Data Evaluation Report on the aerobic biotransformation of SXX0665 (JAU6476-desthio) in soil

PMRA Submission Number 2004-0843 EPA MRID Number 46246513

Data Requirement:

PMRA DATA CODE:	8.2.3.4.2
EPA DP Barcode:	DP 303488
OECD Data Point:	IIA 7.1.1, IIA 7.2.3
EPA Guideline:	162-1

Test material:

Common name: SXX 0665

chemical name:

IUPAC: (R,S) 2-(1-chlorocycloproyl)1-(2-chlorophenyl)-3-(1,2,4-triazol-1-yl)-propan-2-ol

CAS name: 2-(1-Chlorocyclopropyl)1-(2-chlorophenyl)-3-(1,2,4-triazol-1-yl)-propan-2-ol

CAS No: 120983-64-4

synonyms: JAU 6476-desthio

SMILES string: ClC1(C(Cc2ccccc2Cl)(CN2N=CNC2)O)CC1.

Primary Reviewer (officer number): Émilie Larivière (#1269), EAD, PMRA **Signature:** **Date:** March 14, 2005 3/14/05

Secondary Reviewer (officer number): Scott Kirby (#1103), EAD, PMRA **Signature:** **Date:** April 27, 2005

Secondary Reviewer(s) (officer number): Roxolana Kashuba (EPA/OPP/EFED/ERB4) **Signature:** **Date:** Aug. 17, 2005 8/17/05

Company Code: BCZ
Active Code: PRB
Use Site Category: 7, 13, 14 (Industrial Oil Seed Crops and Fibre Crops, Terrestrial Feed Crops, Terrestrial Food Crops)
EPA PC Code: 113961

CITATION: Gilges, M. 2001. Degradation of JAU6476-desthio (SXX0665) in Four Soils under Aerobic Conditions. Performing Laboratory: Bayer AG Crop Protection Business Group, Germany. Bayer CropScience, North Carolina. Unpublished. Report No. MR-327/00. 29 June 2001; amended 31 July 2001.

EXECUTIVE SUMMARY:

The biotransformation of [phenyl-UL-^{14}C] 2-(1-Chlorocyclopropyl)1-(2-chlorophenyl)-3-(1,2,4-triazol-1-yl)-propan-2-ol (JAU6476-desthio; SXX0665), a transformation product of prothioconazole (JAU6476), was studied in Höfchen **silt loam** (pH: 7.3, organic carbon: 1.55%) from Nordrhein-Westfalen (Germany), Laacher Hof A III **silt loam** (pH: 7.9, organic carbon: 0.98%) from Nordrhein-Westfalen (Germany), Laacher Hof A XXa **sandy loam** (pH: 7.2, organic carbon: 1.02%) from Nordrhein-Westfalen (Germany), and Stanley **silty clay** (pH 6.3, organic carbon: 1.46%) from Kansas (USA) for 120 days under aerobic conditions in the dark at 20±1°C and 40% of the maximum water holding capacity. [Phenyl-UL-^{14}C]Prothioconazole-desthio was applied at a rate of 0.0927-0.0955 mg JAU6476-desthio/kg soil (15 cm depth, bulk density of 1.5 g/cm^3), equivalent to 217.5 g JAU6476-desthio/ha (resulting from a seasonal maximum rate for prothioconazole seasonal maximum rate of 600 g a.i./ha and a maximum level of the transformation product of about 40% of the applied radioactivity). The experiment was conducted in accordance with the EC Directive 91/414/EEC Annex I Part 7 and Annex II Part 9 and the SETAC Procedure for Assessing the Environmental Fate and Ecotoxicity of Pesticides, and in compliance with German and OECD GLP standards. The test system consisted of Erlenmeyer flasks attached with traps for the collection of CO_2 and volatile organics. Samples were analysed at 0, 1, 3, 7, 14, 30, 59/63, 90 and 120 days of incubation. The soil samples were extracted three times with acetonitrile/water (80:20 v/v) on a shaker. Volatile organic compounds were extracted with ethylacetate while $^{14}CO_2$ was liberated with HCl and purged into Liquid Scintillation cocktails with nitrogen. The radioactivity was quantified by Liquid Scintillation Counting (LSC) and extracts were analysed and identified by Reverse Phase-Thin Layer Chromatography (RP-TLC) for prothioconazole-desthio and transformation products. Confirmation of the quantitative results was made by Normal Phase-TLC. The extracted soil samples were oxidized by combustion and non-extractable radioactivity was quantified by LSC.

Mean overall recovery was 94.1±1.8% of the applied amount (range: 90.7-96.6% of the applied) in the Höfchen silt loam, 97.1±3.2% of the applied (range: 89.7-101.2% of the applied) in the Laacher Hof A III silt loam, 96.2±2.5% of the applied (range: 92.6-99.1% of the applied) in the Laacher Hof A XXa sandy loam and 94.2±1.6% of the applied (range: 91.4-96.6% of the applied) in the Stanley silty clay. No pattern of decline in material balances was observed. The concentration of [phenyl-UL-^{14}C]prothioconazole-desthio decreased from an average of 83.8%, 88.9%, 87.6% and 79.7% of the applied amount on day 0 in Höfchen silt loam, Laacher Hof A III silt loam, Laacher Hof A XXa sandy loam and Stanley silty clay, respectively, to 19.6%, 9.0%, 2.3% and 6.2% of the applied amount at the end of the study period (120 days). Fifty percent transformation occurred in all soils within 14 days, with the exception of the Laacher Hof A III silt loam, where fifty percent transformation occurred within 30 days. In all soils except for the Laacher Hof A III silt loam which followed simple first order transformation kinetics, an initial rapid transformation phase was followed by a second slow transformation phase, with detectable levels of the parent material after 120 days The PMRA reviewer-calculated DT_{50} (50% decline time) values of [^{14}C]prothioconazole-desthio in aerobic Hofchen silt loam, Laacher Hof A III silt loam, Laacher Hof A XXa sandy loam, and Stanley silty clay were 10.8 days, 24.4 days, 5.8 days and 15.9 days, respectively using first-

order multi-compartment models of exponential decay. The EPA reviewer-calculated half-lives (50% decline time) of [^{14}C]prothioconazole-desthio in aerobic Hofchen silt loam, Laacher Hof A III silt loam, Laacher Hof A XXa sandy loam, and Stanley silty clay were 55.5 days, 45.3 days, 22.6 days and 30.3 days, respectively, using linear regression on log-transformed data, and 29.4 days, 29.0 days, 6.8 days and 18.6 days, respectively, using nonlinear regression on non-transformed data. Additionally, the EPA reviewer-calculated half-lives (50% decline time) of [^{14}C]prothioconazole-desthio and bound residues in aerobic Hofchen silt loam, Laacher Hof A III silt loam, Laacher Hof A XXa sandy loam, and Stanley silty clay were 165.0 days, 113.6 days, 86.6 days and 128.4 days, respectively, using linear regression on log-transformed data, and 144.4 days, 106.6 days, 63.6 days and 115.5 days, respectively, using nonlinear regression on non-transformed data.

No major transformation products were detected. Minor unidentified transformation products M1 and M2 and an unspecified number of other unidentified minor transformation products (reported together) were detected at maximum concentrations of 3.6%, 7.9% and 5.8% of the applied radioactivity, respectively, in any soil. The total unidentified radioactivity in the organic extract was 2.2% to 11.1% of the applied in single replicates in any soil.

For Höfchen silt loam, Laacher Hof A III silt loam, Laacher Hof A XXa sandy loam, and Stanley silty clay, extractable [^{14}C]residues decreased from 88.9%, 92.8%, 92.4%, and 88.0% of the applied amount at day 0 to 30.8%, 15.3%, 5.9%, and 14.7% of the applied at study termination (day 120). Non-extractable [^{14}C]residues increased from 7.4%, 5.7%, 5.7%, and 7.6% of the applied amount at day 0 to 34.4%, 36.3%, 31.6%, and 41.0% of the applied amount at the end of the incubation period (day 120) for Höfchen silt loam, Laacher Hof A III silt loam, Laacher Hof A XXa sandy loam, and Stanley silty clay, respectively. At the end of the study, 29.2%, 43.5%, 60.8% and 36.8% of the applied radioactivity was present as $^{14}CO_2$ in Höfchen silt loam, Laacher Hof A III silt loam, Laacher Hof A XXa sandy loam and Stanley silty clay, respectively. Volatile organics were a maximum of ≤0.1% of the applied radioactivity in any soil.

The primary route of [phenyl-UL-^{14}C]prothioconazole-desthio aerobic soil metabolism is mineralization to CO_2. Incorporation to non-extractable soil residues is also a critical component of [phenyl-UL-^{14}C]prothioconazole-desthio degradation. An unspecified number of minor degradates, other than CO_2 and bound residues, were detected in this study. No information about potential degradation pathway to minor transformation products was provided by the study author.

Results Synopsis:

(PMRA)
Höfchen silt loam
DT_{50}: 10.8 days
DT_{90}: 225 days

Laacher Hof A III silt loam
DT_{50}: 24.4 days
DT_{90}: 117 days

Laacher Hof A XXa sandy loam
DT_{50}: 5.8 days
DT_{90}: 41 days

Stanley silty clay
DT_{50}: 15.9 days
DT_{90}: 93 days

(EPA)
Höfchen silt loam

Prothioconazole-desthio only		*Prothioconazole-desthio + bound residue*	
$t_{1/2}$ (linear regression):	55.5 days	$t_{1/2}$ (linear regression):	165.0 days
$t_{1/2}$ (nonlinear regression):	29.4 days	$t_{1/2}$ (nonlinear regression):	144.4 days
Empirical DT_{50}:	3-7 days	Empirical DT_{50}:	<120 days

Laacher Hof A III silt loam

Prothioconazole-desthio only		*Prothioconazole-desthio + bound residue*	
$t_{1/2}$ (linear regression):	45.3 days	$t_{1/2}$ (linear regression):	113.6 days
$t_{1/2}$ (nonlinear regression):	29.0 days	$t_{1/2}$ (nonlinear regression):	106.6 days
Empirical DT_{50}:	14-30 days	Empirical DT_{50}:	90-120 days

Laacher Hof A XXa sandy loam

Prothioconazole-desthio only		*Prothioconazole-desthio + bound residue*	
$t_{1/2}$ (linear regression):	22.6 days	$t_{1/2}$ (linear regression):	86.6 days
$t_{1/2}$ (nonlinear regression):	6.8 days	$t_{1/2}$ (nonlinear regression):	63.6 days
Empirical DT_{50}:	3-7 days	Empirical DT_{50}:	15-30 days

Stanley silty clay

Prothioconazole-desthio only		*Prothioconazole-desthio + bound residue*	
$t_{1/2}$ (linear regression):	30.3 days	$t_{1/2}$ (linear regression):	128.4 days
$t_{1/2}$ (nonlinear regression):	18.6 days	$t_{1/2}$ (nonlinear regression):	115.5 days
Empirical DT_{50}:	7-14 days	Empirical DT_{50}:	90-120 days

Major transformation products: None
Minor transformation products: None identified; M1, M2 and an unspecified number of other unidentified metabolites reported together

PMRA Submission Number 2004-0843 EPA MRID Number 46246513

Study Acceptability: This study is classified by EPA as supplemental for an aerobic biotransformation study in soil because a potentially toxic degradate was not tracked (no triazole label), soil depth sampled was deeper than recommended guidelines which may affect microbial biomass in the soils, soil taxonomic classifications were not provided, and harsh extraction was not attempted calling into question the nature of the reported bound material. The PMRA does not use the same classification scheme as EPA. This is classified as acceptable to the PMRA.

I. MATERIALS AND METHODS

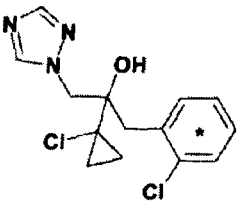
GUIDELINE FOLLOWED: The study was conducted according to EC Directive 91/414/EEC Annex I Part 7 and Annex II Part 9 and the SETAC Procedure for Assessing the Environmental Fate and Ecotoxicity of Pesticides. No deviations were noted by the study author.

COMPLIANCE: Chemicals Law (Chem G), dated July 25,1994 and current version of OECD Principles of Good Laboratory Practice. Signed and dated GLP, Quality Assurance and Data Confidentiality statements were provided.

A. MATERIALS:

1. Test Material [phenyl-UL-^{14}C]JAU6476-desthio (SXX 0665) (p. 8)

Chemical Structure:



* denotes ^{14}C-labelling position

Description: Solid, dried in vacuo (Appendix 2, p. 22).

Purity:
Analytical purity: >99% Lot/Batch No.
Radiochemical purity: >98% Lot/Batch No. 515/1
Specific activity: 3.27MBq/mg
Locations of the radio label: phenyl ring (Appendix 2, p. 22)

Storage conditions of test chemicals: As cool as possible until application (Appendix 2, p. 23).

Physico-chemical properties of JAU6476-desthio (SXX 0665):

Parameter	**Values**	**Comments**
Water solubility	not reported	
Vapour pressure/volatility	not reported	
UV absorption	not reported	
pK_a	not reported	
K_{ow}/log K_{ow}	not reported	
Stability of Compound at room temperature	not reported	

2. Soil Characteristics

Table 1: Description of soil collection and storage.

Description	**Soil 1 (Höfchen am Hohenseh)**	**Soil 2 (Laacher Hof A III)**	**Soil 3 (Laacher Hof A XXa)**	**Soil 4 (Stanley)**
Geographic location	Burscheid, Germany	Monheim, Germany	Monheim, Germany	Stilwell, Kansas, USA
Pesticide use history at the collection site	none used	none used	no pesticides since 1988	none used
Collection procedures	not reported	not reported	not reported	not reported
Sampling depth (cm)	0-20 cm (top 8 inches)	0-30 cm (top 12 inches)	0-30 cm (top 12 inches)	0-15 cm (top 6 inches)
Storage conditions	freshly sampled	freshly sampled	freshly sampled	under vegetation

Storage length	n/a	n/a	n/a	October 15, 1998 to August 26, 1999
Soil preparation (eg: 2 mm sieved; air dried etc.)	Stones and plant parts were removed about one week prior to the start of the study. The soils were gently air dried and screened to ≤2mm.			

Data were obtained from p. 8-9, and Appendix 3, p. 24-27 of the study report.

Table 2: Properties of the soils.

Property	**Soil 1: Höfchen am Hohenseh**	**Soil 2: Laacher Hof A III**	**Soil 3: Laacher Hof A XXa**	**Soil 4: Stanley**
Soil texture	Silt loam	Silt loam	Sandy loam	Silty clay
% sand	8.5	36.9	72.4	2.6
% silt	81.3	51.1	22.6	56.4
% clay	10.2	12	5	41
pH	7.3	7.9	7.2	6.3
Organic carbon (%)	1.55	0.98	1.02	1.46
CEC (meq/100 g)	15	8	8	24
Maximum Water Holding Capacity (g /100 g dry matter)	63.1	36.4	34.4	43.8
Bulk density (g/cm^3)	2.09	2.55	2.5	2.47
Soil Taxonomic classification	Not reported.	Not reported.	Not reported.	Not reported.
Soil Mapping Unit (for EPA)	Not reported.	Not reported.	Not reported.	Not reported.

Data were obtained from p. 8-9, and Appendix 3, p. 24-27 of the study report.

B. EXPERIMENTAL CONDITIONS:

1) Preliminary experiments: No preliminary experiments were described.

2) Experimental conditions:

Table 3: Experimental design.

