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

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

PC Code No: 119031
DP Barcode: D288160

September 14, 2004

MEMORANDUM

SUBJECT: EFED Environmental Fate Data Evaluation Reports in support of the Ecological Risk Assessment for the Section 3 Registration of the New Chemical Penoxsulam for Uses on Rice

FROM: Lucy Shanaman, Chemist
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This memorandum transmits the reviewed environmental fate data evaluation reports (DERs) submitted by Dow AgroSciences in support of the registration of herbicide, Penoxsulam, for its proposed uses on rice crops. The DERs were reviewed under the DP Barcode D288160, and submitted under MRID #'s: 458307-21, 458348-01, 458307-22, 458307-23, 458307-24, 458307-25, 458307-26, 458308-01, 458308-02, 458348-03, 458308-05, 458308-04, 458311-01, 458307-18, 458308-03, and 458308-11.

(1)

Data Evaluation Report on the aerobic biotransformation of penoxsulam (XDE-638) in water-sediment/soil system

PMRA Submission Number {.....} EPA MRID Number 45830726

Data Requirement: PMRA Data Code:
EPA DP Barcode: D288160
OECD Data Point:
EPA Guideline: 162-4

Test material:
Common name: Penoxsulam.
Chemical names:
IUPAC: 6-(2,2-Difluoroethoxy)-N-(5,8-dimethoxy-s-triazolo[1,5-c]pyrimidin-2-yl)-α,α,α-trifluoro-o-toluenesulfonamide;
3-(2,2-Difluoroethoxy)-N-(5,8-dimethoxy[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-α,α,α-trifluorotoluene-2-sulfonamide.
CAS : 2-(2,2-Difluoroethoxy)-N-(5,8-dimethoxy[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)benzenesulfonamide.
CAS No: 219714-96-2.
Synonyms: XDE-638 (Petitioner's code).
SMILES string: n1c(nc2n1c(ncc2OC)OC)NS(=O)(=O)c3c(cccc3C(F)(F)F)OCC(F)F.

Primary Reviewer: Lynne Binari
Dynamac Corporation
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Date: April 15, 2004

Company Code:
Active Code:
Use Site Category:
EPA PC Code: 119031

CITATION: Cook, W.L. and K.P. Smith. 2002. Aerobic aquatic degradation of XDE-638 in six matrices. Unpublished study performed, sponsored and submitted by Dow AgroSciences LLC, Indianapolis, IN. Dow AgroSciences Study No.: 990061. Experiment initiation December 8, 1999, and completion April 19, 2002 (p.6). Final report issued June 28, 2002.

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Data Evaluation Report on the aerobic biotransformation of penoxsulam (XDE-638) in water-sediment/soil system

PMRA Submission Number {.....} EPA MRID Number 45830726

EXECUTIVE SUMMARY:

The biotransformation of [triazolopyrimidine-2-^{14}C]- and [phenyl-U-^{14}C]-labeled 2-(2,2-difluoroethoxy)-N-(5,8-dimethoxy[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-trifluoromethyl)benzenesulfonamide (penoxsulam, XDE-638) was studied in pond water-silty clay sediment (water pH 6.3, organic carbon not reported; sediment pH 5.1, organic carbon 0.35%) and pond water-silt loam soil (water as described above; soil pH 5.8, organic carbon 1.19%) systems from Arkansas, a channel water-loam sediment (water pH 7.7, organic carbon 1.82 mg/L; sediment pH 7.6, organic carbon 4.89%) system from Italy, a lake water-sand sediment (water pH 6.6, organic carbon 2.15 mg/L; sediment pH 6.0, organic carbon 2.43%) system from France, and HPLC water-volcanic loam soil (water not characterized; soil pH 6.9, organic carbon 5.30%) and HPLC water-nonvolcanic loam soil (soil pH 5.3, organic carbon 1.80%) systems from Japan. All incubations were conducted for 99 days under aerobic conditions in darkness either at 25 ± 2°C (Arkansas and Japan systems) or 20 ± 2°C (Italy and France systems). Based on the water volume, [^{14}C]penoxsulam was applied at a nominal rate of either 0.1 mg a.i./L (Arkansas, Italy and France systems) or 0.04 mg a.i./L (Japan systems). The sediment/soil:water ratio used was 1:4 (30 g dry wt. sediment/soil:120 mL water). This experiment was conducted in accordance with USEPA Subdivision N Guideline §162-4 and in compliance with GLP Standards 40 CFR, Part 160. The test system consisted of 250-mL biometer flasks containing water-sediment/soil that were attached to an oxygen manifold and maintained in incubators. Sodium hydroxide solution in the sidearm flask was used for the passive collection of CO_2. Volatile organic compounds were not trapped. The water-sediment/soil systems were pre-incubated 14 days, except for 0-day Arkansas soil, France sediment and Japan soil (volcanic and nonvolcanic) systems which were prepared and treated the same day. Following treatment, a single treated water-sediment/soil system per label (Japan water-nonvolcanic loam systems treated only with [phenyl-U-^{14}C]-label) was collected at some or all of the following intervals: 0, 1, 4, 7/8, 13, 35, 64 and 99 days of incubation. Water layers were filtered (0.45 µm), then analyzed directly. Sediment/soil samples were extracted 3 times with acetone:0.1N HCl (90:10, v:v). Extracts were combined, with a sub-sample filtered (0.45 µm) and concentrated prior to HPLC analysis. Water layers, sediment/soil extracts, extracted sediment/soil and trapping solutions were analyzed for total radioactivity using LSC. Water layers and sediment/soil extracts were analyzed for [^{14}C]penoxsulam and its transformation products by reverse-phase HPLC. [^{14}C]Compounds were identified by comparison to unlabeled reference standards. Identifications were confirmed using LC/MS.

In general, conditions in the six systems were moderately reducing in the water layers and moderately reducing to reducing in the sediment/soil layers throughout the 3-month incubations. In the pond water-silty clay sediment systems, dissolved oxygen, redox potentials and pH in the water layers averaged 6.4 ± 1.8 mg/L, +105.0 ± 62.4 mV and 7.7 ± 0.5, respectively, with an average redox potential in the sediment of -28.2 ± 164.3 mV. In the pond water-silt loam soil systems, dissolved oxygen, redox potentials and pH in the water layers averaged 6.7 ± 2.5 mg/L, +159.4 ± 67.1 mV and 7.0 ± 0.4, respectively, with an average redox potential in the soil of

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+66.1 ± 156.4 mV. In the channel water-loam sediment systems, dissolved oxygen, redox potentials and pH in the water layers averaged 6.6 ± 3.3 mg/L, +86.3 ± 81.4 mV and 7.5 ± 0.6, respectively, with an average redox potential in the sediment of -26.6 ± 108.1 mV. In the lake water-sand sediment systems, dissolved oxygen, redox potentials and pH in the water layers averaged 7.4 ± 2.5 mg/L, +178.2 ± 85.8 mV and 6.1 ± 0.3, respectively, with an average redox potential in the sediment of +167.3 ± 105.4 mV. In the HPLC water-volcanic loam soil systems, dissolved oxygen, redox potentials and pH in the water layers averaged 7.7 ± 1.1 mg/L, +121.3 ± 67.2 mV and 7.8 ± 0.1, respectively, with an average redox potential in the soil of +136.2 ± 55.6 mV. In the HPLC water-nonvolcanic loam soil systems, dissolved oxygen, redox potentials and pH in the water layers averaged 7.5 ± 0.8 mg/L, +207.1 ± 67.8 mV and 6.4 ± 0.5, respectively, with an average redox potential in the soil of +196.9 ± 58.0 mV.

Both labels behaved similarly in all test systems. Overall recoveries of radiolabeled material (both labels) averaged 94.1 ± 5.9% (range 84.1-105.1%) of the applied for the pond water-silty clay sediment systems, 95.9 ± 7.2% (86.0-109.2%) for the pond water-silt loam soil systems, 93.8 ± 5.9% (85.0-105.0%) for the channel water-loam sediment systems, 94.9 ± 6.2% (85.8-105.0%) for the lake water-sand sediment systems, 95.7 ± 5.8% (86.0-103.2%) for the HPLC water-volcanic loam soil systems and 100.4 ± 2.9% (96.7-104.6%; [phenyl-U-^{14}C]-label only) for the HPLC water-nonvolcanic loam soil systems. Following application of [^{14}C]penoxsulam (both labels) to the water layers, [^{14}C]residues partitioned most rapidly into the loam sediment and least rapidly into the silt loam soil; loam sediment>sand sediment>volcanic and nonvolcanic loam soils>silty clay sediment>silt loam soil. [^{14}C]Residues partitioned from the water layer to the loam sediment with distribution ratios (water:sediment/soil) of 15:1 at day 0, 6:1 at 4 days, 2:1 at 1 week, 1:1 at 2 weeks, 1:2 at 2 month and were 1:3 at 3 months. [^{14}C]Residues partitioned from the water layer to the sand sediment with distribution ratios of 28:1 at day 0, 3-5:1 at 1-13 days, 1:1 at 1 month, 1:2 at 2 months and were 1:3 at 3 months. [^{14}C]Residues partitioned from the water layer to the volcanic/nonvolcanic loam soils with average distribution ratios of 26:1 at day 0, 10:1 at 1 day, 5:1 at 4 days, 3:1 at 2 weeks and were 1:1 thereafter. [^{14}C]Residues partitioned from the water layer into the silty clay sediment and silt loam soil with average distribution ratios of 55:1 at day 0, 18:1 at 1 day, 9:1 at 2 weeks, 4:1 at 1-2 months and 2:1 at 3 months.

For all systems, levels of parent penoxsulam and its transformation products in the total system could frequently not be determined because sediment/soil extracts were routinely not analyzed by HPLC. Consequently, in the results presented below, more data were available for the water layers than the sediment/soil layers and total systems. However, to allow for determination of penoxsulam dissipation half-lives in the total system, parent compound recovered in the water layer at the early (0- to 4-day) sampling intervals, when sediment/soil extracts were not analyzed by HPLC, was considered equivalent to the "total system". Two major nonvolatile transformation products for both labels in all six systems were identified via LC/MS as 2-(2,2-difluoroethoxy)-N-(5,6-dihydro-8-methoxy-5-oxo[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl) benzenesulfonamide (5-OH-XDE-638) and 3-[[[2-(2,2-difluoroethoxy)-6-

(trifluoromethyl) phenyl]sulfonyl]amino]-1H-1,2,4-triazole-5-carboxylic acid (BSTCA). No minor transformation products were positively identified. LC/MS analysis of one unidentified HPLC fraction (Composite 4) detected at least two compounds tentatively identified as 3-[[[(3-,4-, or 5-hydroxy)-2-(2,2-difluoroethoxy)-6-(trifluoromethyl)phenyl]sulfonyl]amino]-1H-1,2,4-triazole-5-carboxylic acid (OH-BSTCA) and 2-[[(5-hydroxy-8-methoxy[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)amino]sulfonyl]-3-(2,2,2-trifluoroethoxy)benzoic acid (PCA-5-OH-XDE-638).

In pond water-silty clay sediment systems (both labels), [^{14}C]penoxsulam in the total system decreased from 85.1% of the applied at day 0 to 55.4% at 2 weeks, 16.6% at 1 month, 1.3-4.6% at 2 months and was 1.8% at study termination. In the water layer, [^{14}C]penoxsulam decreased from 85.1-91.2% at 0-1 days to 51.4-53.7% at 2 weeks, 15.9% at 1 month and was 1.2-4.4% thereafter, while in the sediment, [^{14}C]penoxsulam increased from 1.5% at 4 days to 3.2-4.4% at 1 week, then decreased to 1.7% at 2 weeks and was ≤0.7% thereafter. Based on first-order linear regression analysis, [^{14}C]penoxsulam dissipated from the water layer, sediment and total system with calculated half-lives of 16-17 days. 5-OH-XDE-638 was detected in the water layer, sediment and total system at maximums of 30.7%, 1.6% and 32.3% of the applied, respectively, at 1 month, and was 9.3-15.7%, 0.3% and 9.6%, respectively, at study termination. BSTCA was a maximum 39.5-44.4% in the water layer at study termination and was ≤0.8% in the sediment at any sampling interval. Composite 4 and four additional unknowns (Metabolites 1, 2, 3 and 5) were each detected at means of ≤3.1% in the total system at any interval. Extractable [^{14}C]residues increased to 4.4-5.0% of the applied at 1 week, then decreased to 0.5-0.8% at study termination, while nonextractable [^{14}C]residues increased from 0.3-0.8% at day 0 to 24.5-28.6% at study termination. Organic matter fractionation of 3-month extracted sediment found 5.7-6.2%, 16.9-20.2% and 1.9-2.2% of the applied associated with the humin, fulvic acid and humic acid fractions, respectively. At study termination, volatilized $^{14}CO_2$ totaled 1.6-2.3% of the applied.

In pond water-silt loam soil systems (both labels), [^{14}C]penoxsulam in the total system was detected at 77.4-103.8% of the applied at 4-13 days, 43.6% at 1 month, 11.5-45.8% at 2 months and 9.1% at study termination. In the water layer, [^{14}C]penoxsulam was detected at 72.2-99.1% at 0-13 days, 43.4% at 1 month, 11.3-43.9% at 2 months and 8.7% at study termination, while in the soil, [^{14}C]penoxsulam was detected at 3.9-13.2% at 4-13 days and ≤1.9% thereafter. [^{14}C]Penoxsulam dissipated from the water layer, soil and total system with calculated half-lives of 8 days from the soil and 29 days from the water layer and the total system. 5-OH-XDE-638 increased in the water layer and total system to 17.1-25.5% and 19.3-26.1% of the applied, respectively, at 1-2 months, and was 19.4% and 20.6%, respectively, at study termination. 5-OH-XDE-638 was ≤2.2% in the soil at any interval. BSTCA in the water layer increased to 29.5% at study termination and was ≤0.3% in the soil at any interval. Composite 4 and unidentified Metabolites 1, 2, 3 and 5 were each detected at means of ≤3.0% in the total system at any interval. Extractable [^{14}C]residues were 0.4-14.5% of the applied throughout the 3-month study, while nonextractable [^{14}C]residues increased from 0.3-0.8% at day 0 to 22.0% at study termination. At study termination, volatilized $^{14}CO_2$ totaled 1.5% of the applied.

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In channel water-loam sediment systems (both labels), [^{14}C]penoxsulam in the total system decreased from 72.3% of the applied at 4 days to 36.9-40.1% at 1 week, 14.3% at 2 weeks, 0.7-2.7% at 2 months (no 1-month interval) and was 0.4% at study termination. In the water layer, [^{14}C]penoxsulam was detected at 69.5-90.3% at 0-1 days, 69.8% at 4 days, 30.2-38.0% at 1 week, 13.0% at 2 weeks and ≤0.6% thereafter. In the sediment, [^{14}C]penoxsulam was detected at 2.1-6.7% at 4-8 days and ≤2.1% thereafter. [^{14}C]Penoxsulam dissipated from the water layer, sediment and total system with calculated half-lives of 11, 18 and 12 days, respectively. 5-OH-XDE-638 in the water layer, sediment and total system increased to 18.5-18.6%, 1.4-5.4% and 20.0-23.9%, respectively, at 1-2 weeks and was ≤0.9%, ≤1.3% and ≤2.1%, respectively, thereafter. BSTCA increased in the water layer to 20.6-26.9% at 2 months and was 16.7% at study termination, but was ≤1.7% in the sediment at any interval. Composite 4 was detected at a maximum mean of 6.8% in the total system (1.2% in water, 5.6% in sediment) at study termination, with Metabolites 1, 2, 3 and 5 each detected at means of ≤6.2% in the total system at any interval. Extractable [^{14}C]residues were 4.3-16.0% of the applied throughout the 3-month study, while nonextractable [^{14}C]residues increased from 1.1-1.2% at day 0 to 57.9% at study termination. Organic matter fractionation of 3-month extracted sediment found 13.9-14.6%, 35.2-35.3% and 7.9-8.1% of the applied associated with the humin, fulvic acid and humic acid fractions, respectively. At study termination, volatilized $^{14}CO_2$ totaled 0.8% of the applied.

In lake water-sand sediment systems (both labels), [^{14}C]penoxsulam in the total system decreased from 81.3-91.3% of the applied at 4-13 days to 13.3-33.7% at 1-2 months and was 21.8% at study termination. In the water layer, [^{14}C]penoxsulam was detected at 89.2-93.9% at day 0, 61.2-75.9% at 4-13 days, 22.3% at 1 month, 7.5-11.8% at 2 months and 3.9% at study termination. In the sediment, [^{14}C]penoxsulam was detected at 5.8-21.9% throughout the 3-month study. [^{14}C]Penoxsulam dissipated from the water layer and total system with calculated half-lives of 21 and 38 days, respectively, and from the sediment with an observed half-life of >99 days. 5-OH-XDE-638 in the water layer, sediment and total system increased to 14.1%, 15.6% and 29.7%, respectively, at 1 month, then was 6.7-16.5%, 6.7-10.8% and 17.5-23.2%, respectively, at 2 months and 2.4%, 9.5% and 11.9%, respectively, at study termination. BSTCA in the water layer and total system increased to 5.8-18.4% and 6.1-19.6%, respectively, at 1-2 months and was 5.5% and 7.7%, respectively, at study termination. In the sediment, BSTCA was a maximum 2.2% at study termination. Composite 4 was detected in the sediment and total system at maximum means of 15.7% and 17.0%, respectively, at study termination, with a maximum mean of 2.6% in the water layer at 2 months. Metabolites 1, 2, 3 and 5 were each detected at means of ≤2.6% in the total system at any sampling interval. Extractable [^{14}C]residues increased from 3.0-3.8% at day 0 to 47.3% at study termination, while nonextractable [^{14}C]residues increased from ≤0.1% at day 0 to 13.6-23.0% at 2 months and were 20.8% at study termination. At study termination, volatilized $^{14}CO_2$ totaled 2.4% of the applied.

