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

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

September 8, 2004

MEMORANDUM

SUBJECT: Naptalam Sodium (030703) Dislodgeable Foliar Residue Data.
Reregistration Case No. 0183. DP Barcodes 240661, 266798. MRID 44972501.

FROM: Susan V. Hummel, Branch Senior Scientist
Reregistration Branch 4
Health Effects Division (7509C)

Susan V. Hummel

THRU: Ray Kent, Branch Chief
Reregistration Branch 4
Health Effects Division (7509C)

TO: Bentley Gregg, Chemical Review Manager
Special Review and Reregistration Division (7508C)

Uniroyal Chemical Co., Inc. Crop Protection Division has submitted a dislodgeable foliar residue study on watermelons, to support the reregistration of naptalam sodium. The study DER was drafted by Versar, under contract to HED. Minor changes were made to the draft DER. The deviations from the 875 Guidelines identified by Versar are not serious enough to invalidate the study. The geographic representation of the sites chosen is adequate considering all of the cucurbit crops for which naptalam sodium is registered. This study may be used to determine post application exposure.

Attachment:
DER of MRID 44972501

Versar inc.

DER for MRID 44972501
Attachment to DP Barcode D240661, D266798
Dated 9/8/2004

MEMORANDUM

TO: Jeff Dawson cc: 3772.101

FROM: Marit Espevik/Susan Anderson

DATE: September 22, 2000

SUBJECT: Review of *ALANAP®L on Watermelons: Dislodgeable Foliar Residue Study* (MRID No. 449725-01)

This report reviews *ALANAP®L on Watermelons: Dislodgeable Foliar Residue Study,* submitted by Uniroyal Chemical Company Inc., and Excel Research Services, Inc. in support of reregistration requirements for the herbicide naptalam-Na. The requirements for this study are specified by the U.S. Environmental Protection Agency's (US-EPA) OPPTS Series 875, Occupational and Residential Exposure Test Guidelines, Group B: Postapplication Exposure Monitoring Test Guidelines, 875.2100, Dislodgeable Foliar Residue Dissipation: Agriculture. The following information may be used to identify the study:

Title:	*ALANAP®L on Watermelons: Dislodgeable Foliar Residue Study,* 256 pages	
Sponsor:	Uniroyal Chemical Company Inc 74 Amity Road Bethany, CT 06524-3402	
Field Study Test Sites:	Kevin Kiser Heartland Technologies, Inc. 12491 E. 136th Street Noblesville, IN 46060	Mark Qualls Qualls Agricultural Laboratory 3759 Dodson Road Ephrata, WA 98823
Analytical Laboratory:	North Coast Laboratories Ltd. 5680 West End Road Arcata, CA 95521	
Study Director:	Tami J. Belcher Excel Research Services, Inc. 3021 W. Dakota Avenue, Suite 110 Fresno, CA 93772	
Authors:	Tami J. Belcher Excel Research Services, Inc.	Stefan J. Korpalski Uniroyal Chemical Company, Inc.
Report Date:	November 11, 1999	
Identifying Codes:	MRID # 449725-01: Uniroyal Study No. RP-98011; Excel Study No. ERS- 98012; North Coast Study No. 20.066; Field Experiment Nos. DNJ-98-113 and JGC-98-096.	

EXECUTIVE SUMMARY

This report reviews a dislodgeable foliar residue (DFR) study submitted by Uniroyal Chemical Company Inc., and Excel Research Services, Inc. The purpose of this study was to quantify DFR levels of the active ingredient (a.i.) in *ALANAP®L*, naptalam-Na, that could be dislodged from treated watermelon foliage. *ALANAP®L* is a liquid formulation, which contains 23.7 percent sodium salt of naptalam-Na as the active ingredient (i.e., sodium 2-[(1-napthalenylamino)carbonyl]-benzoate); CAS No. 132-67-2, EPA registration number is Reg. 400-49.

The study was conducted between August 12 and November 1998, at test sites located in Indiana, and Washington. At each test site, two applications of 40 lb ai/acre (i.e., maximum label rate) *ALANAP®L* were made using groundboom sprayers. Triplicate DFR samples were collected at intervals from DAT-12 hours through DAT-35 following the second application, and analyzed for naptalam-Na.

Excel Research Services, Inc. calculated DFR dissipation rates for naptalam-Na using the linear regression feature in Microsoft EXCEL® 97 software. DFR values for DAT-12 hours through DAT-7 (Indiana) and DAT 12 hours through DAT-21 (Washington) were used to run the regression. First order kinetics were assumed to apply. The authors corrected DFR values using the daily average recovery of concurrent laboratory control samples.

Versar re-ran the dissipation kinetics analysis using individual data points for DAT-12 hours through DAT-35 for the Washington site and DAT-12 hours through DAT-7 for the Indiana test site. In accordance with EPA guidance, Versar assumed first order dissipation kinetics prevailed. Versar then applied Microsoft EXCEL®'s 7.0 linear regression function to natural log (ln) transformed and laboratory-recovery corrected data.

