions in the New Jersey bareground plot, BAS 510 F had DT50 and DT75 values of 108 days and >359 days calculated using a non-linear model, and a DT50 value of 300 days calculated using a polynomial model. Under field conditions at the turf plot, BAS 510 F had a DT50 value of 44 days and a DT75 value of 174 days calculated using the non-linear model. At the end of the 359 day period, the total carryover of residues of BAS 510 F was 15.6% and 11.8% of the total applied amount, respectively, in the bareground and turf plots.

At the Illinois site, the maximum measured concentration in the bareground plot following the sixth application (day 5) was 0.22 mg a.i./kg soil (after adjusting for the concentration present immediately prior to the sixth application), which is 63% of the applied rate. Following the sixth application, BAS 510 F dissipated from a maximum of 1.04 mg a.i./kg soil at 5 days (0-7.5 cm depth) to 0.65-0.82 mg a.i./kg soil from 29 to 270 days, and was 0.31 mg a.i./kg soil at 344 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. The transformation products detected in the bareground plot were 2-chloronicotinic acid and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide (M510F49), with maximum concentrations of 0.003 mg/kg and 0.01 mg/kg (0.16% and 0.54% of the applied amount, respectively) observed following the sixth application in the 0-7.5 cm soil layer. In the turf plot, BAS 510 F was detected in the 0-7.5 cm depth at 1.15-1.25 mg a.i./kg soil from 0 to 14 days following the sixth application, decreased to 0.82-0.91 mg a.i./kg soil from 29 to 91 days and 0.45-0.72 mg a.i./kg soil by 118-270 days, and was 0.34 mg a.i./kg soil at 344 days posttreatment (the last sampling interval). BAS 510 F was primarily detected in the top (0-15 cm) soil layer and was detected at a maximum depth of 5-30 cm. The transformation products detected in the turf plot were 2-chloronicotinic acid and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide (M510F49), with maximum concentrations of 0.007 mg/kg and 0.02 mg/kg (0.38% and 1.1% of the applied amount, respectively) observed following the sixth application in the 0-7.5 cm soil layer.

Under field conditions in the Illinois bareground plot, BAS 510 F had DT50 and DT75 values of 244 days and >344 days calculated using a non-linear model, and a DT50 value of 307 days calculated using a polynomial model. Under field conditions at the turf plot, BAS 510 F had a DT50 value of 155 days and a DT75 value of >344 days calculated using the non-linear model. At the end of the 344 day period, the total carryover of residues of BAS 510 F was 16.7% and 20.1% of the total applied amount, respectively, in the bareground and turf plots.

At the Texas site, the maximum measured concentration in the bareground plot following the sixth application (day 2) was 0.36 mg a.i./kg soil (after adjusting for the concentration present immediately prior to the sixth application), which is 103% of the applied rate. Following the

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sixth application, BAS 510 F dissipated from a maximum of 1.21 mg a.i./kg soil at 2 days (0-7.5 cm depth) to 0.70-0.98 mg a.i./kg soil from 30 to 180 days, 0.45 mg a.i./kg soil by 271 days, and 0.38 mg a.i./kg soil by 316 days (the end of the study period). 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. The transformation products detected in the bareground plot were 2-chloronicotinic acid and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide (M510F49), with maximum concentrations of 0.03 mg/kg and 0.02 mg/kg (1.6% and 1.1% of the applied amount, respectively) observed following the sixth application in the 0-7.5 cm soil layer. In the turf plot, BAS 510 F was detected in the 0-7.5 cm depth at a maximum of 1.23 mg a.i./kg soil immediately following the sixth application, decreased to 0.61-0.65 mg a.i./kg soil by 61-121 days, was 0.27 mg a.i./kg soil at 271 days, and was 0.14 mg a.i./kg soil at 316 days posttreatment (the last sampling interval). BAS 510 F was only detected in the top (0-15 cm) soil layer. The transformation products detected in the turf plot were 2-chloronicotinic acid and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide (M510F49), both with a maximum concentration of 0.02 mg/kg (1.1% of the applied amount) observed following the sixth application in the 0-7.5 cm soil layer.

Under field conditions in the Texas bareground plot, BAS 510 F had DT50 and DT75 values of 143 days and >316 days calculated using a non-linear model. Under field conditions at the turf plot, BAS 510 F had a DT50 value of 108 days, and a DT75 value of 232 days calculated using the non-linear model and a DT50 value of 194 days calculated using a polynomial model. At the end of the 316 day period, the total carryover of residues of BAS 510 F was 21.0% and 9.1% of the total applied amount, respectively, in the bareground and turf plots.

The major routes of dissipation of BAS 510 F under terrestrial field conditions in New Jersey, Illinois, and Texas could not be determined from the data provided in this report. Leaching was minimal and the major transformation products did not show a pattern of accumulation. 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 CO₂ formation, it is assumed that these were also the predominant dissipation processes in the field.

RESULTS SYNOPSIS

Location/soil type: Hunterdon County, New Jersey/Penn loam soil series
DT50 (non-linear model): 108 days (bareground plot) and 44 days (turf plot)
DT50 (polynomial model): 300 days (bareground plot)
DT75 (non-linear model): >359 days (bareground plot) and 174 days (turf plot)
Major transformation products detected: 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide and 2-chloronicotinic acid (turf plot only)
Dissipation routes: Could not be determined

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Location/soil type: Carlyle County, Illinois/Cisne silt loam soil series

DT50 (non-linear model): 244 days (bareground plot) and 155 days (turf plot)

DT50 (polynomial model): 307 days (bareground plot)

DT75 (non-linear model): >344 days (both plots)

Major transformation products detected: 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide and 2-chloronicotinic acid

Dissipation routes: Could not be determined

Location/soil type: Waller County, Texas/Katy sandy loam soil series

DT50 (non-linear model): 143 days (bareground plot) and 108 days (turf plot)

DT50 (polynomial model): 194 days (turf plot)

DT75 (non-linear model): >316 days (bareground plot) and 232 days (turf plot)

Major transformation products detected: 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide and 2-chloronicotinic acid

Dissipation routes: Could not be determined

Study Acceptability: This study is classified acceptable and partially satisfies the guideline data requirement for a terrestrial field dissipation study.

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: The study was conducted according to U.S. EPA Pesticide Assessment Guidelines Subdivision N, 164-1. The study did not deviate from EPA Subdivision N 164-1.

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

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Chemical Structure of the active ingredient(s):

Description: Wettable granule

Storage conditions of test chemicals: Storage conditions ranged from 7.8 to 38.9°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. 163 in the study report.

2. Test site: The test sites were located in New Jersey, Illinois, and Texas (pp. 12-13). The New Jersey test site was located near Baptistown, in Hunterdon County, and is representative of the northeast region where the largest sales market for turf products exists. The Illinois test site was located near Carlyle, in Clinton County, and is representative of the midwest sales region which is also a large turf sales market. The Texas test site was located near Brookshire, in Waller County, and is representative of the southwestern turf product sales market. The New Jersey test plots had previously been treated with Roundup, Devrinol, Bravo 720, Pounce 3.2 EC, Sencor 4L, Asana 0.66 EC, and Triplet 5H in the past three years, the Illinois test plots had previously been treated with Treflan 4EC, Sencor 75 DF, Dimethoate 4EC, Quadris 2.08 SC, Maneb 75 DF, Quadris, Touchdown, and Touchdown 5L in the past three years, and the Texas test plots had not previously been treated with pesticides in the past three years (Appendix B, Tables X-XII, pp. 96-97, 107-108, 118-119).

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

Details		New Jersey	Illinois	Texas
Geographic coordinates	Latitude	Not available	Not available	Not available
	Longitude	Not available	Not available	Not available
	Province/State	Hunterdon County, NJ	Clinton County, IL	Waller County, TX
	Country	US	US	US

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Details		New Jersey	Illinois	Texas
	Ecoregion	Not available	Not available	Not available
Slope Gradient		2%	1%	0.6%
Depth to ground water (m)		1.2 m	1.2 m	7.6-30.4 m
Distance from weather station used for climatic measurements		12 miles	On-site	0.3 miles
Indicate whether the meteorological conditions before starting or during the study were within 30 year normal levels (Yes/No). If no, provide details.		Precipitation plus irrigation equalled 143% of the historical average.	Precipitation plus irrigation equalled 109% of the historical average.	Precipitation plus irrigation equalled 121% of the historical average.
Other details, if any				

Data obtained from Tables VIII-X, pp. 50-52, and Appendix B, pp. 94-96, 107, 118, in the study report.