In HPLC water-volcanic loam soil systems (both labels), [^{14}C]penoxsulam in the total system decreased from 91.6% at 4 days to 48.2% at 1 month, 22.4% at 2 months and was 8.0-11.3% at study termination. In the water layer, [^{14}C]penoxsulam decreased from 96.2-96.9% at day 0 to

61.9-67.8% at 2 weeks, 36.1-41.1% at 1 month, 13.9% at 2 months and was 6.6-6.9% at study termination. In the soil, [^{14}C]penoxsulam was detected at 10.2-12.8 at 4-35 days, 8.5% at 2 months and 1.1-4.7% at study termination. [^{14}C]Penoxsulam dissipated from the water layer, soil and total system with calculated half-lives of 26, 36 and 30 days, respectively. 5-OH-XDE-638 increased in the water layer, soil and total system to 18.4-20.0%, 11.0-12.2% and 29.4-32.2%, respectively, at 1-2 months and was 19.2-19.9%, 4.9-12.5% and 24.8-31.7%, respectively, at study termination. BSTCA in the water layer and total system were detected at maximums of 8.8-10.7% and 8.9-11.9%, respectively, at study termination. In the soil, BSTCA was ≤1.9% at any interval. At study termination, Composite 4 was detected in the soil and total system at maximum means of 8.8% and 9.1%, respectively, but was ≤1.4% in the water layer at interval. Metabolites 1, 2, 3 and 5 were each detected at means of ≤1.3% in the total system at any interval. Extractable [^{14}C]residues increased from 3.3-3.6% at day 0 to 27.4% at 1 month and were 20.6% at study termination, while nonextractable [^{14}C]residues increased from 0.1% at day 0 to 28.6% at study termination. Organic matter fractionation of 3-month extracted soil found 3.2-3.6%, 17.2-21.4% and 7.4-8.2% of the applied associated with the humin, fulvic acid and humic acid fractions, respectively. At study termination, volatilized $^{14}CO_2$ totaled 1.0% of the applied.

In HPLC water-nonvolcanic loam soil systems ([phenyl-U-^{14}C]-label), [^{14}C]penoxsulam in the total system decreased from 96.0% at 4 days to 79.9% at 2 weeks, 24.2% at 2 months and was 10.1% at study termination. In the water layer, [^{14}C]penoxsulam decreased from 95.2-98.1% at day 0 to 59.6% at 2 weeks, 10.5% at 2 months and was 3.7% at study termination. In the soil, [^{14}C]penoxsulam was detected at 17.0-20.6% at 4-13 days, 13.7% at 2 months and 6.4% at study termination. [^{14}C]Penoxsulam dissipated from the water layer, soil and total system with calculated half-lives of 21, 58 and 31 days, respectively. 5-OH-XDE-638 increased in the water layer, soil and total system to 22.9%, 17.4% and 40.3%, respectively, at 2 months, and was 14.3%, 16.6% and 30.9%, respectively, at study termination. BSTCA in the water layer and total system were detected at maximums of 25.4% and 25.7%, respectively, at study termination. In the soil, BSTCA was ≤0.3% at any interval. Composite 4 was detected at maximums of 0.8%, 7.5% and 8.3%, in the water layer, soil and total system, respectively, at 2 months. Metabolites 1, 2, 3 and 5 were each detected at means of ≤2.9% in the total system at any interval. Extractable [^{14}C]residues increased from 3.7-4.1% at day 0 to 38.8% at 2 months and were 31.6% at study termination, while nonextractable [^{14}C]residues increased from ≤0.9% at 0-4 days to 17.8% at study termination. At study termination, volatilized $^{14}CO_2$ totaled 2.2% of the applied.

A possible transformation pathway was proposed by the study authors. Under aerobic aquatic conditions, the 5-methoxy group on the triazolopyrimdine ring could be converted to a hydroxy group to yield 2-(2,2-difluoroethoxy)-N-(5,6-dihydro-8-methoxy-5-oxo[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)benzenesulfonamide (5-OH-XDE-638; maximums 14.1-30.7%, 1.6-17.4% and 23.9-40.3% in water, sediment/soil and total system, respectively). 5-OH-XDE-638 could then degrade to 3-[[[2-(2,2-difluoroethoxy)-6-(trifluoromethyl)

phenyl]sulfonyl]amino]-1H-1,2,4-triazole-5-carboxylic acid (BSTCA; 7.1-29.5%, 0.3-2.2% and 7.1-29.7% in water, sediment/soil and total system, respectively).

Results Synopsis:

System: Pond water-silty clay sediment from Arkansas.
Half-life (0- to 99-day data) in water: 16.7 days ($r^2 = 0.881$).
Half-life (7- to 99-day data) in sediment: 16.1 days ($r^2 = 0.903$).
Half-life (0- to 99-day data) in total system: 16.3 days (12.6 to 23.1 days at the 90% confidence interval; $r^2 = 0.885$).

System: Pond water-silt loam soil from Arkansas.
Half-life (0- to 99-day data) in water: 29.2 days ($r^2 = 0.875$).
Half-life (4- to 99-day data) in soil: 8.4 days ($r^2 = 0.462$).
Half-life (0- to 99-day data) in total system: 29.1 days (23.4 to 38.4 days at the 90% confidence interval; $r^2 = 0.871$).

System: Channel water-loam sediment from Italy.
Half-life (0- to 99-day data) in water: 11.2 days ($r^2 = 0.934$).
Half-life (8- to 64-day data) in sediment: 15.3 days ($r^2 = 0.284$).
Half-life (0- to 99-day data) in total system: 12.1 days (10.5 to 15.0 days at the 90% confidence interval; $r^2 = 0.944$).

System: Lake water-sand sediment from France.
Half-life (0- to 99-day data) in water: 20.9 days ($r^2 = 0.973$).
Half-life (observed) in sediment: >99 days.
Half-life (0- to 99-day data) in total system: 37.7 days (26.8 to 63.6 days at the 90% confidence interval; $r^2 = 0.801$).

System: HPLC water-volcanic loam soil from Japan.
Half-life (0- to 99-day data) in water: 26.1 days ($r^2 = 0.993$).
Half-life (13- to 99-day data) in soil: 35.5 days ($r^2 = 0.671$).
Half-life (0- to 99-day data) in total system: 29.9 days (27.7 to 32.4 days at the 90% confidence interval; $r^2 = 0.985$).

System: HPLC water-nonvolcanic loam soil from Japan.
Half-life (0- to 99-day data) in water: 21.3 days ($r^2 = 0.996$).
Half-life (7- to 99-day data) in soil: 57.5 days ($r^2 = 0.927$).
Half-life (0- to 99-day data) in total system: 30.9 days (27.9 to 34.6 days at the 90% confidence interval; $r^2 = 0.989$).

All systems:

Major transformation products: 2-(2,2-Difluoroethoxy)-N-(5,6-dihydro-8-methoxy-5-oxo[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)benzenesulfonamide (5-OH-XDE-638). 3-[[[2-(2,2-Difluoroethoxy)-6-(trifluoromethyl)phenyl]-sulfonyl]amino]-1H-1,2,4-triazole-5-carboxylic acid (BSTCA).

Minor transformation products: CO_2.

Study Acceptability: This study is classified acceptable, and can be used toward the fulfillment of the aerobic aquatic metabolism guideline, Subdivision N Guideline §162-4, data requirements for penoxsulam.

I. MATERIALS AND METHODS

GUIDELINE FOLLOWED: This study was conducted in accordance with USEPA Subdivision N Guideline §162-4 (1982), Canada PMRA DACO No.: 8.2.3.5.4 - Biotransformation in Aquatic System-Aerobic Water/Sediment, SETAC, Section 8.2 (1995), and Japanese Guidelines (p.19). The following deviations from USEPA Subdivision N Guideline §162-4 were noted:

For all systems, an aerobic soil/sediment was not treated and flooded at the same time so that both aerobic and anaerobic conditions exist in the soil/sediment and the initial microbial population of the soil/sediment is predominantly aerobic. However, reported redox potentials for the test systems remained within an acceptable range for the study duration. This does not significantly affect the validity of the study.

For five of the six systems (both labels), material balances were incomplete with up to *ca.* 13-16% of the theoretically applied unaccounted for in the Arkansas water-silty clay, Arkansas water-silt loam soil, Italy water-loam sediment, France water-sand sediment and Japan HPLC water-volcanic loam soil systems. This does not significantly affect the validity of the study.

For the France systems, identification of all degradates detected at >10% of the applied was not adequately

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addressed. This does not affect the validity of that portion of the study.

For all systems, the application rates were not confirmed. This does not affect the validity of the study.

COMPLIANCE:

This study was conducted in compliance with USEPA GLP Standards 40 CFR, Part 160 (1989) and OECD Principles of GLP (ISBN 92-64-12367-9, 1982; p.3). Signed and dated Data Confidentiality, GLP and Quality Assurance statements and a Certification of study authenticity were provided (pp.2-5).

A. MATERIALS:

1. Test Material:

[Triazolopyrimidine-2-^{14}C]- and [phenyl-U-^{14}C]-labeled 2-(2,2-difluoroethoxy)-N-(5,8-dimethoxy[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-trifluoromethyl)benzenesulfonamide (penoxsulam, XDE-638; pp.19, 21; Figure 1, p.75).

Chemical Structure:

See DER Attachment 1.

Description:

Technical, solid (p.21).

Purity:

[Triazolopyrimidine-2-^{14}C]:
[TP-2-^{14}C]-label:

Radiochemical purity: 97.5% (p.21; Figure 4, p.79).
Batch No.: INV 1456.
Analytical purity: Not reported.
Specific activity: 28.9 mCi/mmol.
Location of radiolabel: 2-C in triazolopyrimidine ring.

[Phenyl-U-^{14}C]:
[Ph-U-^{14}C]-label:

Radiochemical purity: ≥96.7% (p.21; Figure 4, pp.79-80).
Batch No.: INV 1475/INV 1573.
Analytical purity: Not reported.
Specific activity: 24.6 mCi/mmol (INV 1475), 28.1 mCi/mmol (INV 1573).
Location of radiolabel: Uniformly in phenyl ring.

Storage conditions of test chemicals:

Not reported.

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Table 1: Physico-chemical properties of penoxsulam (XDE-638).

Parameter		Values	Comments
Molecular weight:		483 g/mol	
Water solubility:	pH 5:	5.66 mg/L	
	pH 7:	0.408 g/L	
	pH 9:	1.46 g/L	
	Unbuffered:	4.91 mg/L	
Organic solvent solubility:	DMSO[1]:	78.4 g/L	
	NMP[2]:	40.3 g/L	
	DMF[3]:	39.8 g/L	
	Acetone:	20.3 g/L	
	Acetonitrile:	15.3 g/L	
	Ethyl acetate:	3.23 g/L	
	Methanol:	1.48 g/L	
	Octanol:	0.035 g/L	
	Xylene:	0.017 g/L	
	Heptane:	<1µg/mL	
Vapor pressure:		7.16×10^{-16} mm Hg	At 25°C.
UV absorption:		Not reported.	
pK_a:		5.1	
log K_{ow}:	pH 5:	1.137	
	pH 7:	-0.602	
	pH 9:	-1.418	
	Unbuffered:	-0.354	
Stability of compound at room temperature:		Not reported.	

[1]Dimethyl sulfoxide.
[2]1-Methylpyrrolidone.
[3]N-N-Dimethylformamide.
Data obtained from pp.21-22; Figure 1, p.75 of the study report.

2. Water-sediment/soil collection, storage and properties:

Table 2: Description of water-sediment/soil collection and storage.

Description		Arkansas Water-Sediment	Arkansas Soil	Italian Water-Sediment	French Water-Sediment	Japanese Volcanic Soil	Japanese Non-volcanic Soil
Geographic location:		Farm pond in Arkansas County, Arkansas.	Fallow, cropland in Arkansas County, Arkansas.	Channel near head of Lake Superior of Mantova, Lombardy, Italy.	Small lake in Haut-Languedoc National Park, France.	Rice cropland in Japan; no further details.	Rice cropland, Fukuoka, Japan.
Pesticide use history at the collection site:		Not reported.	Propanil, Prowl, Grandstand; no further details.	Not reported.	Not reported.	Not reported.	Not reported.
Collection dates:		May 23, 1999.	May 23, 1999.	April 26, 1999.	April 20, 1999.	May 28, 1999.	June 2, 1999.
Collection procedures:		Water-sediment from 10-12 sites within a 50' x 50' plot into 5-gallon plastic bucket.	Soil from 10-12 sites within a 50' x 50' plot into 5-gallon plastic bucket.	Sediment by scoop into 10-L container. Water collected into 20-L container by submersion.	Sediment by scoop into 6.5-L container. Water collected into 20-L container by submersion.	Soil from 10-12 sites within a 50' x 50' plot into 5-gallon plastic bucket.	Soil from 10-12 sites within a 50' x 50' plot into 5-gallon plastic bucket.
Sampling depth:	Water:	Not reported	NA[1]	Surface.	Surface.	NA	NA
	Sediment/soil:	To 3-inch depth.	To 15-cm depth.	To 10-30 cm.	To 10-cm depth.	To 15-cm depth.	To 15-cm depth.
Storage conditions (at test facility):		25°C.	25°C.	20°C.	20°C.	Ambient and 25°C.	Ambient and 25°C.
Storage length:		208 days.	208 days.	232 days.	225 days.	195 days.	195 days.
Preparation:	Water:	Filtered, glass wool.	NA	0.2-mm sieved.	0.2-mm sieved.	NA	NA
	Sediment/soil:	2-mm sieved.	2-mm sieved.	2-mm sieved.	2-mm sieved.	2-mm sieved.	2-mm sieved.

[1]Not applicable. Data obtained from Appendix B, pp.109-110 of the study report.

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Table 3: Properties of the waters.

Property	Arkansas		Italy		France	
Storage temperature (°C):	25°C		20°C		20°C	
pH:	6.3		7.7		6.6	
Redox potential (mV):	Initial:	Final:	Initial:	Final:	Initial:	Final:
	+238.2	+170.0	+261.6	+136.3	+246.5	+210.8
Oxygen concentration (mg/L):	Initial:	Final:	Initial:	Final:	Initial:	Final:
	5.08	7.97	2.0	9.5	7.4	4.9
Dissolved organic carbon (mg/L):	Not determined.		1.82		2.15	
Hardness (mg $CaCO_3$/L):	216		240		6	
Electrical conductivity (mS/cm):	0.21		0.33		0.04	
Biomass (mg microbial C/100 g, CFU or other):	Not reported.					

Data obtained from Table 2, p.51 of the study report.

Table 4: Properties of the sediment/soil.

Property	Arkansas Sediment		Arkansas Soil		Italy Sediment		France Sediment		Japan Volcanic Soil		Japan Non-volcanic Soil	
Sediment/soil texture:	Silty clay.		Silt loam.		Loam[1].		Sand.		Loam[2].		Loam.	
% sand (2000-50 µm):	4.4		4.3		52.7		89.3		27.5		43.5	
% silt (50-2 µm):	47.6		71.7		35.7		7.1		46.5		38.5	
% clay (<2 µm):	48.0		24.0		11.6		3.6		26.0		18.0	
pH:	5.1		5.8		7.6		6.0		6.9		5.3	
Organic carbon (%)[1]:	0.35		1.19		4.89		2.43		5.30		1.80	
Organic matter (%):	0.60		2.02		8.41		4.17		9.12		3.17	
CEC (meq/100 g soil):	21.91		16.54		21.61		5.28		25.78		12.55	
Redox potential (mV):	Initial:	Final:	Initial:	Final:	Initial:	Final:	Initial:	Final:	Initial:	Final:	Initial:	Final:
	+236.9	+194.5	+241.8	+194.5	+242.8	+109.5	+250.0	+179.9	+238.9	+201.7	+130.6	+319.4
Bulk density, disturbed (g/cm^3):	1.23		1.11		0.90		1.24		0.82		1.04	
Biomass (CFU/g):	3.45×10^5		3.3×10^7		4.9×10^5		8.5×10^5		1.55×10^7		1.6×10^7	
Soil Taxonomic classification:	Not reported.		Fine-silty, mixed, active, thermic Typic Endoaqualfs.		Not reported.		Not reported.		Not reported.		Not reported.	
Soil Series:	Not reported.		Amagon.		Not reported.		Not reported.		Volcanic.		Nonvolcanic.	

[1]Textural classification at loam/sandy loam boundary.
[2]Textrual classification at loam/clay loam boundary.
[2]Estimated by formula %OC = %OM/1.72 (Table 1, p.50).

Data obtained from Table 1, pp.49-50 of the study report.

B. EXPERIMENTAL CONDITIONS:

1. Preliminary experiments: None.

2. Experimental conditions:

Table 5: Study design.

Parameter		Details
Duration of the test:		99 days.
Water: Filtered/unfiltered water: Type and size of filter used, if any:		Arkansas, Italy and France waters: filtered. HPLC grade water used with Japan soils. Arkansas water: glass wool. Italy and France waters: 0.2-mm sieved.
Amount of sediment/soil and water per treatment:	Water:	120 mL.
	Sediment/soil:	30 g dry wt.
Water:sediment/soil ratio:		4:1 (120 mL:30 g dry wt.).
Nominal application rate (mg a.i./L):		Arkansas, Italy and France systems: 0.1 (12 µg/120 mL). Japan systems: 0.04 (4.8 µg/120 mL).
Actual application rate (mg a.i./L):		Arkansas, Italy and France systems: 0.1. Japan systems: 0.04.
Control conditions, if used:		Sterile controls were not used.
No. of Replications:	Controls, if used:	Sterile controls were not used.
	Treatments:	In general, a single treated water-sediment/soil system per label for each sampling interval. For the Japan nonvolcanic loam soil, single Ph-label[1] treated systems were collected at each interval.
Test apparatus (Type/material/volume):		Water-sediment/soil (120 mL:30 g dry wt.) contained in 250-mL biometer flasks was maintained at 25°C (Arkansas sediment/soil, Japan soils) or 20°C (Italy, France sediments) for 14 days prior to treatment, except for the day 0 Arkansas soil, France sediment and Japan volcanic and nonvolcanic soil systems which were prepared and treated the same day. The biometer flasks were attached to an oxygen manifold via an expansion bulb.
Details of traps for CO_2 and organic volatiles, if any:		The sidearm flask of each biometer flask contained 0.2M NaOH solution (100 mL).
If no traps were used, is the system closed/open?		Volatiles traps were used.