Versar's results agreed well with Excel Research Services, Inc. Excel Research Services, Inc. calculated dissipation half-lives for naptalam-Na ranging between 1.66 (Indiana) and 2.88 days (Washington). R-squared values for the linear regressions were 0.873 and 0.889, respectively. Versar estimated the half-life for residues at the Indiana site to be 1.45 days ($R^2 = 0.878$) and3.62 days ($R^2 = 0.908$) for the Washington site.

Versar found the study to be generally well-written and well-organized. It met OPPTS Series 875 guidelines in most significant respects. The most important discrepancies and issues of concern are identified below:

- According to July 2000 National Agricultural Statistics Service data, Georgia, Texas, California, South Carolina, Mississippi, and Alabama are the major watermelon-producing states (in order of harvested acreage). Field testing in these locations would be more representative of actual watermelon production conditions.

- Samples were collected from two locations only. Series 875 guidelines recommend testing at three geographically distinct locations.

STUDY REVIEW

Study Background

ALANAP®L is a herbicide used on a wide variety of cucurbit crops, including watermelon. *ALANAP®L* is a liquid formulation containing the active ingredient naptalam-Na, sodium salt, at 24 percent. The study presents DFR data for naptalam-Na (i.e., sodium 2-[(1-napthalenylamino)carbonyl]-benzoate; CAS No. 132-67-2, EPA registration number 400-49) residues before and after two applications of *ALANAP®L*. The data were submitted by Uniroyal Chemical Company Inc., and Excel Research Services, Inc. in support of reregistration requirements, and in response to an October 18, 1995 (amended January 10, 1997) EPA Data Call-in.

The study was performed at two geographical locations. Field-phase work was overseen and coordinated by Excel Research Services, Inc., California. On-site field work was managed by Heartland Technologies, Inc., Indiana, and Qualls Agricultural Laboratory, Washington. All samples were analyzed by North Coast Laboratories Ltd. of California. Samples were collected between August 12 and September 14, 1998, in Indiana and between July 10 and August 12, 1998 in Washington. All sample analyses were conducted between September 4 and November 11, 1998.

Test Plot

The test sites were located near Noblesville (Hamilton county) IN, and Ephrata (Grant county) WA, to represent two major climatic regions of North America. The watermelon varieties treated were Crimson Sweet in IN, and Jubilee in WA. Plot diagrams for both test sites were available for review (see pages 31-32 of the Study Report).

Each field trial consisted of two test plots: one control and one treated. Each plot was a minimum of eight rows by 100 feet. Rows one and eight were buffer rows and were not sampled. The control plots were positioned a minimum of 100 feet upwind from the treated plots.

Meteorology

Average daily minimum/maximum temperatures, and monthly rainfall are summarized on pages 119 and 127 of the Study Report. In-life rainfall events were measured from weather stations located 100 ft and 1,200 ft from the WA and IN test sites, respectively. Historical (10-year) daily temperature and monthly rainfall averages are also presented for comparison. [These historical data were obtained from NOAA stations located in Quincy, WA, about 15 miles from the WA test site, and in Indianapolis, IN, approximately 20 miles from the IN test location.]

In Washington State, July 1998 was wetter than the 10-year (1988-1997) historical average (i.e., 172 inches in 1998 while 0.46 inches is the 10-year average), while August was drier. A total of 0.02 inches fell in August 1998, while the 10-year historical average is 0.31 inches. Rainfall at the IN site was less than one-half the historical average during August and less than one tenth the historical average during September. July rainfall was approximately the same as the historical average. As shown in Table 1, test plots were not irrigated during the field trial. Indiana's rainfall in June was unusually high (i.e., 10.02 inches). An application of *ALANAP®L* was made on June 4, 1998, but the sampling was

discontinued due to poor crop emergence. The test location was moved, and a first application of *ALANAP®L* was made on July 3, 1998. September rainfall was about normal.

For each herbicide application day, further detail is provided, including relative humidity, soil temperatures, windspeed, wind direction, cloud cover, estimated soil moisture, etc. See pages 115 and 124 of the Study Report.

In Washington State, rainfall was measured at a weather station located approximately 100 feet from the site. There were 9 rainfall events from the first application to the final sampling event (May 28, 1998 to August 12, 1998). Total rainfall during the period was 2.34 inches. There were also 18 irrigation events during the sampling period, totaling 17.76 inches. Plots were irrigated with drip tape and placed 4 inches below the surface according to normal watermelon-growing practice. Emitters were spaced every 12 inches in each row, and approximately 0.08 acre of inches of water was delivered per hour. Plots were not watered within 6 days of an application event.

In Indiana, rainfall was measured at a weather station located approximately 1200 feet from the test site. Twenty-three rain events occurred during the trial period, but none coincided with an application day. Rainfall occurred the day following each application. No irrigation was applied at the test site during the sampling period.