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

Use	Year	New Jersey	Illinois	Texas
Crops grown	Previous year	Tall Fescue (turf plot)	Fescue mixture (turf plot)	Bermuda grass (turf plot)
	2 years previous	Tall Fescue (turf plot)	Fescue mixture (turf plot)	Bermuda grass (turf plot)
	3 years previous	Tall Fescue (turf plot)	Fescue mixture (turf plot)	Bermuda grass (turf plot)
Pesticides used	Previous year	Roundup	Treflan 4EC, Sencor 75 DF, Dimethoate 4EC, Quadris 2.08 SC, Maneb 75 DF	None
	2 years previous	Devrinol, Bravo 720, Pounce 3.2 EC, Sencor 4L, Asana 0.66 EC	Quadris, Quadris 2.08 SC	None
	3 years previous	Triplet 5H	Touchdown, Touchdown 5L	None
Fertilizers used	Previous year	20-9-9 fertilizer (turf plot only)	Not available	Not available
	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	Mold board plowed (bareground plot only)	Not available	Not available

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Use	Year	New Jersey	Illinois	Texas
	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. 96-97, 107-108, 118-119, in the study report.

3. Soils:

Table 3: Properties of the soil from New Jersey.

Property	Depth (cm)							
	0-15	15-30	30-45	45-60	60-75	75-90	90-105	105-120
Textural classification	loam					clay loam	loam	
% sand	30	28	32	46	40	34	40	46
% silt	50	46	42	28	34	38	36	30
% clay	20	26	26	26	26	28	24	24
pH (1:1 soil:water or other)	6.3	6.7	6.6	6.3	6.6	5.8	5.4	5.3
Total organic carbon (%)								
Total organic matter (%)	2.6	0.9	0.3	0.1	0.2	0.1	0.1	0.1
CEC (meq/100 g)	8.5	7.6	8.6	8.9	7.9	8.1	8.0	8.7
Bulk density (g/cm3)	1.32-1.42	1.47-1.65	1.63-1.75	1.72-1.87	1.73-1.88	1.70-1.83	1.66-1.76	1.59-1.72
Moisture at 1/3 atm (%)	28.2	24.3	23.0	21.8	21.7	23.0	23.5	22.0
Taxonomic classification (e.g., ferro-humic podzol)	Fine-loamy, mixed, mesic Ultic Hapludalfs							
Soil mapping unit	Not provided (Penn soil series)							
Others								

Data obtained from p. 13, and Table VIII, p. 50 in the study report.

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Table 4: Properties of the soil from Illinois.

Property	Depth (cm)							
	0-15	15-30	30-45	45-60	60-75	75-90	90-105	105-120
Textural classification	silt loam			clay			clay loam	
% sand	27	23	23	21	21	25	21	23
% silt	58	58	56	38	32	30	40	42
% clay	15	19	21	41	47	45	39	35
pH (1:1 soil:water or other)	6.1	5.5	4.9	4.7	4.7	4.8	4.8	4.8
Total organic carbon (%)								
Total organic matter (%)	1.7	1.2	0.5	0.8	0.7	0.6	0.4	0.2
CEC (meq/100 g)	10.6	9.5	10.1	23.6	29.4	25.8	22.3	20.1
Bulk density (g/cm ³)	1.56-1.67	1.54-1.67	1.55-1.59	1.42-1.58	1.43-1.65	1.31-1.55	1.53-1.74	1.52-1.68
Moisture at 1/3 atm (%)	29.0	29.8	28.6	38.3	42.8	40.7	37.0	37.2
Taxonomic classification (e.g., ferro-humic podzol)	Fine, smectitic, mesic Vertic Albaqualfs							
Soil mapping unit	Not provided (Cisne soil series)							
Others								

Data obtained from p. 13, and Table IX, p. 51 in the study report.

Table 5: Properties of the soil from Texas.

Property	Depth (cm)							
	0-15	15-30	30-45	45-60	60-75	75-90	90-105	105-120
Textural classification	sandy loam			sandy clay loam		sandy clay	clay	sandy clay loam
% sand	71	69	63	59	49	45	41	49
% silt	22	22	26	20	20	14	18	16
% clay	7	9	11	21	31	41	41	35
pH (1:1 soil:water or other)	5.9	6.4	6.3	5.8	5.9	6.2	6.6	6.8
Total organic carbon (%)								
Total organic matter (%)	0.9	0.3	0.3	0.5	0.6	0.5	0.3	0.2
CEC (meq/100 g)	4.9	4.3	4.8	10.4	14.5	18.4	18.9	17.4

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Property	Depth (cm)							
	0-15	15-30	30-45	45-60	60-75	75-90	90-105	105-120
Bulk density (g/cm ³)	1.56-1.67	1.62-1.80	1.79-1.91	1.79-1.91	1.65-1.87	1.68-1.87	1.72-1.96	1.90-2.09
Moisture at 1/3 atm (%)	8.4	9.3	11.1	17.4	22.8	27.8	27.4	23.0
Taxonomic classification (e.g., ferro-humic podzol)	Fine-loamy, siliceous, thermic Aquic Paleudalfs							
Soil mapping unit	Not provided (Katy soil series)							
Others								

Data obtained from p. 13, and Table X, p. 52 in the study report.

B. EXPERIMENTAL DESIGN:

1. Experimental design:

Table 6: Experimental design.

Details		New Jersey	Illinois	Texas
Duration of study		429 days (359 days following the last application)	414 days (344 days following the last application)	386 days (316 days following the last application)
Uncropped (bare) or cropped		Bare and turf	Bare and turf	Bare and turf
Control used (Yes/No)		Yes	Yes	Yes
No. of replications	Controls	1	1	1
	Treatments	3 for both the bareground and turf plots	3 for both the bareground and turf plots	3 for both the bareground and turf plots
Plot size (L x W m)	Control	7.6 x 12.2 m	3.0 x 30.4 m	3.3 x 27.4 m
	Treatment	5.0 x 24.3 m	3.0 x 30.4 m	3.3 x 32.8 m
Distance between control plot and treated plot		>35 m from the nearest treated plot	45.6 m from the nearest treated plot	40.4 m from the nearest treated plot
Distance between treated plots		1.5-3 m, >90 m between bare and turf plots	6.1 m, 9.1 m between bare and turf plots	3.0 m between replicate plots and between the nearest bare and turf plots
Application rate(s) used (g a.i./ha)		302 g a.i./ha (applications 1-3) and 392 g a.i./ha (applications 4-6)	302 g a.i./ha (applications 1-3) and 392 g a.i./ha (applications 4-6)	302 g a.i./ha (applications 1-3) and 392 g a.i./ha (applications 4-6)

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Details		New Jersey	Illinois	Texas
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)		26/5/1999, 9/6/1999, 23/6/1999, 7/7/1999, 21/7/1999, and 4/8/1999	3/6/1999, 17/6/1999, 2/7/1999, 15/7/1999, 29/7/1999, and 12/8/1999	7/7/1999, 21/7/1999, 4/8/1999, 18/8/1999, 1/9/1999, and 15/9/1999
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/cm ³)		0.27 and 0.35 mg/kg for applications 1-3 and 4-6, respectively	0.27 and 0.35 mg/kg for applications 1-3 and 4-6, respectively	0.27 and 0.35 mg/kg for applications 1-3 and 4-6, respectively
Application method (eg., spraying, broadcast etc.)		Broadcast	Broadcast	Broadcast
Type of spray equipment, if used		Tractor-mounted flat broadcast boom sprayer with flat fan nozzles	Tractor-mounted flat broadcast boom sprayer with flat fan nozzles	Tractor-mounted flat broadcast boom sprayer with flat fan nozzles
Total volume of spray solution applied/plot OR total amount broadcasted/plot		60 gal/A	60 gal/A	60 gal/A
Identification and volume of carrier (e.g., water), if used		Water	Water	Water
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	0%, <5%, 10-15%, 25%, 95%, and 5%	100%, 0%, 10%, 60%, 0%, and 20%	90%, 80%, 25%, 0%, 0%, and 0%