Parameter			Details
Identity and concentration of co-solvent:			Acetone, final concentration 0.008-0.04% based on water layer (10-50 µL acetone in 120 mL water).
Test material application:	Volume of test solution used/treatment:	TP-label:	10 or 20 µL of 392 or 447 µg/mL solutions.
		Ph-label:	30 or 50 µL of 320, 465 or 582 µg/µL solutions.
	Application method:		Applied to uniformly to water surface via positive displacement pipette.
Any indication of the test material adsorbing to the walls of the test apparatus?			Biometer flasks were rinsed with acetonitrile:0.1N HCl (90:10, v:v) after removal of system.
Biomass (mg microbial C/100 g, CFU or other) of controls:			No sterile controls were used.
Biomass (mg microbial C/100 g, CFU or other) of treated systems:			Not reported.
Experimental conditions:	Temperature (°C):		Arkansas and Japan systems: 25 ± 2°C. Italy and France systems: 20 ± 2°C. Treated systems were maintained in incubators.
	Continuous darkness (Yes/No):		Yes.
Other details, if any:			The Italy and France sediment systems were gently agitated using an orbital shaker (50 rpm, ≥1 hour) at 22 and 57 days posttreatment.

[1]Ph-label = [phenyl-U-^{14}C]-label and TP-label = [triazolopyrimidine-2-^{14}C]-label.
Data obtained from pp.23-26; Table 3, p.52; Table 5, p.54; Figure 3, p.78 of the study report.

3. Aerobic conditions: Biometer flasks were attached to an oxygen manifold during the 14-day pre-incubation and following treatment. However, introduction of oxygen into the flasks was not further described (p.25). In general, dissolved oxygen, redox potential and pH of the water layer and redox potential of the sediment/soil were measured at each sampling interval (p.27; Table 8, pp.57-59).

In Arkansas water-silty clay sediment (both labels), initial (day 0) dissolved oxygen, redox potentials and pH in the water layers were 5.08 mg/L ([phenyl-U-^{14}C]-label only), +142.3 to +261.6 mV and 7.3-7.4, respectively, and redox potentials in the sediments were +216.3 to +242.8 mV (Table 8, p.57).

In Arkansas water-silt loam soil (both labels), initial (1 day) dissolved oxygen, redox potentials and pH in the water layers were 8.87 mg/L ([phenyl-U-^{14}C]-label only), +194.4 to +235.8 mV and 6.7-6.9, respectively, and redox potentials in the soils were +217.2 to +281.2 mV (Table 8, p.57).

In Italy water-loam sediment (both labels), initial (day 0) dissolved oxygen, redox potentials and pH in the water layers were 2.04 mg/L ([triazolopyrimidine-2-^{14}C]-label only), +70.6 to +261.6 mV and 7.4-7.7, respectively, and redox potentials in the sediments were +116.4 to +242.8 mV (Table 8, p.58).

In France water-sand sediment (both labels), initial (4-8 days) dissolved oxygen, redox potentials and pH in the water layers at were 3.69-8.24 mg/L, +88.4 to +299.9 mV and 5.7-6.3, respectively, and redox potentials in the sediments were +18.5 to +305.4 mV (Table 8, p.58).

In Japan HPLC water-volcanic loam soil (both labels), initial (4-7 days) dissolved oxygen, redox potentials and pH in the water layers were 6.75-6.98 mg/L, +14.4 to +101.3 mV and 7.5-7.8, respectively, and redox potentials in the soils were +47.7 to +87.1 mV (Table 8, p.59).

In Japan HPLC water-nonvolcanic loam soil ([phenyl-U-^{14}C]-label), initial (day 1) dissolved oxygen, redox potential and pH in the water layer were 6.45 mg/L, +175.7 mV and 6.3, respectively, and redox potential in the soil was +187.4 mV (Table 8, p.59).

4. Supplementary experiments: Exaggerated rate (2x) experiment. To facilitate the identification of nonvolatile transformation products, an additional France water-sand sediment system was prepared (*ca.* 106 mL water:55 g sediment), treated with [phenyl-U-^{14}C]penoxsulam at 0.2 mg a.i./L, then incubated in darkness at 30°C for 31 days (p.24). Upon sampling, the water layer and sediment were separated as described below (p.28; Figure 5, p.81). An aliquot (90 mL) of the water layer was concentrated to dryness via turbovap. The resulting residues were reconstituted in acetonitrile:0.1N HCl (90:10, v:v; 1 mL), then analyzed by HPLC and LC/MS (described below).

5. Sampling:

Table 6: Sampling details.

Criteria		Details
Sampling intervals:	Arkansas sediment:	0, 1, 4, 7, 13, 35, 64 and 99 days.
	Arkansas soil:	0, 1, 4, 8, 13, 35, 64 and 99 days.
	Italy sediment:	0, 1, 4, 8, 13, 64 and 99 days.
	France sediment:	0, 4, 8, 13, 35, 64 and 99 days.
	Japan volcanic soil:	0, 1, 4, 7, 13, 35, 64 and 99 days.
	Japan nonvolcanic soil:	0, 1, 4, 7, 13, 64 and 99 days.
Sampling method:		In general, a single treated water-sediment/soil system per label for each sampling interval. For the Japan nonvolcanic loam soil, single Ph-label[1] treated systems were collected at each interval. Each water-sediment/soil system was transferred to a 250-mL Nalgene centrifuge bottle for separation and extraction.
Method of collection of CO_2 and volatile organic compounds:		Upon collection at each sampling interval, except for 0 day, *ca.* 20 mL of the trapping solution was transferred to a glass scintillation vial via aspiration with the remaining solution discarded.
Sampling intervals/times for: Sterility check, if sterile controls are used: Redox potential, or other:		Sterile controls were not used. At each sampling interval, dissolved oxygen, redox potential and pH of the water layer and redox potential of the sediment/soil were measured upon collection.
Sample storage before analysis:		Upon sampling, water layers and sediment/soil were separated and the sediment/soil extracted. Water layers, sediment/soil extracts and trapping solutions were analyzed by LSC the day of sampling. Water layers were analyzed by HPLC within 1 week of sampling. Samples were stored either frozen or refrigerated (temperatures not specified) until analysis. Sediment/soil extracts were frozen up to 5 months prior to HPLC analysis.
Other observations, if any:		None.

[1]Ph-label = [phenyl-U-^{14}C]-label and TP-label = [triazolopyrimidine-2-^{14}C]-label.
Data obtained from pp.24, 26-27, 46; Tables 3-5, pp.52-54; Table 8, pp.57-59 of the study report.

C. ANALYTICAL METHODS:

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Separation of the sediment and water: Water was separated from sediment/soil by centrifugation (2,500 rpm, 10 minutes), then the water layer was decanted into a container (not described) and aliquots (1 mL x 3) were analyzed for total radioactivity by LSC (p.27).

Extraction/clean up/concentration methods: An aliquot (volume not specified) of the water layer was filtered (0.45 µm GMF filter) prior to HPLC analysis (p.28; Figure 5, p.81).

Sediment/soil samples were extracted 3 times with acetone:0.1N HCl (90:10, v:v). Extraction solvent volumes were 60 mL for the initial extraction and 50 mL for the remaining two extractions (p.27; Figure 5, p.81). For each extraction, the sediment/soil pellet and extraction solvent were vortexed to combine, the sample was then shaken using horizontal shaker for 45 minutes and the sediment/soil and extract were separated by centrifugation (2,500 rpm, 10 minutes). Extracts were combined, brought to volume, then aliquots (aliquot volume and number of replicate not specified) were analyzed for total radioactivity using LSC. Prior to HPLC analysis, an aliquot (10 mL) of the combined extract was concentrated to *ca.* 1 mL using a turbovap and filtered (0.45 µm GMF filter, p.28).

Nonextractable residue determination: Extracted sediment/soil was air-dried, then aliquots (0.5 or 1.0 g x 2-3) were analyzed for total radioactivity by LSC following combustion (p.28).

To separate nonextractable [^{14}C]residues into humin, humic acid and fulvic acid fractions, aliquots (*ca.* 3 g) of the 99-day extracted sediment/soil (Arkansas silty clay sediment, Italy loam sediment and Japan nonvolcanic loam soil) were further extracted with 0.5M NaOH (10 mL) using a mechanical shaker for 24 hours at room temperature (p.29). Extract was separated from the sediment/soil by centrifugation (3,000 rpm, 15 minutes). The remaining sediment/soil pellet was combined with 0.5M NaOH (6 mL), centrifuged with removal of the NaOH rinse, then the pellet was rinsed with deionized water (6 mL) and centrifuged. The NaOH extract and rinses (NaOH and water) were combined, acidified to pH 2 and held at room temperature for 24 hours. The resulting precipitates (humic acids) were separated out by centrifugation (3,000 rpm, 15 minutes). The supernatant (fulvic acids) was decanted, brought to volume (not specified) with deionized water, then aliquots (1 mL x 3) were analyzed for radioactivity by LSC. The precipitate (humic acids) was re-dissolved in 0.5M NaOH (5 mL) and aliquots (50 µL or 1 mL x 3) were analyzed by LSC. [^{14}C]Residues remaining in the extracted sediment/soil (humins) were quantified by LSC following combustion.

Volatile residue determination: Triplicate aliquots (volume not specified) of the trapping solutions were analyzed for total radioactivity using LSC (p.26).

Total ^{14}C measurement: Total ^{14}C residues were determined by summing the concentrations of [^{14}C]residues measured in the water layers, sediment/soil extracts, extracted sediment/soil, and volatile trapping solutions (p.31).

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Derivatization method, if used: A derivatization method was not employed.

Identification and quantification of parent compound: Filtered water layers and sediment/soil extracts were analyzed by reverse-phase HPLC under the following conditions: Alltech Intersil ODS column (4.6 x 250 mm, particle size not specified), gradient mobile phase combining (A) 1% acetic acid in acetonitrile and (B) 1% aqueous acetic acid [Method 1: percent A:B at 0 min. 30:70 (v:v), 40 min. 70:30, 40.1 min. 95:5, 45 min. 95:5. Method 2: percent A:B at 0 min. 2:98, 40 min. 70:30], injection volume not specified, flow rate 1 mL/minute, UV at 254 nm, Berthold Beta (RAM) radioactivity detector equipped with a 150 µL YG solid cell (p.30; Table 6, p.55; Appendix D, pp.119-122). Additionally, radio-chromatograms were constructed following fraction collection (0.5 - to 1.0-minute intervals) and LSC analysis (p.30). Column recoveries were reported as 90-110%. However, individual results were not provided for review (p.39). Parent [^{14}C]penoxsulam (XDE-638) was identified by comparison to the retention time of unlabeled reference standard (p.30; Figure 2, p.77).

Identification of parent [phenyl-U-^{14}C]penoxsulam isolated from an exaggerated rate (2x) France water-sand sediment system was confirmed using LC/MS under the following conditions: HPLC conditions were as described above except for the following gradient mobile phase combining (C) 1% aqueous acetic acid and (D) 1% acetic acid in acetonitrile [percent C:D at 0 min. 98:2 (v:v), 40 min. 30:70, 45 min. 98:2, 50 min. 98:2], post-LC column split ratio *ca.* 3:1 (RAM:MS), Micromass Quattro II MS, electrospray ionization (ESI), alternating positive/negative, mass range 65-600 amu, scan rate of 1.5 seconds, cone 20 or 40 volts (Appendix D, pp.119). [^{14}C]Penoxsulam was identified by comparison to unlabeled reference standard (p.30; Appendix D, Figures 1-4, pp.125-128).

Identification and quantification of transformation products: Transformation products were separated, quantified and identified as described for the parent.

Detection limits (LOD, LOQ) for the parent compound and transformation products: The limits of quantification (LOQ) for LSC analyses of trapping solutions, water layers and sediment/soil extracts were reported as 0.07-0.20%, 0.06-0.17% and 0.29-0.80% of the applied, respectively, LOQ for LSC analyses following soil/sediment combustion were reported as 0.04-0.12% of the applied (Table 7, p.56). LOQ for HPLC analyses of the water layers and sediment/soil extracts were reported as 0.02-0.05% and 0.04-0.12% of the applied, respectively.

II. RESULTS AND DISCUSSION:

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A. TEST CONDITIONS: In general, conditions in the six systems were moderately reducing (-50 to +200 mV) in the water layers and moderately reducing to reducing (-200 to -50 mV) in the sediment/soil layers throughout the 99-day incubations.

In Arkansas water-silty clay sediment systems (both labels), dissolved oxygen, redox potentials and pH in the water layers averaged 6.4 ± 1.8 mg/L (range 3.78-9.12 mg/L, n = 10), +105.0 ± 62.4 mV (+36.1 to +261.6 mV, n = 13) and 7.7 ± 0.5 (7.2-8.7, n = 13), respectively, and redox potentials in the sediment averaged -28.2 ± 164.3 mV (-233.5 to +242.8 mV, n = 13; Table 8, p.57).

In Arkansas water-silt loam soil systems (both labels), dissolved oxygen, redox potentials and pH in the water layers averaged 6.7 ± 2.5 mg/L (2.85-9.11 mg/L, n = 9), +159.4 ± 67.1 mV (+13.2 to +257.0 mV, n = 12) and 7.0 ± 0.4 (6.3-7.9, n = 12), respectively, and redox potentials in the soil averaged +66.1 ± 156.4 mV (-227.4 to +294.4 mV, n = 12; Table 8, p.57).

In Italy water-loam sediment systems (both labels), dissolved oxygen, redox potentials and pH in the water layers averaged 6.6 ± 3.3 mg/L (2.04-12.90 mg/L, n = 8), +86.3 ± 81.4 mV (-13.4 to +261.6 mV, n = 11) and 7.5 ± 0.6 (6.4-8.5, n = 11), respectively, and redox potentials in the sediment averaged -26.6 ± 108.1 mV (-151.6 to +242.8 mV, n = 11; Table 8, p.58).

In France water-sand sediment systems (both labels), dissolved oxygen, redox potentials and pH in the water layers averaged 7.4 ± 2.5 mg/L (3.69-10.58 mg/L, n = 6), +178.2 ± 85.8 mV (+88.4 to +341.1 mV, n = 8) and 6.1 ± 0.3 (5.7-6.5, n = 8), respectively, and redox potentials in the sediment averaged +167.3 ± 105.4 mV (+18.5 to +327.1 mV, n = 8; Table 8, p.58).

In Japan HPLC water-volcanic loam soil systems (both labels), dissolved oxygen, redox potentials and pH in the water layers averaged 7.7 ± 1.1 mg/L (6.51-9.79 mg/L, n = 8), +121.3 ± 67.2 (+14.4 to +235.2 mV, n = 9) and 7.8 ± 0.1 (7.5-8.0, n = 9), respectively, and redox potentials in the soil averaged +136.2 ± 55.6 mV (+47.7 to +204.1 mV, n = 9; Table 8, p.59).

In Japan HPLC water-nonvolcanic loam soil systems (both labels), dissolved oxygen, redox potentials and pH in the water layers averaged (n = 6) 7.5 ± 0.8 mg/L (6.45-8.91 mg/L), +207.1 ± 67.8 mV (+108.1 to +309.0 mV) and 6.4 ± 0.5 (5.4-6.9), respectively, and redox potentials in the soil averaged +196.9 ± 58.0 mV (+121.8 to +285.3 mV; Table 8, p.59).

B. MATERIAL BALANCE: Recoveries of material balances averaged (both labels) 94.1 ± 5.9% (range 84.1-105.1%, n = 12) of the applied for Arkansas water-silty clay sediment systems, 95.9 ± 7.2% (86.0-109.2%, n = 14) for Arkansas water-silt loam soil systems, 93.8 ± 5.9% (85.0-105.0%, n = 11) for Italy water-loam sediment systems, 94.9 ± 6.2% (85.8-105.0%, n = 11) for France water-sand sediment systems, 95.7 ± 5.8% (86.1-103.2%, n = 12) for Japan HPLC water-volcanic loam systems and 100.4 ± 2.9% (96.7-104.6%, n = 8) for Japan HPLC water-nonvolcanic loam systems (Appendix C, pp.112-117; Attachment 1).

Following application of [^{14}C]penoxsulam (both labels) to the water layers, [^{14}C]residues partitioned into the Arkansas silty clay sediment and silt loam soil with average (n = 2-4) distribution ratios (water:sediment/soil) of 55:1 at day 0, 18:1 at 1 day, 9:1 at 13 days, 4:1 at 35-64 days and were 2:1 at 99 days (Attachment 1). [^{14}C]Residues partitioned from the water layer to the Italy loam sediment with distribution ratios (water:sediment, n = 1-2) of 15:1 at day 0, 6:1 at 4 days, 2:1 at 8 days, 1:1 at 13 days, 1:2 at 64 days and were 1:3 at 99 days. [^{14}C]Residues partitioned from the water layer to the France sand sediment with distribution ratios (water:sediment, n = 1-2) of 28:1 at day 0, 3-5:1 at 1-13 days, 1:1 at 35 days, 1:2 at 64 days and were 1:3 at 99 days. [^{14}C]Residues partitioned from the water layer to the Japan volcanic and nonvolcanic loam soils with distribution ratios (water:soil, n = 1-3) of 26:1 at day 0, 10:1 at 1 day, 5:1 at 4 days, 3:1 at 13 days and were 1:1 thereafter.

Table 7: Biotransformation of [^{14}C]penoxsulam (both labels), expressed as percentage of applied radioactivity (n = 1 or mean ± s.d.[1], n = 2), in Arkansas pond water-silty clay sediment under aerobic conditions.