Table 1, below, tabulates rainfall/irrigation events and associates them with dates of application and sampling.

Table 1 - Timing of Rainfall/Irrigation Events vs. Application/Sampling Events

Test Location	Application/Sampling Date	Rainfall/Irrigation Event Date	Amount (inches)
Indiana	**App 1- July 3, 1998**	7/4/98	1.08
		7/6/98	0.02
		7/7/98	0.08
		7/17/98	0.21
		7/18/98	0.09
		7/19/98	0.77
		7/20/98	0.23
		7/21/98	0.03
		7/22/98	0.78
		7/23/98	0.17
		7/30/98	0.32
		7/31/98	0.06
		8/4/98	0.06
		8/5/98	0.40
		8/6/98	0.25
		8/7/98	0.24
		8/8/98	0.12

Test Location	Application/Sampling Date	Rainfall/Irrigation Event Date	Amount (inches)
		8/9/98	0.01
	App 2 - August 10, 1998		
	DAT-1	8/11/98	0.17
	DAT-21	8/24/98	0.42
		8/28/98	0.06
		9/7/98	0.11
		9/10/98	0.06
Washington	**App 1- May 29, 1998**	6/3/98	1.92 (irrig'n)
		6/5/98	0.35
		6/6/98	0.04
		6/7/98	0.01
		6/8/98	0.09
		6/9/98	1.92 (irrig'n)
		6/15/98	0.12
		6/15/98	1.92 (irrig'n)
		6/18/98	0.01
		6/20/98	1.92 (irrig'n)
		6/24/98	0.8 (irrig'n)
		6/27/98	0.8 (irrig'n)
		6/30/98	0.8 (irrig'n)
		7/2/98	0.48 (irrig'n)
		7/2/98	0.41
		7/3/98	0.73
		7/7/98	0.96 (irrig'n)
	App 2- July 8, 1998		
		7/13/98	0.64 (irrig'n)
	DAT-10	7/18/98	0.8 (irrig'n)
	DAT-14	7/22/98	0.8 (irrig'n)
		7/25/98	0.64 (irrig'n)
		7/27/98	0.8 (irrig'n)
		7/31/98	0.58
		8/1/98	0.8 (irrig'n)
		8/5/98	0.64 (irrig'n)
		8/9/98	0.48 (irrig'n)
	DAT-35	8/13/98	0.64 (irrig'n)

Materials and Equipment

A product label was provided in the Study Report for review purposes *(ALANAP®L* [EPA Reg. No. 400-49]). The maximum application rate is 2 gallons of *ALANAP®L* formulated product in 20 to 40 gallons/Acre (i.e., 4.0 lb ai/A). The label instructs the user to "Apply *ALANAP®L* pre-emergence immediately after planting (within 48 hours). A second application may be made before plants start to vine, but before weeds have emerged."

In this study, the maximum label rate of 8.0 qt formulated product was applied per acre using ground application equipment calibrated to deliver approximately 20 gallons per acre spray volume (i.e., 4.0 lb ai/A). Applications were made 38 days apart in Indiana and 41 days apart in Washington. Two applications were made at each of the test sites. The author points out that the first application was made pre-emergence, within 48 hours of planting and the second application was made when the plants were vining at both trial sites.

In Washington, " a Honda sprayer equipped with a 3 gallon stainless steel beverage can with bypass recirculation on a 10 feet rear mounted boom was used for each application. The boom was equipped with six Spray System XR8003 VK nozzles at 20 inch spacings operating at approximately 32 psi." The equipment was calibrated prior to the first application of *ALANAP®L.*

In Indiana, "a R & D sprayer with a 3 point hitch and CO2 off-set 10 feet boom, equipped with a 3 gallon stainless steel canister, was used for each application. The sprayer was mounted on an IH 284 tractor. The boom was equipped with eight TeeJet XR 11002VS nozzles at 15 inch spacings operating at approximately 30 psi."

Pesticide Use & Orchard Maintenance History

Detailed crop maintenance and pesticide use history (back to 1995) with application rates was provided (see pages 113 and 122 of the Study Report). At the Washington site, one or two pesticides per year are listed as having been used in prior years, including 2,4-D, Ethalfluralin, Aldicarb, and EPTC. At the Indiana site, the pesticides Diglycolamine Salt of Dicamba Nicosulfuron Glyphosate, Trifluralin, Permethrin, and Diazinon were applied to the site at different times in the 3 years prior to the study. The herbicide Sethoxydim was applied 11 days prior to the second application of *ALANAP®L.*

No cultural practices were performed during the trial in Washington State. In Indiana, sampling at the original site was discontinued due to heavy rain and poor crop emergence. A second plot was chisel plowed on November 10, 1997, disked and cultipacked on May 18, 1998, rototilled on June 3, 1998, the treated plot was rototilled and replanted on July 2, 1998, and all plots were hand weeded on August 7, 1998.