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Details		New Jersey	Illinois	Texas
	Temperature (°C)	17.8, 22.8, 22.8, 25.0, 24.4, and 26.1	20.6, 13.3, 25.6, 21.1, 24.4, and 23.9	25.0, 25.0, 26.7, 27.7, 24.4, and 21.1
	Humidity	43%, 63%, 64%, 55%, 75%, and 63%	90%, 90%, 90%, 88%, 99%, and 63%	91%, 100%, 87%, 88%, 87%, and 72%
	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 3 times each with Roundup Ultra (2%), Gramoxone (1 qt/A), and Roundup (2%), and once with 2,4-D (2 pt/A).	The test plots were treated 7 times with Touchdown (1-3 lb a.i./A), 4 times with Roundup Ultra (1 lb a.i./A), twice with Atrazine (1.5-2 lb a.i./A), and once with Gramoxone (1.5 lb a.i./A).	The test plots were treated 7 times each with Gramoxone extra (0.94 lb a.i./A), Roundup Ultra (1.5 lb a.i./A), and Dual Magnum (1.91-7.64 lb a.i./A), twice with MSMA (1.12-1.84 lb a.i./A), and once each with Paraquat (0.94 lb a.i./A) and Roundup (1.5 lb a.i./A).
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 18.9 inches from irrigation (1.15-5.88 inches of water per month except during the winter months and June 2000 when the plots were not irrigated).	Yes, via sprinkler. The test plots received a total of 23.7 inches from irrigation (0.45-7.20 inches of water per month except during the winter and early spring months when the plots were not irrigated).	Yes, via sprinkler. The test plots received a total of 35.0 inches from irrigation (0.64-4.18 inches of water per month).
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 ¹ , if used)		Yes	Yes	Yes
Good agricultural practices followed (Yes or No)		Yes	Yes	Yes

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Details	New Jersey	Illinois	Texas
Indicate if any abnormal climatic events occurred during the study (eg., drought, heavy rainfall, flooding, storm etc.)	The plots received 16.73 inches of precipitation during the month of September 1999.	The plots received 10.07 inches of precipitation during the month of June 2000.	No
If cropped plots are used, provide the following details: Plant - Common name/variety: Details of planting: Crop maintenance (eg., fertilizers used):	The turf plot was an established Tall Fescue (Ky31). 20-9-9 N-P-K fertilizer (300-320 lb/A) was applied on April 7, July 23, and September 15, 1999, and on April 20, 2000, and lime (1.5 ton/A) was applied on July 20, 1999.	The turf plot was a fescue mix. No fertilizers were reported.	The turf plot was sodded with Bermuda grass in 1994. 12-8-8 N-P-K fertilizer (830 lb/A) was applied on June 3, 1999, and 21-0-0 N-P-K fertilizer (400 lb/A) was applied on July 4, 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 VIII-X, pp. 50-52, Appendix B, pp. 79-128, 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. 14). 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 turf plots using application monitors.

† 3. Field Spiking: Samples (20 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. 15; Appendix B, p. 92). The field fortified samples were analyzed at about the same time as the corresponding soil core samples (p. 27). Field spiked samples were not prepared for the degradates 2-chloronicotinic acid and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide.

§ 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, 5, 7, and 9 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

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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. 23).

* **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. 85-86). 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 ¹⁴C-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 and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide 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. Samples fortified with 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide were collected for analysis at day 0 and 1 and 3 months posttreatment; all samples were extracted and analyzed according to BASF Method D0004/1.

8. Sampling:

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Table 7: Soil sampling.

Details	New Jersey	Illinois	Texas
Method of sampling (random or systematic)	Random	Random	Random
Sampling intervals	Prior to and following all six applications, at 1, 2, 3, 5, 7, and 9 days following the first application, and at 1, 2, 3, 5, 8, 10, 14, 21, 30, 63, 92, 120, 216, 274, and 359 days following the sixth application	Prior to and following all six applications, at 1, 2, 3, 5, 7, and 9 days following the first application, and at 1, 2, 3, 5, 7, 10, 14, 21, 29, 60, 91, 118, 180, 270, and 344 days following the sixth application	Prior to and following all six applications, at 1, 2, 3, 5, 7, and 9 days following the first application, and at 1, 2, 3, 5, 7, 10, 14, 21, 30, 61, 90, 121, 180, 271, and 316 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)	4 inch diameter (0-15 cm depth samples) and 1.0-2.0 inch diameter (15-120 cm depth samples)	4 inch diameter (0-15 cm depth samples) and 1.0-2.0 inch diameter (15-120 cm depth samples)	4 inch diameter (0-15 cm depth samples) and 1.0-2.0 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)	546 days	546 days	546 days

Data obtained from pp. 13, 17, 19, and Appendix B, pp. 89-90, in the study report.

9. Analytical Procedures: Soil samples were analyzed for BAS 510 F and the degradates 2-chloronicotinic acid (M510F47) and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide (M510F49) using BASF Draft Analytical Method D0004/1 (p. 17). 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, 2-chloronicotinic acid, and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide from concurrent fortification samples (prepared at each test site) were 95% for BAS 510 F (all three sites), ranged from 88 to 103% for 2-chloronicotinic acid and 90 to 93% for

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2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide, and indicated that the method was adequate (pp. 17-18).

II. RESULTS AND DISCUSSION

1. APPLICATION MONITORS: The mean recoveries from the field application monitors placed in the bareground plots were 82-98%, 91-125% and 76-88% of the target for the New Jersey, Illinois, and Texas bareground plots, respectively (data are reported as ranges of the mean recoveries from applications 1, 3 and 6; Table I, p. 26). The application rate was not verified for the turf 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 $89 \pm 9.3\%$, $82 \pm 9.8\%$, and $106 \pm 12.1\%$ of the applied for the samples fortified at the New Jersey, Illinois, and Texas field sites, respectively (Appendix E, p. 559). Field spiked samples were not prepared for the degradates, 2-chloronicotinic acid and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide.

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

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

Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	2	3	5	7	9	13	App2	13	App3	13	App4	13	App5	13
Parent compound (BAS 510 F)	0-7.5	0.35	0.35	0.27	0.27	0.19	0.18	0.18	0.57	0.44	0.71	0.46	0.79	0.43	0.92	0.71
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.003	0.003	<0.01	<0.01	0.003	<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
Transformation product (2-hydroxy-N-(4-chlorobiphenyl-1,2-yl)nicotinamide)	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	0.003	<0.01	0.008	0.004
	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

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Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	2	3	5	7	9	13	App2	13	App3	13	App4	13	App5	13
	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
Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App6	1	2	3	5	8	14	30	63	92	216	274	359		
Parent compound (BAS 510 F)	0-7.5	0.81	0.92	0.84	0.81	0.73	0.67	0.68	0.64	0.56	0.46	0.44	0.66	0.27		
	7.5-15	0.01	0.02	<0.01	0.01	0.003	0.01	<0.01	0.02	0.04	0.05	0.03	0.09	0.02		
	15-30	<0.01	0.003	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	0.003	0.01	0.007	<0.01	<0.01		
	30-45	<0.01	<0.01	<0.01	<0.01	0.003	<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		
	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		
	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		
	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		
Transformation product (2-hydroxy-N-(4-chlorobiphenyl-1-2-yl)nicotinamide)	0-7.5	0.003	0.01	0.003	0.003	<0.01	<0.01	0.007	0.004	0.006	0.002	0.007	0.008	<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		
	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		
	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		
Total extractable residues (if determined)	0-7.5	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		
	15-30	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		

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Compound	Soil depth (cm)	Sampling times (application number or days following previous application)												
		App6	1	2	3	5	8	14	30	63	92	216	274	359
Total non-extractable residues (if determined)	0-7.5	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
	15-30	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
Total recovery	0-7.5	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
	15-30	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

Data obtained from Tables XI-XIII, pp. 53-55.

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

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Table 9. Concentration of BAS 510 F residues expressed as mg/kg soil, in the New Jersey turf plot.

Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	2	3	5	7	9	13	App2	13	App3	13	App4	13	App5	13
Parent compound (BAS 510 F)	0-7.5	0.24	0.29	0.32	0.26	0.31	0.27	0.27	0.67	0.24	0.42	0.78	0.93	0.84	1.14	0.54
	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	0.003	<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	0.007	0.003	0.007	0.007
	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-hydroxy-N-(4-chlorobiphenyl-1-yl)nicotinamide)	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	0.003	<0.01	<0.01	0.003
	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

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Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	2	3	5	7	9	13	App2	13	App3	13	App4	13	App5	13
	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
Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App6	1	2	3	5	8	14	30	63	92	216	274	359		
Parent compound (BAS 510 F)	0-7.5	1.91	0.86	1.47	1.38	0.67	1.24	0.48	1.29	0.58	0.45	0.42	0.29	0.21		
	7.5-15	0.007	<0.01	0.007	<0.01	<0.01	0.003	0.007	0.02	0.02	0.02	0.02	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		
	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		
Transformation product (2-chloronicotinic acid)	0-7.5	0.04	0.01	0.02	0.02	0.007	0.02	0.007	0.007	0.007	0.02	<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		
	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		
	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		
Transformation product (2-hydroxy-N-(4-chlorobiphenyl-2-yl) nicotinamide)	0-7.5	0.02	0.008	0.02	0.02	<0.01	0.02	<0.01	0.02	0.003	0.003	<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		
	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		
	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		
Total extractable residues (if determined)	0-7.5	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		
	15-30	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		

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Compound	Soil depth (cm)	Sampling times (application number or days following previous application)												
		App6	1	2	3	5	8	14	30	63	92	216	274	359
Total non-extractable residues (if determined)	0-7.5	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
	15-30	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
Total recovery	0-7.5	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
	15-30	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

Data obtained from Tables XIV-XVI, pp. 56-58.

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

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

Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	2	3	5	7	9	13	App2	13	App3	13	App4	13	App5	13
Parent compound (BAS 510 F)	0-7.5	0.29	0.18	0.17	0.28	0.23	0.13	0.27	0.47	0.48	0.49	0.39	0.68	0.59	1.12	0.82
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.003	<0.01	<0.01	<0.01	<0.01	0.007	NA	NA
	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	NA	NA
	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-hydroxy-N-(4-chlorobiphenyl-2-yl) nicotinamide)	0-7.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.002	<0.01	<0.01	0.003	0.003	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	NA	NA
	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

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Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	2	3	5	7	9	13	App2	13	App3	13	App4	13	App5	13
	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
Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App6	1	2	3	5	7	14	29	60	91	118	180	270	344	
Parent compound (BAS 510 F)	0-7.5	0.93	0.95	0.98	0.67	1.04	0.90	1.02	0.80	0.76	0.82	0.68	0.77	0.65	0.31	
	7.5-15	<0.01	<0.01	<0.01	0.10	<0.01	<0.01	<0.01	0.003	0.007	<0.01	NA	<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	NA	<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	0.003	<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	NA	<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	NA	<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-hydroxy-N-(4-chlorobiphenyl-2-yl)nicotinamide)	0-7.5	0.003	0.007	0.007	0.003	0.01	0.01	0.003	<0.01	0.003	0.01	0.003	0.003	0.003	<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	NA	<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	NA	<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	

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Compound	Soil depth (cm)	Sampling times (application number or days following previous application)													
		App6	1	2	3	5	7	14	29	60	91	118	180	270	344
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

Data obtained from Tables XVII-XIX, pp. 59-61.

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

NA = Not analyzed

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

Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	2	3	5	7	9	13	App2	13	App3	13	App4	13	App5	13
Parent compound (BAS 510 F)	0-7.5	0.17	0.14	0.18	0.20	0.21	0.19	0.19	0.45	0.44	0.28	0.68	0.73	0.91	1.48	0.30
	7.5-15	0.01	<0.01	0.008	<0.01	<0.01	<0.01	<0.01	0.003	0.01	0.02	0.01	0.02	0.01	0.03	0.005
	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	0.003	<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
Transformation product (2-hydroxy-N-(4-chlorobiphenyl-1-yl)nicotinamide)	0-7.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.003	<0.01	0.01	0.02	<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

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Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	2	3	5	7	9	13	App2	13	App3	13	App4	13	App5	13
	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
Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App6	1	2	3	5	7	14	29	60	91	118	180	270	344	
Parent compound (BAS 510 F)	0-7.5	1.17	1.19	1.24	1.16	1.23	1.15	1.25	0.91	0.82	0.90	0.72	0.45	0.65	0.34	
	7.5-15	0.06	0.02	0.03	0.02	0.05	0.01	0.03	0.05	0.03	0.05	NA	0.04	0.05	0.03	
	15-30	<0.01	0.003	<0.01	<0.01	0.007	<0.01	<0.01	0.007	0.007	0.01	NA	<0.01	0.003	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	
Transformation product (2-chloronicotinic acid)	0-7.5	<0.01	<0.01	<0.01	0.007	<0.01	<0.01	0.003	0.003	<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	NA	<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	NA	<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-hydroxy-N-(4-chlorophenyl-1-2-yl)nicotinamide)	0-7.5	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	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	NA	<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	NA	<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	

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Compound	Soil depth (cm)	Sampling times (application number or days following previous application)													
		App6	1	2	3	5	7	14	29	60	91	118	180	270	344
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

Data obtained from Tables XX-XXII, pp. 62-64.

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

NA = Not analyzed

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

Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	2	3	5	7	9	13	App2	13	App3	13	App4	13	App5	13
Parent compound (BAS 510 F)	0-7.5	0.28	0.27	0.27	0.18	0.20	0.24	0.23	0.39	0.36	0.61	0.55	0.68	0.67	0.86	0.85
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.007	<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	0.003	<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
Transformation product (2-hydroxy-N-(4-chlorobiphenyl-1-2-yl)nicotinamide)	0-7.5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.003	0.003	0.007	<0.01	0.01	0.008
	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

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Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	2	3	5	7	9	13	App2	13	App3	13	App4	13	App5	13
	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
Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App6	1	2	3	5	7	14	30	61	90	180	271	316		
Parent compound (BAS 510 F)	0-7.5	1.12	1.16	1.21	1.15	1.00	1.19	1.07	0.70	0.98	0.89	0.79	0.45	0.38		
	7.5-15	<0.01	<0.01	<0.01	<0.01	0.007	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.007	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		
	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		
Transformation product (2-chloronicotinic acid)	0-7.5	0.03	<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		
	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		
	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		
Transformation product (2-hydroxy-N-(4-chlorobiphenyl-1-2-yl) nicotinamide)	0-7.5	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.01	0.02	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		
	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		
	30-45	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.003	<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		
	7.5-15	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		
	30-45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		

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Compound	Soil depth (cm)	Sampling times (application number or days following previous application)												
		App6	1	2	3	5	7	14	30	61	90	180	271	316
Total non-extractable residues (if determined)	0-7.5	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
	15-30	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
Total recovery	0-7.5	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
	15-30	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

Data obtained from Tables XXIII-XXV, pp. 65-67.

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

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Table 13. Concentration of BAS 510 F residues expressed as mg/kg soil, in the Texas turf plot.

Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	2	3	5	7	9	13	App2	13	App3	13	App4	13	App5	13
Parent compound (BAS 510 F)	0-7.5	0.21	0.2	0.17	0.18	0.17	0.21	0.16	0.32	0.28	0.50	0.41	0.68	0.65	0.79	0.89
	7.5-15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.005	0.01	0.02	0.03	0.02	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	<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	0.02
	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-hydroxy-N-(4-chlorobiphenyl-1-yl)nicotinamide)	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	0.003	0.003	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	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<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

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Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App1	2	3	5	7	9	13	App2	13	App3	13	App4	13	App5	13
	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
Compound	Soil depth (cm)	Sampling times (application number or days following previous application)														
		App6	1	2	3	5	7	14	30	61	90	121	180	271	316	
Parent compound (BAS 510 F)	0-7.5	1.23	0.94	1.15	1.12	0.92	0.94	0.76	0.80	0.65	0.61	0.63	0.54	0.27	0.14	
	7.5-15	0.05	0.04	0.04	0.03	0.04	0.04	0.04	0.06	0.04	0.04	0.03	0.05	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	0.02	0.01	0.02	0.007	<0.01	0.003	0.01	0.007	0.003	<0.01	0.02	0.007	<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	
Transformation product (2-hydroxy-N-(4-chlorobiphenyl-2-yl)nicotinamide)	0-7.5	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.007	
	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	

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Compound	Soil depth (cm)	Sampling times (application number or days following previous application)													
		App6	1	2	3	5	7	14	30	61	90	121	180	271	316
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

Data obtained from Tables XXVI-XXXVIII, pp. 68-70.