Parameter		**Soil 1: Höfchen am Hohenseh**	**Soil 2: Laacher Hof A III**	**Soil 3: Laacher Hof A XXa**	**Soil 4: Stanley**
Duration of the test		120 days			
Soil condition: (Air dried/fresh)		air-dried			
Soil (g/replicate)		100 dry matter			
Test concentrations (mg a.i./kg soil) and equivalent g a.i./ha		Nominal: 0.097 mg JAU6476-desthio/kg soil; taking molecular mass into account, equivalent to 217.5 g JAU6476-desthio/ha resulting from a seasonal maximum rate for prothioconazole of 600 g a.i./ha and a maximum level of the transformation product of about 40% of the applied radioactivity (15 cm depth, 1.5 g/cm^3 bulk density); or to 72.5 g JAU6476-desthio/ha from a single use rate for prothioconazle of 200 g a.i./ha and a maximum level of the transformation product of about 40% (5 cm depth, 1.5 g/cm^3 bulk density). Measured: Höfchen: 0.0934 mg JAU6476-desthio/kg soil Laacher Hof A III: 0.0955 mg JAU6476-desthio/kg soil Laacher Hof A XXa: 0.0951 mg JAU6476-desthio/kg soil Stanley: 0.0927 mg JAU6476-desthio/kg soil			
Control conditions, if used (present differences from other treatments, i.e., sterile/non-sterile, experimental conditions)		Controls were used for microbial carbon determinations.			
No. of Replication	Controls, if used	1 flask per microbial carbon determination sampling interval, per soil			
	Treatments	1 flask per sampling interval, per soil, except for time 0, where n=2			
Test apparatus (Type/material/volume)		300 mL Erlenmeyer flasks			
Details of traps for CO_2 and organic volatile, if any		Traps filled with soda lime granules for absorption of CO_2 and fitted with polyurethane foam plug for absorption of any volatile organic transformation products.			
If no traps were used, is the system closed/open		n/a			
Identity and concentration of co-solvent		acetonitrile/water (50:50 v/v)			
Test material application	volume of test solution used/treatment	470 µL	661µL	661µL	470 µL

	application method (eg: applied on surface, homogeneous mixing etc.)	small droplets on soil using a microliter syringe		treated sub-sample reunited with the bulk soil and homogeneously mixed		treated sub-sample reunited with the bulk soil and homogeneously mixed		small droplets on soil using a microliter syringe	
	Is the co-solvent evaporated:	not reported		yes		yes		not reported	
Microbial biomass/microbial population of control soil		initial	final	initial	final	initial	final	initial	final
(mg microbial carbon/kg dry weight of soil)		940	503	127	103	478	386	400	268
Microbial biomass/microbial population of treated soil		initial	final	initial	final	initial	final	initial	final
(mg microbial carbon/kg dry weight of soil)		940	143	127	100	478	370	400	426
Any indication of the test material adsorbing to the walls of the test apparatus		no							
Experimental conditions	Temperature (°C)	20±1°C							
	Moisture content Moisture maintenance method:	40% MHC_{max} Flasks without traps were weighed at study initiation. Amount of water evaporating from the soil was determined by weighing the flasks without the traps approximately every 30 days. The evaporated portion was replenished accordingly.							
	Continuous darkness (Yes/No):	yes							
Other details, if any		none							

Data were obtained from p. 7-11, and Appendices 3-4, p. 28-29 of the study report.

3. Aerobic conditions: Trap attachments are permeable to oxygen according to the study author (p. 10). No details were provided.

4. Supplementary experiments: No supplementary experiments were described.

5. Sampling:

Table 4: Sampling details.

Parameters	Details
Sampling intervals	0 (2 hours), 1, 3, 7, 14, 30, 59/63, 90 and 120 days
Sampling method for soil samples	Total soil portion of each test vessel was transferred into a centrifuging beaker and extracted at room temperature on a shaker.
Method of collection of CO_2 and volatile organic compounds	Volatile compounds were transferred into the trap attachment by purging vessels with humid air for 10 minutes.
Sampling intervals/times for: sterility check, if sterile controls are used: moisture content: redox potential/other:	 Beginning and end of study approximately every 30 days not measured
Sample storage before analysis	Samples were extracted immediately after sampling. Traps were stored in freezer until processing.
Other observations, if any	none

Data were obtained from p. 10-11, and Appendices 3-4, p. 28-29 of the study report.

C. ANALYTICAL METHODS:

Extraction/clean up/concentration methods: The soil was extracted immediately after sampling. The total soil portion of each test vessel was transferred into a centrifuging beaker and extracted 3 times with acetonitrile/water (80:20 v/v) at room temperature on a shaker. After each shaking procedure the solution was centrifuged for 10 min. The clear supernatants were decanted through a paper filter and united. Each filter paper was pressed into four pellets for radioassay by combustion. For an overall evaluation and calculation of material balances the radioactivity of the filters was added to the non-extracted (bound) residues of soil.

Volatile organic compounds were extracted by squeezing in 50 of 100 mL of ethylacetate. Aliquots were radioassayed by LSC. $^{14}CO_2$ absorbed by the soday lime was liberated with 18% HCl and into ice-cooled scintillation cocktail with nitrogen. The identity of $^{14}CO_2$ in samples of day 120 in Stanley soil was confirmed by reaction to [^{14}C]benzoic acid.

Non-extractable residue determination: Non-extracted radioactivity was determined by combusting aliquots of air-dried homogenised soils in an oxidiser. The resulting carbon dioxide was absorbed in Oxysolve C400 and measured in an LS counter.

Total ^{14}C measurement: The radioactivity in solution was measured by LSC.

Identification and quantification of the parent and transformation products: Within one week of preparation, crude extracts were analysed by reversed phase TLC without enrichment or conditioning for identification and quantification of JAU6476-desthio and its transformation products. Confirmation of the quantitative results was made by normal phase TLC.

Aliquots of 200 µL of organic extracts were spotted on plates of 200 mm height, F-254 coated (Merck) as bands of 10 mm width using an automatic plate spotter (Linomat IV, Camag) at 20 mm distance from the edge. The plates were developed in a glass tank using the solvent system: acetonitrile / water / methanol / glacial acetic acid (70 : 25 : 5 : 0.1, v/v/v/v) + 1 g/L glycine. Alternatively cysteine · HCl can be used instead of glycine without affecting selectivity. The radioactive zones were visualised and quantified by digital autoradiography of the thinlayer plates by a Bio-Imaging Analyser Fujix BAS 2000 (Fuji Co.) and evaluated by TINA® software (Version 2.09G, Raytest) (p. 12-14).

Detection limits (LOD, LOQ) for the parent compound and transformation products: The LOD and LOQ for the parent compound and transformation products were approximately 0.1% and 0.2% of the applied radioactivity, respectively, as stated by the company in a response to a clarifax received by the PMRA on September 8, 2004.

II. RESULTS AND DISCUSSION:

A. TEST CONDITIONS: Aerobicity was not measured in this study.

Moisture data were not provided. According to the study author, moisture was maintained by replenishing the evaporated portion of water from the soil approximately every 30 days (p. 11).

No soil temperature data were submitted but the study author claims soil temperature was maintained at 20±1°C ; test vessels were in a climatic cabinet (p. 10).

The measured values for microbial biomass were in the usual range expected of soils taken from agricultural fields, according to the study author. An effect of the test substance was not apparent. Microbial biomass determinations at day 120 in the silt loam (Laacher Hof A III) and the sandy loam (Laacher Hof A XXa) were similar between samples treated and not treated with prothioconazole. However, microbial biomass determinations at day 120 were lower in the treated compared to the non-treated sample in the silt loam (Höfchen soil), while the opposite was observed in the silty clay (Stanley) (p. 15).

The pH did not vary significantly in any soil between study initiation and termination. The pH in the silt loam (Höfchen soil) decreased slightly from 6.2 (day 0) to 4.6-5.9 at the end of the study (day 120) (p. 15).

B. MATERIAL BALANCE: Material balance showed no pattern of increase or decrease in any of the soils over time. Material balance was recalculated by the reviewer. The applicant reported values as a percent of radioactivity recovered at Time 0, instead of as a percent of initial radioactivity applied. The reviewer reports the actual material balance (which was also used by EPA in determining the half-life of the test material).

Summary of material balance for the four soils tested (% of applied radioactivity).[1]

	Hofchen	Laacher Hof A III	Laacher Hof A XXa	Stanley
Mean	94.1	97.1	96.2	94.2
Std. Dev.	1.8	3.2	2.5	1.6
Min.	90.7	89.7	92.6	91.4
Max.	96.6	101.2	99.1	96.6

Data were obtained from p. 15, and Appendix 10, p. 34-35 of the study report.
[1] Statistics calculated and reported using initial applied radioactivity of 31720 Bq/100g.

Total recovery of the radiolabelled material averaged 94.1±1.8% of the applied amount (range: 90.7-96.6% of the applied) in the Höfchen silt loam, 97.1±3.2% of the applied (range: 89.7-101.2% of the applied) in the Laacher Hof A III silt loam, 96.2±2.5% of the applied (range: 92.6-99.1% of the applied) in the sandy loam and 94.2±1.6% of the applied (range: 91.4-96.6% of the applied) in the silty clay.

Table 5: Biotransformation of [phenyl-UL-^{14}C]JAU6476-desthio (SXX0665), expressed as percentage of applied radioactivity in silt loam (Höfchen soil) under aerobic conditions (n=1, except a day 0, where n=2).

Compound	**Sampling times (days)**								
	0	1	3	7	14	30	63	90	120
JAU6476-desthio	83.3 ± 0.8	76.5	65.2	48.5	37.7	33.9	21.2	19.3	19.6
M1	n.d.	n.d.	n.d.	1.2	1.5	1.2	1.3	1.2	1.2
M2	n.d.	2.4	4.6	5.8	4.7	5.7	4.4	4.6	3.7
Other minor transformation products	n.d.	0.8	1.6	1.8	1.7	1.2	n.d.	2.7	1.5

Unidentified radioactivity in organic extract	5.1 ± 0.4	4.1	4.4	4.0	5.7	5.3	6.4	4.0	4.6
Total extractable residues	88.9 ± 0.3	83.9	75.8	61.3	51.3	47.2	33.4	31.8	30.6
CO_2	n.m.	0.9	3.2	7.0	16.2	15.6	25.8	25.1	29.2
Volatile organics	n.m.	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	n.d.
Non-extractable residues	7.4 ± 0.1	10.6	16.1	22.5	26.7	30.2	33.6	35.8	34.4
Total unidentified (in extractable and non-extractable residues)	12.4 ±0.3	14.8	20.5	26.5	32.4	35.5	39.9	39.7	39.0
Total % recovery	96.2 ± 0.5	95.4	95.3	90.7	94.1	93.1	92.6	92.7	94.3

n.d. = not detected; LOD = 0.1% of the applied radioactivity, according to the company response to a clarifax received by the PMRA on September 8, 2004).
n.m. = not measured
Data obtained from Appendices 10 and 21, pp. 34 and 46.

Table 6: Biotransformation of [phenyl-UL-^{14}C]JAU6476-desthio (SXX0665), expressed as percentage of applied radioactivity in silt loam (Laacher Hof A III soil) under aerobic conditions (n=1, except a day 0, where n=2).

Compound	**Sampling times (days)**								
	0	1	3	7	14	30	63	90	120
JAU6476-desthio	88.9 ± 1.5	85.9	78.6	68.5	56.4	39.8	22.1	13.6	9.0
M1	n.d.	n.d.	0.9	1.4	2.3	3.6	3.3	3.3	2.7
M2	n.d.	1.4	2.2	1.9	1.8	0.9	0.8	0.4	n.d.
Other minor transformation products	n.d.	0.8	1.1	1.4	1.5	0.5	n.d.	n.d.	n.d.
Unidentified radioactivity in organic extract	3.9 ± 1.2	4.3	3.5	5.6	5.0	2.7	5.3	4.4	3.7
Total extractable residues	92.8 ± 2.7	92.4	86.3	78.8	67.0	47.5	31.4	21.6	15.3
CO_2	n.m.	0.3	1.4	4.4	10.4	22.4	25.4	35.5	43.5

Volatile organics	n.m.	<0.1	<0.1	<0.1	<0.1	0.1	n.d.	<0.1	<0.1
Non-extractable residues	5.7 ± 1.6	8.5	8.5	15.0	21.0	29.8	33.0	37.8	36.3
Total unidentified (in extractable and non-extractable residues)	9.6 ± 0.5	12.9	12.0	20.6	26.0	32.5	38.2	42.2	40.0
Total % recovery	98.5 ± 1.0	101.2	96.2	98.2	98.5	99.7	89.7	95.0	95.1

n.d. = not detected; LOD = 0.1% of the applied radioactivity, according to the company response to a clarifax received by the PMRA on September 8, 2004).
n.m. = not measured
Data obtained from Appendices 10 and 21, pp. 34 and 46.

Table 7: Biotransformation of [phenyl-UL-^{14}C]JAU6476-desthio (SXX0665), expressed as percentage of applied radioactivity in sandy loam (Laacher Hof A XXa soil) under aerobic conditions (n=1, except a day 0, where n=2).

Compound	**Sampling times (days)**								
	0	1	3	7	14	30	63	90	120
JAU6476-desthio	87.6 ± 1.0	74.0	60.8	37.9	23.4	10.1	6.6	3.2	2.3
M1	n.d.	1.3	2.3	2.8	1.7	0.8	0.7	0.5	0.4
M2	n.d.	2.9	3.7	2.9	1.8	0.8	0.6	n.d.	0.8
Other minor transformation products	n.d.	1.7	2.0	1.8	1.0	0.5	n.d.	n.d.	n.d.
Unidentified radioactivity in organic extract	4.8 ± 0.4	4.0	4.6	5.2	3.7	2.6	3.1	2.5	2.3
Total extractable residues	92.4 ± 0.5	83.9	73.4	50.7	31.6	14.9	10.9	6.3	5.9
CO_2	n.m.	2.8	10.4	22.9	36.6	47.0	50.4	55.9	60.8
Volatile organics	n.m.	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
Non-extractable residues	5.8	5.8	15.5	24.0	28.4	30.6	32.9	32.5	31.6
Total unidentified (in extractable and non-extractable residues)	10.5 ± 2.4	9.8	20.1	29.3	32.1	33.3	36.0	35.1	33.9

Total % recovery	98.1 ±1.5	92.6	99.3	97.6	96.7	92.6	94.3	94.7	98.3

n.d. = not detected; LOD = 0.1% of the applied radioactivity, according to the company response to a clarifax received by the PMRA on September 8, 2004).
n.m. = not measured
Data obtained from Appendices 10 and 21, pp. 35 and 47.

Table 8: Biotransformation of [phenyl-UL-^{14}C]JAU6476-desthio (SXX0665), expressed as percentage of applied radioactivity in silty clay (Stanley soil) under aerobic conditions (n=1, except a day 0, where n=2).