DFR Sample Collection

Samples were collected at the following intervals: prior to each application, then at intervals following the second application, i.e., DAT-12 hours, DAT-2, DAT-4, 7, 10, 14, 21, 28 (29 in Indiana), and 35. Triplicate samples were collected at each sampling interval.

Leaf disc samples were collected using a 2.54 cm diameter Birkestrand leaf punch. The leaf punch was fitted to a prelabeled glass amber jar which received the leaf discs directly. Separate leaf punches were used for the control and treated plots. All leaf punch samples were collected when the foliage was dry except for the Postapplication (12 hour) sampling event in Indiana where some leaves were observed to be wet. The control plot was sampled prior to the treated plot to minimize cross-contamination. Three replicates of 40 leaf discs each and two untreated replicates, each containing 40 leaf discs, were collected at each sampling interval. The author states that leaf discs were "impartially collected from all areas of the plants within each subplot." Leaf discs were transported to the field laboratory in ice chests containing blue ice.

Samples were dislodged within three hours of field collection with 0.01% v/v Aerosol OT 75 solution by adding 100 mL into each jar. The jars were capped then placed on an Eberbach reciprocating shaker operating at 200 cycles per minute for approximately 10 minutes. The discs were separated from the solution by decanting the solution into a clean, prelabeled amber glass jar. An additional 100 mL of the 0.01% v/v Aerosol OT 75 solution was added to the leaf discs and the dislodging process repeated. The sample jars were then secured with their teflon-lined lids and placed in a freezer used for transport. Samples were later transferred into freezers located at the field facility.

QA/QC

Sample Handling & Storage

In the field, leaf discs were transported to the field laboratory in ice chests containing blue ice and samples were dislodged within three hours of field collection. Samples were later transferred into freezers located at the field facility. All samples were frozen on the day of collection. Frozen samples were shipped to North Coast Laboratories, located in Arcata, CA, via ACDS freezer truck service. At the analytical laboratory, samples were stored at -20°C ± 10°C .

Analytical Methodology

The analytical method was validated prior to initiation of the DFR study. The methodology involved hydrolysis of a portion of the dislodging solution sample with sulfuric acid:water, adding sodium chloride to the hydrolysate to increase the ionic strength of the solution. The solution was then made basic, and the hydrolysis product was extracted into acetonitrile. The acetonitrile extract was analyzed for 1-aminonapthalene using a liquid chromatograph with a fluorescence detector.

A copy of the analytical method used in this study, North Coast Laboratories Ltd. Method ME 001 04, was included for review (Appendix C of the Study Report).

Sample chromatograms for the *ALANAP®L* analyses showed good peak separation and sharpness of peaks.

Sample History

A chronological list of events appears on pages 121 and129 of the Study Report. Sampling dates, sample shipment dates, sample receipt dates, and dates of sample extraction and sample analysis are listed for each sample collected.

Limits of Detection (LOD) & Limit of Quantitation (LOQ)

The reported limit of quantification (LOQ) was 20 μg/200 mL sample (0.10 μg/mL) for *ALANAP®L*. The procedure for determination of the limit of detection (LOD) was discussed on page 236 of the Study Report.

Method Validation

A method validation was performed using untreated control dislodging solution samples that had been handled in the same way that the study control samples were handled. The sample set for the method performance verification consisted of a reagent blank, two untreated control samples, and triplicate control samples fortified with *ALANAP®L* at each of three fortification levels; 20 μg/200 mL (1xLOQ), 200 μg/200 mL (10xLOQ), and 2,000 μg/200 mL (100xLOQ). Over all fortification levels, the average percent recovery for the method verification was 93.3 ± 5.6 percent.

Laboratory Recovery

Two concurrent laboratory fortification samples were extracted and analyzed with each set of samples. The concurrent fortifications were prepared at concentrations between 20 μg and 2,000 μg *ALANAP®L*/200 mL and at a level greater than the highest observed residue. Recoveries from concurrent laboratory fortifications of *ALANAP®L* ranged from 81.4 to 99.8 percent, with an average recovery of 91.2 ± 5.5 percent.

Storage Stability Recovery

The stability of *ALANAP®L* during sample storage was studied by preparing four fortifications at 100 μg *ALANAP®L*/200 mL sample using untreated control dislodging solution samples that had been handled in the same way that the study control samples were handled. The four fortifications and two unfortified control samples were stored frozen. After the last set of experimental samples was analyzed, the stored samples were analyzed and demonstrated stability when samples are stored under frozen conditions for a storage of 82 days. The storage stability verification set included the four stored fortifications, one of the controls fortified as a fresh concurrent fortification at 100 μg /200 mL, and the other control sample unfortified. The average corrected percent recovery