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

NA = Not analyzed

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4. PARENT COMPOUND: In the New Jersey bareground plot, the maximum measured concentration following the sixth application (day 1) was 0.21 mg a.i./kg soil (after adjusting for the concentration present immediately prior to the sixth application), which is 60% of the applied rate (Table II, p. 27). BAS 510 F was detected in the 0-7.5 cm depth at 0.35 mg a.i./kg soil following the first application, decreased to 0.18 mg a.i./kg soil by 13 days following the first application (one day prior to the second application), was 0.57 mg a.i./kg soil following the second application, 0.71 mg a.i./kg soil following the third application, 0.79 mg a.i./kg soil following the fourth application, 0.92 mg a.i./kg soil following the fifth application, and 0.71 mg a.i./kg soil at 13 days following the fifth application (just prior to the sixth and final application; Table XI, p. 53). Following the sixth application, BAS 510 F was detected in the 0-7.5 cm depth at 0.81 mg a.i./kg soil at day 0, was a maximum of 0.92 mg a.i./kg soil at 1 day, decreased to 0.44-0.46 mg a.i./kg soil by 92 to 216 days, was 0.66 mg a.i./kg soil at 274 days, and was 0.27 mg a.i./kg soil at 359 days (the last sampling interval). BAS 510 F was detected in the 7.5-15 cm depth following the third application, but was not detected above 0.09 mg a.i./kg soil (274 days). BAS 510 F was detected in the 15-30 cm depth at 0.003-0.03 mg a.i./kg soil at 1 day and 30-216 days following the last application and was only detected once in the 30-45 cm depth (at 0.003 mg a.i./kg soil at 5 days posttreatment of the last application).

In the New Jersey turf plot, BAS 510 F was detected in the 0-7.5 cm depth at 0.24, 0.67, 0.42, 0.93, and 1.14 mg a.i./kg soil following each of the first five applications, was a maximum of 1.91 mg a.i./kg soil following the sixth application, was variable from 0.48 to 1.47 mg a.i./kg soil from 1 to 63 days, and then decreased to 0.42 mg a.i./kg soil by 216 days, 0.29 mg a.i./kg soil by 274 days, and 0.21 mg a.i./kg soil by 359 days posttreatment (the last sampling interval; Table XIV, p. 56). BAS 510 F was detected in the 7.5-15 cm depth following the sixth application, but was not detected above 0.02 mg a.i./kg soil (30-274 days), and was not generally detected below that depth.

In the Illinois bareground plot, the maximum measured concentration following the sixth application (day 5) was 0.22 mg a.i./kg soil (after adjusting for the concentration present immediately prior to the sixth application), which is 63% of the applied rate (reviewer-calculated based on the registrant-calculated zero-time core concentration reported in Table II, p. 27). BAS 510 F was detected in the 0-7.5 cm depth at 0.13-0.29 mg a.i./kg soil from 0 to 13 days following the first application, was 0.47 mg a.i./kg soil following the second application, 0.49 mg a.i./kg soil following the third application, 0.68 mg a.i./kg soil following the fourth application, 1.12 mg a.i./kg soil following the fifth application, and 0.82 mg a.i./kg soil at 13 days following the fifth application (just prior to the sixth and final application; Table XVII, p. 59). Following the sixth application, BAS 510 F was detected in the 0-7.5 cm depth at a maximum of 1.04 mg a.i./kg soil at 5 days, was variable from 0.65 to 0.82 mg a.i./kg soil from 29 to 270 days, and was 0.31 mg a.i./kg soil at 344 days (the last sampling interval). BAS 510 F was detected sporadically in the 7.5-15 cm depth at a maximum of 0.007 mg a.i./kg soil and was not detected below that depth.

In the Illinois turf plot, BAS 510 F was detected in the 0-7.5 cm depth at 0.17, 0.45, 0.28, 0.73, and 1.48 mg a.i./kg soil following each of the first five applications, ranged from 1.15 to 1.25 mg a.i./kg soil from 0 to 14 days following the sixth application, decreased to 0.82-0.91 mg a.i./kg soil by 29 to 91 days and 0.45-0.72 mg a.i./kg soil by 118-270 days, and was 0.34 mg a.i./kg soil at 344 days posttreatment (the last sampling interval; Table XX, p. 62). BAS 510 F was detected

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in the 7.5-15 cm depth throughout the study period, but was not detected above 0.06 mg a.i./kg soil (immediately following the sixth application). BAS 510 F was detected sporadically in the 15-30 cm depth following the sixth application, and was a maximum of 0.01 mg a.i./kg soil at 91 days posttreatment. BAS 510 F was not detected below the 15-30 cm depth.

In the Texas bareground plot, the maximum measured concentration following the sixth application (day 2) was 0.36 mg a.i./kg soil (after adjusting for the concentration present immediately prior to the sixth application), which is 103% of the applied rate (Table II, p. 27). BAS 510 F was detected in the 0-7.5 cm depth at 0.18-0.28 mg a.i./kg soil from 0 to 13 days following the first application, was 0.39 mg a.i./kg soil following the second application, 0.61 mg a.i./kg soil following the third application, 0.68 mg a.i./kg soil following the fourth application, 0.86 mg a.i./kg soil following the fifth application, and 0.85 mg a.i./kg soil at 13 days following the fifth application (just prior to the sixth and final application; Table XXIII, p. 65). Following the sixth application, BAS 510 F was detected in the 0-7.5 cm depth at a maximum of 1.21 mg a.i./kg soil at 2 days, decreased to 0.70-0.98 mg a.i./kg soil from 30 to 180 days, 0.45 mg a.i./kg soil by 271 days, and was 0.38 mg a.i./kg soil at 316 days (the end of the study period). BAS 510 F was detected sporadically in the 7.5-15 cm depth where it was a maximum of 0.01 mg a.i./kg soil at 316 days, and was not detected below that depth.

In the Texas turf plot, BAS 510 F was detected in the 0-7.5 cm depth at 0.21, 0.32, 0.50, 0.68, and 0.79 mg a.i./kg soil following each of the first five applications, was a maximum of 1.23 mg a.i./kg soil immediately following the sixth application, decreased to 0.61-0.65 mg a.i./kg soil by 61-121 days, was 0.27 mg a.i./kg soil at 271 days, and was 0.14 mg a.i./kg soil at 316 days posttreatment (the last sampling interval; Table XXVI, p. 68). BAS 510 F was detected in the 7.5-15 cm depth throughout the study period following the second application, but was not detected above 0.06 mg a.i./kg soil (30 days), 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. 19-22, Table III, p. 28, Figures 4-9, pp. 29-31):

New Jersey bareground plot	DT50 = 108 days	DT75 = >359 days
New Jersey turf plot	DT50 = 44 days	DT75 = 174 days
Illinois bareground plot	DT50 = 244 days	DT75 = >344 days
Illinois turf plot	DT50 = 155 days	DT75 = >344 days
Texas bareground plot	DT50 = 143 days	DT75 = >316 days
Texas turf plot	DT50 = 108 days	DT75 = 232 days

However, some of the data sets had a pronounced sigmoidal dissipation pattern, and where appropriate, the study authors used a third-order polynomial to describe the data (p. 22, Table III, p. 28, Figures 4, 5, 9, pp. 29, 31):

New Jersey bareground plot	DT50 = 300 days
Illinois bareground plot	DT50 = 307 days
Texas turf plot	DT50 = 194 days

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The dissipation pattern was not clear due to temporal and inter-replicate variability in many of the data sets.

5. TRANSFORMATION PRODUCTS: The only transformation product detected in the New Jersey bareground plot was 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide (M510F49), with a maximum concentration of 0.01 mg/kg soil (0.5% of the applied amount) observed at 1 day following the sixth application in the 0-7.5 cm soil layer (Tables XII-XIII, pp. 54-55). 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide was not detected at the end of the study period. The transformation products detected in the New Jersey turf plot were 2-chloronicotinic acid and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide (M510F49), with maximum concentrations of 0.04 mg/kg and 0.02 mg/kg (2.2% and 1.1% of the applied amount, respectively) observed following the sixth application in the 0-7.5 cm soil layer (Tables XV-XVI, pp. 57-58). 2-chloronicotinic acid and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide were not detected at the end of the study period.

The transformation products detected in the Illinois bareground plot were 2-chloronicotinic acid and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide (M510F49), with maximum concentrations of 0.003 mg/kg and 0.01 mg/kg (0.16% and 0.54% of the applied amount, respectively) observed following the sixth application in the 0-7.5 cm soil layer (Tables XVIII-XIX, pp. 60-61). 2-chloronicotinic acid and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide were not detected at the end of the study period. The transformation products detected in the Illinois turf plot were 2-chloronicotinic acid and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide (M510F49), with maximum concentrations of 0.007 mg/kg and 0.02 mg/kg (0.38% and 1.1% of the applied amount, respectively) observed following the sixth application in the 0-7.5 cm soil layer (Tables XXI-XXII, pp. 63-64). 2-chloronicotinic acid was not detected at the end of the study period and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide was detected at 0.01 mg/kg at the end of the study period.