Compound	**Sampling times (days)**								
	0	1	3	7	14	30	63	90	120
JAU6476-desthio	79.7 ± 3.4	81.6	72.9	54.9	43.0	26.8	12.8	7.6	6.2
M1	n.d.	n.d.	n.d.	n.d.	2.4	n.d.	n.d.	0.7	0.5
M2	n.d.	1.1	3.6	7.9	6.7	5.3	3.0	1.9	1.5
Other minor transformation products	n.d.	n.d.	0.3	4.7	5.8	2.2	3.0	2.2	4.4
Unidentified radioactivity in organic extract	8.4 ± 3.9	3.5	4.0	5.1	4.0	8.4	5.3	4.6	2.2
Total extractable residues	88.1 ± 0.5	86.2	80.8	72.6	61.8	42.7	24.1	17.0	14.7
CO_2	n.m.	<0.1	0.8	2.1	6.7	15.0	25.6	33.0	36.8
Volatile organics	n.m.	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1
Non-extractable residues	7.6 ± 0.0	10.4	13.6	19.5	25.7	35.9	41.8	42.7	41.0
Total unidentified (in extractable and non-extractable residues)	15.9 ± 3.9	13.9	17.5	24.6	29.7	44.3	47.1	47.4	43.2
Total % recovery	95.6 ± 0.5	96.6	95.1	94.3	94.2	93.7	91.4	92.7	92.6

n.d. = not detected; LOD = 0.1% of the applied radioactivity, according to the company response to a clarifax received by the PMRA on September 8, 2004.
n.m. = not measured
Data obtained from Appendices 10 and 21, pp. 35 and 47.

C. TRANSFORMATION OF PARENT COMPOUND: The concentration of [phenyl-UL-^{14}C]prothioconazole-desthio (JAU6476-desthio; SXX0665) decreased from an average of 83.8%, 88.9%, 87.6% and 79.7% of the applied amount on day 0 in Höfchen silt loam, Laacher Hof A III silt loam, Laacher Hof A XXa sandy loam and Stanley silty clay, respectively, to 19.6%, 9.0%, 2.3% and 6.2% of the applied amount at the end of the study period (120 days). Fifty percent transformation occurred in all soils within 14 days, with the exception of the Laacher Hof A III silt loam, where fifty percent transformation occurred within 30 days. Also, in all soils except for the Laacher Hof A III silt loam which followed simple first order transformation kinetics, an initial rapid transformation phase was followed by a second slow transformation phase, with detectable levels of the parent material after 120 days (Appendices 10 and 21, pp. 34-35, 46-47).

HALF-LIFE: The half-lives/DT_{50} (50% decline time) of [phenyl-UL-^{14}C]prothioconazole-desthio using first order multi-component models (PMRA), first order linear regression on log-transformed data (EPA), and first order nonlinear regression on non-transformed data (EPA), were:

Table 8a: DT_{50} values for [phenyl-UL-^{14}C]JAU6476-desthio in aerobic soil, calculated by PMRA.

Soil type	First order multi-compartment model of exponential decay			observed DT_{50} from curvilinear interppolation (days)	observed DT_{90} from curvilinear interppolation (days)
	DT_{50} and DT_{90} (days)	Regression equation $y = a*exp(-b*x) + c*exp(-d*x)$	r^2		
silt loam (Höfchen)	DT_{50} = 10.8 DT_{90} = 224.7	a = 55.4376 b = 0.1784 c = 45.0630 d = 0.0067	0.99	10	>120
silt loam (Laacher Hof A III)	DT_{50} = 24.4 DT_{90} = 116.9	a = 27.2726 b = 0.1118 c = 72.9745 d = 0.0170	1	24	120
	$t_{1/2}$ = 36.1 $t_{9/10}$ = 120.0	linear regression of ln- transformed data y = -0.0192x + 4.3972	0.989		
sandy loam (Laacher Hof A XXa)	DT_{50} = 5.8 DT_{90} = 41.2	a = 76.6532 b = 0.1589 c = 21.884 d = 0.0193	0.998	6	32
silty clay (Stanley)	DT_{50} = 15.9 DT_{90} = 93.0	a = 56.8506 b = 0.0892 c = 47.2362 d = 0.0167	0.992	16	86

Table 8b. DT_{50} and $t_{1/2}$ values for [phenyl-UL-^{14}C]JAU6476-desthio calculated by EPA.

Soil type	First order half-life, linear regression[1] $\ln [A] = - kt + \ln [A]_o$			First order half-life, non-linear regression[1] $[A] = [A]_o \exp (- kt)$			Empirical DT_{50} (days)
	$t_{1/2}$	k $\ln [A]_o$	r^2	$t_{1/2}$	k $[A]_o$	r^2	
[phenyl-UL-^{14}C]Prothiconazole-desthio							
Silt loam (Höfchen)	55.5	0.0125 4.1484	0.8086	29.4	0.0236 73.7957	0.8362	38417
Silt loam (Laacher Hof A III)	45.3	0.0153 4.4857	0.9961	29	0.0239 85.8648	0.9876	14-30
Sandy Loam (Laacher Hof A XXa)	22.6	0.0307 4.0300	0.9008	6.8	0.1023 85.1625	0.9873	38417
Silty Clay (Stanley)	30.3	0.0229 4.2418	0.959	18.6	0.0372 79.5825	0.9801	38546
[phenyl-UL-^{14}C]Prothiconazole-desthio and bound residues							
Silt loam (Höfchen)	165	0.0042 4.3863	0.7302	144.4	0.0048 82.0825	0.7277	<120
Silt loam (Laacher Hof A III)	113.6	0.0061 4.4761	0.9505	106.6	0.0065 89.1272	0.9534	90-120
Sandy Loam (Laacher Hof A XXa)	86.6	0.0080 4.2925	0.7391	63.6	0.0029 78.9772	0.7494	14-30
Silty Clay (Stanley)	128.4	0.0054 4.4140	0.8807	115.5	0.0060 84.1353	0.8687	90-120

Data were obtained from Appendices 10 and 21, pp. 34-35, 46-47 of the study report.
[1]See Appendix of this DER for plots of linear and nonlinear regressions.

The soils were extracted only with 80:20 acetonitrile/water (30 minutes shaking, 10 minutes centrifugation, 3 times), and 31.4-40.8% of the applied radioactivity is bound by 120 days. It is difficult to know whether the radioactive material unextracted from the soil has become a bound, organic part of the soil or whether it has not been harshly enough extracted. Due to this uncertainty associated with weak extraction, half-lives were also calculated by adding "bound residue" to parent to account for the possibility that residue bound to soil in each sample may be unextracted parent instead of an unavailable, organically bound part of the soil.

TRANSFORMATION PRODUCTS: No major transformation products were detected in any of the four soils. Minor unidentified transformation products M1 and M2 and an unspecified number of other unidentified minor transformation products (reported together) were detected at maximum

concentrations of 3.6%, 7.9% and 5.8% of the applied radioactivity (AR), respectively, in any soil. (Per soil, M1, M2 and an unspecified number of other unidentified minor transformation products reported together were detected at maximum concentrations of 1.5%, 5.8%, and 1.8% of the applied, respectively, at 14, 7, and 7 days of incubation in Hofchen silt loam; 3.6%, 2.2%, and 1.5% of the applied, respectively, at 30, 3, and 14 days of incubation in Laacher Hof A III silt loam, 2.8%, 3.7%, and 2.0% of applied, respectively, at 7, 3, and 3 days of incubation in Laacher Hof A XXa sandy loam; and 2.4%, 7.9% and 5.8% of applied, respectively, at 14, 7, and 14 days of incubation in Stanley silty clay.) The total unidentified radioactivity in the organic extract was a maximum 6.4%, 5.6%, 5.2% and 11.1% of the applied in single replicates, respectively, in Höfchen silt loam, Laacher Hof A III silt loam, Laacher Hof A XXa sandy loam and Stanley silty clay (Appendices 10 and 21, pp. 34-35, 46-47).

NON-EXTRACTABLE AND EXTRACTABLE RESIDUES:
In the Höfchen silt loam, extractable [^{14}C]residues decreased from 88.9% of the AR at day 0 to 30.8% of the AR at study termination (day 120). Non-extractable [^{14}C]residues (including residues on the filter through which organic extracts were decanted) increased from 7.4% of the AR at day 0 to 34.4% of the AR at the end of the incubation period (Appendix 10, p.34).

In the Laacher Hof A III silt loam, extractable [^{14}C]residues decreased from 92.8% of the AR at day 0 to 15.3% of the AR at study termination (day 120). Non-extractable [^{14}C]residues (including residues on the filter through which organic extracts were decanted) increased from 5.7% of the AR at day 0 to 36.3% of the AR at the end of the incubation period (Appendix 10, p.34).

In the Laacher Hof A XXa sandy loam, extractable [^{14}C]residues decreased from 92.4% of the AR at day 0 to 5.9% of the AR at study termination (day 120). Non-extractable [^{14}C]residues (including residues on the filter through which organic extracts were decanted) increased from 5.7% of the AR at day 0 to 31.6% of the AR at the end of the incubation period (Appendix 10, p.35).

In the Stanley silty clay, extractable [^{14}C]residues decreased from 88.0% of the AR at day 0 and to 14.7% of the AR at study termination (day 120). Non-extractable [^{14}C]residues (including residues on the filter through which organic extracts were decanted) increased from 7.6% of the AR at day 0 to 41.0% of the AR at the end of the incubation period (Appendix 10, p.35).

VOLATILIZATION: At the end of the study, 29.2%, 43.5%, 60.8% and 36.8% of the AR was present as $^{14}CO_2$ in Höfchen silt loam, Laacher Hof A III silt loam, Laacher Hof A XXa sandy loam and Stanley silty clay, respectively. Volatile organics were a maximum of ≤0.1% of the AR in any soil.

TRANSFORMATION PATHWAY: The primary route of [phenyl-UL-^{14}C]prothioconazole-desthio aerobic soil metabolism is mineralization to CO_2. Incorporation to non-extractable soil residues is also a critical component of [phenyl-UL-^{14}C]prothioconazole-desthio degradation. An unspecified number of minor degradates, other than CO_2 and bound residues, were detected in this

study. No information about potential degradation pathway to minor transformation products was provided by the study author.

D. SUPPLEMENTARY EXPERIMENT-RESULTS: No supplementary experiments were described.

III. STUDY DEFICIENCIES: The triazole label was not used in this study, which does not allow for the tracking of the 1,2,4-triazole degradate, a potentially toxic degradate. This study should provide information on timing and amount of 1,2,4-triazole formation from prothioconazole-desthio degradation. A study submitted for prothioconazole (Hellpointner, 2001; MRID# 46246511) did not appear to show a difference related to non-1,2,4-triazole product formation for the phenyl and triazole labels. Trace amounts of 1,2,4-triazole were detected in aerobic soil treated with [triazole-3,5-^{14}C]prothioconazole.

The EPA guideline recommends using the top 14 cm of soil (the OECD recommends using the top 20 cm), while the top 30 cm were used in the collection of the Laacher Hof soils (AIII and A XXa). The study author states that the measured values for microbial biomass were in the usual range expected of soils taken from agricultural fields but does not support the assertion with data.

Three German soils and one US soil are used in this study. Soil taxonomic classifications are not reported for any of the soils. It is important to know the taxonomy of the soil, particularly the foreign (non-US) soils, in order to be able to evaluate and verify whether or not the test soil is representative of the intended use areas within the U.S.

The soils were extracted only with 80:20 acetonitrile/water (30 minutes shaking, 10 minutes centrifugation, 3 times), and 31.4-40.8% of the applied radioactivity is bound by 120 days. It is difficult to know whether the radioactive material unextracted from the soil has become a bound, organic part of the soil or whether it has not been harshly enough extracted. Due to this uncertainty associated with weak extraction, half-lives were also calculated by adding unextracted residue to parent to account for the possibility that residue bound to soil in each sample may be parent that was not extracted instead of an unavailable, organically bound part of the soil.

This study is classified as supplemental by EPA for an aerobic biotransformation study in soil because a potentially toxic degradate was not tracked (no triazole label), soil depth sampled was deeper than recommended guidelines which may affect microbial biomass in the soils, soil taxonomic classifications were not provided, and harsh extraction was not attempted calling into question the nature of the reported bound material. The PMRA does not use the same classification scheme as EPA. This is classified as acceptable to the PMRA.

IV. REVIEWER'S COMMENTS:

(1) The study author incorrectly used values of % of radioactivity relative to that recovered at time 0 (ie., radioactivity measured at time 0 is considered 100%) to determine the DT_{50} and DT_{90} values

for prothioconazole, as opposed to expressing the values as % of initial applied radioactivity. EPA re-calculated material balances and reported metabolite concentrations from raw radioactivity and peak area data (Appendices 10 and 21, p. 34-35 and 46-47) to reflect % initial applied radioactivity (31.72 kBq/100 g soil; p. 15).

(2) The PMRA reviewer used SigmaPlot to calculate the DT_{50}s following a first order multi-compartment model of exponential decay (Table 8). The models used by the PMRA reviewer resulted in higher regression coefficients than those of the study author. Although the DT_{50} values reported by the study author were slightly longer than those obtained by the PMRA reviewer, the models reported by the study author consistently underestimated the DT_{90} values. The difference in DT_{50} values will not result in a different persistence classification for JAU6476-desthio in soil, except for the Höfchen silt loam.

DT_{50} and DT_{90} values for [phenyl-UL-^{14}C]JAU6476-desthio reported by the study author

Soil type	Simple First Order Model		DT_{50} (days)	DT_{90} (days)
	Regression equation	r^2		
silt loam (Höfchen)	y = 72.8*exp(-0.0204*x)	0.794	34	113
silt loam (Laacher Hof A III)	y = 86.2*exp(-0.0234*x)	0.986	29.6	98.3
sandy loam (Laacher Hof A XXa)	y = 85.5*exp(-0.0992*x)	0.983	6.99	23.2
silty clay (Stanley)	y = 83.2*exp(-0.0372*x)	0.976	18.6	61.9

Based on the DT_{50} values calculated by the EAD reviewer using first order multi-compartment models of exponential decay, JAU6476-desthio is non-persistent to slightly persistent in the silt loams (Höfchen and Laacher Hof A III soils), non-persistent in the sandy loam and slightly persistent in the silty clay under aerobic conditions, according to the classification scheme of Goring *et al.* (1975).

(3) There is a low amount of JAU6476-desthio at time 0 (79.7-88.9% applied radioactivity), when, theoretically all starting material should still be present. The remaining applied radioactivity is unidentified and reported to be in origin and diffuse sections of organic extract and in unextractable soil and filter. Summing this unidentified radioactivity in unextracted soil and filter and unidentified radioactivity in organic extract (origin and diffuse radioactivity), a maximum of 39.9%, 42.2%. 36.0%, and 47.4% of the applied radioactivity is unidentified in Höfchen silt loam, Laacher Hof A

III silt loam, Laacher Hof A XXa sandy loam, Stanley silty clay, respectively (on days 63, 90, 59, and 90, respectively).

(4) With the exception of the two samples taken at time 0, there was only one replicate per sampling interval. It is preferred that two or more samples be collected from each treatment interval, so that within sample variation can be quantified.

(5) The number of individual minor metabolites reported together was not provided, nor was the potential identity of these and additional minor metabolites M1 and M2 discussed.

(6) Physico-chemical properties of JAU6476-desthio are not reported.

(7) Aerobicity was not measured in this study.

(8) Moisture data were not provided.

(9) No soil temperature data were submitted.

(10) Soil classification is reported in this DER using the USDA classification scheme, despite the fact that soil classification is reported in the study using the DIN scheme. Notably, the soil type called "loamy silt" in the study is called "silt loam" in this DER.

V. REFERENCES:

Goring, C.A.I., D.A. Laskowki, J.H. Hamaker, and R.W. Meikle. 1975. Principles of pesticide degradation in soil. Pages 135-172 in (R. Haque and V.H. Freed, eds.) *Environmental dynamics of pesticides*. Plenum Press, New York.

Hellpointner, E. 2001. Proazolthion (proposed) [JAU6476]: Degradation and Metabolism of JAU6476 in Aerobic Soils. Performing Laboratory: Bayer AG Crop Protection Business Group, Germany. Bayer CropScience, North Carolina. Unpublished. Report No. MR-104/01. July 25, 2001.