Field Fortification Recovery

Sets of field fortifications were prepared at each field site using untreated control dislodging solution samples. At each of three sampling intervals, field fortifications were prepared in triplicate at 50 μg/200 mL sample and at 1,000 μg/200 mL *ALANAP®L* sample. These levels were 2.5 times and 50 times the LOQ, respectively. Field fortified samples were generated on 7 days prior to the second application; DAT-7, postappliation 2, and DAT-21, postapplication 2. The field fortification samples

were analyzed with two concurrent lab fortified samples and a control sample. Field fortification results were corrected for the average percent recovery (<100 percent) in concurrent laboratory fortifications. The average corrected percent recoveries were 103 ± 5.9 percent for the field fortifications from the Washington site, and 97.2 ± 4.2 percent for the field fortifications from the Indiana site. Versar broke down the averages by fortification level, as shown below in Table 2.

Table 2 - Fortified Field Recovery Values by Fortification Level

DFR	µg/200 mL sample	Washington (Percent)	Indiana (Percent)
Naptalam-Na	50	96.7 (N=9)	95.2 (N=9)
	1,000	104.5 (N=9)	94.7 (N=9)
	Overall	100.6 (N=18)	94.9 (N=18)

Sample Calculations

Chapter IV Analytical Procedures of the Study Report contains raw naptalam-Na DFR data, including sample extraction and injection dates. Quantitation was done based on a linear external standard response curve.

Calculation of ALANAP®L concentration was accomplished using the following formula:

$$Y = bX + a$$

where Y = area counts for analyte
X = concentration of analyte
a = intercept constant from linear regression
b = slope constant from linear regression

Sample calculations are provided on page 149 through 153 of the Study Report. Versar spot-checked a few of the calculations, using the above equations, and assuming a sample volume of 200 mLs and a sample surface area of 400 cm^2 (this value was used by Excel Research Services, Inc.; Versar would not use the rounded number and would use 405.16 cm^2/sample).

Results

Measured Naptalam-Na values in the WA site ranged from 5,510 (uncorrected) µg/sample at DAT-12 hours to less than LOQ (20 µg/sample) at DAT-28. At the Indiana site residue values ranged from 454 (uncorrected) µg/sample at DAT-12 hours to <LOQ at DAT-7 following the second application. A high percentage of sample data from Indiana fell below the LOQ (63 percent). Also, many of the sample data from Indiana fell below the "lowest" field fortification level of 50 µg/sample (see Table 3, below, for a breakdown).

Table 3. Summary of Naptalam-Na DFR Data

Study Sample Set (after second application)	Maximum value µg/sample and Day Attained	Minimum value µg/sample and Day Attained	Number of Samples < 50 µg/sample
Washington	5510 (Day 0-0.5 hours)	< LOQ (Day 21)	7/27
Indiana	454 (Day 0-0.5 hours)	< LOQ (Day 7)	15/24

Note: Lowest fortification level = 50 µg/sample LOQ = 20 µg/sample

Excel Research Services, Inc. performed a statistical analysis of the four data-sets as follows. Individual residue values were used for regression of the decline data, corrected using the average percent recovery of the method fortification samples in the analytical set where recoveries were less than 100 percent. Linear regression of results following the second application was performed for determination of half-life. Values based on linear regressions conducted on all ln (DFR) measurements vs. time, as follows:

- WA: Application 2 through DAT-21, Post application 2
- IN: Application 2 through DAT-7, Post application 2

Versar re-ran the dissipation kinetics analysis assuming pseudo-first order kinetics, in accordance with US-EPA requirements. Versar included all individual data points (not averages) for DAT-0 through DAT-35 after the second application at the Washington site, and for DAT-0 through DAT-7 at the Indiana test site. Versar did not correct because the overall average fortified recovery values were above 100 percent. Versar calculated residue values using a leaf surface area of 405.16 cm^2, and then applied Microsoft EXCEL®'s Version 7.0 linear regression function to log (ln) transformed data.

See Table 4 for a comparison between Excel Research Services, Inc. and Versar-calculated residue half-lives.

Table 4. Naptalam-Na Half-lives as Estimated by Excel Research Services, Inc. and Versar

Regression Method	Washington		Indiana	
	Half-life (days)	Correlation Coefficient (R^2)	Half-life (days)	Correlation Coefficient (R^2)
Calculated by Excel Research Services	2.88	0.889	1.66	0.873
Calculated by Versar	3.62	0.909	1.45	0.878

Compliance Checklist

Compliance with OPPTS Series 875, Occupational and Residential Exposure Test Guidelines, Group B: Postapplication Exposure Monitoring Test Guidelines, 875.2100, Transferable Residue Dissipation: Agriculture, is critical. The itemized checklist below describes compliance with the major technical aspects of OPPTS 875.2100, and is based on the "Checklist for Residue Dissipation Data" used for study review by the U.S. EPA/OPP/HED.

- *Typical end use products of the active ingredient used.* This criterion was met.