The transformation products detected in the Texas bareground plot were 2-chloronicotinic acid and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide (M510F49), with maximum concentrations of 0.03 mg/kg and 0.02 mg/kg (1.6% and 1.1% of the applied amount, respectively), observed following the sixth application in the 0-7.5 cm soil layer (Tables XXIV-XXV, pp. 66-67). 2-chloronicotinic acid was not detected at the end of the study period and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide was detected at 0.01 mg/kg at the end of the study period. The transformation products detected in the Texas turf plot were 2-chloronicotinic acid and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide (M510F49), each with a maximum concentration of 0.02 mg/kg (1.1% of the applied amount, respectively), observed following the sixth application in the 0-7.5 cm soil layer (Tables XXVII-XXVIII, pp. 69-70). 2-chloronicotinic acid was not detected at the end of the study period and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide was detected at 0.007 mg/kg at the end of the study period.

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Tale 14: 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	
M510F49		2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide	$C_{18}H_{13}ClN_2O_2$	324.77	

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

Table 15: Dissipation routes of BAS 510 F under field conditions.

Route of dissipation	% of applied amount (at the end of study period)		
	New Jersey test site	Illinois test site	Texas test site
Accumulation (residues) in soil/ carry over ¹	15.6% and 11.8% for the bareground and turf plots, respectively.	16.7% and 20.1% for the bareground and turf plots, respectively.	21.0% and 9.1% for the bareground and turf plots, respectively.
Transformation (% of transformation products) ¹	0%	0-0.5%	0.4-0.5%
Leaching, if measured	Did not leach beyond 45 cm in the bareground plot and 15 cm in the turf plot.	Did not leach beyond 15 cm in the bareground plot and 30 cm in the turf plot.	Did not leach beyond 15 cm in either test plot.
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 and transformation were calculated by the reviewer by dividing the total parent BAS 510 F residues at the end of the study period or the total transformation products at the end of the study period by the total application rate (1.86 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 turf plots.

9. LEACHING: BAS 510 F did not leach below 15 cm in the bareground plots in Illinois and Texas, and was only detected once (at 5 days posttreatment of the last application) in the 30-45 cm soil depth in the New Jersey bareground plot (Tables XI, XVII, and XXIII, pp. 53, 59, and 65). Maximum concentrations of BAS 510 F in the bareground plots (all three test sites) were 0.92-1.21 mg a.i./kg soil in the 0-7.5 cm depth, 0.007-0.09 mg a.i./kg soil in the 7.5-15 cm depth, and 0.03 mg a.i./kg soil in the 15-30 cm depth (New Jersey bareground plot only). Compound

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movement in the New Jersey bareground plot was correlated to soil water recharge events (Figure 12, p. 36). Maximum concentrations of BAS 510 F in the New Jersey, Illinois, and Texas turf plots were 1.23-1.91 mg a.i./kg soil in the 0-7.5 cm depth, 0.02-0.06 mg a.i./kg soil in the 7.5-15 cm depth, and 0.003-0.01 mg a.i./kg soil in the 15-30 cm depth (New Jersey and Illinois turf plots only; Tables XIV, XX, and XXVI, pp. 56, 62, and 68). The transformation products 2-chloronicotinic acid and 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide did not leach beyond the 0-7.5 cm layer in any of the test plots (bareground or turf) with the exception of a single detection in the 30-45 cm depth of the Texas bareground plot at 30 days posttreatment of the last application (Tables XII, XIII, XV, XVI, XVIII, XIX, XXI, XXII, XXIV, XXV, XXVII, and XXVIII, pp. 54, 55, 57, 58, 60, 61, 63, 64, 66, 67, 69, and 70).

10. Runoff: Runoff was not studied.

11. RESIDUE CARRYOVER: DT75 values were >359 days, >344 days, and >316 days for the New Jersey, Illinois, and Texas bareground plots, and 174 days, >344 days, and 232 days for the corresponding turf plots (Table III, p. 28). After 316-359 days, 15.6%, 16.7%, and 21.0% of the total applied parent compound (1.86 mg/kg, based on three applications at a rate of 0.27 mg/kg and three applications at a rate of 0.35 mg/kg; Table II, p. 27) was detected in the bareground plots at New Jersey, Illinois, and Texas, respectively, and has the potential to carryover into the following season. Carryover from the New Jersey, Illinois, and Texas turf plots was 11.8%, 20.1%, and 9.1% of the total applied parent compound, respectively. At the end of the study, carryover of the transformation products was <1% in each test plot.

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, mean recoveries of 2-chloronicotinic acid were 93%, 96%, and 88% for the 0.01, 0.1, and 1.0 ppm fortifications, respectively, and mean recoveries of 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide were 88%, 91%, and 92% 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 because they do not pertain to the study 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, mean recoveries of 2-chloronicotinic acid were 91% and 94% for the 0.01 and 0.10 mg/kg fortifications, respectively, and mean recoveries of 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide were 84% and 91% for the 0.01 and 0.10 mg/kg fortifications, respectively (Table 1, p. 16).

Based on data reported in the storage stability study **MRID 45405224**, diphenyl ring-labeled ¹⁴C-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

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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). Recoveries of 2-hydroxy-N-(4'-chlorobiphenyl-2-yl)nicotinamide decreased from 99-111% at day 0 to 70-76% by 1 month and 75-84% by 3 months posttreatment (Tables II.A-II.B, p. 25).

III. STUDY DEFICIENCIES: No major deficiencies were noted. However, total plant residues in the turf were not reported. It is necessary to report such data so that the routes of dissipation of the applied pesticide may be adequately defined.

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 definitively determined from the data provided in this report. Leaching was minimal, the major transformation products did not show a pattern of accumulation, and data were variable (temporally and between replicates). 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 CO₂ formation, it is assumed that these were also the predominant dissipation processes in the field.
2. The registrant-calculated DT50s of BAS 510 F in the bareground plots were most accurately described using the polynomial model at the New Jersey (300 days) and Illinois (307 days) sites and the non-linear model at the Texas site (143 days; Figures 4-6, pp. 29-30). These values were comparable to the observed half-lives and the reviewer-calculated half-lives (301, 301, and 289 days, respectively; r^2 values were 0.45, 0.39, and 0.31, respectively). The reviewer-calculated half-lives were calculated 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 reviewer-calculated half-lives were calculated based on only the top 0-7.5 cm soil depth.
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 9 days) using a model based on the accumulation of soil heat units (p. 24). Results were reported in Table IV (p. 34) and shown graphically in Figure 11 (p. 33).
4. Evapotranspiration data were reported for each test location in place of pan evaporation data.
5. The reviewer noted an error in Table II (p. 27) of the study report. According to Table XVII (p. 59), the maximum concentration of BAS 510 F in soil following the last application was 1.04 mg/kg soil observed at 5 days posttreatment, which corresponds to a zero-time core concentration (adjusted for the concentration of BAS 510 F present just prior to the last application, 0.82 mg/kg) of 0.22 mg/kg and a % recovery of 62.9%. The

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reviewer reported these corrected values in the DER where appropriate and did not report the registrant-calculated values for the Illinois plot reported in Table II.

6. 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.

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The material not included contains the following type of information:

- ☐ Identity of product inert ingredients.
- ☐ Identity of product impurities.
- ☐ Description of the product manufacturing process.
- ☐ Description of quality control procedures.
- ☐ Identity of the source of product ingredients.
- ☐ Sales or other commercial/financial information.
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Chemical Name
PC Code
MRID
Guideline No.