Chemical: Prothioconazole
PC Code: 113961
MRID: 46246513
Guideline No: 162-1

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio, expressed as total radioactivity (Bq/100 g soil) in Hofchen silt loam, 72.5 g/ha, under aerobic conditions

Time (days)	Organic	Soil		Total soil	Volatiles		Total	Total
	extract	not extracted	filter	unidentified	CO_2	VOCs	volatiles	radioactivity
0	28110	1550	758	2308	N/A	N/A	N/A	30418
0	28264	1668	705	2373	N/A	N/A	N/A	30637
1	26616	2791	586	3377	274	1	275	30268
3	24060	4617	505	5122	1025	8	1033	30215
7	19431	6437	685	7122	2206	2	2208	28761
14	16229	8066	392	8458	5150	2	5152	29839
30	15005	9188	402	9590	4935	9	4944	29539
63	10543	10508	143	10651	8178	14	8192	29386
90	10084	11138	203	11341	7965	4	7969	29394
120	9755	10751	153	10904	9252	0	9252	29911

Applied radioactivity= 31720 Bq/100g (p. 15 of the study report).
Average total recovery for Day 0 for Hofchen loam silt= 30528 Bq/100g.
LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were obtained from Appendix 10, p. 34 of the study report.
N/A= Not Applicable because not sampled.

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio, expressed as percent of Day 0 recovery (% Day 0 radioactivity) in Hofchen silt loam, 72.5 g/ha, under aerobic conditions

Time (days)	Organic	Soil		Total soil	Volatiles		Total	Total
	extract	not extracted	filter	unidentified	CO_2	VOCs	volatiles	radioactivity
0	92.1	5.1	2.5	7.6	N/A	N/A	N/A	99.6
0	92.6	5.5	2.3	7.8	N/A	N/A	N/A	100.4
1	87.2	9.1	1.9	11.1	0.9	0.0	0.9	99.1
3	78.8	15.1	1.7	16.8	3.4	0.0	3.4	99.0
7	63.7	21.1	2.2	23.3	7.2	0.0	7.2	94.2
14	53.2	26.4	1.3	27.7	16.9	0.0	16.9	97.7
30	49.2	30.1	1.3	31.4	16.2	0.0	16.2	96.8
63	34.5	34.4	0.5	34.9	26.8	0.0	26.8	96.3
90	33.0	36.5	0.7	37.2	26.1	0.0	26.1	96.3
120	32.0	35.2	0.5	35.7	30.3	0.0	30.3	98.0
							AVR	**97.7**
							STDEV	**1.9**

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were calculated from Appendix 10, p. 34 of the study report.
N/A= Not Applicable because not sampled.

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio, expressed as percent of applied radioactivity in Hofchen silt loam, 72.5 g/ha, under aerobic conditions

Time (days)	Organic	Soil		Total soil	Volatiles		Total	Total
	extract	not extracted	filter	unidentified	CO_2	VOCs	volatiles	radioactivity
0	88.6	4.9	2.4	7.3	N/A	N/A	N/A	95.9
0	89.1	5.3	2.2	7.5	N/A	N/A	N/A	96.6
1	83.9	8.8	1.8	10.6	0.9	0.0	0.9	95.4
3	75.9	14.6	1.6	16.1	3.2	0.0	3.3	95.3
7	61.3	20.3	2.2	22.5	7.0	0.0	7.0	90.7
14	51.2	25.4	1.2	26.7	16.2	0.0	16.2	94.1
30	47.3	29.0	1.3	30.2	15.6	0.0	15.6	93.1
63	33.2	33.1	0.5	33.6	25.8	0.0	25.8	92.6
90	31.8	35.1	0.6	35.8	25.1	0.0	25.1	92.7
120	30.8	33.9	0.5	34.4	29.2	0.0	29.2	94.3
							AVR	**94.1**
							STDEV	**1.8**

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were calculated from Appendix 10, p. 34 of the study report.
N/A= Not Applicable because not sampled.

Chemical: Prothioconazole
PC Code: 113961
MRID: 46246513
Guideline No: 162-1

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio **in organic extract**, expressed as of Day 0 recovery (% Day 0 radioactivity) in Hofchen silt loam, 72.5 g/ha, under aerobic conditic

Time (days)	JAU6476 -desthio	M1	M2	Minor metabs.	Unidentified		Total Unidentified	Total in Organic extract
					Origin	Diffuse		
0	86.5	<MDL	<MDL	<MDL	0.2	5.3	5.5	92.0
0	87.6	<MDL	<MDL	<MDL	0.2	4.8	5.0	92.6
1	79.5	<MDL	2.5	0.9	0.2	4.1	4.3	87.2
3	67.8	<MDL	4.8	1.7	0.2	4.4	4.6	78.9
7	50.4	1.2	6.0	1.9	0.1	4.0	4.1	63.6
14	39.2	1.6	4.9	1.8	0.2	5.6	5.8	53.3
30	35.3	1.2	5.9	1.2	0.3	5.3	5.6	49.2
63	22.1	1.4	4.6	<MDL	0.1	6.3	6.4	34.5
90	20.0	1.3	4.8	2.8	0.3	3.9	4.2	33.1
120	20.4	1.2	3.9	1.6	0.3	4.7	5.0	32.1

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were obtained from Appendix 15, p. 40 of the study report.

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio **in organic extract**, expressed as percent area ratio in Hofchen silt loam, 72.5 g/ha, under aerobic conditions

Time (days)	JAU6476 -desthio	M1	M2	Minor metabs.	Unidentified		Total Unidentified	Total in Organic extract
					Origin	Diffuse		
0	93.96	<MDL	<MDL	<MDL	0.25	5.79	6.04	100.00
0	94.65	<MDL	<MDL	<MDL	0.18	5.17	5.35	100.00
1	91.17	<MDL	2.91	0.99	0.22	4.69	4.91	99.98
3	86.01	<MDL	6.08	2.10	0.17	5.59	5.76	99.95
7	79.11	1.96	9.45	2.98	0.29	6.33	6.62	100.12
14	73.66	2.98	9.24	3.31	0.62	10.52	11.14	100.33
30	71.76	2.47	11.98	2.45	0.42	10.73	11.15	99.81
63	63.85	4.06	13.29	<MDL	0.77	18.38	19.15	100.35
90	60.67	3.83	14.44	8.55	0.82	11.73	12.55	100.04
120	63.77	3.73	12.07	4.88	0.30	14.73	15.03	99.48

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were obtained from Appendix 21, p. 46 of the study report.

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio **in organic extract**, expressed as percent applied radioactivity in Hofchen silt loam, 72.5 g/ha, under aerobic conditions

Time (days)	JAU6476 -desthio	M1	M2	Minor metabs.	Unidentified		Total Unidentified	Total in Organic extract
					Origin	Diffuse		
0	83.3	<MDL	<MDL	<MDL	0.2	5.1	5.4	88.6
0	84.3	<MDL	<MDL	<MDL	0.2	4.6	4.8	89.1
1	76.5	<MDL	2.4	0.8	0.2	3.9	4.1	83.9
3	65.2	<MDL	4.6	1.6	0.1	4.2	4.4	75.8
7	48.5	1.2	5.8	1.8	0.2	3.9	4.1	61.3
14	37.7	1.5	4.7	1.7	0.3	5.4	5.7	51.3
30	33.9	1.2	5.7	1.2	0.2	5.1	5.3	47.2
63	21.2	1.3	4.4	<MDL	0.3	6.1	6.4	33.4
90	19.3	1.2	4.6	2.7	0.3	3.7	4.0	31.8
120	19.6	1.1	3.7	1.5	0.1	4.5	4.6	30.6

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were calculated from Appendices 10 and 21, pp. 34 and 46 of the study report.

Chemical: Prothioconazole
PC Code: 113961
MRID: 46246513
Guideline No: 162-1

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio, expressed as total radioactivity (Bq/100 g soil) in Laacher Hof A III silt loam, 72.5 g/ha, under aerobic conditions

Time (days)	Organic	Soil		Total soil	Volatiles		Total	Total
	extract	not extracted	filter	unidentified	CO_2	VOCs	volatiles	radioactivity
0	30036	915	520	1435	N/A	N/A	N/A	31471
0	28833	1542	633	2175	N/A	N/A	N/A	31008
1	29309	2447	258	2705	84	6	90	32104
3	27366	2461	233	2694	439	8	447	30507
7	24993	4371	378	4749	1393	6	1399	31141
14	21250	6347	324	6671	3298	12	3310	31231
30	15060	9235	212	9447	7101	16	7117	31624
59	9955	10279	175	10454	8056	0	8056	28465
90	6863	11813	183	11996	11261	3	11264	30123
120	4868	11390	111	11501	13808	1	13809	30178

Applied radioactivity= 31720 Bq/100g (p. 15 of the study report).
Average total recovery for Day 0 for Laacher Hof A III loam silt= 31240 Bq/100g.
LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were obtained from Appendix 10, p. 34 of the study report.
N/A= Not Applicable because not sampled.

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio, expressed as percent of Day 0 recovery (% Day 0 radioactivity) in Laacher Hof A III silt loam, 72.5 g/ha, under aerobic conditions

Time (days)	Organic	Soil		Total soil	Volatiles		Total	Total
	extract	not extracted	filter	unidentified	CO_2	VOCs	volatiles	radioactivity
0	96.1	2.9	1.7	4.6	N/A	N/A	N/A	100.7
0	92.3	4.9	2.0	7.0	N/A	N/A	N/A	99.3
1	93.8	7.8	0.8	8.7	0.3	0.0	0.3	102.8
3	87.6	7.9	0.7	8.6	1.4	0.0	1.4	97.7
7	80.0	14.0	1.2	15.2	4.5	0.0	4.5	99.7
14	68.0	20.3	1.0	21.4	10.6	0.0	10.6	100.0
30	48.2	29.6	0.7	30.2	22.7	0.1	22.8	101.2
59	31.9	32.9	0.6	33.5	25.8	0.0	25.8	91.1
90	22.0	37.8	0.6	38.4	36.0	0.0	36.1	96.4
120	15.6	36.5	0.4	36.8	44.2	0.0	44.2	96.6

LOQ is 0.2% and LOD is 0.1% of applied radioactivity. **AVR** **98.5**
Data were calculated from Appendix 10, p. 34 of the study report. **STDEV** **3.3**
N/A= Not Applicable because not sampled.

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio, expressed as percent of applied radioactivity in Laacher Hof A III silt loam, 72.5 g/ha, under aerobic conditions

Time (days)	Organic	Soil		Total soil	Volatiles		Total	Total
	extract	not extracted	filter	unidentified	CO_2	VOCs	volatiles	radioactivity
0	94.7	2.9	1.6	4.5	N/A	N/A	N/A	99.2
0	90.9	4.9	2.0	6.9	N/A	N/A	N/A	97.8
1	92.4	7.7	0.8	8.5	0.3	0.0	0.3	101.2
3	86.3	7.8	0.7	8.5	1.4	0.0	1.4	96.2
7	78.8	13.8	1.2	15.0	4.4	0.0	4.4	98.2
14	67.0	20.0	1.0	21.0	10.4	0.0	10.4	98.5
30	47.5	29.1	0.7	29.8	22.4	0.1	22.4	99.7
59	31.4	32.4	0.6	33.0	25.4	0.0	25.4	89.7
90	21.6	37.2	0.6	37.8	35.5	0.0	35.5	95.0
120	15.3	35.9	0.3	36.3	43.5	0.0	43.5	95.1

LOQ is 0.2% and LOD is 0.1% of applied radioactivity. **AVR** **97.1**
Data were calculated from Appendix 10, p. 34 of the study report. **STDEV** **3.2**
N/A= Not Applicable because not sampled.

Chemical: Prothioconazole
PC Code: 113961
MRID: 46246513
Guideline No: 162-1

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio **in organic extract**, expressed as percent of Day 0 recovery (% Day 0 radioactivity) in Laacher Hof A III silt loam, 72.5 g/ha, under aerobic conditions

Time (days)	JAU6476 -desthio	M1	M2	Minor metabs.	Unidentified		Total Unidentified	Total in Organic extract
					Origin	Diffuse		
0	91.3	<MDL	<MDL	<MDL	<MDL	4.8	4.8	96.1
0	89.2	<MDL	<MDL	<MDL	<MDL	3.1	3.1	92.3
1	87.2	<MDL	1.4	0.8	<MDL	4.4	4.4	93.8
3	79.8	0.9	2.3	1.1	0.2	3.3	3.5	87.6
7	69.5	1.4	1.9	1.4	0.3	5.4	5.7	79.9
14	57.2	2.4	1.8	1.5	0.4	4.7	5.1	68.0
30	40.4	3.6	0.9	0.5	0.5	2.3	2.8	48.2
59	22.4	3.3	0.8	<MDL	0.5	4.8	5.3	31.8
90	13.8	3.3	0.4	<MDL	0.5	4.0	4.5	22.0
120	9.1	2.7	<MDL	<MDL	0.4	3.4	3.8	15.6

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were obtained from Appendix 16, p. 41 of the study report.

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio **in organic extract**, expressed as percent area ratio in Laacher Hof A III silt loam, 72.5 g/ha, under aerobic conditions

Time (days)	JAU6476 -desthio	M1	M2	Minor metabs.	Unidentified		Total Unidentified	Total in Organic extract
					Origin	Diffuse		
0	95.00	<MDL	<MDL	<MDL	<MDL	5.00	5.00	100.00
0	96.59	<MDL	<MDL	<MDL	<MDL	3.41	3.41	100.00
1	92.92	<MDL	1.54	0.84	<MDL	4.69	4.69	99.99
3	91.09	1.02	2.58	1.26	0.27	3.78	4.05	100.00
7	86.91	1.76	2.41	1.75	0.36	6.81	7.17	100.00
14	84.15	3.50	2.67	2.22	0.60	6.85	7.45	99.99
30	83.79	7.55	1.87	0.99	1.01	4.78	5.79	99.99
59	70.27	10.50	2.43	<MDL	1.61	15.20	16.81	100.01
90	62.63	15.19	2.03	<MDL	2.15	18.00	20.15	100.00
120	58.47	17.47	<MDL	<MDL	2.35	21.72	24.07	100.01

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were obtained from Appendix 21, p. 46 of the study report.

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio **in organic extract**, expressed as percent applied radioactivity in Laacher Hof A III silt loam, 72.5 g/ha, under aerobic conditions

Time (days)	JAU6476 -desthio	M1	M2	Minor metabs.	Unidentified		Total Unidentified	Total in Organic extract
					Origin	Diffuse		
0	90.0	<MDL	<MDL	<MDL	<MDL	4.7	4.7	94.7
0	87.8	<MDL	<MDL	<MDL	<MDL	3.1	3.1	90.9
1	85.9	<MDL	1.4	0.8	<MDL	4.3	4.3	92.4
3	78.6	0.9	2.2	1.1	0.2	3.3	3.5	86.3
7	68.5	1.4	1.9	1.4	0.3	5.4	5.6	78.8
14	56.4	2.3	1.8	1.5	0.4	4.6	5.0	67.0
30	39.8	3.6	0.9	0.5	0.5	2.3	2.7	47.5
59	22.1	3.3	0.8	<MDL	0.5	4.8	5.3	31.4
90	13.6	3.3	0.4	<MDL	0.5	3.9	4.4	21.6
120	9.0	2.7	<MDL	<MDL	0.4	3.3	3.7	15.3

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were calculated from Appendices 10 and 21, pp. 34 and 46 of the study report.