- *Dislodgeable foliar residue (DFR) data to be collected from at least three geographically distinct locations for each formulation.* This criterion was not met. Samples were collected from two locations. According to July 2000 National Agricultural Statistics Service data, Georgia, Texas, California, South Carolina, Mississippi, and Alabama are the major watermelon-producing states (in order of harvested acreage). Field testing in these locations would be more representative of actual watermelon production conditions.

- *End use product applied by application method recommended for the crop. Application rate given and should be at the least dilution and highest, label permitted, application rate.* These criteria were met.

- *If multiple applications are made, the minimum allowable interval between applications should be used.* This criterion was mostly met. Two applications were made at each test site. However, the label instructs the user to "apply *ALANAP®L* pre-emergence immediately after planting (within 48 hours). A second application may be made before plants start to vine, but before weeds have emerged." The first application was made pre-emergence, within 48 hours of planting but the second application was made when the plants were vining, not before they start to vine, at both trial sites.

- *Sampling should be sufficient to cover three half-lives and establish a dissipation curve. Recommended sampling intervals are 1 hour, 4 hours, 8 hours, 12 hours, 1, 2 and 3 days after application.* This criterion was only partially met. Samples were collected at DAT-12 hours, DAT-2, DAT-4, DAT-7, DAT-10, DAT-14, DAT-21, DAT-28 (29 in Indiana), and DAT-35. However no positive data were generated at the Indiana site after DAT-7, indicating that shorter sampling intervals were needed to adequately establish a dissipation curve.

- *Reported residue dissipation data in conjunction with toxicity data must be sufficient to support the determination of a reentry interval.* This criterion was probably met. No toxicity data were provided with this study report.

- *Triplicate, randomly collected samples to be collected at each sampling interval.* This criterion was satisfied.

- *Control and baseline foliar or soil samples collected.* The criterion was met. No soil samples were collected.

Regression Analysis: Summary Output for naptalam-na (Indiana)

Regression Statistics	
Multiple R	0.937191
R Square	0.878326
Adjusted R^2	0.866159
Standard Error	0.473561
Observations	12

ANOVA

	df	*SS*	*MS*	*F*	*Signif. F*
Regression	1	16.1887	16.1887	72.187095	6.92399E-06
Residual	10	2.242603	0.22426		
Total	11	18.4313			

	Coeff.	*Std. Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	-0.070591	0.233742	-0.302005	0.7688357	-0.59139976	0.450217495
Slope	-0.477294	0.056177	-8.496299	6.924E-06	-0.602463163	-0.352124302