BAS 510 F
128008
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164-1

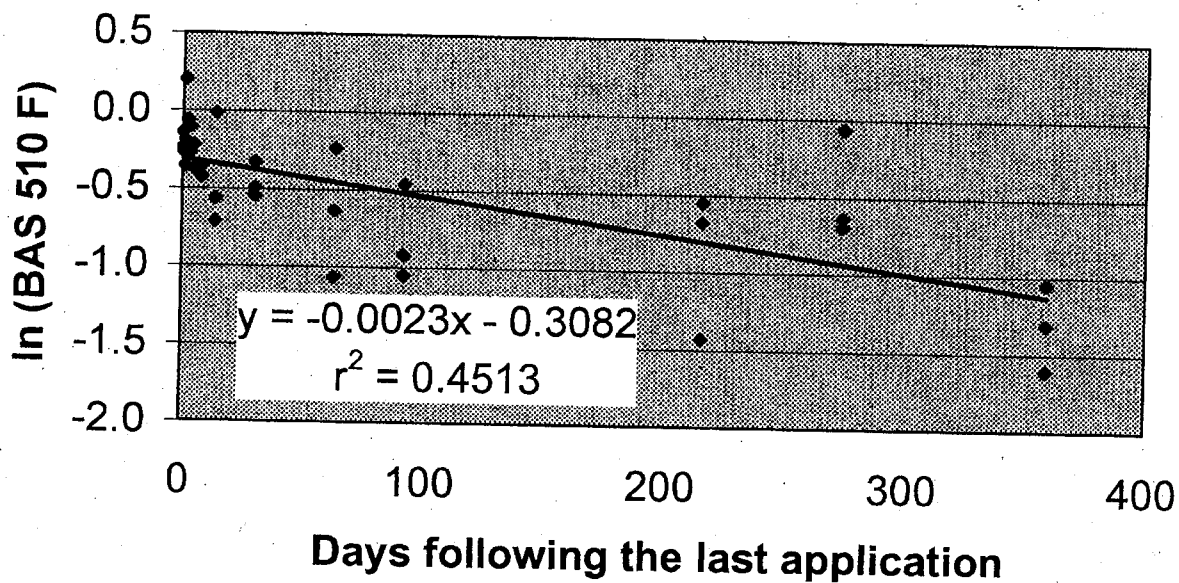
New Jersey Bare-ground Plot

Half-life (days) = 301.4

Days posttreatment of the last application	BAS 510 F (mg/kg)	Ln (BAS 510 F)
0	0.77	-0.261
0	0.87	-0.139
0	0.79	-0.236
1	0.70	-0.357
1	0.83	-0.186
1	1.225*	0.203
2	0.94	-0.062
2	0.80	-0.223
2	0.78	-0.248
3	0.90	-0.105
3	0.77	-0.261
3	0.76	-0.274
5	0.69	-0.371
5	0.69	-0.371
5	0.80	-0.223
8	0.66	-0.416
8	0.65	-0.431
8	0.70	-0.357
14	0.57	-0.562
14	0.99	-0.010
14	0.49	-0.713
30	0.72	-0.329
30	0.61	-0.494
30	0.58	-0.545
63	0.79	-0.236
63	0.53	-0.635
63	0.345*	-1.064
92	0.35	-1.050
92	0.40	-0.916
92	0.63*	-0.462
216	0.58	-0.545
216	0.51	-0.673
216	0.24	-1.427
274	0.94*	-0.062
274	0.53	-0.635
274	0.50	-0.693
359	0.35	-1.050
359	0.20	-1.609
359	0.27	-1.309

* Reviewer-calculated average of two replicates

Dissipation of BAS 510 F from the New Jersey bare-ground plot



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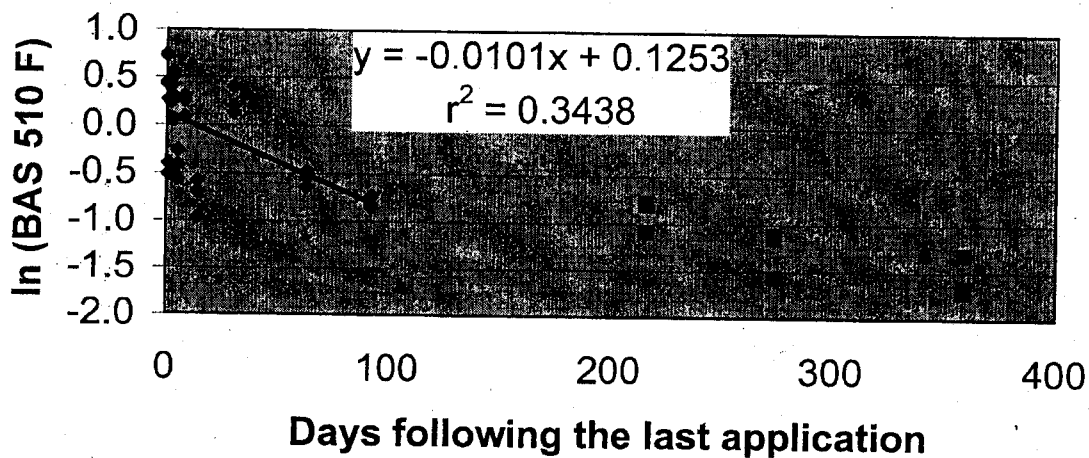
New Jersey Turf Plot
Half-life (days) = 68.6

Days posttreatment of the last application	BAS 510 F (mg/kg)	Ln (BAS 510 F)
0	2.095	0.740
0	1.55	0.438
0	2.08	0.732
1	0.67	-0.400
1	0.60	-0.511
1	1.31	0.270
2	1.51	0.412
2	1.27	0.239
2	1.63	0.489
3	1.74	0.554
3	1.06	0.058
3	1.34	0.293
5	0.77	-0.261
5	0.57	-0.562
5	0.66	-0.416
8	1.35	0.300
8	1.29	0.255
8	1.09	0.086
14	0.50	-0.693
14	0.56	-0.580
14	0.38	-0.968
30	1.50	0.405
30	1.14	0.131
30	1.22	0.199
63	0.62	-0.478
63	0.58	-0.545
63	0.53	-0.635
92	0.44	-0.821
92	0.43	-0.844
92	0.48	-0.734
216	0.46	-0.777
216	0.45	-0.799
216	0.34	-1.079
274	0.33	-1.109
274	0.32	-1.139
274	0.21	-1.561
359	0.27	-1.309
359	0.19	-1.661
359	0.18	-1.715

* Reviewer-calculated average of two replicates

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Dissipation of BAS 510 F from the New Jersey turf plot



Chemical Name

BAS 510 F

Illinois Bare-ground Plot

PC Code

128008

MRID

45405219

Half-life (days) = 301.4

Guideline No.

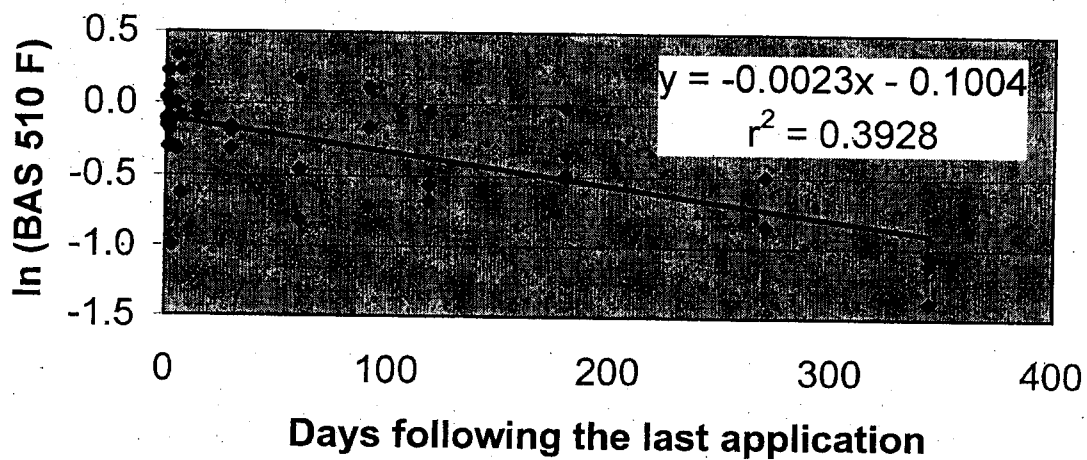
164-1

Days posttreatment of the last application	BAS 510 F (mg/kg)	Ln (BAS 510 F)
0	1.04	0.039
0	0.86	-0.151
0	0.90	-0.105
1	1.25	0.223
1	0.74	-0.301
1	0.86	-0.151
2	0.99	-0.010
2	1.12	0.113
2	0.83	-0.186
3	0.37	-0.994
3	0.89	-0.117
3	0.74	-0.301
5	1.00	0.000
5	1.40	0.336
5	0.73	-0.315
7	0.535	-0.625
7	1.26	0.231
7	0.91	-0.094
14	1.16	0.148
14	0.93	-0.073
14	0.97	-0.030
29	0.73	-0.315
29	0.85	-0.163
29	0.83	-0.186
60	0.445	-0.810
60	1.19	0.174
60	0.635	-0.454
91	0.85	-0.163
91	1.12	0.113
91	0.49	-0.713
118	0.51	-0.673
118	0.945	-0.057
118	0.57	-0.562
180	0.71	-0.342
180	0.98	-0.020
180	0.61	-0.494
270	0.43	-0.844
270	0.61	-0.494
270	0.90	-0.105
344	0.33	-1.109
344	0.35	-1.050
344	0.25	-1.386

* Reviewer-calculated average of two replicates

SD

Dissipation of BAS 510 F from the Illinois bare-ground plot



Chemical Name
PC Code
MRID
Guideline No.