Compound		Sampling times (days)							
		0	1	4	7	13	35	64	99
Penoxsulam (XDE-638)	water	87.2 ± 2.1	91.2	80.3	77.6 ± 1.8	52.5 ± 1.2	15.9	2.8 ± 1.6	2.8 ± 1.1
	sediment	N/A[2]	N/A	1.5	3.8 ± 0.6	1.7	0.7	0.2 ± 0.0	0.1
	system[3]	85.1	NQ[4]	81.8	81.5 ± 2.3	55.4	16.6	3.0 ± 1.7	1.8
5-OH-XDE-638[5]	water	1.5 ± 0.2	7.4	5.3	9.8 ± 0.6	18.8 ± 1.1	30.7	24.4 ± 3.2	12.5 ± 3.2
	sediment	N/A	N/A	0.3	0.5 ± 0.1	0.7	1.6	0.6 ± 0.3	0.3
	system	1.2	NQ	5.6	10.3 ± 0.7	20.6	32.3	25.0 ± 2.9	9.6
BSTCA[6]	water	0.6 ± 0.3	0.7	1.7	3.2 ± 0.4	7.5 ± 0.4	19.9	29.0 ± 2.8	42.0 ± 2.4
	sediment	N/A	N/A	0.8	0.1 ± 0.1	0.3	ND[7]	ND	ND
	system	0.3	NQ	2.5	3.4 ± 0.4	8.2	19.9	29.0 ± 2.8	39.5
Total extractable sediment residues		≤1.8	3.6	3.0	4.7 ± 0.3	3.6 ± 0.7	3.5	1.0	0.6 ± 0.2
Total CO_2		N/A	0.0	0.0	0.0 ± 0.0	0.1 ± 0.1	0.1	0.7	1.9 ± 0.4
Total volatile organics		–[8]	--	--	--	--	--	--	--
Nonextractable sediment residues		0.5 ± 0.3	0.9	1.0	2.9 ± 1.0	6.7 ± 1.1	16.3	23.6	26.6 ± 2.0
Total % recovery	water	89.4 ± 6.1	100.6	87.5	92.4 ± 0.9	83.6 ± 3.6	71.0	62.1	63.2 ± 3.7
	sediment[9]	1.5 ± 0.6	4.5	4.0	7.6 ± 1.3	10.3 ± 0.5	19.8	24.6	27.2 ± 2.2
	system	93.3 ± 4.1	105.1	91.6	99.9 ± 2.1	93.9 ± 4.2	90.9	87.4	92.3 ± 1.9

[1] Means as reported by study authors (with some exceptions), and standard deviations calculated by reviewer. For many intervals, only one system was analyzed (Appendix C, p.113).

[2] Although not specified, N/A typically represents "not analyzed".

[3]Entire system; water + sediment. Values determined using data obtained in Appendix C, p.113 (Attachment 1). Total system results could not always be determined because sediment/soil extracts were not always analyzed by HPLC.

[4]Not quantifiable because sediment extract was not analyzed by HPLC.

[5]2-(2;2-Difluoroethoxy-N-(5,6-dihydro-8-methoxy-5-oxo[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)benzenesulfonamide (Figure 1, p.76).

[6]3-[[[2-(2,2-Difluoroethoxy)-6-(trifluoromethyl)phenyl]sulfonyl]amino]-1H-1,2,4-triazole-5-carboxylic acid.

[7]Not detected; LOQ for HPLC analysis in water layer and sediment/soil extract reported as 0.05% and 0.12% of the applied, respectively (pp.37-38).

[8]Not trapped.

[9]Data obtained from pp.37-38; Table 11, p.62; Appendix C, p.113 of the study report and Attachment 1.

Table 8: Biotransformation of [^{14}C]penoxsulam (both labels), expressed as percentage of applied radioactivity (n = 1 or mean ± s.d.[1], n = 2), in Arkansas pond water-silt loam soil under aerobic conditions.

Compound		Sampling times (days)							
		0	1	4	8	13	35	64	99
Penoxsulam (XDE-638)	water	92.2 ± 2.1	93.5 ± 5.6	89.3 ± 9.5	83.4 ± 11.3	77.9 ± 0.4	43.4	27.6 ± 16.3	8.7
	soil	N/A[2]	N/A	9.1 ± 4.1	4.6 ± 0.6	5.9 ± 2.0	0.2	1.1 ± 0.9	0.4
	system[3]	NQ[4]	NQ	98.4 ± 5.4	88.1 ± 10.6	83.8 ± 1.5	43.6	28.7 ± 17.2	9.1
5-OH-XDE-638[5]	water	1.4 ± 1.4	ND[7]	2.3 ± 0.9	4.3 ± 0.4	6.2 ± 1.4	21.1	21.3 ± 4.2	19.4
	soil	N/A	N/A	0.5 ± 0.2	0.6 ± 0.3	0.8 ± 0.4	0.1	1.4 ± 0.8	1.2
	system	NQ	NQ	2.8 ± 0.8	4.9 ± 0.1	7.0 ± 1.8	21.2	22.7 ± 3.4	20.6
BSTCA[6]	water	ND	ND	ND	ND	1.4 ± 0.0	9.4	19.2 ± 3.8	29.5
	soil	N/A	N/A	ND	0.2 ± 0.1	0.1 ± 0.0	ND	ND	0.2
	system	NQ	NQ	ND	0.2 ± 0.1	1.4 ± 0.1	9.4	19.2 ± 3.8	29.7
Total extractable soil residues		2.7 ± 0.1	5.6 ± 0.8	9.9 ± 4.6	5.7 ± 0.2	7.1 ± 2.5	0.4	3.3 ± 2.0	3.1
Total CO_2		N/A	0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.0	0.1 ± 0.0	0.2	0.6 ± 0.4	1.5
Total volatile organics		–[8]	--	--	--	--	--	--	--
Nonextractable soil residues		ND	0.2 ± 0.1	0.3 ± 0.1	1.1 ± 0.1	1.6 ± 0.6	14.6	14.5 ± 5.4	22.0
Total % recovery	water	93.6 ± 0.7	94.3 ± 5.7	92.6 ± 11.0	89.9 ± 10.8	85.9 ± 0.9	78.1	72.0 ± 7.6	60.6
	soil	2.7 ± 0.1	5.8 ± 0.7	10.3 ± 4.7	6.8 ± 0.3	8.7 ± 1.8	15.0	17.9 ± 3.4	25.1
	system	96.3 ± 0.6	100.1 ± 6.3	102.9 ± 6.4	96.7 ± 10.5	94.6 ± 2.7	93.3	90.4 ± 4.4	87.2

[1] Means as reported by study authors (with some exceptions), and standard deviations calculated by reviewer. For many intervals, only one system was analyzed (Appendix C, p.112).

[2] Although not specified, N/A typically represents "not analyzed".

[3]Entire system; water + soil. Values determined using data obtained in Appendix C, p.112 (Attachment 1). Total system results could not always be determined because sediment/soil extracts were not always analyzed by HPLC.

[4]Not quantifiable because soil extract was not analyzed by HPLC.

[5]2-(2,2-Difluoroethoxy-N-(5,6-dihydro-8-methoxy-5-oxo[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)benzenesulfonamide (Figure 1, p.76).

[6]3-[[[2-(2,2-Difluoroethoxy)-6-(trifluoromethyl)phenyl]sulfonyl]amino]-1H-1,2,4-triazole-5-carboxylic acid.

[7]Not detected; LOQ for HPLC analysis in water layer and sediment/soil extract reported as 0.05% and 0.12% of the applied, respectively (pp.37-38).

[8]Not trapped.

[9]Data obtained from pp.37-38; Table 10, p.61; Appendix C, p.112 of the study report and Attachment 1.

Table 9: Biotransformation of [^{14}C]penoxsulam (both labels), expressed as percentage of applied radioactivity (n = 1 or mean ± s.d.[1], n = 2), in Italy channel water-loam sediment under aerobic conditions.

Compound		Sampling times (days)						
		0	1	4	8	13	64	99
Penoxsulam (XDE-638)	water	87.5 ± 2.9	76.8 ± 7.3	69.8	34.1 ± 3.9	13.0	0.6 ± 0.0	0.4
	sediment	N/A[2]	N/A	2.5	4.4 ± 2.3	1.3	1.1 ± 1.0	ND[7]
	system[3]	NQ[4]	NQ	72.3	38.5 ± 1.6	14.3	1.7 ± 1.0	0.4
5-OH-XDE-638[5]	water	0.2 ± 0.1	9.4 ± 6.9	14.5	18.6 ± 0.0	18.5	0.9 ± 0.0	ND
	sediment	N/A	N/A	1.6	3.4 ± 2.0	2.2	0.7 ± 0.6	ND
	system	NQ	NQ	16.1	22.0 ± 2.0	20.7	1.5 ± 0.6	ND
BSTCA[6]	water	ND	1.7 ± 1.2	2.4	3.6 ± 0.3	5.1	23.8 ± 3.1	16.7
	sediment	N/A	N/A	0.3	0.9 ± 0.6	0.6	0.3 ± 0.1	1.7
	system	NQ	NQ	2.7	4.5 ± 0.2	5.7	24.0 ± 3.1	18.4
Total extractable sediment residues		4.6 ± 0.3	7.1 ± 0.2	5.2	10.2 ± 5.8	5.3	4.9 ± 0.6	8.0
Total CO_2		N/A	0.0 ± 0.0	0.1	0.0 ± 0.0	0.0	0.4 ± 0.0	0.8
Total volatile organics		-[8]	--	--	--	--	--	--
Nonextractable sediment residues		1.2 ± 0.1	1.8 ± 0.2	9.2	18.2 ± 1.0	36.0	52.3 ± 5.0	57.9
Total % recovery	water	87.9 ± 2.7	90.4 ± 3.4	90.5	65.2 ± 6.7	50.9	29.5 ± 3.5	20.1
	sediment	5.8 ± 0.3	8.9 ± 0.4	14.4	28.5 ± 4.9	41.3	57.2 ± 5.6	65.9
	system	93.7 ± 2.9	99.3 ± 2.9	105.0	93.6 ± 1.8	92.3	87.1 ± 2.1	86.7

[1] Means as reported by study authors (with some exceptions), and standard deviations calculated by reviewer. For many intervals, only one system was analyzed (Appendix C, p.114).
[2] Although not specified, N/A typically represents "not analyzed".
[3]Entire system; water + sediment. Values determined using data obtained in Appendix C, p.113 (Attachment 1). Total system results could not always be determined because sediment/soil extracts were not always analyzed by HPLC.
[4]Not quantifiable because sediment extract was not analyzed by HPLC.
[5]2-(2,2-Difluoroethoxy-N-(5,6-dihydro-8-methoxy-5-oxo[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)benzenesulfonamide (Figure 1, p.76).
[6]3-[[[2-(2,2-Difluoroethoxy)-6-(trifluoromethyl)phenyl]sulfonyl]amino]-1H-1,2,4-triazole-5-carboxylic acid.
[7]Not detected; LOQ for HPLC analysis in water layer and sediment/soil extract reported as 0.05% and 0.12% of the applied, respectively (pp.37-38).
[8]Not trapped.
[9]Data obtained from pp.37-38; Table 12, p.63; Appendix C, p.114 of the study report and Attachment 1.

Table 10: Biotransformation of [^{14}C]penoxsulam (both labels), expressed as percentage of applied radioactivity (n = 1 or mean ± s.d.[1], n = 2), in France lake water-sand sediment under aerobic conditions.

Compound		Sampling times (days)						
		0	4	8	13	35	64	99
Penoxsulam (XDE-638)	water	91.6 ± 2.3	61.2	71.4 ± 4.5	72.1	22.3	9.7 ± 2.2	3.9
	sediment	N/A[2]	20.9	15.0 ± 0.3	9.2	11.0	13.9 ± 8.1	17.9
	system[3]	NQ[4]	82.1	86.5 ± 4.8	81.3	33.3	23.5 ± 10.2	21.8
5-OH-XDE-638[5]	water	1.2 ± 1.1	1.5	5.0 ± 0.3	8.1	14.1	11.6 ± 4.9	2.4
	sediment	N/A	0.7	1.5 ± 0.2	1.6	15.6	8.8 ± 2.1	9.5
	system	NQ	2.2	6.5 ± 0.5	9.7	29.7	20.4 ± 2.8	11.9
BSTCA[6]	water	0.2 ± 0.2	0.3	1.7 ± 0.0	2.5	6.0	12.1 ± 6.3	5.5
	sediment	N/A	ND[7]	0.8 ± 0.0	0.9	1.2	0.8 ± 0.5	2.2
	system	NQ	0.3	2.6 ± 0.0	3.4	7.2	12.8 ± 6.8	7.7
Composite 4 - 9 minutes[8]	water	ND	1.0	ND	0.4	0.6	2.6 ± 1.8	1.3
	sediment	N/A	ND	0.3 ± 0.1	0.4	8.5	10.6 ± 0.1	15.7
	system	NQ	1.0 ± 0.1	0.3 ± 0.1	0.8	9.1	13.2 ± 1.9	17.0
Total extractable sediment residues		3.4 ± 0.4	21.8	18.2 ± 0.7	15.5	40.6 ± 0.1	36.6 ± 9.7	47.3
Total CO_2		N/A	0.0	0.3 ± 0.3	0.0	1.2 ± 1.0	2.1 ± 2.0	2.4
Total volatile organics		[9]	--	--	--	--	--	--
Nonextractable sediment residues		0.1 ± 0.0	1.2	0.8 ± 0.2	1.9	8.0 ± 1.4	18.3 ± 4.7	20.8
Total % recovery	water	93.3 ± 0.6	65.1	78.6 ± 4.4	84.0	40.1 ± 5.1	38.3 ± 12.5	23.6
	sediment	3.5 ± 0.4	23.0	19.1 ± 0.9	17.4	48.6 ± 1.3	54.9 ± 5.0	68.1
	system	96.8 ± 0.2	88.1	97.9 ± 5.1	101.4	89.9 ± 2.8	95.4 ± 9.6	94.0

[1] Means as reported by study authors (with some exceptions), and standard deviations calculated by reviewer. For many intervals, only one system was analyzed (Appendix C, p.115).
[2] Although not specified, N/A typically represents "not analyzed".
[3]Entire system; water + sediment. Values determined using data obtained in Appendix C, p.115 (Attachment 1). Total system results could not always be determined because sediment/soil extracts were not always analyzed by HPLC.
[4]Not quantifiable because sediment extract was not analyzed by HPLC.
[5]2-(2,2-Difluoroethoxy-N-(5,6-dihydro-8-methoxy-5-oxo[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)benzenesulfonamide (Figure 1, p.76).
[6]3-[[[2-(2,2-Difluoroethoxy)-6-(trifluoromethyl)phenyl]sulfonyl]amino]-1H-1,2,4-triazole-5-carboxylic acid.
[7]Not detected; LOQ for HPLC analysis in water layer and sediment/soil extract reported as 0.02% and 0.04-0.05% of the applied, respectively (Table 7, p.56).
[8]This fraction was determined via LC/MS to consist of ≥2 separate components; two were tentatively identified as OH-BSTCA and PCA-5-OH-XDE-638, but no chromatograms were provided (p.41; Appendix D, pp.119-120).
[9]Not trapped.
Data obtained from Table 7, p.56; Table 13, p.64; Appendix C, p.115 of the study report and Attachment 1.

Table 11: Biotransformation of [^{14}C]penoxsulam (both labels), expressed as percentage of applied radioactivity (n = 1 or mean ± s.d.[1], n = 2), in Japan HPLC water-volcanic loam soil under aerobic conditions.

Compound		Sampling times (days)							
		0	1	4	7	13	35	64	99
Penoxsulam (XDE-638)	water	96.6 ± 0.3	83.8 ± 6.1	79.9	74.5 ± 2.4	64.9 ± 3.0	38.6 ± 2.5	13.9	6.8 ± 0.2
	soil	N/A[2]	N/A	11.7	11.5 ± 1.3	12.0 ± 0.5	12.1	8.5	2.9 ± 1.8
	system[3]	NQ[4]	NQ	91.6	86.0 ± 3.7	76.8 ± 2.5	48.2	22.4	9.7 ± 1.7
5-OH-XDE-638[5]	water	ND[7]	0.6 ± 0.0	3.8	3.0 ± 0.7	8.9 ± 1.8	18.9 ± 0.4	20.0	19.6 ± 0.4
	soil	N/A	N/A	0.4	1.0 ± 0.1	4.0 ± 1.4	11.0	12.2	8.7 ± 3.8
	system	NQ	NQ	4.2	4.1 ± 0.7	12.9 ± 0.4	29.4	32.2	28.3 ± 3.4
BSTCA[6]	water	ND	ND	ND	ND	0.3 ± 0.3	3.8 ± 0.7	8.3	9.8 ± 0.9
	soil	N/A	N/A	ND	ND	0.9 ± 0.9	ND	ND	0.6 ± 0.6
	system	NQ	NQ	ND	ND	1.3 ± 1.3	4.4	8.3	10.4 ± 1.5
Total extractable soil residues		3.4 ± 0.1	6.1 ± 0.2	12.8	13.2 ± 0.8	17.9 ± 2.7	27.4	24.8	20.6[8]
Total CO_2		N/A	0.2 ±0.0	0.1	0.0 ± 0.0	0.0 ± 0.0	0.2	0.4	1.0
Total volatile organics		–[9]	--	--	--	--	--	--	--
Nonextractable soil residues		0.1 ± 0.0	1.2 ± 0.1	2.4	3.3 ± 0.6	5.0 ± 0.1	16.4	21.4	28.6
Total % recovery	water	97.2 ± 0.3	84.8 ± 5.8	83.6	77.5 ± 3.1	75.6 ± 0.0	59.3	42.8	35.9
	soil	3.6 ± 0.2	7.4 ± 0.1	15.2	16.5 ± 0.2	22.9 ± 2.9	43.8	46.2	49.2
	system	100.7 ± 0.5	92.2 ± 5.8	98.9	94.0 ± 3.3	98.4 ± 2.9	103.2	89.5	86.1

[1] Means as reported by study authors (with some exceptions), and standard deviations calculated by reviewer. For many intervals, only one system was analyzed (Appendix C, p.116).
[2] Although not specified, N/A typically represents "not analyzed".
[3]Entire system; water + soil. Values determined using data obtained in Appendix C, p.116 (Attachment 1). Total system results could not always be determined because sediment/soil extracts were not always analyzed by HPLC.
[4]Not quantifiable because soil extract was not analyzed by HPLC. 35-Day [Ph-U]-label soil extract also not HPLC analyzed.
[5]2-(2,2-Difluoroethoxy-N-(5,6-dihydro-8-methoxy-5-oxo[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)benzenesulfonamide (Figure 1, p.76).
[6]3-[[[2-(2,2-Difluoroethoxy)-6-(trifluoromethyl)phenyl]sulfonyl]amino]-1H-1,2,4-triazole-5-carboxylic acid.
[7]Not detected; LOQ for HPLC analysis in water layer and sediment/soil extract reported as 0.05% and 0.12% of the applied, respectively (pp.37-38).
[8]Total radioactivity recovered in 99-day [Ph-U]-label water layer and soil extract were not reported.
[9]Not trapped.