Chemical: Prothioconazole
PC Code: 113961
MRID: 46246513
Guideline No: 162-1

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio, expressed as total radioactivity (Bq/100 g soil) in Laacher Hof A XXa sandy loam, 72.5 g/ha, under aerobic conditions

Time (days)	Organic	Soil		Total soil	Volatiles		Total	Total
	extract	not extracted	filter	unidentified	CO_2	VOCs	volatiles	radioactivity
0	29189	1603	645	2248	N/A	N/A	N/A	31437
0	29426	913	427	1340	N/A	N/A	N/A	30766
1	26622	1422	413	1835	894	8	902	29359
3	23285	4656	264	4920	3295	6	3301	31506
7	16071	7342	282	7624	7256	10	7266	30961
14	10024	8764	247	9011	11622	16	11638	30673
30	4720	9525	190	9715	14916	12	14928	29363
59	3467	10323	128	10451	15996	2	15998	29916
90	1987	10230	91	10321	17729	1	17730	30038
120	1860	9945	73	10018	19300	1	19301	31179

Applied radioactivity= 31720 Bq/100g (p. 15 of the study report).
Average total recovery for Day 0 for Hofchen loam silt= 31102 Bq/100g.
LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were obtained from Appendix 10, p. 35 of the study report.
N/A= Not Applicable because not sampled.

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio, expressed as percent of Day 0 recovery (% Day 0 radioactivity) in Laacher Hof A XXa sandy loam, 72.5 g/ha, under aerobic condition

Time (days)	Organic	Soil		Total soil	Volatiles		Total	Total
	extract	not extracted	filter	unidentified	CO_2	VOCs	volatiles	radioactivity
0	93.9	5.2	2.1	7.2	N/A	N/A	N/A	101.1
0	94.6	2.9	1.4	4.3	N/A	N/A	N/A	98.9
1	85.6	4.6	1.3	5.9	2.9	0.0	2.9	94.4
3	74.9	15.0	0.8	15.8	10.6	0.0	10.6	101.3
7	51.7	23.6	0.9	24.5	23.3	0.0	23.4	99.5
14	32.2	28.2	0.8	29.0	37.4	0.1	37.4	98.6
30	15.2	30.6	0.6	31.2	48.0	0.0	48.0	94.4
59	11.1	33.2	0.4	33.6	51.4	0.0	51.4	96.2
90	6.4	32.9	0.3	33.2	57.0	0.0	57.0	96.6
120	6.0	32.0	0.2	32.2	62.1	0.0	62.1	100.2
							AVR	**98.1**
							STDEV	**2.6**

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were calculated from Appendix 10, p. 35 of the study report.
N/A= Not Applicable because not sampled.

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio, expressed as percent of applied radioactivity in Laacher Hof A XXa sandy loam, 72.5 g/ha, under aerobic conditions

Time (days)	Organic	Soil		Total soil	Volatiles		Total	Total
	extract	not extracted	filter	unidentified	CO_2	VOCs	volatiles	radioactivity
0	92.0	5.1	2.0	7.1	N/A	N/A	N/A	99.1
0	92.8	2.9	1.3	4.2	N/A	N/A	N/A	97.0
1	83.9	4.5	1.3	5.8	2.8	0.0	2.8	92.6
3	73.4	14.7	0.8	15.5	10.4	0.0	10.4	99.3
7	50.7	23.1	0.9	24.0	22.9	0.0	22.9	97.6
14	31.6	27.6	0.8	28.4	36.6	0.1	36.7	96.7
30	14.9	30.0	0.6	30.6	47.0	0.0	47.1	92.6
59	10.9	32.5	0.4	32.9	50.4	0.0	50.4	94.3
90	6.3	32.3	0.3	32.5	55.9	0.0	55.9	94.7
120	5.9	31.4	0.2	31.6	60.8	0.0	60.8	98.3
							AVR	**96.2**
							STDEV	**2.5**

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were calculated from Appendix 10, p. 35 of the study report.
N/A= Not Applicable because not sampled.

Chemical: Prothioconazole
PC Code: 113961
MRID: 46246513
Guideline No: 162-1

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio **in organic extract**, expressed as percent of Day 0 recovery (% Day 0 radioactivity) in Laacher Hof A XXa sandy loam, 72.5 g/ha, under aerobic conditions

Time (days)	JAU6476 -desthio	M1	M2	Minor metabs.	Unidentified		Total Unidentified	Total in Organic extract
					Origin	Diffuse		
0	88.6	<MDL	<MDL	<MDL	<MDL	5.2	5.2	93.8
0	90.0	<MDL	<MDL	<MDL	<MDL	4.6	4.6	94.6
1	75.5	1.3	3.0	1.8	<MDL	4.1	4.1	85.7
3	62.0	2.3	3.8	2.1	0.2	4.5	4.7	74.9
7	38.7	2.9	3.0	1.8	0.3	5.0	5.3	51.7
14	23.8	1.8	1.9	1.0	0.4	3.4	3.8	32.3
30	10.3	0.9	0.8	0.5	0.3	2.4	2.7	15.2
59	6.7	0.7	0.6	<MDL	0.3	2.9	3.2	11.2
90	3.3	0.5	<MDL	<MDL	0.2	2.4	2.6	6.4
120	2.3	0.4	0.8	<MDL	0.2	2.0	2.2	5.7

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were obtained from Appendix 17, p. 42 of the study report.

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio **in organic extract**, expressed as percent area ratio in Laacher Hof A XXa sandy loam, 72.5 g/ha, under aerobic conditions

Time (days)	JAU6476 -desthio	M1	M2	Minor metabs.	Unidentified		Total Unidentified	Total in Organic extract
					Origin	Diffuse		
0	94.42	<MDL	<MDL	<MDL	<MDL	5.57	5.57	99.99
0	95.11	<MDL	<MDL	<MDL	<MDL	4.89	4.89	100.00
1	88.16	1.51	3.51	2.06	<MDL	4.76	4.76	100.00
3	82.82	3.12	5.01	2.74	0.32	5.99	6.31	100.00
7	74.82	5.56	5.74	3.55	0.60	9.72	10.32	99.99
14	73.90	5.50	5.74	3.03	1.16	10.66	11.82	99.99
30	68.03	5.65	5.40	3.12	2.26	15.52	17.78	99.98
59	60.23	6.46	5.06	<MDL	2.42	25.83	28.25	100.00
90	51.63	7.77	<MDL	<MDL	3.32	37.28	40.60	100.00
120	39.00	7.44	14.30	<MDL	3.31	35.94	39.25	99.99

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were obtained from Appendix 21, p. 47 of the study report.

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio **in organic extract**, expressed as percent applied radioactivity in Laacher Hof A XXa sandy loam, 72.5 g/ha, under aerobic conditions

Time (days)	JAU6476 -desthio	M1	M2	Minor metabs.	Unidentified		Total Unidentified	Total in Organic extract
					Origin	Diffuse		
0	86.9	<MDL	<MDL	<MDL	<MDL	5.1	5.1	92.0
0	88.2	<MDL	<MDL	<MDL	<MDL	4.5	4.5	92.8
1	74.0	1.3	2.9	1.7	<MDL	4.0	4.0	83.9
3	60.8	2.3	3.7	2.0	0.2	4.4	4.6	73.4
7	37.9	2.8	2.9	1.8	0.3	4.9	5.2	50.7
14	23.4	1.7	1.8	1.0	0.4	3.4	3.7	31.6
30	10.1	0.8	0.8	0.5	0.3	2.3	2.6	14.9
59	6.6	0.7	0.6	<MDL	0.3	2.8	3.1	10.9
90	3.2	0.5	<MDL	<MDL	0.2	2.3	2.5	6.3
120	2.3	0.4	0.8	<MDL	0.2	2.1	2.3	5.9

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were calculated from Appendices 10 and 21, pp. 35 and 47 of the study report.

Chemical: Prothioconazole
PC Code: 113961
MRID: 46246513
Guideline No: 162-1

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio, expressed as total radioactivity (Bq/100 g soil) in Stanley silty clay, 72.5 g/ha, under aerobic conditions

Time (days)	Organic extract	Soil		Total soil unidentified	Volatiles		Total volatiles	Total radioactivity
		not extracted	filter		CO_2	VOCs		
0	28040	1509	881	2390	N/A	N/A	N/A	30430
0	27796	1569	840	2409	N/A	N/A	N/A	30205
1	27348	2672	618	3290	12	3	15	30653
3	25620	3648	656	4304	250	2	252	30176
7	23028	5459	737	6196	674	3	677	29901
14	19598	7603	550	8153	2130	3	2133	29884
30	13553	10983	406	11389	4768	21	4789	29731
63	7616	13136	132	13268	8110	5	8115	28999
90	5380	13439	113	13552	10474	6	10480	29412
120	4668	12937	83	13020	11668	2	11670	29358

Applied radioactivity= 31720 Bq/100g (p. 15 of the study report).
Average total recovery for Day 0 for Hofchen loam silt= 30318 Bq/100g.
LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were obtained from Appendix 10, p. 35 of the study report.
N/A= Not Applicable because not sampled.

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio, expressed as percent of Day 0 recovery (% Day 0 radioactivity) in Stanley silty clay, 72.5 g/ha, under aerobic conditions

Time (days)	Organic extract	Soil		Total soil unidentified	Volatiles		Total volatiles	Total radioactivity
		not extracted	filter		CO_2	VOCs		
0	92.5	5.0	2.9	7.9	N/A	N/A	N/A	100.4
0	91.7	5.2	2.8	7.9	N/A	N/A	N/A	99.6
1	90.2	8.8	2.0	10.9	0.0	0.0	0.0	101.1
3	84.5	12.0	2.2	14.2	0.8	0.0	0.8	99.5
7	76.0	18.0	2.4	20.4	2.2	0.0	2.2	98.6
14	64.6	25.1	1.8	26.9	7.0	0.0	7.0	98.6
30	44.7	36.2	1.3	37.6	15.7	0.1	15.8	98.1
63	25.1	43.3	0.4	43.8	26.8	0.0	26.8	95.7
90	17.7	44.3	0.4	44.7	34.5	0.0	34.6	97.0
120	15.4	42.7	0.3	42.9	38.5	0.0	38.5	96.8
							AVR	**98.5**
							STDEV	**1.7**

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were calculated from Appendix 10, p. 35 of the study report.
N/A= Not Applicable because not sampled.

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio, expressed as percent of applied radioactivity in Stanley silty clay, 72.5 g/ha, under aerobic conditions

Time (days)	Organic extract	Soil		Total soil unidentified	Volatiles		Total volatiles	Total radioactivity
		not extracted	filter		CO_2	VOCs		
0	88.4	4.8	2.8	7.5	N/A	N/A	N/A	95.9
0	87.6	4.9	2.6	7.6	N/A	N/A	N/A	95.2
1	86.2	8.4	1.9	10.4	0.0	0.0	0.0	96.6
3	80.8	11.5	2.1	13.6	0.8	0.0	0.8	95.1
7	72.6	17.2	2.3	19.5	2.1	0.0	2.1	94.3
14	61.8	24.0	1.7	25.7	6.7	0.0	6.7	94.2
30	42.7	34.6	1.3	35.9	15.0	0.1	15.1	93.7
63	24.0	41.4	0.4	41.8	25.6	0.0	25.6	91.4
90	17.0	42.4	0.4	42.7	33.0	0.0	33.0	92.7
120	14.7	40.8	0.3	41.0	36.8	0.0	36.8	92.6
							AVR	**94.2**
							STDEV	**1.6**

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were calculated from Appendix 10, p. 35 of the study report.
N/A= Not Applicable because not sampled.

Chemical: Prothioconazole
PC Code: 113961
MRID: 46246513
Guideline No: 162-1

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio **in organic extract**, expressed as percent of Day 0 recovery (% Day 0 radioactivity) in Stanley silty clay, 72.5 g/ha, under aerobic conditions

Time (days)	JAU6476 -desthio	M1	M2	Minor metabs.	Unidentified		Total Unidentified	Total in Organic extract
					Origin	Diffuse		
0	80.9	<MDL	<MDL	<MDL	0.2	11.5	11.7	92.6
0	85.9	<MDL	<MDL	<MDL	0.2	5.6	5.8	91.7
1	85.4	<MDL	1.1	<MDL	0.1	3.6	3.7	90.2
3	76.2	<MDL	3.8	0.3	0.1	4.0	4.1	84.4
7	57.4	<MDL	8.3	4.9	0.1	5.2	5.3	75.9
14	45.0	2.5	7.0	6.1	0.2	4.0	4.2	64.8
30	28.0	<MDL	5.5	2.3	0.3	8.5	8.8	44.6
63	13.4	<MDL	3.1	3.1	0.1	5.4	5.5	25.1
90	7.9	0.7	2.0	2.3	0.2	4.7	4.9	17.8
120	6.4	0.6	1.6	4.6	0.2	2.1	2.3	15.5

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were obtained from Appendix 18, p. 43 of the study report.

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio **in organic extract**, expressed as percent area ratio in Stanley silty clay, 72.5 g/ha, under aerobic conditions

Time (days)	JAU6476 -desthio	M1	M2	Minor metabs.	Unidentified		Total Unidentified	Total in Organic extract
					Origin	Diffuse		
0	87.45	<MDL	<MDL	<MDL	0.18	12.38	12.56	100.01
0	93.69	<MDL	<MDL	<MDL	0.19	6.13	6.32	100.01
1	94.70	<MDL	1.24	<MDL	0.11	3.96	4.07	100.01
3	90.22	<MDL	4.50	0.39	0.15	4.75	4.90	100.01
7	75.56	<MDL	10.95	6.47	0.17	6.86	7.03	100.01
14	69.57	3.83	10.81	9.37	0.31	6.12	6.43	100.01
30	62.68	<MDL	12.35	5.23	0.64	19.08	19.72	99.98
63	53.43	<MDL	12.38	12.49	0.37	21.50	21.87	100.17
90	44.52	3.84	11.17	13.10	1.09	26.28	27.37	100.00
120	41.82	3.69	10.34	29.58	1.31	13.35	14.66	100.09

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were obtained from Appendix 21, p. 47 of the study report.

Table 5 Biotransformation of [phenyl-UL-C^{14}]prothioconazole-desthio **in organic extract**, expressed as percent applied radioactivity in Stanley silty clay, 72.5 g/ha, under aerobic conditions

Time (days)	JAU6476 -desthio	M1	M2	Minor metabs.	Unidentified		Total Unidentified	Total in Organic extract
					Origin	Diffuse		
0	77.3	<MDL	<MDL	<MDL	0.2	10.9	11.1	88.4
0	82.1	<MDL	<MDL	<MDL	0.2	5.4	5.5	87.6
1	81.6	<MDL	1.1	<MDL	0.1	3.4	3.5	86.2
3	72.9	<MDL	3.6	0.3	0.1	3.8	4.0	80.8
7	54.9	<MDL	7.9	4.7	0.1	5.0	5.1	72.6
14	43.0	2.4	6.7	5.8	0.2	3.8	4.0	61.8
30	26.8	<MDL	5.3	2.2	0.3	8.2	8.4	42.7
63	12.8	<MDL	3.0	3.0	0.1	5.2	5.3	24.1
90	7.6	0.7	1.9	2.2	0.2	4.5	4.6	17.0
120	6.2	0.5	1.5	4.4	0.2	2.0	2.2	14.7

LOQ is 0.2% and LOD is 0.1% of applied radioactivity.
Data were calculated from Appendices 10 and 21, pp. 35 and 47 of the study report.