Half Life = 1.452244 Days

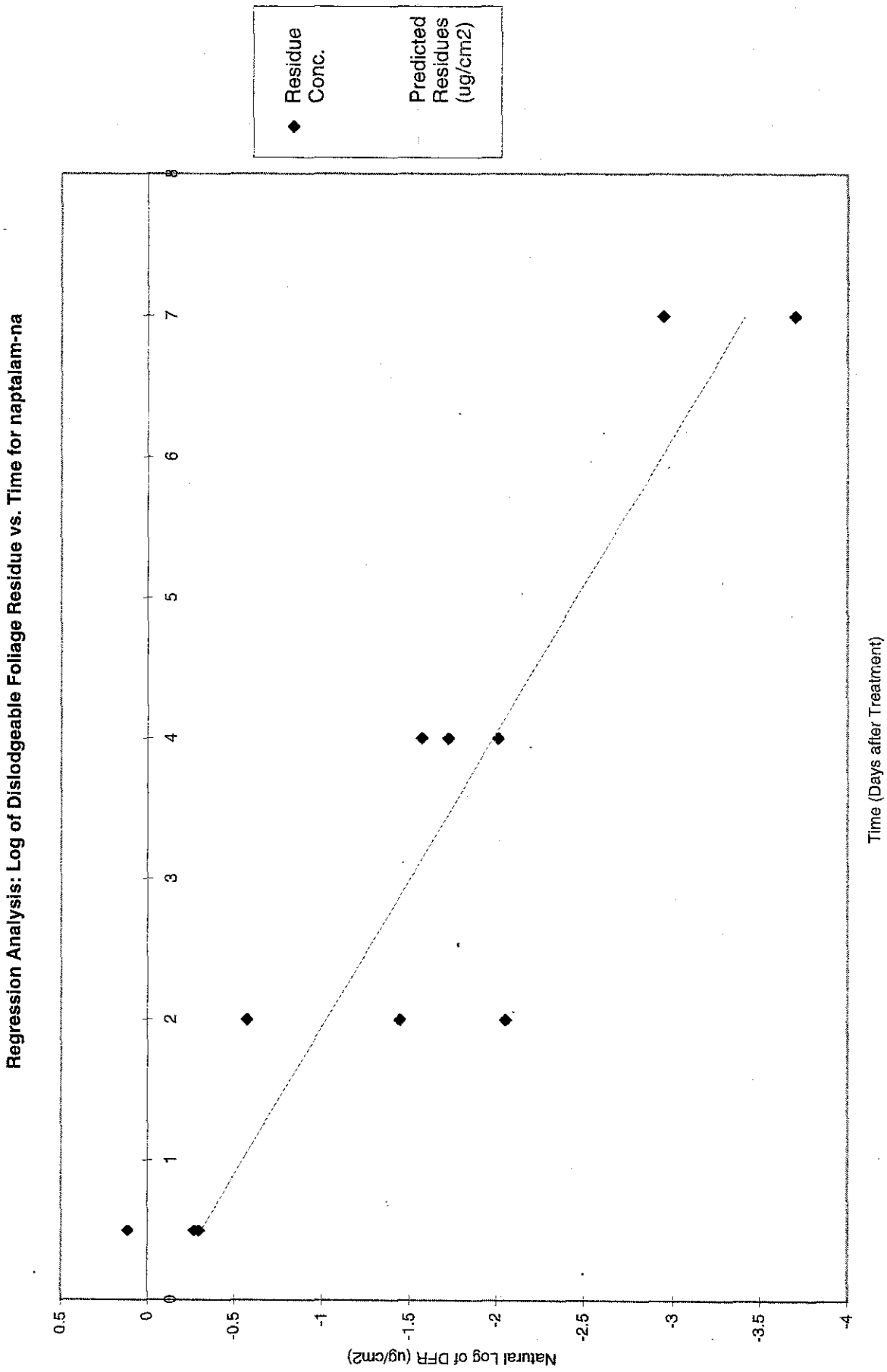
Predicted DFR Levels

Time (Days)	Residue (ug/cm2)
0	0.931843
1	0.578171
2	0.358732
3	0.222579
4	0.138102
5	0.085687
6	0.053165
7	0.032987
8	0.020467
9	0.012699
10	0.007879
11	0.004889
12	0.003033
13	0.001882
14	0.001168
15	0.000725
16	0.00045
17	0.000279
18	0.000173
19	0.000107
20	6.66E-05

Time (Days)	Residue (ug/cm2)
21	4.134E-05
22	2.565E-05
23	1.591E-05
24	9.874E-06
25	6.126E-06
26	3.801E-06
27	2.358E-06
28	1.463E-06
29	9.079E-07
30	5.633E-07
31	3.495E-07
32	2.169E-07
33	1.346E-07
34	8.349E-08
35	5.18E-08

Regression Analysis: Means and CVs for naptalam-na

Days after Last Treatment	Residues (ug/cm2)	Mean (ug/cm2)	Standard Deviation (ug/cm2)	Coefficient of Variation (%)
0.5	0.742916	0.875	0.213	24.3
	0.762662			
	1.120545			
2	0.128098	0.309	0.226	73.3
	0.235709			
	0.562741			
4	0.208313	0.174	0.0374	21.5
	0.178942			
	0.134021			
7	0.024682	0.034	0.0161	47.4
	0.024682			
	0.052572			


Regression Analysis: Log of Dislodgeable Foliage Residue vs. Time for naptalam-na
Residue Conc.
Predicted Residues (ug/cm2)
Natural Log of DFR (ug/cm2)
Time (Days after Treatment)
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
0
1
2
3
4
5
6
7
8

Regression Analysis: Summary Output for naptalam-na (Washington)

Regression Statistics	
Multiple R	0.944563
R Square	0.892198
Adjusted R^2	0.886525
Standard Error	0.604566
Observations	21

ANOVA

	df	*SS*	*MS*	*F*	*Signif. F*
Regression	1	57.4747	57.4747	157.24969	1.2277E-10
Residual	19	6.944492	0.3655		
Total	20	64.41919			

	Coeff.	*Std. Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	2.436893	0.210278	11.58889	4.657E-10	1.996774991	2.877010468
Slope	-0.245699	0.019593	-12.53992	1.228E-10	-0.286708471	-0.204689744