Data obtained from pp.37-38; Table 14, p.65; Appendix C, p.116 of the study report and Attachment 1.

Table 12: Biotransformation of [phenyl-U-^{14}C]penoxsulam, expressed as percentage of applied radioactivity (n = 1 or mean ± s.d.[1], n = 2), in Japan HPLC water-nonvolcanic loam soil under aerobic conditions.

Compound		Sampling times (days)						
		0	1	4	8	13	64	99
Penoxsulam (XDE-638)	water	96.7 ± 1.4	78.9	79.9	64.0	59.6	10.5	3.7
	soil	N/A[2]	N/A	17.0	20.6	20.3	13.7	3.4
	system[3]	NQ[4]	NQ	96.0	84.6	79.9	24.2	10.1
5-OH-XDE-638[5]	water	ND[6]	1.8	3.8	8.3	15.6	22.9	14.3
	soil	N/A	N/A	2.0	2.4	5.1	17.4	16.6
	system	NQ	NQ	5.8	10.7	20.7	40.3	30.9
BSTCA[7]	water	ND	0.7	ND	0.8	1.6	13.6	25.4
	soil	N/A	N/A	ND	ND	ND	ND	0.3
	system	NQ	NQ	ND	0.8	1.6	13.6	25.7
Total extractable soil residues		3.8 ± 0.2	14.3	20.9	22.9	25.6	38.8	31.6
Total CO_2		N/A	0.0	0.0	0.0	0.1	1.7	2.2
Total volatile organics		-[8]	--	--	--	--	--	--
Nonextractable soil residues		0.0 ± 0.0	0.4	0.9	2.1	0.8	8.3	17.8
Total % recovery	water	97.7 ± 1.0	81.9	82.8	73.8	77.6	48.3	48.6
	soil	3.8 ± 0.2	14.7	21.8	25.0	26.4	47.1	49.4
	system	101.6 ± 0.9	96.7	104.6	97.8	104.0	97.1	100.1

[1] Means as reported by study authors (with some exceptions), and standard deviations calculated by reviewer (TI-60 hand calculator). Duplicate systems only at day 0 (Appendix C, p.117).
[2]Although not specified, N/A typically represents "not analyzed".
[3]Entire system; water + soil. Values determined using data obtained in Appendix C, p.117(Attachment 1). Total system results could not always be determined because sediment/soil extracts were not always analyzed by HPLC.
[4]Not quantifiable because soil extract was not analyzed by HPLC. 35-Day [Ph-U]-label soil extract also not HPLC analyzed.
[5]2-(2,2-Difluoroethoxy-N-(5,6-dihydro-8-methoxy-5-oxo[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)benzenesulfonamide (Figure 1, p.76).
[6]Not detected; LOQ for HPLC analysis in water layer and sediment/soil extract reported as 0.05% and 0.12% of the applied, respectively (pp.37-38).
[7]3-[[[2-(2,2-Difluoroethoxy)-6-(trifluoromethyl)phenyl]sulfonyl]amino]-1H-1,2,4-triazole-5-carboxylic acid.
[8]Not trapped.
Data obtained from pp.37-38; Table 15, p.66 Appendix C, p.117of the study report and Attachment 1.

C. TRANSFORMATION OF PARENT COMPOUND:

In Arkansas pond water-silty clay sediment systems, [^{14}C]penoxsulam (both labels) in the total system decreased from 85.1% of the applied at day 0 posttreatment to 79.1-83.8% at 1-7 days, 55.4% at 13 days, 16.6% at 35 days, 3.0% at 64 days and was 1.8% at 99 days (Attachment 1). In the water layer, [^{14}C]penoxsulam decreased from 85.1-91.2% at 0-1 days to 51.4-53.7% at 13 days, 15.9% at 35 days, and was 1.2-4.4% at 64-99 days (Appendix C, p.113). In sediment extracts, [^{14}C]penoxsulam was a maximum 3.2-4.4% at 7 days decreasing to 1.7% at 13 days and was ≤0.7% thereafter.

In Arkansas pond water-silt loam soil systems, [^{14}C]penoxsulam (both labels) in the total system decreased from 93.0-103.8% of the applied at 4 days to 43.6% at 35 days, then was 11.5-45.8% at 64 days and 9.1% at 99 days (Attachment 1). In the water layer, [^{14}C]penoxsulam decreased from 72.2-99.1% at 0-8 days to 43.4-43.9% at 35-64 days and was 8.7% at 99 days (Appendix C, p.112). In soil extracts, [^{14}C]penoxsulam was detected at 3.9-13.2% at 4-13 days and was ≤1.9% thereafter.

In Italy channel water-loam sediment systems, [^{14}C]penoxsulam (both labels) in the total system decreased from 72.3% of the applied at 4 days to 36.9-40.1% at 8 days, 14.3% at 13 days, 0.6-2.7% at 64 days and was 0.4% at 99 days (Attachment 1). In the water layer, [^{14}C]penoxsulam decreased from 84.6-90.3% at day 0 to 69.8% at 4 days, 30.2-38.0% at 8 days, 13.0% at 13 days and was ≤0.6% thereafter (Appendix C, p.114). In sediment extracts, [^{14}C]penoxsulam was detected at 2.1-6.7% at 4-8 days, ≤2.1% at 13-64 days and not detected (0.12% of applied) at 99 days.

In France lake water-sand sediment systems, [^{14}C]penoxsulam (both labels) in the total system decreased from 81.3-91.3% of the applied at 4-13 days to 33.3% at 35 days, then was 13.3-33.7% at 64 days and 21.8% at 99 days (Attachment 1). In the water layer, [^{14}C]penoxsulam decreased from 89.2-93.9% at day 0 to 61.2-75.9% at 4-13 days, 22.3% at 35 days, 7.5-11.8% at 64 days and 3.9% at 99 days (Appendix C, p.115). In sediment extracts, [^{14}C]penoxsulam decreased from 20.9% at 4 days to 9.2-11.0% at 13-35 days, then was 5.8-21.9% at 64 days and 17.9% at 99 days.

In Japan HPLC water-loam (volcanic and nonvolcanic) soil systems, [^{14}C]penoxsulam (both labels) in the total system decreased from 91.6-96.0% of the applied at 4 days to 48.2% at 35 days, 22.4-24.2% at 64 days and was 8.0-11.3% at 99 days (Attachment 1). In the water layer, [^{14}C]penoxsulam decreased from 95.2-98.1% at day 0 to 59.6-67.8% at 13 days, 36.1-41.1% at 35 days, 10.5-13.9% at 64 days and was 3.7-6.9% at 99 days (Appendix C, pp.116-117). In volcanic loam soil extracts, [^{14}C]penoxsulam was detected at 10.2-12.8% at 4-35 days decreasing to 8.5% at 64 days and 1.1-4.7% at 99 days. In nonvolcanic loam soil extracts, [^{14}C]penoxsulam was detected at 17.0-20.6% at 4-13 days decreasing to 13.7% at 64 days and 6.4% at 99 days.

HALF-LIFE/DT50: Half-life values for the dissipation of [^{14}C]penoxsulam (both labels plotted together) from the water layer, sediment/soil and total system of the treated systems were

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determined using linear regression analysis based on first-order kinetics (Attachment 2). For determination of penoxsulam dissipation half-lives in the total system, parent compound recovered in the water layer at the early (0- to 4-day) sampling intervals, when sediment/soil extracts were not analyzed by HPLC, was considered equivalent to the "total system".

Table 13: Half-life ($t_{1/2}$) values of penoxsulam in aerobic water-sediment/soil systems.

System		First-order Linear[1]		
		Half-life	Regression equation	r^2
Arkansas pond water-silty clay sediment	water	0- to 99-day data: 16.7 days	y = -0.0415x + 4.43	0.881
	sediment	7- to 99-day data: 16.1 days	y = -0.0431x + 1.29	0.903
	total system	0- to 99-day data: 16.8 days	y = -0.0412x + 4.45	0.885
Arkansas pond water-silt loam soil	water	0- to 99-day data: 29.2 days	y = -0.0238x + 4.59	0.875
	soil	4- to 99-day data: 8.4 days	y = -0.0826x + 6.76	0.462
	total system	0- to 99-day data: 29.1 days	y = -0.0238x + 4.63	0.871
Italy channel water-loam sediment	water	0- to 99-day data: 11.2 days	y = -0.0617x + 4.15	0.934
	sediment	8- to 64-day data: 15.3 days	y = -0.0452+ 3.86	0.284
	total system	0- to 99-day data: 12.2 days	y = -0.0566x + 4.22	0.944
France lake water-sand sediment	water	0- to 99-day data: 20.9 days	y = -0.0332x + 4.47	0.973
	sediment	observed: >99 days (data highly variable).		
	total system	0- to 99-day data: 37.7 days	y = -0.0184x + 4.49	0.801
Japan HPLC water-volcanic loam soil	water	0- to 99-day data: 26.1 days	y = -0.0266x + 4.51	0.993
	soil	13- to 99-day data: 35.5 days	y = -0.0195x + 2.92	0.671
	total system	0- to 99-day data: 29.9 days	y = -0.0232x + 4.58	0.985
Japan HPLC water-nonvolcanic loam soil	water	0- to 99-day data: 21.3 days	y = -0.0325x + 4.49	0.996
	soil	7- to 99-day data: 57.5 days	y = -0.0121x + 3.18	0.927
	total system	0- to 99-day data: 30.9 days	y = -0.0224x + 4.58	0.989

[1]Data used for half-life calculations obtained from Appendix C, pp.112-117 of the study report (see Attachment 1).

Half-life/DT50 values and DT90 values (50% and 90% decline times, respectively) for penoxsulam in the water, sediment/soil and total system were determined by the study authors using first-order nonlinear regression analysis as calculated by Microsoft Excel with both labels plotted together (p.42; Table 17, p.68; Figures 19-21, pp.95-97). DT50 and DT90 values for penoxsulam in the total system were also determined using one-compartment regression analysis as calculated by ModelMaker, version 3 (p.42; Table 19, p.70; Figures 22-27, pp.98-103).

Table 14: Half-life ($t_{1/2}$) and DT90 values (90% decline time) for dissipation of penoxsulam (labels plotted together) in aerobic water-sediment/soil systems.

	First-order Nonlinear				One-compartment Nonlinear	
	Half-life	Regression equation	r^2	DT90	DT50	DT90
Arkansas pond water-silty clay sediment						
water	16 days	$y = 100e^{-0.0439x}$	0.8725	52 days		
sediment	16 days	$y = 100e^{-0.0423x}$	0.8670	53 days		
total system	16 days	$y = 100e^{-0.0434x}$	0.8781	54 days	15 days	50 days
Arkansas pond water-silt loam soil						
water	29 days	$y = 100e^{-0.0240x}$	0.8745	96 days		
soil	15 days	$y = 100e^{-0.0456x}$	0.4334	50 days		
total system	30 days	$y = 100e^{-0.0234x}$	0.8696	98 days	35 days	114 days
Italy channel water-loam sediment						
water	10 days	$y = 100e^{-0.0681x}$	0.9037	34 days		
sediment		Not determined.				
total system	11 days	$y = 100e^{-0.0627x}$	0.9094	37 days	6 days	18 days
France lake water-sand sediment						
water	20 days	$y = 100e^{-0.0352x}$	0.9645	65 days		
sediment		Not determined.				
total system	34 days	$y = 100e^{-0.0202x}$	0.7840	114 days	30 days	98 days
Japan HPLC water-volcanic loam soil						
water	25 days	$y = 100e^{-0.0280x}$	0.9867	82 days		
soil	40 days	$y = 100e^{-0.0172x}$	0.6768	134 days		
total system	29 days	$y = 100e^{-0.0235x}$	0.9842	98 days	31 days	103 days
Japan HPLC water-nonvolcanic loam soil						
water	20 days	$y = 100e^{-0.0340x}$	0.9887	68 days		
soil		Not determined.				
total system	30 days	$y = 100e^{-0.0228x}$	0.9879	101 days	32 days	103 days

Data obtained from Table 17, p.68; Table 19, p.70 of the study report.

TRANSFORMATION PRODUCTS: Two major nonvolatile transformation products for both labels in all six systems were identified via LC/MS as 2-(2,2-difluoroethoxy)-N-(5,6-dihydro-8-methoxy-5-oxo[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)benzenesulfonamide (5-OH-XDE-638) and 3-[[[2-(2,2-difluoroethoxy)-6-(trifluoromethyl)phenyl]sulfonyl]amino]-1H-1,2,4-triazole-5-carboxylic acid (BSTCA; Appendix D, p.119). No minor transformation products were positively identified. LC/MS analysis of one unidentified HPLC fraction (Composite 4, retention time *ca.* 9 minutes) detected at least two compounds tentatively identified as 3-[[[(3-,4-, or 5-hydroxy)-2-(2,2-difluoroethoxy)-6-

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(trifluoromethyl)phenyl]sulfonyl]amino]-1H-1,2,4-triazole-5-carboxylic acid (OH-BSTCA) and 2-[[(5-hydroxy-8-methoxy[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)amino]sulfonyl]-3-(2,2,2-trifluoroethoxy)benzoic acid (PCA-5-OH-XDE-638; p.41; Tables 10-15, pp.61-66; Appendix D, pp.119-120).

The study authors determined DT50 and DT90 values for 5-OH-XDE-638 using one-compartment regression analysis (ModelMaker, version 3, both labels plotted together) in the total system of 35 and 117 days, respectively, for the Arkansas pond water-silty clay sediment, 44 and 143 days, respectively, for the Arkansas pond water-silt loam soil, 24 and 80 days, respectively, for the Italy channel water-loam sediment, 75 and 248 days, respectively, for the France lake water-sand sediment, and 129 and 429 days, respectively, for the Japan HPLC water-loam (volcanic and nonvolcanic) loam soils (Table 19, p.70).

In Arkansas pond water-silty clay sediment systems, 5-OH-XDE-638 (both labels) was detected in the water layer, sediment and total system at maximums of 30.7%, 1.6% and 32.3% of the applied, respectively, at 35 days decreasing to 9.3-15.7%, 0.3% and 9.6% at 99 days (99-day [phenyl-U-^{14}C]-labeled sediment extract not analyzed; Appendix C, p.113; Attachment 1). BSTCA in the water layer increased to maximums of 39.5-44.4% at 99 days and was ≤0.8% in the sediment at any sampling interval. The HPLC fraction (Composite 4) consisting of tentatively identified OH-BSTCA and PCA-5-OH-XDE-638 was detected at a maximum mean (individual results were not provided) of 3.1% at 99 days in the total system (2.8% in water, 0.3% in sediment; Table 11, p.62). Four additional unknowns (Metabolites 1, 2, 3 and 5) were each detected at means of ≤2.1% in the total system at any sampling interval. Additional unidentified radioactivity was detected at a maximum of 7.1% in the water layer at 64 days, but was ≤0.3% in sediment at any interval (Appendix C, p.113).

In Arkansas pond water-silt loam soil systems, 5-OH-XDE-638 (both labels) increased in the water layer and total system to 17.1-25.5% and 19.3-26.1% of the applied, respectively, at 35-64 days and were 19.4% and 20.6%, respectively, at 99 days. 5-OH-XDE-638 was ≤2.2% in the soil at any interval (Appendix C, p.112; Attachment 1). BSTCA in the water layer increased to a maximum 29.5% at 99 days and was ≤0.3% in the soil at any sampling interval. Composite 4 plus unidentified Metabolites 1, 2, 3 and 5 were each detected at means of ≤3.0% in the total system at any sampling interval (Table 10, p.61). Additional unidentified radioactivity was detected at a maximum 2.3% in the water layer at 8 days and was ≤0.3% in soil at any interval (Appendix C, p.112).

In Italy channel water-loam sediment systems, 5-OH-XDE-638 (both labels) increased in the water layer, sediment and total system to 18.5-18.6%, 1.4-5.4% and 20.0-23.9% of the applied, respectively, at 8-13 days decreasing to 0.8-0.9%, ≤1.3% and 1.0-2.1%, respectively, at 64 days (no 35-day sampling interval) and were not detected at 99 days (Appendix C, p.114; Attachment 1). BSTCA in the water layer and total system increased to maximums of 20.6-26.9% and 20.9-27.1%, respectively, at 64 days and were 16.7% and 18.4%, respectively, at 99 days. BSTCA was a maximum of 1.7% in the sediment at 99 days. Composite 4 was detected at a maximum

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mean of 6.8% in the total system (1.2% in water, 5.6% in sediment) at 99 days (Table 12, p.63). Unidentified Metabolites 1, 2, 3 and 5 were each detected at means of ≤6.2% in the total system at any sampling interval. Additional unidentified radioactivity was detected at a maximum 3.2% in the water layer at 8 days and was ≤0.5% in sediment at any interval (Appendix C, p.114).

In France lake water-sand sediment systems, 5-OH-XDE-638 (both labels) increased in the water layer, sediment and total system to 14.1%, 15.6% and 29.7% of the applied, respectively, at 35 days, then were 6.7-16.5%, 6.7-10.8% and 17.5-23.2%, respectively, at 64 days and 2.4%, 9.5% and 11.9%, respectively, at 99 days (Appendix C, p.115; Attachment 1). BSTCA in the water layer and total system increased to 5.8-18.4% and 6.1-19.6%, respectively, at 35-64 days and were 5.5% and 7.7%, respectively, at 99 days. BSTCA was a maximum of 2.2% in the sediment at 99 days. Composite 4 was detected in the sediment and total system at maximum means of 15.7% and 17.0%, respectively, at 99 days, with a maximum mean of 2.6% in the water layer at 64 days (Table 13, p.64). Unidentified Metabolites 1, 2, 3 and 5 were each detected at means of ≤2.6% in the total system at any sampling interval. Additional unidentified radioactivity was detected at maximums of 8.3% in the water layer at 8 days and 2.5% in the sediment at 13 days (Appendix C, p.115).