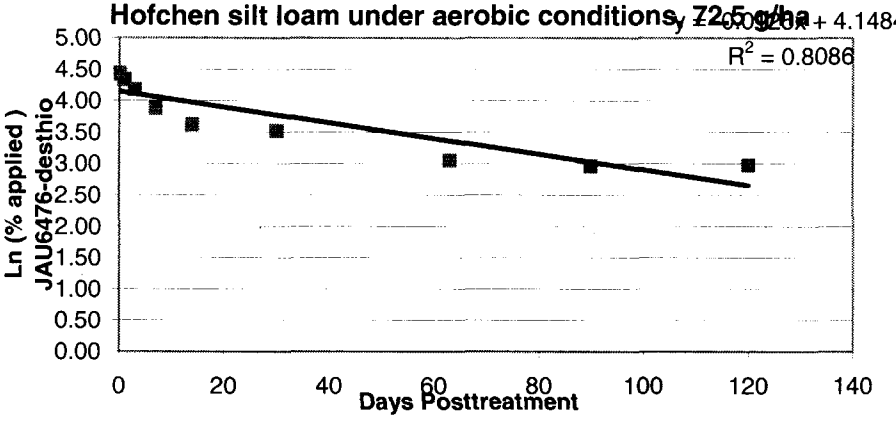
Chemical: Prothioconazole
PC Code: 113961
MRID: 46246513
Guideline No: 162-1

Days	JAU6476-desthio % applied	Ln (% applied)
0	83.3	4.42
0	84.3	4.43
1	76.5	4.34
3	65.2	4.18
7	48.5	3.88
14	37.7	3.63
30	33.9	3.52
63	21.2	3.06
90	19.3	2.96
120	19.6	2.98

Data were calculated from Appendices 10 and 21, pp. 34 and 46 of the study report.

Empirical DT50= 3-7 days
Linear Half life = 55.5 days
Nonlinear Half life = 29.4 days

Biotransformation of [^{14}C] prothioconazole-desthio in Hofchen silt loam under aerobic conditions, 72.5 g/ha



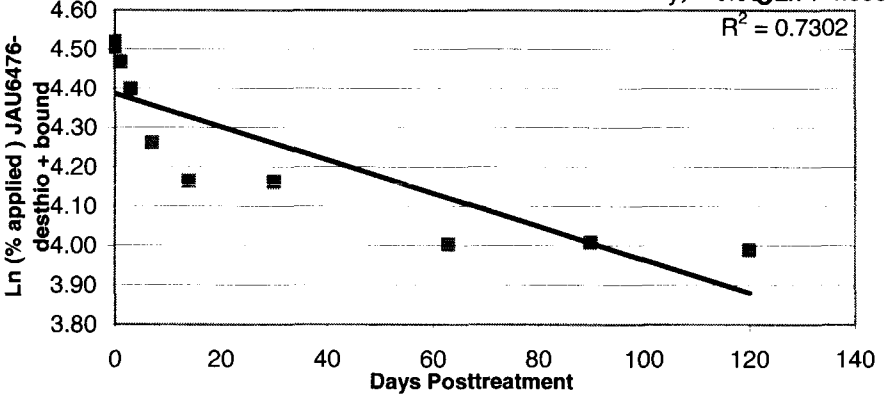
JAU6476-desthio and non-extractible residues

Days	JAU6476-desthio % applied	Non-extractibles % applied	Sum % applied	Ln (% applied)
0	83.3	7.3	90.5	4.51
0	84.3	7.5	91.8	4.52
1	76.5	10.6	87.1	4.47
3	65.2	16.1	81.4	4.40
7	48.5	22.5	70.9	4.26
14	37.7	26.7	64.4	4.16
30	33.9	30.2	64.2	4.16
63	21.2	33.6	54.8	4.00
90	19.3	35.8	55.0	4.01
120	19.6	34.4	54.0	3.99

Data were calculated from Appendices 10 and 21, pp. 34 and 46 of the study report.

Empirical DT50= <120 days
Linear Half life = 165.0 days
Nonlinear Half life = 144.4 days

Biotransformation of [^{14}C] prothioconazole-desthio in Hofchen silt loam under aerobic conditions, 72.5 g/ha

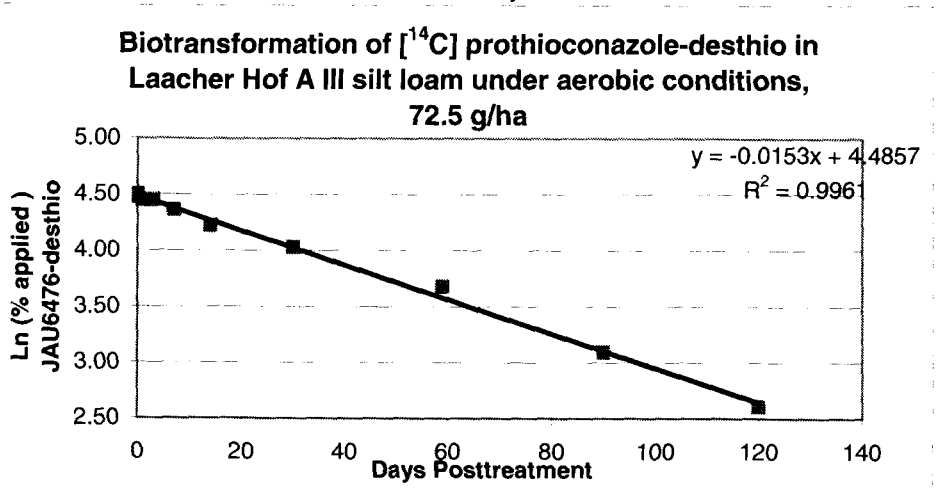


Chemical: Prothioconazole
PC Code: 113961
MRID: 46246513
Guideline No: 162-1

Days	JAU6476-desthio % applied	Ln (% applied)
0	90.0	4.50
0	87.8	4.48
1	85.9	4.45
3	78.6	4.45
7	68.5	4.36
14	56.4	4.23
30	39.8	4.03
59	22.1	3.68
90	13.6	3.09
120	9.0	2.61

Data were calculated from Appendices 10 and 21, pp. 34 and 46 of the study report.

Empirical DT50= 14-30 days
Linear Half life = 45.3 days
Nonlinear Half life = 29.0 days

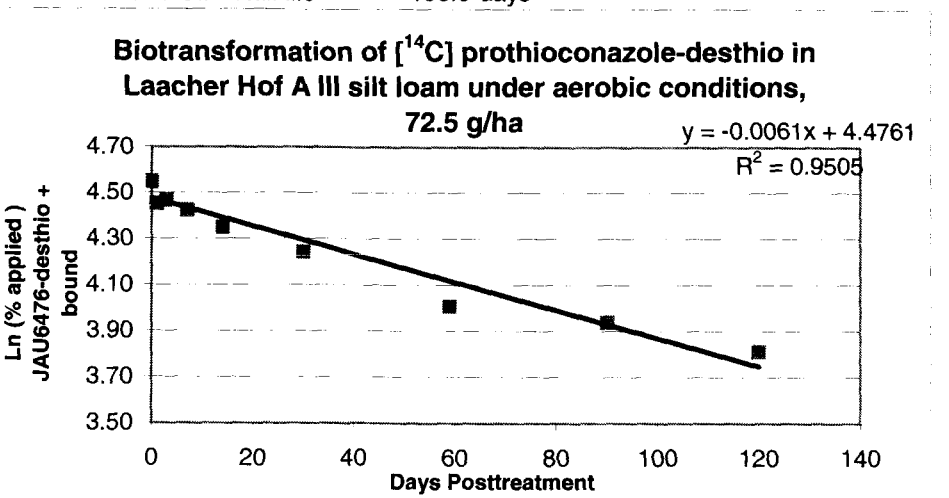


JAU6476-desthio and non-extractible residues

Days	JAU6476-desthio % applied	Non-extractibles % applied	Sum % applied	Ln (% applied)
0	90.0	4.5	94.5	4.55
0	87.8	6.9	94.7	4.55
1	85.9	8.5	85.9	4.45
3	78.6	8.5	87.1	4.47
7	68.5	15.0	83.5	4.42
14	56.4	21.0	77.4	4.35
30	39.8	29.8	69.6	4.24
59	22.1	33.0	55.0	4.01
90	13.6	37.8	51.4	3.94
120	9.0	36.3	45.2	3.81

Data were calculated from Appendices 10 and 21, pp. 34 and 46 of the study report.

Empirical DT50= 90-120 days
Linear Half life = 113.6 days
Nonlinear Half life = 106.6 days

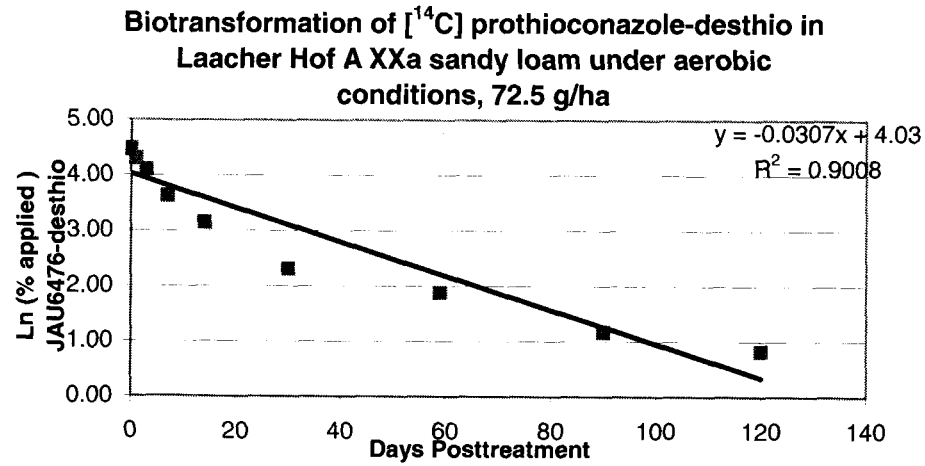


Chemical: Prothioconazole
PC Code: 113961
MRID: 46246513
Guideline No: 162-1

Days	JAU6476-desthio % applied	Ln (% applied)
0	86.9	4.46
0	88.2	4.48
1	74.0	4.30
3	60.8	4.11
7	37.9	3.64
14	23.4	3.15
30	10.1	2.31
59	6.6	1.88
90	3.2	1.17
120	2.3	0.83

Data were calculated from Appendices 10 and 21, pp. 34 and 46 of the study report.

Empirical DT50= 3-7 days
Linear Half life = 22.6 days
Nonlinear Half life = 6.8 days

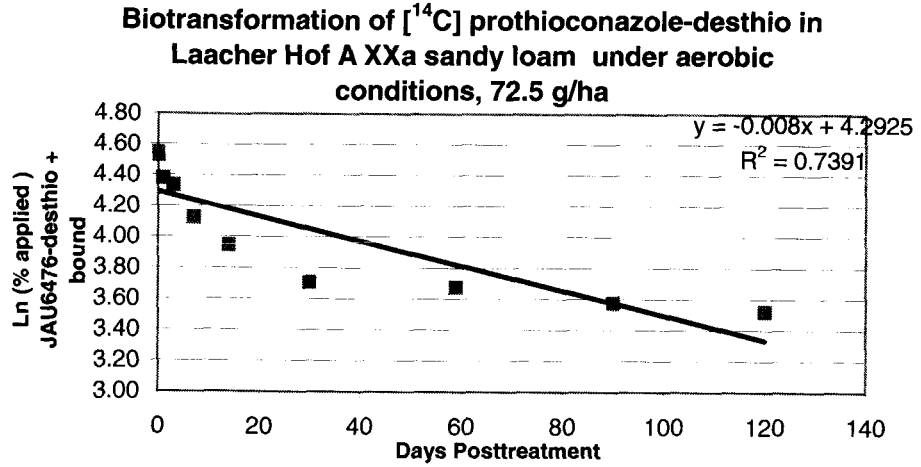


JAU6476-desthio and non-extractible residues

Days	JAU6476-desthio % applied	Non-extractibles % applied	Sum % applied	Ln (% applied)
0	86.9	7.1	94.0	4.54
0	88.2	4.2	92.5	4.53
1	74.0	5.8	79.8	4.38
3	60.8	15.5	76.3	4.33
7	37.9	24.0	61.9	4.13
14	23.4	28.4	51.8	3.95
30	10.1	30.6	40.8	3.71
59	6.6	32.9	39.5	3.68
90	3.2	32.5	35.8	3.58
120	2.3	31.6	33.9	3.52

Data were calculated from Appendices 10 and 21, pp. 34 and 46 of the study report.

Empirical DT50= 14-30 days
Linear Half life = 86.6 days
Nonlinear Half life = 63.6 days

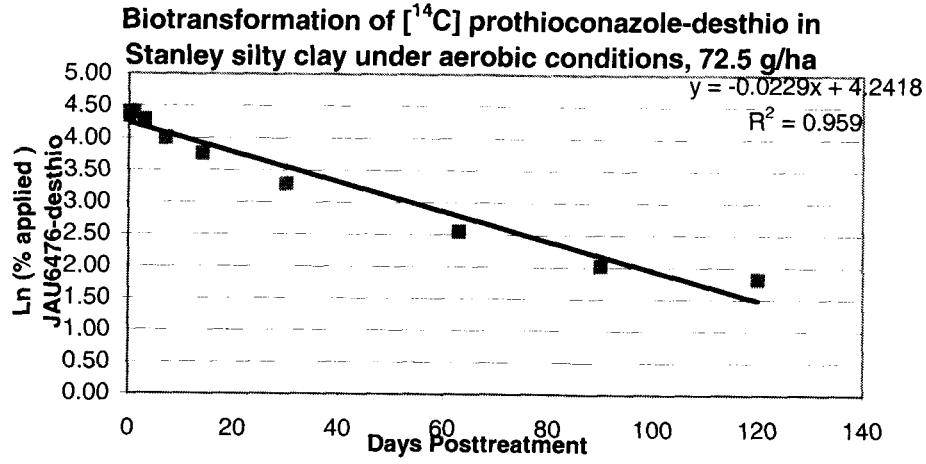


Chemical: Prothioconazole
PC Code: 113961
MRID: 46246513
Guideline No: 162-1

Days	JAU6476-desthio % applied	Ln (% applied)
0	77.3	4.35
0	82.1	4.41
1	81.6	4.40
3	72.9	4.29
7	54.9	4.00
14	43.0	3.76
30	26.8	3.29
63	12.8	2.55
90	7.6	2.02
120	6.2	1.82

Data were calculated from Appendices 10 and 21, pp. 35 and 47 of the study report.