Half Life = 2.821122 Days

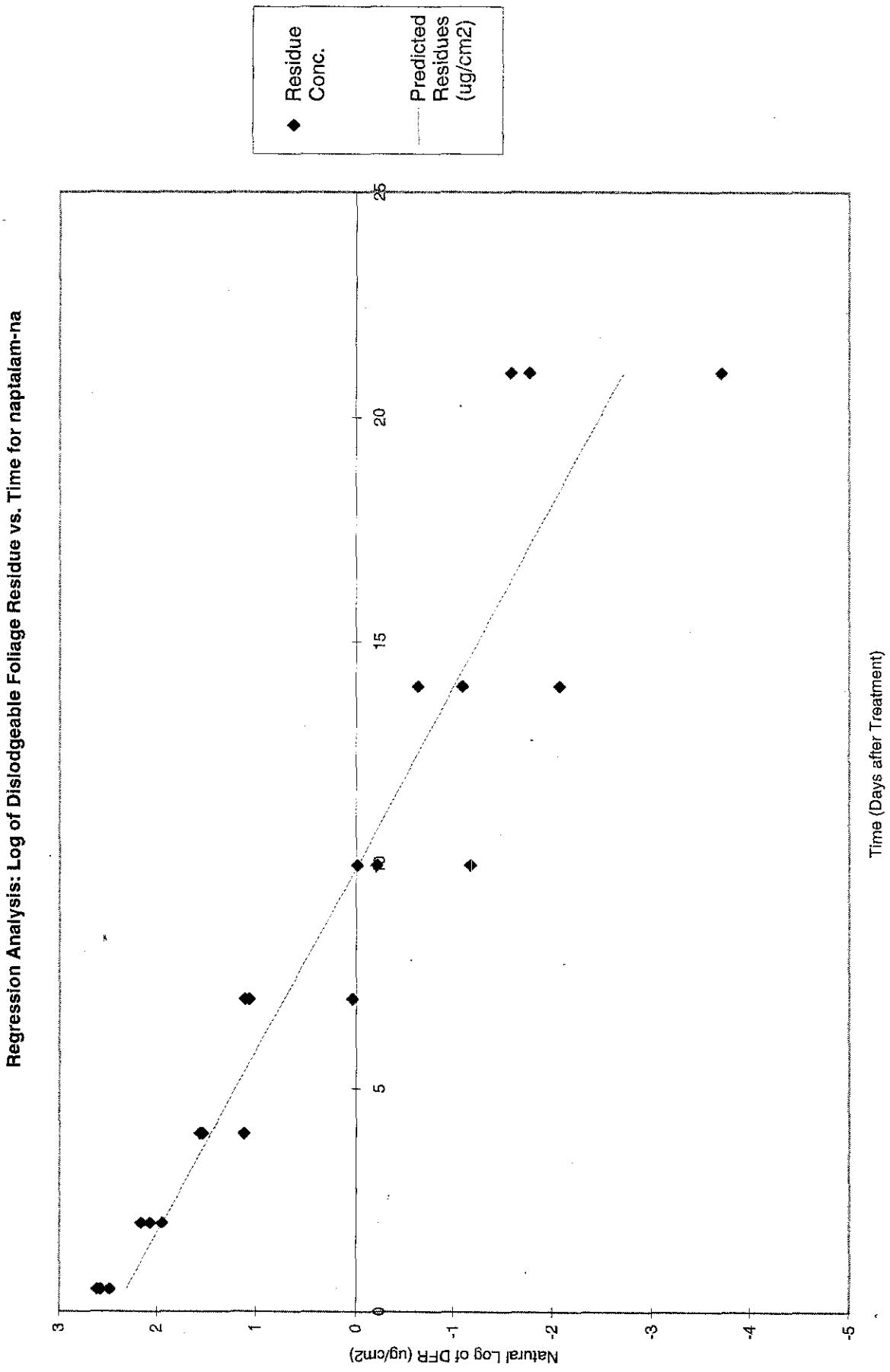
Predicted DFR Levels

Time (Days)	Residue (ug/cm2)
0	11.43745
1	8.945885
2	6.997091
3	5.472828
4	4.280613
5	3.348114
6	2.618753
7	2.048277
8	1.602075
9	1.253075
10	0.980102
11	0.766594
12	0.599598
13	0.46898
14	0.366816
15	0.286908
16	0.224407
17	0.175522
18	0.137286
19	0.107379
20	0.083987

Time (Days)	Residue (ug/cm2)
21	0.0656913
22	0.051381
23	0.040188
24	0.0314333
25	0.0245858
26	0.01923
27	0.0150409
28	0.0117643
29	0.0092016
30	0.0071971
31	0.0056292
32	0.004403
33	0.0034438
34	0.0026936
35	0.0021068

Regression Analysis: Means and CVs for naptalam-na

Days after Last Treatment	Residues (ug/cm2)	Mean (ug/cm2)	Standard Deviation (ug/cm2)	Coefficient of Variation (%)
0.5	13.1553	12.9	0.801	6.21
	13.59957			
	12.04462			
2	8.687926	7.88	0.828	10.5
	7.922796			
	7.034258			
4	4.788232	4.17	0.964	23.1
	4.664824			
	3.060519			
7	2.91243	2.33	1.12	48
	3.035838			
	1.039096			
10	0.989732	0.703	0.352	50
	0.809557			
	0.310988			
14	0.33567	0.33	0.201	61.1
	0.528186			
	0.125383			
21	0.170303	0.134	0.0962	71.8
	0.206338			
	0.024682			


Regression Analysis: Log of Dislodgeable Foliage Residue vs. Time for naptalam-na
Residue Conc.
Predicted Residues (ug/cm2)
Natural Log of DFR (ug/cm2)
3
2
1
0
-1
-2
-3
-4
-5
0
5
10
15
20
25
Time (Days after Treatment)

13544

R102182

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