In Japan HPLC water-volcanic loam soil systems, 5-OH-XDE-638 (both labels) increased in the water layer, soil and total system to 18.4-20.0%, 11.0-12.2% and 29.4-32.2% of the applied, respectively, at 35-64 days, then were 19.2-19.9%, 4.9-12.5% and 24.8-31.7%, respectively, at 99 days (Appendix C, p.116; Attachment 1). BSTCA in the water layer and total system were detected at maximums of 8.8-10.7% and 8.9-11.9%, respectively, at 99 days. BSTCA was a maximum of 8.8-10.7% in water and 8.9-11.9% in the total system at 99 days and was ≤1.9% in the soil at any interval. Composite 4 was detected in the soil and total system at maximum means of 8.8% and 9.1%, respectively, at 99 days, with a maximum mean of 1.4% in the water layer at 13 days (Table 14, p.65). Unidentified Metabolites 1, 2, 3 and 5 were each detected at means of ≤1.3% in the total system at any sampling interval. Additional unidentified radioactivity was detected at maximums of ≤1.0% in the water layer and soil at any interval (Appendix C, p.116).

In Japan HPLC water-nonvolcanic loam soil systems, 5-OH-XDE-638 ([phenyl-U-^{14}C]-label only) increased in the water layer, soil and total system to 22.9%, 17.4% and 40.3% of the applied, respectively, at 64 days, then were 14.3%, 16.6% and 30.9%, respectively, at 99 days (Appendix C, p.117; Attachment 1). BSTCA was detected at maximums of 25.4%, 0.3% and 25.7% in the water layer, soil and total system, respectively, at 99 days. Composite 4 was detected at maximums of 0.8%, 7.5% and 8.3%, in the water layer, soil and total system, respectively, at 64 days (Table 15, p.66). Unidentified Metabolites 1, 2, 3 and 5 were each detected at means of ≤2.9% in the total system at any sampling interval. Additional unidentified radioactivity was detected at maximums of ≤3.7% in the water layer and soil at any interval (Appendix C, p.117).

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NONEXTRACTABLE AND EXTRACTABLE RESIDUES: In Arkansas silty clay sediment, extractable [^{14}C]residues (both labels) increased to 4.4-5.0% of the applied at 7 days, then decreased to 0.5-0.8% at 99 days, while nonextractable [^{14}C]residues increased from 0.3-0.8% at day 0 to 24.5-28.6% at 99 days (Appendix C, p.113). Organic matter fractionation of 99-day extracted sediment found 5.7-6.2%, 16.9-20.2% and 1.9-2.2% of the applied associated with the humin, fulvic acid and humic acid fractions, respectively (Table 16, p.67).

In Arkansas silt loam soil, extractable [^{14}C]residues (both labels) increased from 2.6-2.8% of the applied at day 0 to 4.8-14.5% at 1-4 days, then were 4.6-9.5% at 8-13 days and 0.4-5.3% at 35-99 days (Appendix C, p.112). Nonextractable [^{14}C]residues increased from ≤0.4% at 0-4 days to 22.0% at 99 days.

In Italy loam sediment, extractable [^{14}C]residues (both labels) were 4.3-16.0% of the applied during the 99-day incubation with no increasing/decreasing pattern, while nonextractable [^{14}C]residues increased from 1.1-1.2% at day 0 to 57.9% at 99 days (Appendix C, p.114). Organic matter fractionation of the 99-day extracted sediment found 13.9-14.6%, 35.2-35.3% and 7.9-8.1% of the applied associated with the humin, fulvic acid and humic acid fractions, respectively (Table 16, p.67).

In France sand sediment, extractable [^{14}C]residues (both labels) increased from 3.0-3.8% of the applied at day 0 to 26.9-46.3% at 35-64 days and were 47.3% at 99 days, while nonextractable [^{14}C]residues were ≤0.1%, 13.6-23.0% and 20.8% at the same respective intervals (Appendix C, p.115).

In Japan volcanic loam soil, extractable [^{14}C]residues (both labels) increased from 3.3-3.6% of the applied at day 0 to 27.4% at 35 days and were 20.6% at 99 days, while nonextractable [^{14}C]residues increased from 0.1% at day 0 to 28.6% at 99 days (Appendix C, p.116). Organic matter fractionation of the 99-day extracted soil found 3.2-3.6%, 17.2-21.4% and 7.4-8.2% of the applied associated with the humin, fulvic acid and humic acid fractions, respectively (Table 16, p.67).

In Japan nonvolcanic loam soil, extractable [^{14}C]residues (both labels) increased from 3.7-4.1% of the applied at day 0 to 38.8% at 64 days and were 31.6% at 99 days, while nonextractable [^{14}C]residues increased from ≤0.4% at 0-4 days to 17.8% at 99 days (Appendix C, p.117).

VOLATILIZATION: Formation of volatilized of $^{14}CO_2$ (both labels) was not significant for any system totaling ≤2.4% of the applied radioactivity at study termination (Appendix C, pp.112-117). Volatile [^{14}C]organic compounds were not trapped.

TRANSFORMATION PATHWAY: A transformation pathway was proposed by the study authors (Figure 28, p.104). Under aerobic aquatic conditions, the 5-methoxy group on the triazolopyrimdine ring is converted to a hydroxy group to yield 2-(2,2-difluoroethoxy)-N-(5,6-dihydro-8-methoxy-5-oxo[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)

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benzenesulfonamide (5-OH-XDE-638). 5-OH-XDE-638 then degrades to 3-[[[2-(2,2-difluoroethoxy)-6-(trifluoromethyl)phenyl]sulfonyl]amino]-1H-1,2,4-triazole-5-carboxylic acid (BSTCA).

Table 15: Chemical names for identified transformation products of penoxsulam (XDE-638) in aerobic water-sediment/soil.

Applicant's code	CAS Number	Chemical Name(s)	Chemical formula	Molecular weight	SMILES string
5-OH-XDE-638	None	CAS: 2-(2,2-Difluoroethoxy)-N-(5,6-dihydro-8-methoxy-5-oxo[1,2,4]-triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)benzenesulfonamide.		469	n1c(nc2n1c(ncc2OC)O)NS(=O)(=O)c3c(cccc3C(F)(F)F)OCC(F)F
		IUPAC: 6-(2,2-Difluoroethoxy)-N-(5,6-dihydro-8-methoxy-5-oxo-s-triazolo[1,5-c]pyrimidin-2-yl)-α,α,α-trifluoro-o-toluenesulfonamide.			
BSTCA	None	CAS: 3-[[[2-(2,2-Difluoroethoxy)-6-(trifluoromethyl)phenyl]sulfonyl]amino]-1H-1,2,4-triazole-5-carboxylic acid		416	n1c(nc(n1)C(O)=O)NS(=O)(=O)c2c(cccc2C(F)(F)F)OCC(F)F
		IUPAC: 3-[6-(2,2-Difluoroethoxy)-α,α,α-trifluoro-o-toluenesulfonamido]-s-triazole-5-carboxylic acid			

Data obtained from Figure 1, p.76 of the study report.

D. SUPPLEMENTARY EXPERIMENT-RESULTS:

Exaggerated rate (2x) experiment. The France water-sand sediment system was used to isolate parent penoxsulam and its transformation products for identification confirmation via LC/MS as described above.

Extraction recovery. One water-sediment/soil system of each type was taken at 16 days posttreatment to assess extraction recovery (p.39). Water and sediment/soil were separated and extracted as described above. By the fourth extraction <5% of the [^{14}C]residues in the sample were extractable. Therefore, three extractions were used for the method (Table 9, p.60).

III. STUDY DEFICIENCIES:

1. For all systems, the soil/sediment was not flooded and treated at the same time. For an aerobic aquatic metabolism study, an aerobic soil/sediment should be treated and flooded at the same time so that both aerobic and anaerobic conditions exist in the soil/sediment and the initial microbial population of the soil/sediment is predominantly aerobic. In this study, water-sediment/soil systems were prepared and pre-incubated for 2 weeks prior to application of penoxsulam to the water layer.

2. For all systems, sediment/soil extracts from 0- to 4-day systems were routinely not analyzed by HPLC even though extractable [^{14}C]residues comprised up to 14.3% of the applied radioactivity.

3. For five of the six systems (both labels), material balances were incomplete with up to *ca.* 13-16% of the theoretically applied unaccounted for in the Arkansas water-silty clay, Arkansas water-silt loam soil, Italy water-loam sediment, France water-sand sediment and Japan HPLC water-volcanic loam soil systems.

4. For the French systems, identification of all degradates detected at >10% of the applied was not adequately addressed. Composite 4 was detected in the sediment and total system at maximum means of 15.7% and 17.0%, respectively, at study termination (Table 13, p.64). The study authors reported that two compounds comprising Composite 4 were tentatively identified as OH-BSTCA and PCA-5-OH-XDE-638. However, the individual amounts of each degradate were not reported, but should have been to determine if either degradate individually comprised ≥10% of the applied.

5. For all systems, the application rates were not confirmed. Although the study author reported that aliquots of the test application solutions were taken for analysis to determine application rates (p.25), the quantitative data from those analyses were not provided for review. In addition, the reported amounts (µg) of [^{14}C]penoxsulam were inconsistent with the reported test solution concentrations and application volumes that were used.

IV. REVIEWER'S COMMENTS:

1. Material balances reported by the study authors were verified by the reviewer (Appendix C, pp.112-117; Attachment 2). In general, there was agreement (within ± 0.1% of applied) between the study authors reported values and those determined by the reviewer. However, the study authors reported a material balance of 89.1% of applied for the 0-day [phenyl-U-^{14}C]-label treated Arkansas water-silty clay sediment system, while the value determined by the reviewer was 84.1% of applied. The study authors' reported mean values were presented in this review unless there was a discrepancy of >0.1% of the applied between the value reported by the study authors and that determined by the reviewer, in which case, the value determined by the reviewer was presented (Attachment 2).

   Standard deviations not provided by the study authors were determined by the reviewer (Attachment 2). Standard deviations provided by the study authors were re-calculated by the reviewer.

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2. The study authors calculated standard deviations using the "sample" standard deviation function equivalent to the "n-1 weighted" standard deviation which should only be used when data are taken from a sample of a population. The reviewer re-determined standard deviations as needed using the "population" standard deviation function which is used when data are taken from the entire population (Tables 8, pp.57-59; Attachment 2).

3. The study authors "Entire system average for all sampling times" determined for each system is a mean of the means ([phenyl-U-^{14}C]- and [triazolopyrimidine-2-^{14}C]-label) determined at each interval (Tables 10-15), and, therefore, is not in agreement with the overall mean determined for each system by the reviewer.

4. Water layers were stored frozen or refrigerated and analyzed by HPLC within 1 week of sampling, while sediment/soil extracts were frozen up to 5 months prior to HPLC analysis (p.46). The study authors reported that re-analysis of selected water layers after 4 months of storage indicated that penoxsulam, 5-OH-XDE-638 and BSTCA were stable during frozen storage. However, quantitative results were not provided for review (p.46).

   An aqueous storage stability study (MRID 45830803) indicated that penoxsulam did not significantly degrade after 130 days of refrigerated storage (average recovery 100.7% of applied) or 221 days of frozen storage (average recovery 96.0%), while recoveries of 5-OH-XDE-638 and BSTCA after 284 days of refrigerated storage averaged 99.7% and 90.7%, respectively (Tables 2-3, pp.28-35 in MRID 45830803).

5. Although "TP"-label results are presented at the day 0 sampling interval for the Arkansas water-silt loam soil (Appendix C, p.112), the France water-sand sediment (Table 8, p.58; Appendix C, p.115) and the Japan HPLC water-volcanic loam (Table 8, p.59; Appendix C, p.116) and -nonvolcanic loam (Appendix C, p.117) soils, there were no day 0 [triazolopyrimidine-2-^{14}C]-label treated samples for those systems. Duplicate [phenyl-U-^{14}C]-label treated systems were prepared and collected at day 0 posttreatment for those systems (p.24).

6. Sediment/soil extracts from 0- to 4-day systems were routinely not analyzed by HPLC even though extractable [^{14}C]residues comprised up to 14.3% of the applied radioactivity (Appendix C, pp.112-117). Consequently, levels of parent [^{14}C]penoxsulam and/or its degradates in the total system could not be determined at those intervals and at later intervals for which the sediment/soil extracts were not analyzed. The one exception was the 0-day [phenyl-U-^{14}C]-label treated Arkansas water-silty clay sediment system, because, reportedly, no [^{14}C]residues were recovered in the sediment extract. Thus, [phenyl-^{14}C]penoxsulam and its degradates detected in the water layer was equivalent to the total system (Appendix C, p.113).

7. For five of the six systems (Arkansas pond water-silty clay sediment, Arkansas pond water-silt loam soil, Italy channel water-loam sediment, France lake water-sand sediment and Japan

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HPLC water-volcanic loam soil) a single treated water-sediment/soil system for each label was reportedly collected at each sampling interval. However, routinely, results were not provided for one of the two systems (either [phenyl-U-^{14}C]- or [triazolopyrimidine-2-^{14}C]-label) at various intervals (Appendix C, pp.112-117). No explanations were provided as to either why the systems was not analyzed, or why the results were not reported. Replicate (duplicate) sampling at each collection interval is preferred, so that normal variability can be quantified and outliers identified.

8. Foreign sediment/soils from Italy and France were used in this study and classified as a loam and sand, respectively, according to the USDA soil classification system. In addition, two soils, a volcanic and nonvolcanic, from Japan were used, with both classified as loams.

9. According to N. Wolfe, *et al.* (see reference below), redox potentials in the range of +400 to +800 mV are considered strongly oxidizing, +200 to +400 mV moderately oxidizing, -50 to +200 mV moderately reducing, -200 to -50 mV reducing, and -400 to -200 mV strongly reducing.

10. The study authors reported a proposed field application rate for penoxsulam of 50 g a.i./ha, dependent upon timing of application, target weeds and the crop (p.20). The 150 g a.i./ha treatment rate selected for the Arkansas silty clay sediment and silt loam soil, Italy loam sediment and France sand sediment systems in this study, although three times the maximum seasonal application rate (50 g a.i./ha), was chosen to allow for sufficient material for detection of parent penoxsulam and its transformation products. Assuming application to a body of water 15 cm in depth and water density of 1.0 g/cm^3, a treatment rate of 150 g a.i./ha would be equivalent to an aqueous concentration of 0.1 mg a.i./L (p.20).

    For the Japan loam soil (volcanic and nonvolcanic) systems, a treatment rate of 0.15 mg/kg was selected based upon Japan guidelines, which was equivalent to an aqueous concentration of 0.04 mg a.i./L.

11. 6-(2,2-Difluoroethoxy)-N-(5,8-dimethoxy-s-triazolo[1,5-c]pyrimidin-2-yl)-α,α,α-trifluoro-o-toluenesulfonamide was identified as an IUPAC name of penoxsulam by the study authors (Figure 1, p.73). 3-(2,2-Difluoroethoxy)-N-(5,8-dimethoxy[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-α,α,α-trifluorotoluene-2-sulfonamide identified as an IUPAC name of penoxsulam by the Compendium of Pesticide Common Names (http://www.hclrss.demon.co.uk/penoxsulam.html). 2-(2,2-Difluoroethoxy)-N-(5,8-dimethoxy[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)benzenesulfonamide was identified as the CAS name of penoxsulam by the study authors, the USEPA/OPP Chemical Database (http://www.cdpr.ca.gov/cgi-bin/epa/chemidetriris.pl?pccode=119031) and the Compendium of Pesticide Common Names. CAS Reg. No. 219714-96-2 for penoxsulam was verified with the USEPA/OPP Chemical Database.

12. The study authors determined apparent (non-equilibrium) K_d values (L/kg) and K_{oc} (mL/g) for penoxsulam and it transformation products (p.45; Tables 20-21, pp.71-74). For parent penoxsulam, apparent K_d values tended to increase with time in all the sediment/soils, except the Arkansas silt loam soil.

    For the Arkansas silty clay sediment, reported apparent K_d and K_{oc} values for penoxsulam and its transformation products were as follows: 0.07-0.24 mL/g and 20.01-69.64 mL/g, respectively, for penoxsulam, 0.09-0.23 mL/g and 25.80-66.68 mL/g, respectively, for 5-OH-XDE-638, and 0.01-1.96 mL/g and 0.88-559.54 mL/g, respectively, for BSTCA.

    For the Arkansas silt loam soil, reported apparent K_d and K_{oc} values were as follows: ≤0.43 mL/g and ≤36.50 mL/g, respectively, for penoxsulam, ≤1.09 mL/g and ≤91.90 mL/g, respectively, for 5-OH-XDE-638, and 0.03-0.08 mL/g and ≤6.43 mL/g, respectively, for BSTCA.

    For the Italy loam sediment, reported apparent K_d and K_{oc} values were as follows: 0.14-6.63 mL/g and ≤135.64 mL/g, respectively, for penoxsulam, 0.43-3.18 mL/g and 8.83-65.11 mL/g, respectively, for 5-OH-XDE-638, and 0.05-1.01 mL/g and 1.00-20.69 mL/g, respectively, for BSTCA.

    For the France sand sediment, reported apparent K_d and K_{oc} values were as follows: 0.51-18.42 mL/g and 20.98-758.17 mL/g, respectively, for penoxsulam, 0.81-16.10 mL/g and 33.23-662.61 mL/g, respectively, for 5-OH-XDE-638, and ≤1.92 mL/g and 10.03-79.10 mL/g, respectively, for BSTCA.

    For the Japan volcanic loam soil, reported apparent K_d and K_{oc} values were as follows: 0.57-2.39 mL/g and 10.70-45.01 mL/g, respectively, for penoxsulam, 0.42-2.38 mL/g and 7.95-44.89 mL/g, respectively, for 5-OH-XDE-638, and ≤10.47 mL/g and ≤197.64 mL/g, respectively, for BSTCA.