Empirical DT50= 7-14 days
Linear Half life = 30.3 days
Nonlinear Half life = 18.6 days

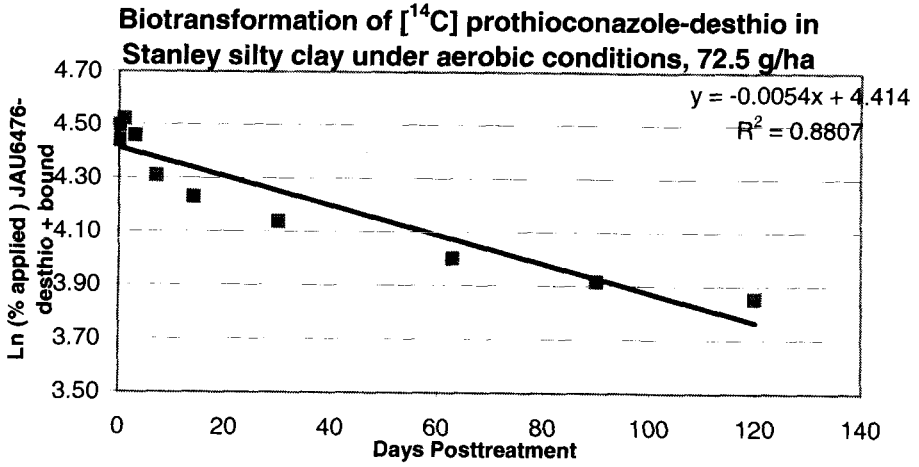


JAU6476-desthio and non-extractible residues

Days	JAU6476-desthio % applied	Non-extractibles % applied	Sum % applied	Ln (% applied)
0	77.3	7.5	84.8	4.44
0	82.1	7.6	89.7	4.50
1	81.6	10.4	92.0	4.52
3	72.9	13.6	86.4	4.46
7	54.9	19.5	74.4	4.31
14	43.0	25.7	68.7	4.23
30	26.8	35.9	62.7	4.14
63	12.8	41.8	54.7	4.00
90	7.6	42.7	50.3	3.92
120	6.2	41.0	47.2	3.85

Data were calculated from Appendices 10 and 21, pp. 35 and 47 of the study report.

Empirical DT50= 90-120 days
Linear Half life = 128.4 days
Nonlinear Half life = 115.5 days



Hofchen, 72.5 g/ha, JAU6476-desthio
Nonlinear Regression
Equation: Single, 2 Parameter
$y=ae^{-bx}$

R = 0.91445739 Rsqr = 0.83623232 Adj Rsqr = 0.81576136

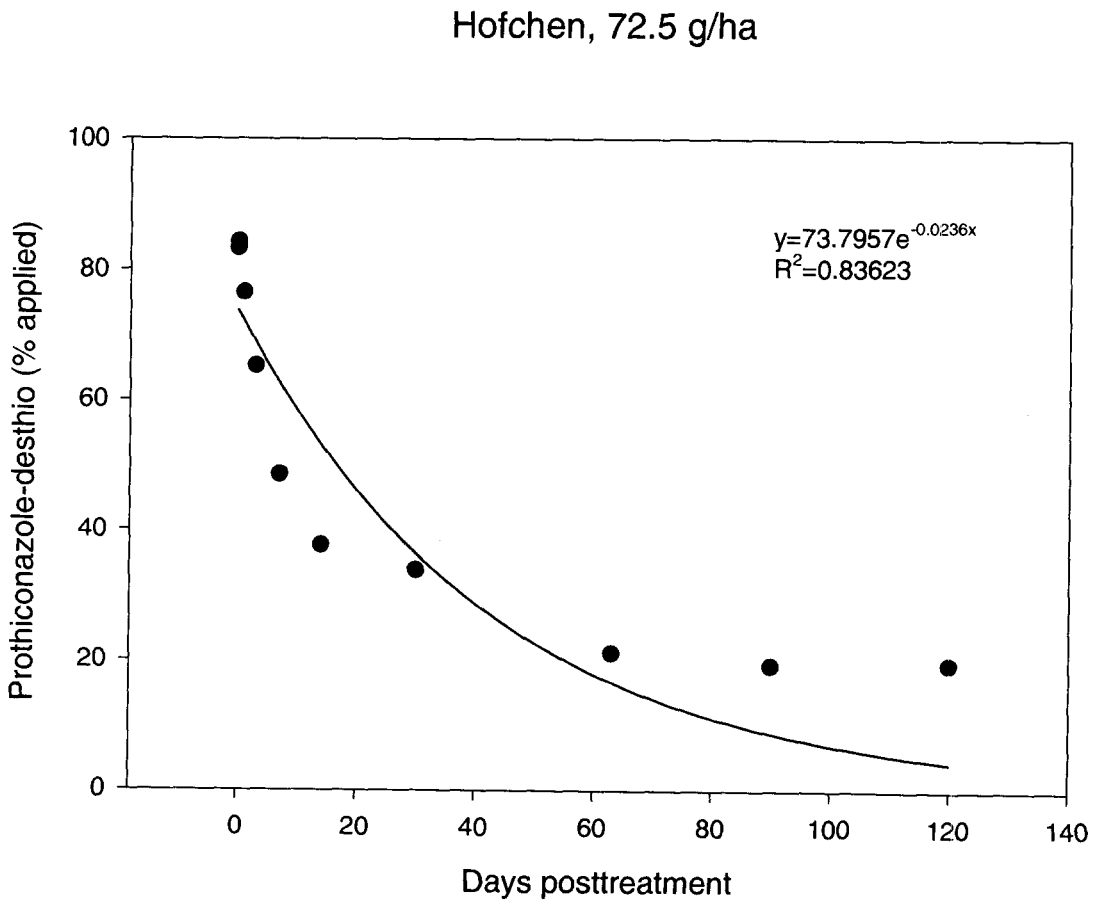
Standard Error of Estimate = 11.3712

	Coefficient	Std. Error	t	P
a	73.7957	5.4922	13.4365	<0.0001
b	0.0236	0.0064	3.6736	0.0063

Analysis of Variance:

	DF	SS	MS	F	P
Regression	1	5282.0489	5282.0489	40.8497	0.0002
Residual	8	1034.4361	129.3045		
Total	9	6316.4850	701.8317		

PRESS = 1482.6405
Durbin-Watson Statistic = 0.4703
Normality Test: Passed (P = 0.3338)
Constant Variance Test: Passed (P = 0.5826)
Power of performed test with alpha = 0.0500: 0.9843



Hofchen, 72.5 g/ha, JAU6476-desthio and bound residues
Nonlinear Regression
Equation: Single, 2 Parameter
$y=ae^{-bx}$

R = 0.85306548 Rsqr = 0.72772071 Adj Rsqr = 0.69368580

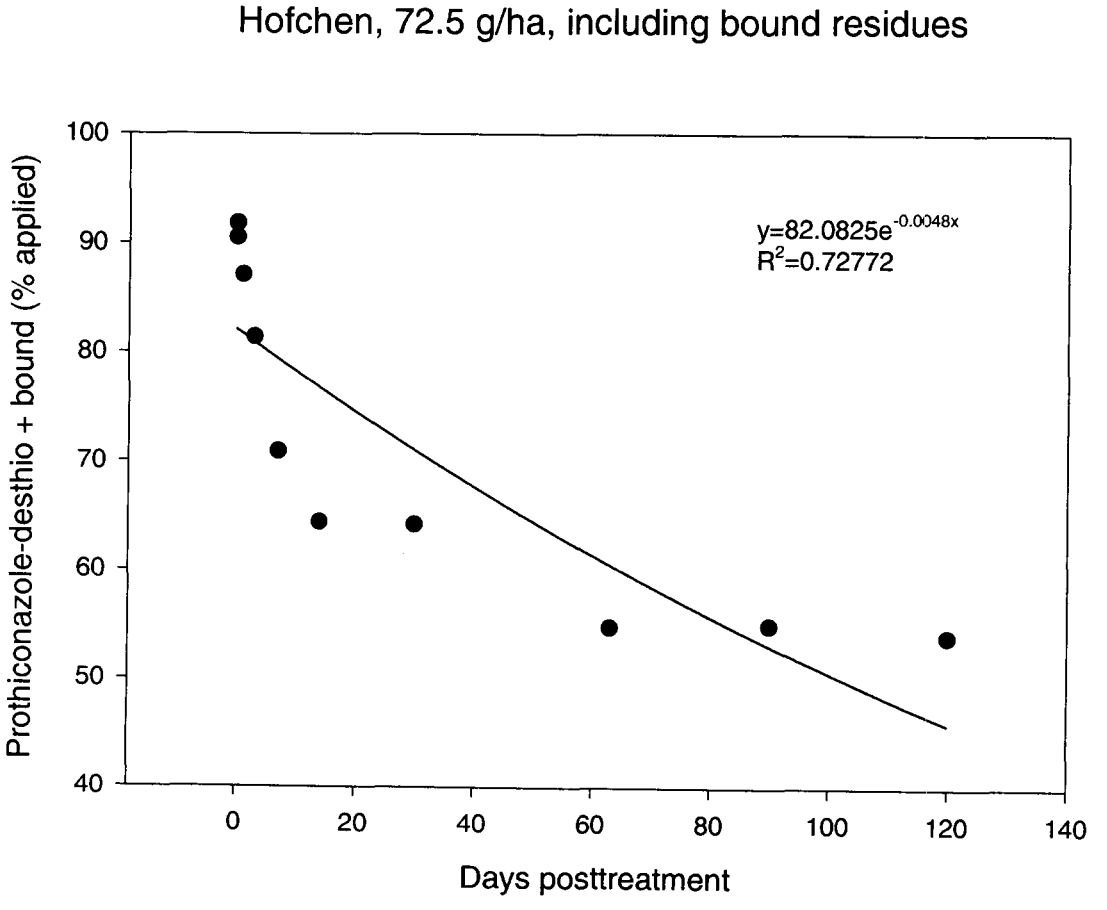
Standard Error of Estimate = 8.4054

	Coefficient	Std. Error	t	P
a	82.0825	3.5479	23.1357	<0.0001
b	0.0048	0.0012	4.2009	0.0030

Analysis of Variance:

	DF	SS	MS	F	P
Regression	1	1510.6237	1510.6237	21.3816	0.0017
Residual	8	565.2053	70.6507		
Total	9	2075.8290	230.6477		

PRESS = 900.7667
Durbin-Watson Statistic = 0.4723
Normality Test: Passed (P = 0.5278)
Constant Variance Test: Passed (P = 0.4678)
Power of performed test with alpha = 0.0500: 0.9182



Laacher Hof A III, 72.5 g/ha, JAU6476-desthio
Nonlinear Regression
Equation: Single, 2 Parameter
$y=ae^{-bx}$

R = 0.99378565 Rsqr = 0.98760992 Adj Rsqr = 0.98606116

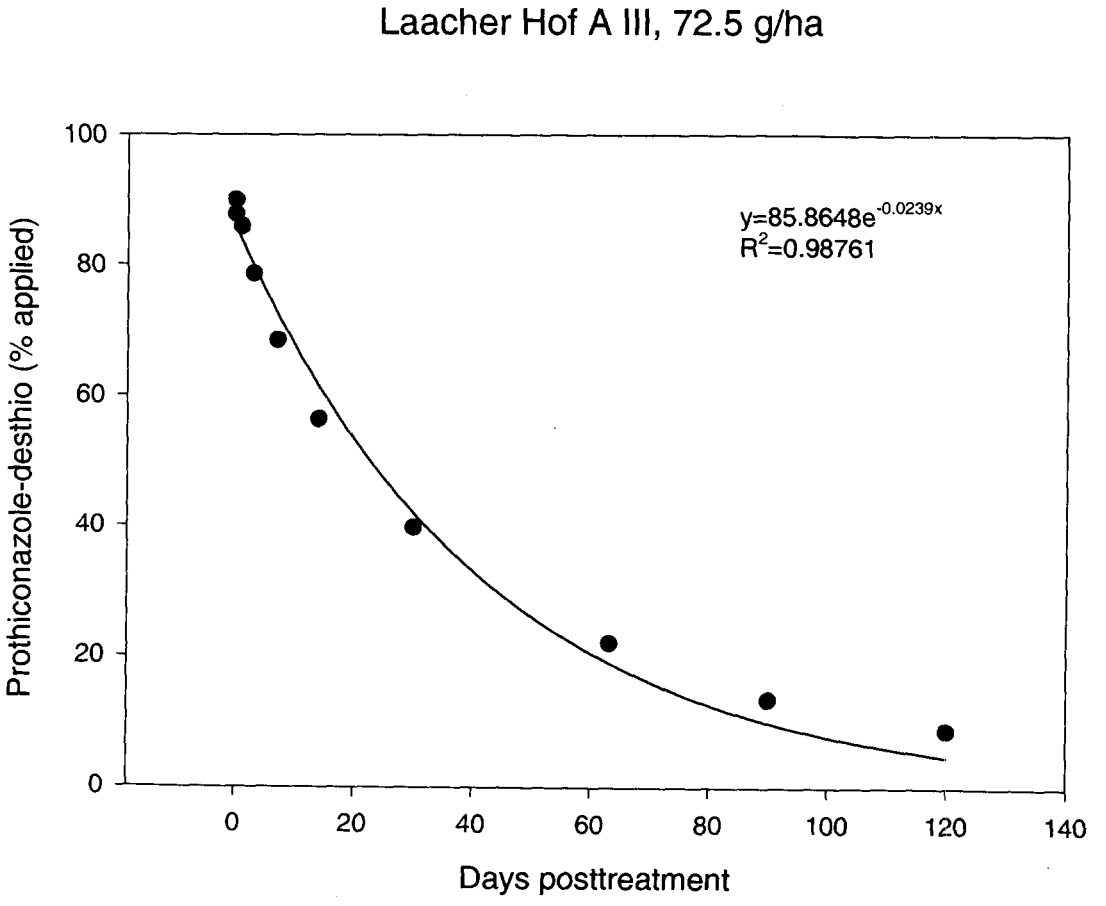
Standard Error of Estimate = 3.7624

	Coefficient	Std. Error	t	P
a	85.8648	1.8183	47.2237	<0.0001
b	0.0239	0.0018	13.0102	<0.0001

Analysis of Variance:

	DF	SS	MS	F	P
Regression	1	9026.6964	9026.6964	637.6780	<0.0001
Residual	8	113.2446	14.1556		
Total	9	9139.9410	1015.5490		

PRESS = 171.6417
Durbin-Watson Statistic = 0.5384
Normality Test: Passed (P = 0.0847)
Constant Variance Test: Passed (P = 0.4250)
Power of performed test with alpha = 0.0500: 1.0000



Laacher Hof A III, 72.5 g/ha, JAU6476-desthio and bound residues
Nonlinear Regression
Equation: Single, 2 Parameter
$y=ae^{-bx}$