BAS 510 F
128008
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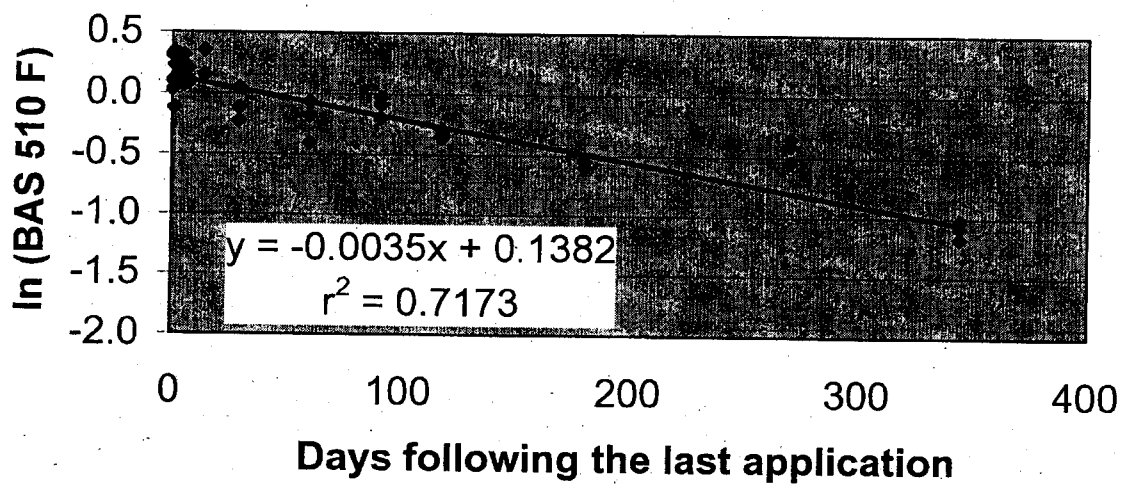
Illinois Turf Plot

Half-life (days) = 198.0

Days posttreatment of the last application	BAS 510 F (mg/kg)	Ln (BAS 510 F)
0	1.37	0.315
0	1.11	0.104
0	1.03	0.030
1	0.89	-0.117
1	1.41	0.344
1	1.26	0.231
2	1.27	0.239
2	1.07	0.068
2	1.38	0.322
3	1.15	0.140
3	1.15	0.140
3	1.17	0.157
5	1.24	0.215
5	1.07	0.068
5	1.37	0.315
7	1.12	0.113
7	1.23	0.207
7	1.09	0.086
14	1.42	0.351
14	1.16	0.148
14	1.17	0.157
29	1.05	0.049
29	0.80	-0.223
29	0.89	-0.117
60	0.94	-0.062
60	0.84	-0.174
60	0.67	-0.400
91	0.82	-0.198
91	0.92	-0.083
91	0.97	-0.030
118	0.75	-0.288
118	0.70	-0.357
118	0.72	-0.329
180	0.58	-0.545
180	0.55	-0.598
180	0.205	-1.585
270	0.67	-0.400
270	0.71	-0.342
270	0.58	-0.545
344	0.36	-1.022
344	0.34	-1.079
344	0.31	-1.171

* Reviewer-calculated average of two replicates

Dissipation of BAS 510 F from the Illinois Turf plot



Chemical Name
PC Code
MRID
Guideline No.

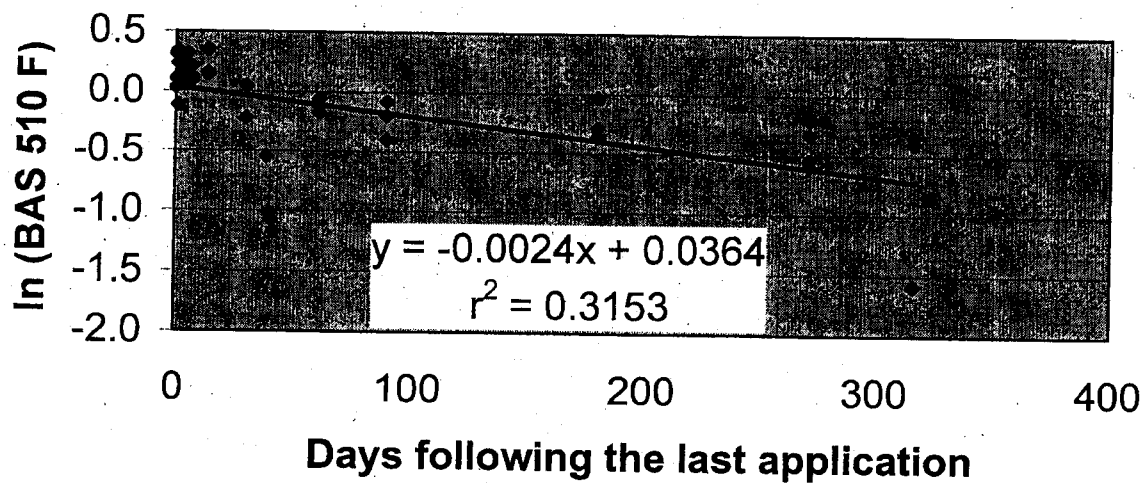
BAS 510 F
128008
45405219
164-1

Texas Bare-ground Plot
Half-life (days) = 288.8

Days posttreatment of the last application	BAS 510 F (mg/kg)	Ln (BAS 510 F)
0	1.12	0.113
0	0.95	-0.051
0	1.28	0.247
1	0.98	-0.020
1	1.32	0.278
1	1.19	0.174
2	0.95	-0.051
2	1.36	0.307
2	1.31	0.270
3	0.99	-0.010
3	1.14	0.131
3	1.32	0.278
5	1.00	0.000
5	0.87	-0.139
5	1.12	0.113
7	1.16	0.148
7	1.07	0.068
7	1.34	0.293
14	1.16	0.148
14	1.17	0.157
14	0.88	-0.128
30	1.13	0.122
30	0.97	-0.030
61	0.84	-0.174
61	1.16	0.148
61	0.94	-0.062
90	0.92	-0.083
90	0.88	-0.128
90	0.87	-0.139
180	0.69	-0.371
180	0.68	-0.386
180	0.99	-0.010
271	0.38	-0.968
271	0.51	-0.673
271	0.46	-0.777
316	0.45	-0.799
316	0.41	-0.892
316	0.29	-1.238

* Reviewer-calculated average of two replicates

Dissipation of BAS 510 F from the Texas bare-ground plot



Chemical Name
PC Code
MRID
Guideline No.

BAS 510 F
128008
45405219
164-1

Texas Turf Plot

Half-life (days) = 128.4

Days posttreatment of the last application	BAS 510 F (mg/kg)	Ln (BAS 510 F)
0	1.33	0.285
0	1.15	0.140
0	1.22	0.199
1	1.22*	0.199
1	0.71*	-0.342
1	0.875*	-0.134
2	1.36	0.307
2	1.09	0.086
2	1.01	0.010
3	1.37	0.315
3	0.98	-0.020
3	1.00	0.000
5	0.685*	-0.378
5	1.345*	0.296
5	0.73*	-0.315
7	1.08	0.077
7	0.71*	-0.342
7	1.02	0.020
14	0.83	-0.186
14	0.57*	-0.562
14	0.88	-0.128
30	0.71	-0.342
30	0.845*	-0.168
30	0.84	-0.174
61	0.71	-0.342
61	0.45	-0.799
61	0.78	-0.248
90	0.73	-0.315
90	0.55	-0.598
90	0.55	-0.598
121	0.74	-0.301
121	0.485*	-0.724
121	0.67	-0.400
180	0.70	-0.357
180	0.48	-0.734
180	0.45	-0.799
271	0.37	-0.994
271	0.20	-1.609
271	0.25	-1.386
316	0.15	-1.897
316	0.15	-1.897
316	0.11	-2.207

* Reviewer-calculated average of two replicates

Dissipation of BAS 510 F from the Texas Turf plot