    For the Japan nonvolcanic loam soil, reported apparent K_d and K_{oc} values were as follows: 0.88-6.81 mL/g and 48.72-378.59 mL/g, respectively, for penoxsulam, 1.14-4.64 mL/g and 63.53-257.81 mL/g, respectively, for 5-OH-XDE-638, and ≤0.04 mL/g and ≤2.49 mL/g, respectively, for BSTCA.

13. The following typographical errors/discrepancies were noted in this study:

    i) In Table 3 (p.52), the study authors reported that the natural waters were filtered with a 0.2-mm sieve. However, in Appendix B (p.109), it was reported that the Arkansas water was filtered through glass wool.

    ii) In Table 8 (p.57), the Average oxygen concentration (mg/L) in water for the Arkansas pond water-silt loam soil systems (U.S. Soil) reported as 6.5 should read 6.7, and the

Average Aqueous Potential and Sediment Potential for the Arkansas pond water-silty clay sediment systems (U.S. Sediment) reported as 104.6 mV and -20.7 mV, respectively, should read 105.0 mV and -28.2 mV, respectively (Attachment 1).

In Table 8 (p.58), the Average pH, O_2, Aqueous Potential and Sediment Potential for the France lake water-sand sediment systems (French Sediment) reported as 6.3, 12.9 ppm, 153.6 mV and 197.5 mV, respectively, should read 6.1, 7.4 ppm, 178.2 mV and 167.3 mV, respectively (Attachment 1).

In Table 8 (p.59), the Average O_2, Aqueous Potential and Sediment Potential for the Japan HPLC water-nonvolcanic loam soil systems (Non-volcanic Soil) reported as 7.8 ppm, 194.5 mV and 216.3 mV, respectively, should read 7.5 ppm, 207.1 mV and 196.9 mV, respectively (Attachment 1).

All standard deviations in Table 8 were re-calculated by the reviewer.

iii) In Table 11 (p.62), results for Total % recovery for water and sediment at day 0 reported as 91.9 and 0.5, respectively, should read 89.4 and 0.9, respectively (Attachment 1). Results for CO_2, NER, and Total % recovery water, sediment and entire system at day 64 were reported as 1.2, 23.8, 61.1 and 1.4, respectively, but as 0.7, 23.6, 62.1 and 1.0, respectively, in Appendix C (p.113). The results from Appendix C were presented in this review.

iv) In Table 12 (p.63), the result for CO_2, at day 4 was reported as 0.0, but as 0.1 in Appendix C (p.114). The result from Appendix C was presented in this review.

v) Results for Composite 4 - 9 minutes in Table 13 (p.64) are defined as 9 minute composite, Metabolite 5 in Appendix C (p.115).

vi) In Table 14 (p.65), results for CO_2, NER and Total % recovery water, sediment and entire system at day 35 were reported as 0.8, 15.7, 62.2, 23.7 and 102.3, respectively, but was 0.2, 16.4, 59.3, 27.4 and 103.2, respectively, in Appendix C (p.116). The results from Appendix C were presented in this review.

vii) In Table 15 (p.66), the result for Parent compound at 4 days was reported as 73.9, but as 78.9 in Appendix C (p.117). In addition, the result for NER at 8 days was reported as 1.1, but as 2.1 in Appendix C. The results from Appendix C were presented in this review.

viii) In Figure 19 (p.95), for the U.S. Sediment, the regression equation for the sediment reads $y = 3.3211e^{-0.0423x}$, but as $y = 100e^{-0.0423x}$ in Table 17 (p.68).

ix) In Appendix C (p.114), the result for 5-OH-XDE-638 sediment Ph at day 99 of nd should read N/A.

In Appendix C (p.115), the result for Unidentified radioactivity water Ph at day 35 of 0.4 should read N/A.

V. REFERENCES:

1. U.S. Environmental Protection Agency. 1982. Pesticide Assessment Guidelines, Subdivision N, Chemistry: Environmental Fate, Section 162-4, Aerobic Aquatic Metabolism Studies. Office of Pesticide and Toxic Substances, Washington, DC. EPA 540/9-82-021.

2. U.S. Environmental Protection Agency. 1989. FIFRA Accelerated Reregistration, Phase 3 Technical Guidance. Office of the Prevention, Pesticides, and Toxic Substances, Washington, DC. EPA 540/09-90-078.

3. U.S. Environmental Protection Agency. 1993. Pesticide Registration Rejection Rate Analysis - Environmental Fate. Office of the Prevention, Pesticides, and Toxic Substances, Washington, DC. EPA 738-R-93-010.

4. Wolfe, N., *et al.* 1990. Abiotic transformations in water, sediments and soil. *In* Pesticides in the Soil Environment, Soil Science Society of America, pp.103-110.

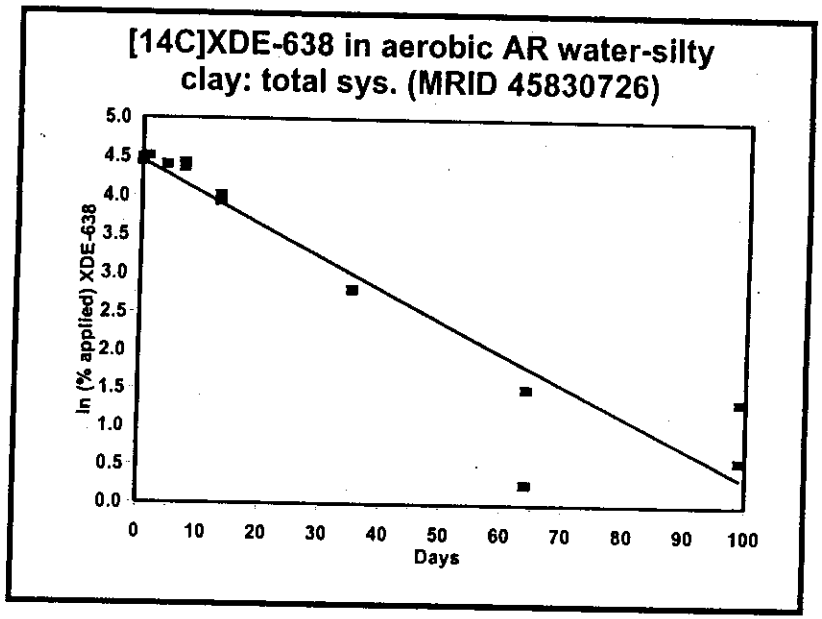
Attachment 1

Quattro Pro Graphs and Spreadsheets

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Arkansas water-silty clay sediment.
[^{14}C]Penoxsulam (both labels).
Total system
Half-life Determination

Penoxsulam (XDE-638)			
Day	Label	%App	Ln(%App)
0	Ph-U	85.1	4.443827
0	TP-2	89.3	4.4920015
1	TP-2	91.2	4.5130549
4	Ph-U	81.8	4.4042772
7	Ph-U	79.1	4.3707129
7	TP-2	83.8	4.428433
13	Ph-U	51.4	3.9396382
13	TP-2	55.4	4.0145796
35	Ph-U	16.6	2.8094027
64	Ph-U	4.6	1.5260563
64	TP-2	1.3	0.2623643
99	Ph-U	3.9	1.3609766
99	TP-2	1.8	0.5877867



0- to 99-day data

Regression Output:

Constant	4.45
Std Err of Y Est	0.580432
R Squared	0.885
No. of Observations	13
Degrees of Freedom	11
X Coefficient(s)	-0.0412
Std Err of Coef.	0.004479

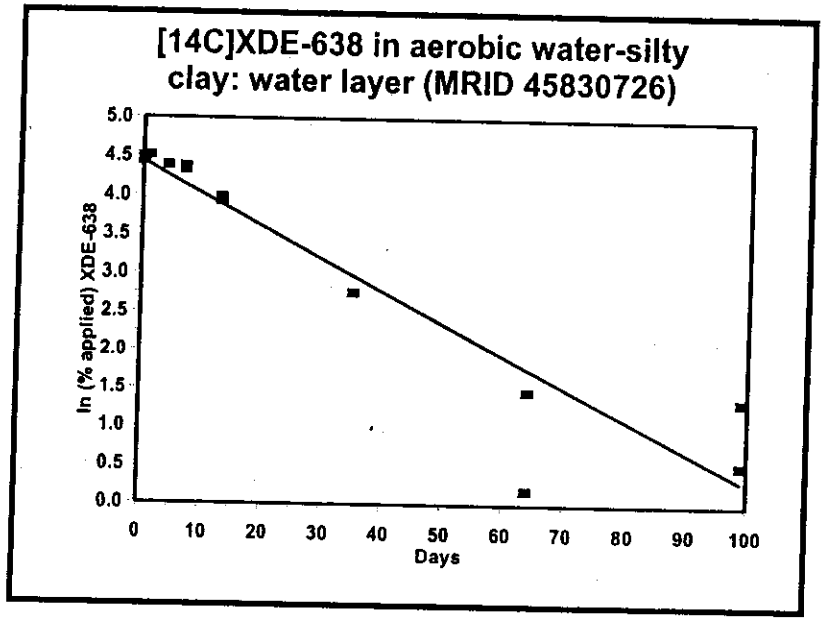
*AR = Applied Radioactivity **half-life 16.8 days**

Linear regression analysis performed using Corel Quattro Pro 8.
Results from Appendix C, p. 113 of study report and Attachment 1.
As worst case scenario, parent compound recovered in water layer at early sampling intervals, when sediment/soil ext analyzed, considered equivalent to "total system".

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Arkansas water-silty clay sediment.
[^{14}C]Penoxsulam (both labels).
Water layer
Half-life Determination

Penoxsulam (XDE-638)			
Day	Label	%App	Ln(%App)
0	Ph-U	85.1	4.443827
0	TP-2	89.3	4.4920015
1	TP-2	91.2	4.5130549
4	Ph-U	80.3	4.3857696
7	Ph-U	75.9	4.3294167
7	TP-2	79.4	4.3744984
13	Ph-U	51.4	3.9396382
13	TP-2	53.7	3.983413
35	Ph-U	15.9	2.7663191
64	Ph-U	4.4	1.4816045
64	TP-2	1.2	0.1823216
99	Ph-U	3.9	1.3609766
99	TP-2	1.7	0.5306283



0- to 99-day data

Regression Output:

Constant	4.43
Std Err of Y Est	0.597293
R Squared	0.881
No. of Observations	13
Degrees of Freedom	11
X Coefficient(s)	-0.0415
Std Err of Coef.	0.004609

half-life **16.7 days**

*AR = Applied Radioactivity
Linear regression analysis performed using Corel Quattro Pro 8.
Results from Appendix C, p. 113 of study report.

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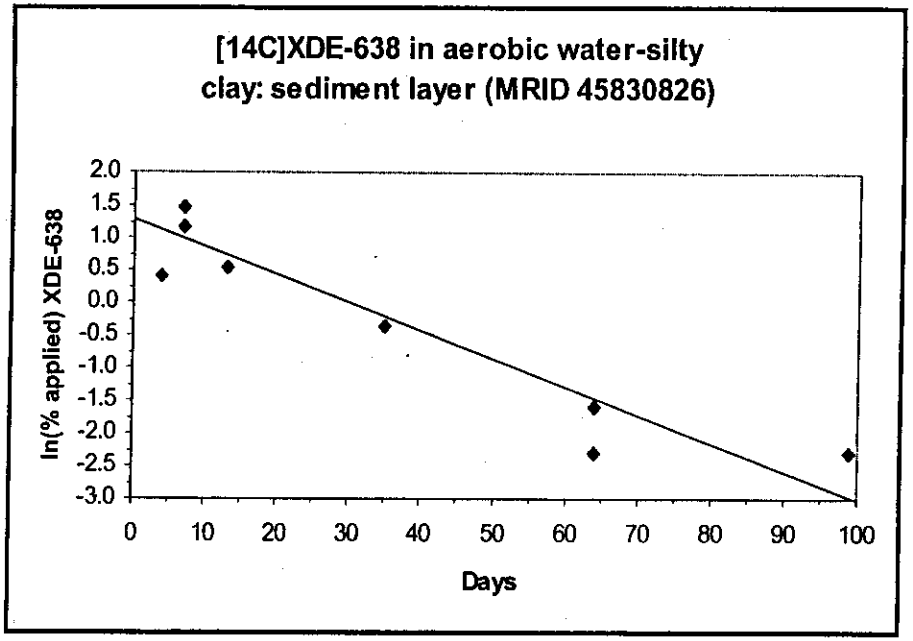
Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Arkansas water-silty clay sediment.
[^{14}C]Penoxsulam (both labels).
Sediment layer
Half-life Determination

Penoxsulam (XDE-638)			
Day	Label	%App	Ln(%App)
0	Ph-U		ERR
0	TP-2		ERR
1	TP-2		ERR
4	Ph-U	1.5	0.4054651
7	Ph-U	3.2	1.1631508
7	TP-2	4.4	1.4816045
13	TP-2	1.7	0.5306283
35	Ph-U	0.7	-0.3566749
64	Ph-U	0.2	-1.6094379
64	TP-2	0.1	-2.3025851
99	TP-2	0.1	-2.3025851



7- to 99-day data

Regression Output:

Constant	1.29
Std Err of Y Est	0.548262
R Squared	0.903
No. of Observations	7
Degrees of Freedom	5
X Coefficient(s)	-0.0431
Std Err of Coef.	0.006308

half-life 16.1 days

*AR = Applied Radioactivity
Linear regression analysis performed using Corel Quattro Pro 8.
Results from Appendix C, p. 113 of study report.

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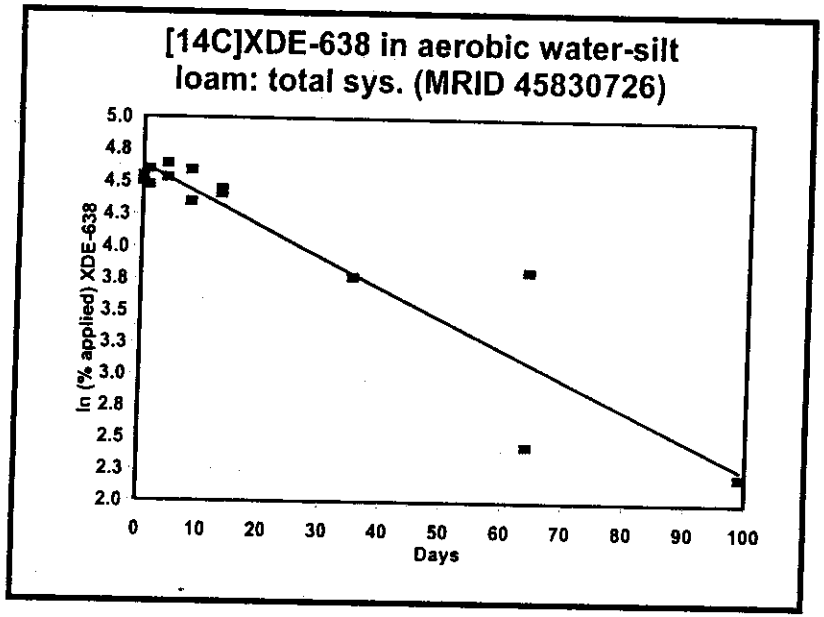
Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Arkansas water-silt loam soil.
[^{14}C]Penoxsulam (both labels).
Total system
Half-life Determination

Penoxsulam (XDE-638)			
Day	Label	%App	Ln(%App)
0	Ph-U	94.3	4.5464812
0	Ph-U	90.1	4.5009202
1	Ph-U	99.1	4.5961294
1	TP-2	87.9	4.4761998
4	Ph-U	103.8	4.642466
4	TP-2	93.0	4.5325995
8	Ph-U	77.4	4.3489868
8	TP-2	98.7	4.5920849
13	Ph-U	82.2	4.4091553
13	TP-2	85.3	4.4461745
35	Ph-U	43.6	3.7750572
64	Ph-U	45.8	3.8242841
64	TP-2	11.5	2.442347
99	Ph-U	9.1	2.2082744



0- to 99-day data

Regression Output:

Constant	4.63
Std Err of Y Est	0.298379
R Squared	0.871
No. of Observations	14
Degrees of Freedom	12
X Coefficient(s)	-0.0238
Std Err of Coef.	0.00265

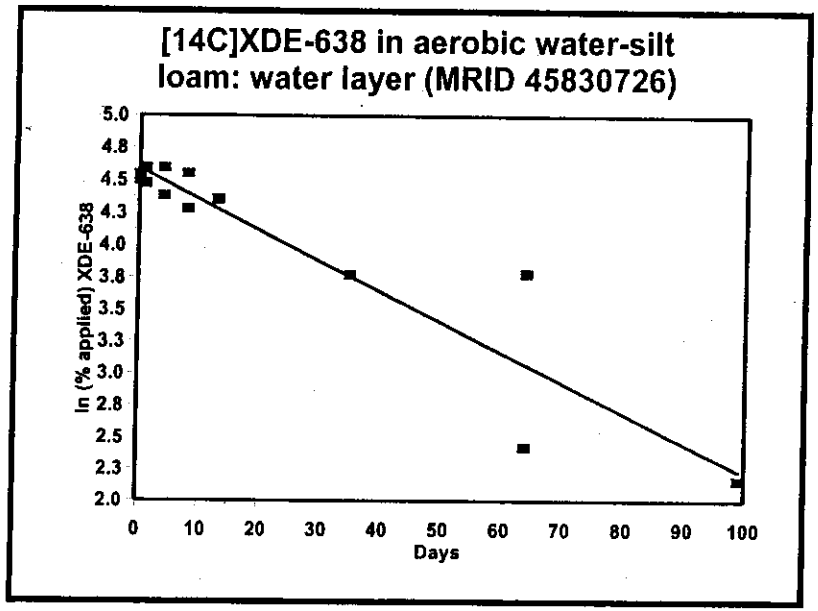
*AR = Applied Radioactivity **half-life 29.1 days**

Linear regression analysis performed using Corel Quattro Pro 8.
Results from Appendix C, p. 112 of study report and Attachment 1.
As worst case scenario, parent compound recovered in water layer at early sampling intervals, when sediment/soil extracts we analyzed, considered equivalent to "total system".