R = 0.97642922 Rsqr = 0.95341402 Adj Rsqr = 0.94759077

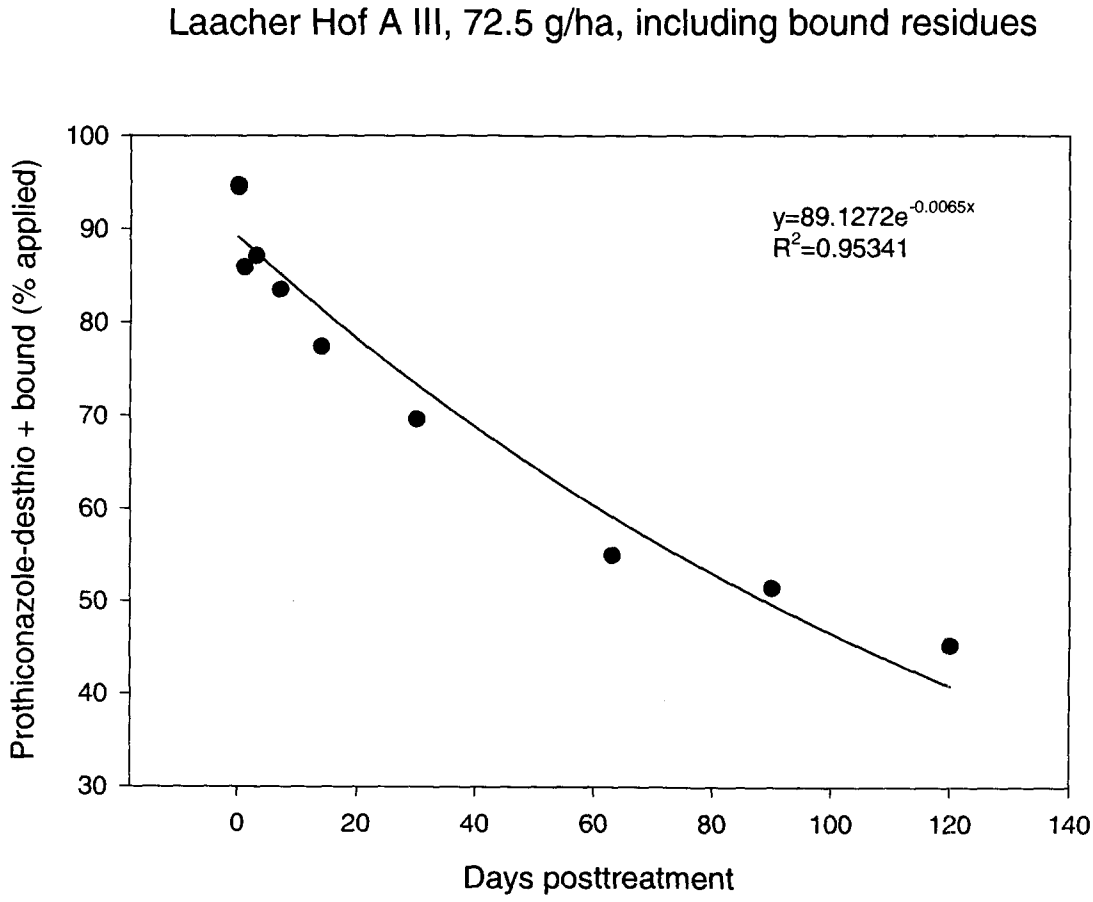
Standard Error of Estimate = 4.1675

	Coefficient	Std. Error	t	P
a	89.1272	1.7827	49.9958	<0.0001
b	0.0065	0.0006	10.8245	<0.0001

Analysis of Variance:

	DF	SS	MS	F	P
Regression	1	2843.5392	2843.5392	163.7255	<0.0001
Residual	8	138.9418	17.3677		
Total	9	2982.4810	331.3868		

PRESS = 229.4870
Durbin-Watson Statistic = 0.8816
Normality Test: Passed (P = 0.5117)
Constant Variance Test: Passed (P = 0.6068)
Power of performed test with alpha = 0.0500: 1.0000



Laacher Hof A XXa, 72.5 g/ha, JAU6476-desthio
Nonlinear Regression
Equation: Single, 2 Parameter
$y=ae^{-bx}$

R = 0.99361634 Rsqr = 0.98727344 Adj Rsqr = 0.98568262

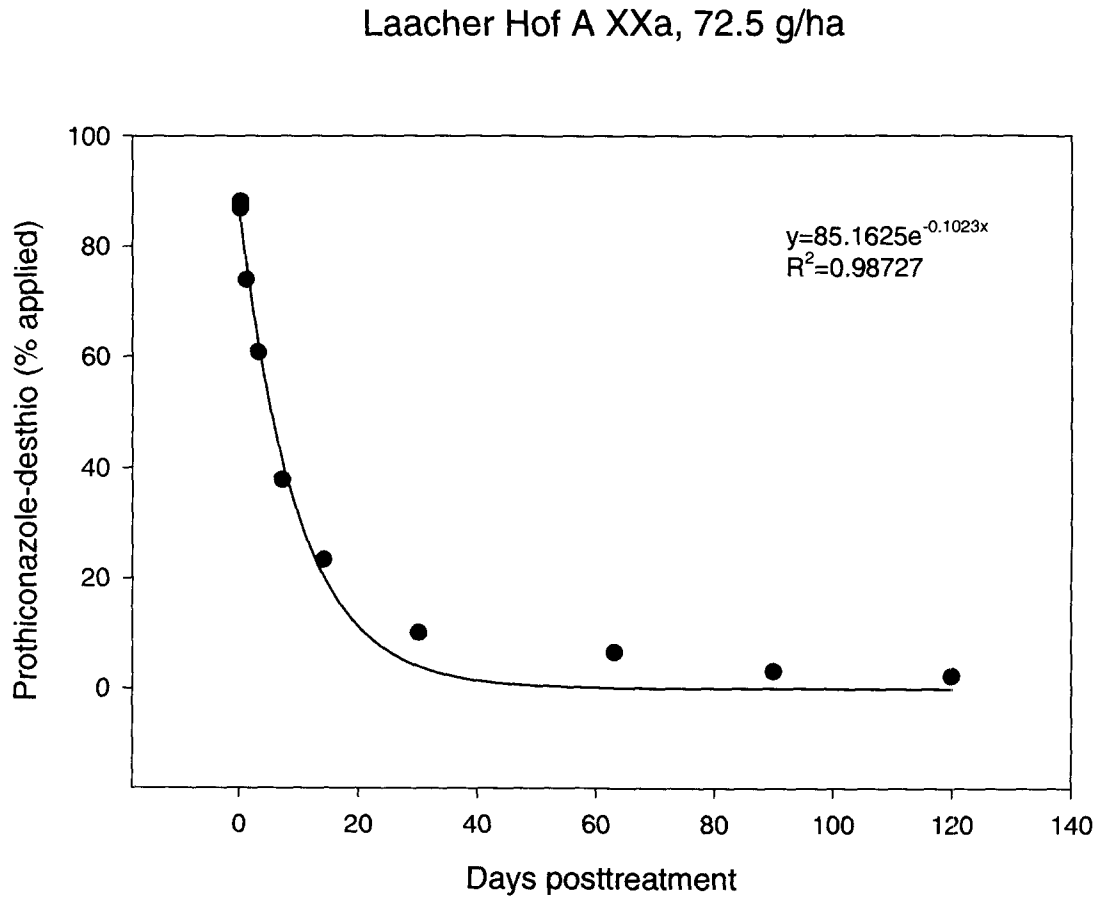
Standard Error of Estimate = 4.2158

	Coefficient	Std. Error	t	P
a	85.1625	2.4996	34.0703	<0.0001
b	0.1023	0.0101	10.0783	<0.0001

Analysis of Variance:

	DF	SS	MS	F	P
Regression	1	11030.0203	11030.0203	620.6066	<0.0001
Residual	8	142.1837	17.7730		
Total	9	11172.2040	1241.3560		

PRESS = 212.5452
Durbin-Watson Statistic = 0.7623
Normality Test: Passed (P = 0.2997)
Constant Variance Test: Passed (P = 0.1601)
Power of performed test with alpha = 0.0500: 1.0000



Laacher Hof A XXa, 72.5 g/ha, JAU6476-desthio and bound residues
Nonlinear Regression
Equation: Single, 2 Parameter
$y=ae^{-bx}$

R = 0.86568337 Rsqr = 0.74940769 Adj Rsqr = 0.71808365

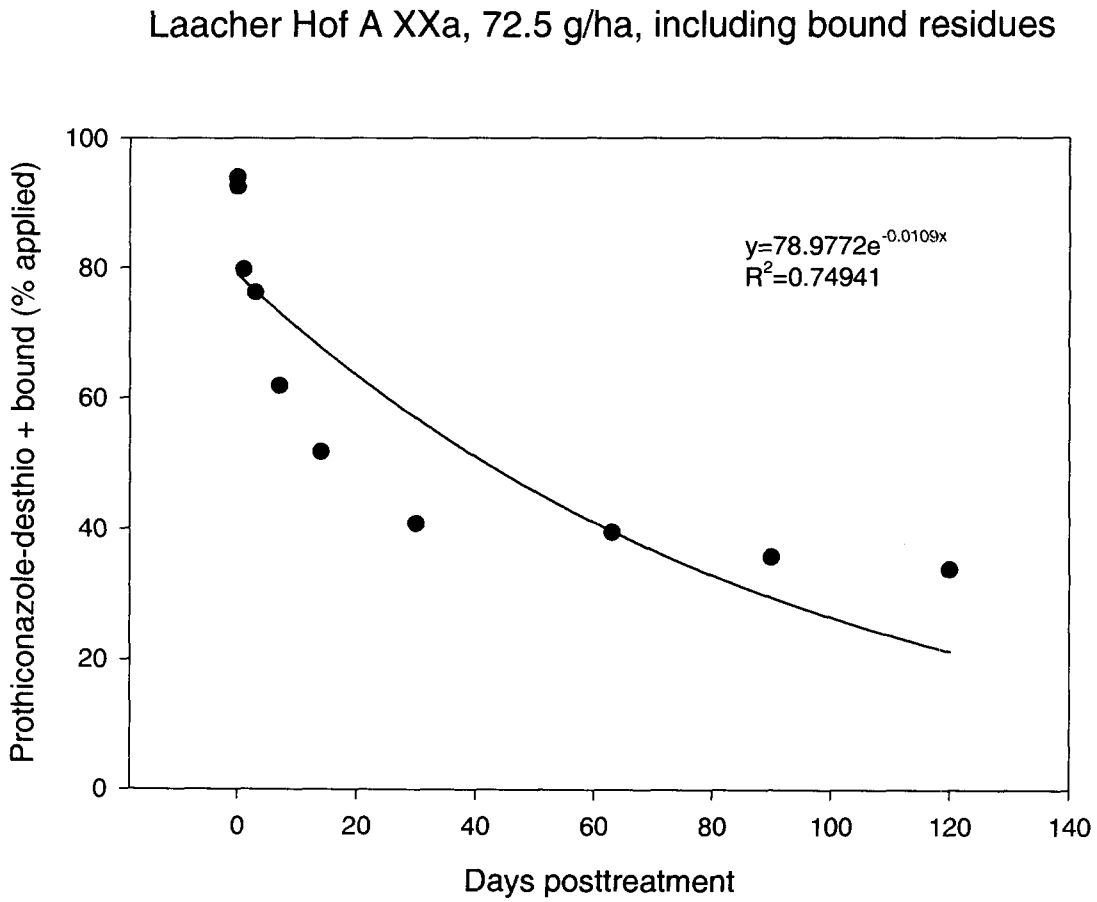
Standard Error of Estimate = 12.5055

	Coefficient	Std. Error	t	P
a	78.9772	5.5327	14.2746	<0.0001
b	0.0109	0.0029	3.7878	0.0053

Analysis of Variance:

	DF	SS	MS	F	P
Regression	1	3741.4936	3741.4936	23.9244	0.0012
Residual	8	1251.1074	156.3884		
Total	9	4992.6010	554.7334		

PRESS = 1885.2907
Durbin-Watson Statistic = 0.5015
Normality Test: Passed (P = 0.4672)
Constant Variance Test: Passed (P = 0.8113)
Power of performed test with alpha = 0.0500: 0.9358



Stanley, 72.5 g/ha, JAU6476-desthio
Nonlinear Regression
Equation: Single, 2 Parameter
$y=ae^{-bx}$

R = 0.99001476 Rsqr = 0.98012923 Adj Rsqr = 0.97764539

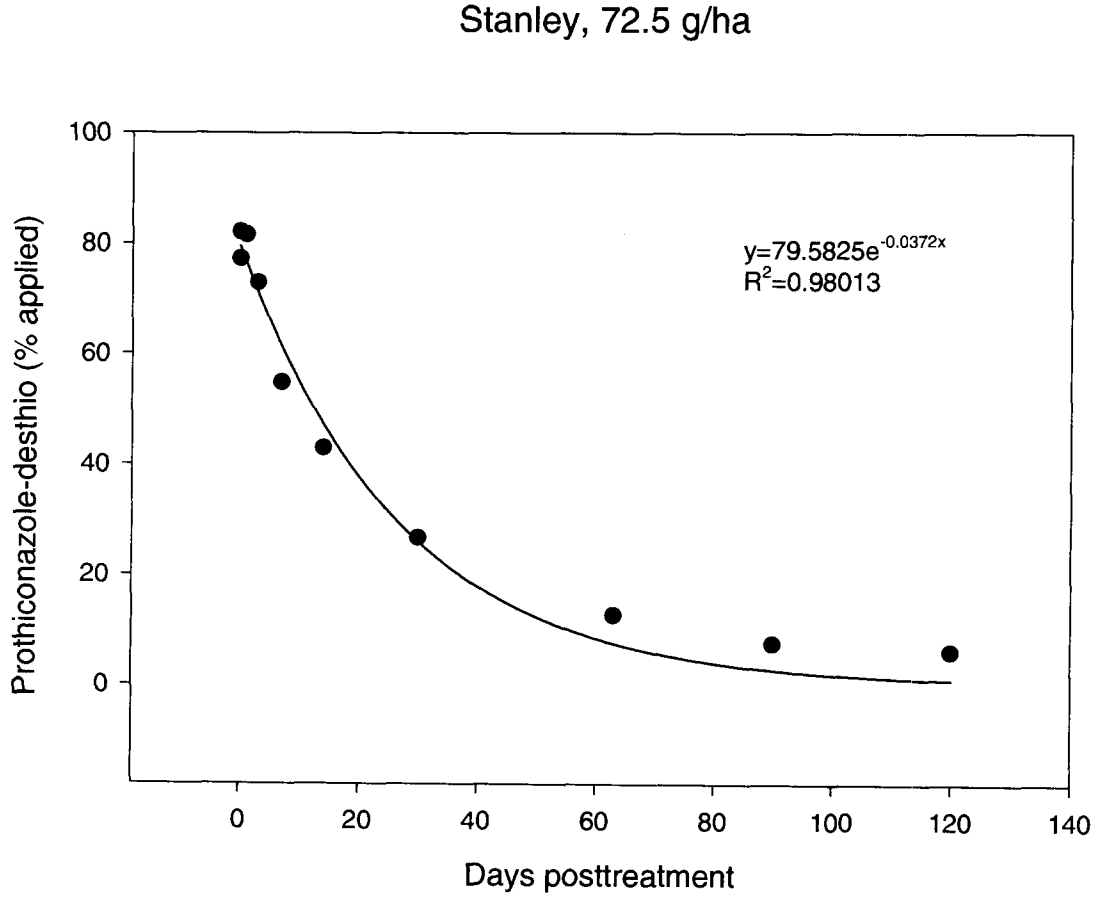
Standard Error of Estimate = 4.6988

	Coefficient	Std. Error	t	P
a	79.5825	2.4338	32.6994	<0.0001
b	0.0372	0.0042	8.8002	<0.0001

Analysis of Variance:

	DF	SS	MS	F	P
Regression	1	8712.2276	8712.2276	394.6015	<0.0001
Residual	8	176.6284	22.0785		
Total	9	8888.8560	987.6507		

PRESS = 253.7818
Durbin-Watson Statistic = 0.8793
Normality Test: Passed (P = 0.2871)
Constant Variance Test: Passed (P = 0.2583)
Power of performed test with alpha = 0.0500: 1.0000



Stanley, 72.5 g/ha, JAU6476-desthio and bound residues
Nonlinear Regression
Equation: Single, 2 Parameter
$y=ae^{-bx}$

R = 0.93206368 Rsqr = 0.86874270 Adj Rsqr = 0.85233554

Standard Error of Estimate = 6.4867

	Coefficient	Std. Error	t	P
a	84.1353	2.7641	30.4383	<0.0001
b	0.0060	0.0010	6.3209	0.0002

Analysis of Variance:

	DF	SS	MS	F	P
Regression	1	2227.9506	2227.9506	52.9490	<0.0001
Residual	8	336.6184	42.0773		
Total	9	2564.5690	284.9521		

PRESS = 523.3849
Durbin-Watson Statistic = 0.6689
Normality Test: Passed (P = 0.6516)
Constant Variance Test: Passed (P = 0.7849)
Power of performed test with alpha = 0.0500: 0.9932