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Arkansas water-silt loam soil.
[^{14}C]Penoxsulam (both labels).
Water layer
Half-life Determination

Penoxsulam (XDE-638)			
Day	Label	%App	Ln(%App)
0	Ph-U	94.3	4.546481
0	Ph-U	90.1	4.50092
1	Ph-U	99.1	4.596129
1	TP-2	87.9	4.4762
4	Ph-U	98.8	4.593098
4	TP-2	79.8	4.379524
8	Ph-U	72.2	4.27944
8	TP-2	94.7	4.550714
13	Ph-U	78.3	4.360548
13	TP-2	77.5	4.350278
35	Ph-U	43.4	3.770459
64	Ph-U	43.9	3.781914
64	TP-2	11.3	2.424803
99	Ph-U	8.7	2.163323



0- to 99-day data

Regression Output:

Constant	4.59
Std Err of Y Est	0.291399
R Squared	0.875
No. of Observations	14
Degrees of Freedom	12
X Coefficient(s)	-0.0238
Std Err of Coef.	0.002588

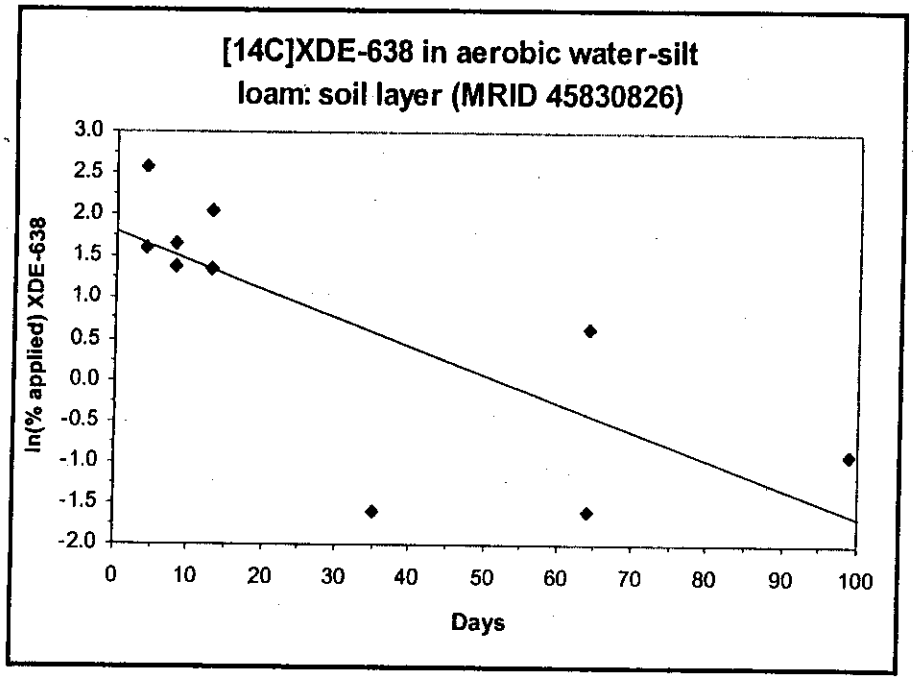
half-life 29.2 days

*AR = Applied Radioactivity
Linear regression analysis performed using Corel Quattro Pro 8.
Results from Appendix C, p. 112 of study report.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Arkansas water-silt loam soil
[^{14}C]Penoxsulam (both labels).
Soil layer
Half-life Determination

Penoxsulam (XDE-638)			
Day	Label	%App	Ln(%App)
0	Ph-U		ERR
0	Ph-U		ERR
1	Ph-U		ERR
1	TP-2		ERR
4	Ph-U	5.0	1.609438
4	TP-2	13.2	2.580217
8	Ph-U	5.2	1.648659
8	TP-2	4.0	1.386294
13	Ph-U	3.9	1.360977
13	TP-2	7.8	2.054124
35	Ph-U	0.2	-1.609438
64	Ph-U	1.9	0.641854
64	TP-2	0.2	-1.609438
99	Ph-U	0.4	-0.916291



4- to 99-day data

Regression Output:

Constant	6.76
Std Err of Y Est	3.148893
R Squared	0.462
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.0826
Std Err of Coef.	0.031518

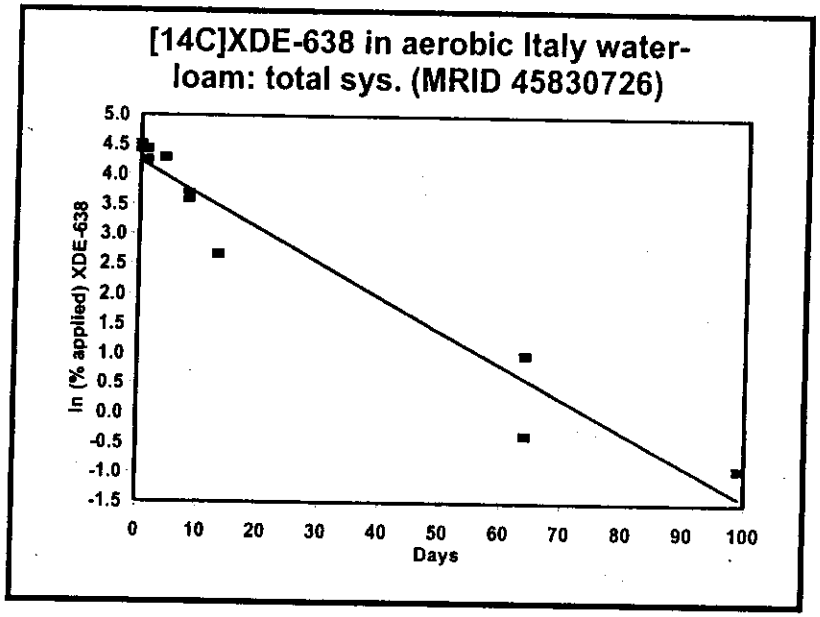
half-life **8.4 days**

*AR = Applied Radioactivity
Linear regression analysis performed using Corel Quattro Pro 8.
Results from Appendix C, p. 112 of study report.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Italy water-loam sediment.
[^{14}C]Penoxsulam (both labels).
Total system
Half-life Determination

Penoxsulam (XDE-638)			
Day	Label	%App	Ln(%App)
0	Ph-U	90.3	4.503137
0	TP-2	84.6	4.437934
1	Ph-U	69.5	4.241327
1	TP-2	84.0	4.430817
4	TP-2	72.3	4.280824
8	Ph-U	40.1	3.691376
8	TP-2	36.9	3.608212
13	TP-2	14.3	2.66026
64	Ph-U	2.7	0.993252
64	TP-2	0.7	-0.356675
99	TP-2	0.4	-0.916291



0- to 99-day data

Regression Output:

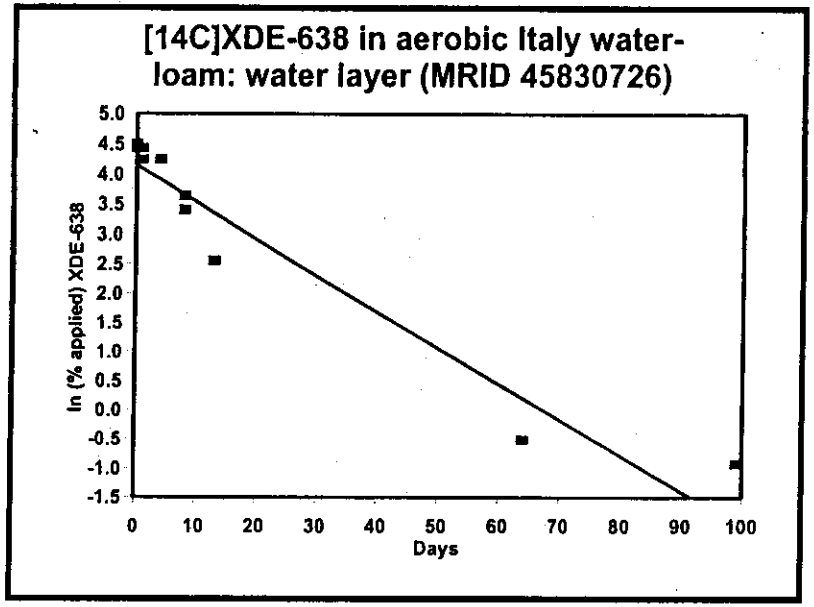
Constant	4.22
Std Err of Y Est	0.503652
R Squared	0.944
No. of Observations	11
Degrees of Freedom	9
X Coefficient(s)	-0.0566
Std Err of Coef.	0.004585

*AR = Applied Radioactivity **half-life 12.2 days**
Linear regression analysis performed using Corel Quattro Pro 8.
Results from Appendix C, p. 114 of study report and Attachment 1.
As worst case scenario, parent compound recovered in water layer at early sampling intervals, when sediment/soil extracts w analyzed, considered equivalent to "total system".

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Italy water-loam sediment.
[^{14}C]Penoxsulam (both labels).
Water layer
Half-life Determination

Penoxsulam (XDE-638)			
Day	Label	%App	Ln(%App)
0	Ph-U	90.3	4.503137
0	TP-2	84.6	4.437934
1	Ph-U	69.5	4.241327
1	TP-2	84.0	4.430817
4	TP-2	69.8	4.245634
8	Ph-U	38.0	3.637586
8	TP-2	30.2	3.407842
13	TP-2	13.0	2.564949
64	Ph-U	0.6	-0.510826
64	TP-2	0.6	-0.510826
99	TP-2	0.4	-0.916291



0- to 99-day data

Regression Output:

Constant	4.15
Std Err of Y Est	0.600026
R Squared	0.934
No. of Observations	11
Degrees of Freedom	9
X Coefficient(s)	-0.0617
Std Err of Coef.	0.005462

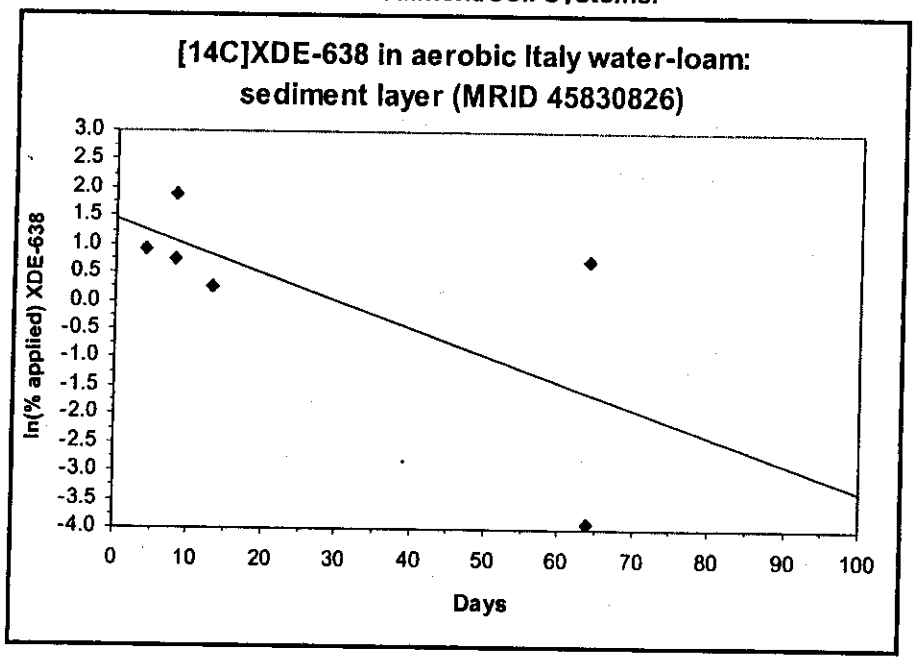
half-life 11.2 days

*AR = Applied Radioactivity
Linear regression analysis performed using Corel Quattro Pro 8.
Results from Appendix C, p. 114.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Italy water-loam sediment.
[^{14}C]Penoxsulam (both labels).
Sediment layer
Half-life Determination

Penoxsulam (XDE-638)			
Day	Label	%App	Ln(%App)
0	Ph-U		ERR
0	TP-2		ERR
1	Ph-U		ERR
1	TP-2		ERR
4	TP-2	2.5	0.916291
8	Ph-U	2.1	0.741937
8	TP-2	6.7	1.902108
13	TP-2	1.3	0.262364
64	Ph-U	2.1	0.741937
64	TP-2	0.02	-3.912023
99	TP-2	ND	ERR



8- to 64-day data

Regression Output:

Constant	3.86
Std Err of Y Est	2.468231
R Squared	0.284
No. of Observations	5
Degrees of Freedom	3
X Coefficient(s)	-0.0452
Std Err of Coef.	0.041372

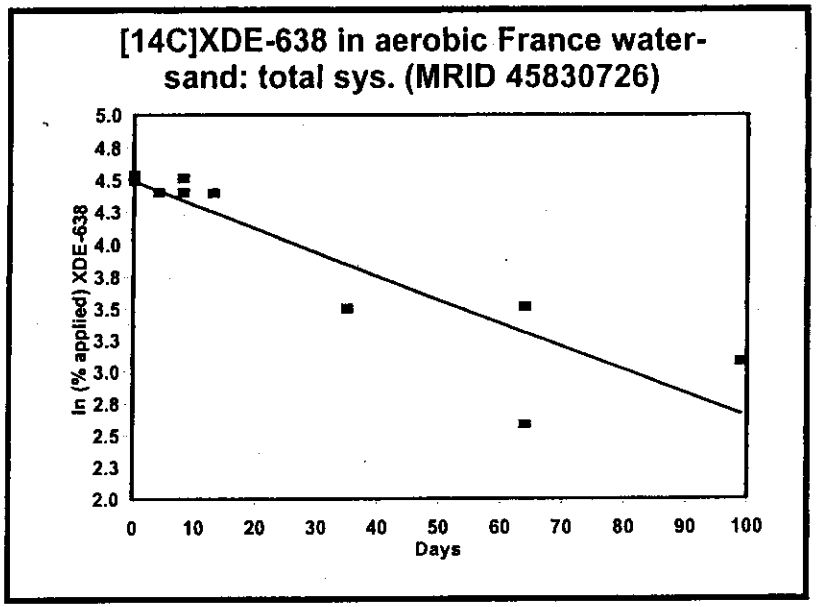
half-life **15.3 days**

*AR = Applied Radioactivity
Linear regression analysis performed using Corel Quattro Pro 8.
Results from Appendix C, p. 114.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

France water-sand sediment.
[^{14}C]Penoxsulam (both labels).
Total system
Half-life Determination

Penoxsulam (XDE-638)			
Day	Label	%App	Ln(%App)
0	Ph-U	89.2	4.490881
0	Ph-U	93.9	4.5422304
4	TP-2	82.1	4.407938
8	Ph-U	91.3	4.5141508
8	TP-2	81.6	4.4018293
13	Ph-U	81.3	4.398146
35	TP-2	33.3	3.5055574
64	Ph-U	13.3	2.587764
64	TP-2	33.7	3.5174978
99	Ph-U	21.8	3.08191



0- to 99-day data

Regression Output:

Constant	4.49
Std Err of Y Est	0.337518
R Squared	0.801
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.0184
Std Err of Coef.	0.003243

*AR = Applied Radioactivity **half-life 37.7 days**

Linear regression analysis performed using Corel Quattro Pro 8.

Results from Appendix C, p. 115 of study report and Attachment 1.

As worst case scenario, parent compound recovered in water layer at early sampling intervals, when sediment/soil extracts analyzed, considered equivalent to "total system".

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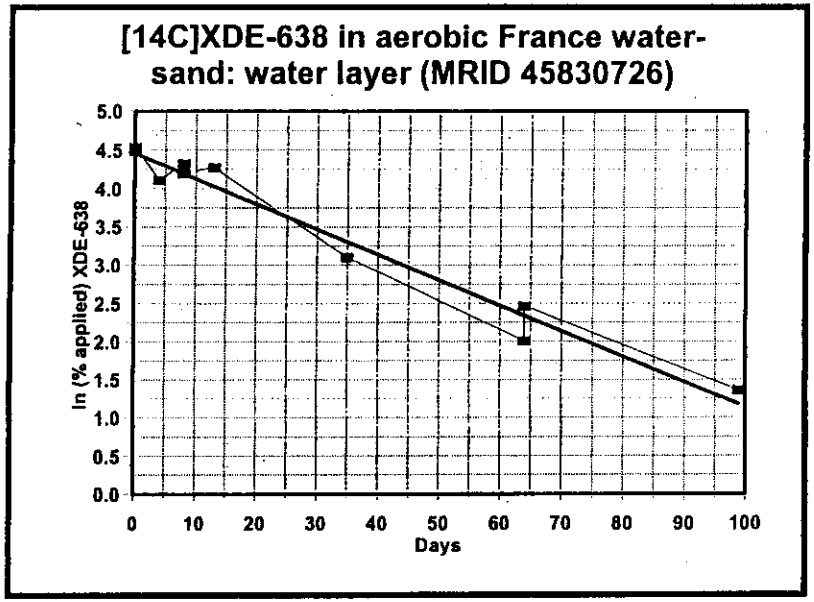
Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

France water-sand sediment.
[^{14}C]Penoxsulam (both labels).
Water layer
Half-life Determination

Penoxsulam (XDE-638)			
Day	Label	%App	Ln(%App)
0	Ph-U	89.2	4.490881
0	Ph-U	93.9	4.5422304
4	TP-2	61.2	4.1141472
8	Ph-U	75.9	4.3294167
8	TP-2	66.9	4.203199
13	Ph-U	72.1	4.278054
35	TP-2	22.3	3.1045867
64	Ph-U	7.5	2.014903
64	TP-2	11.8	2.4680995
99	Ph-U	3.9	1.3609766



0- to 99-day data

Regression Output:

Constant	4.47
Std Err of Y Est	0.201754
R Squared	0.973
No. of Observations	10
Degrees of Freedom	8
X Coefficient(s)	-0.0332
Std Err of Coef.	0.001939

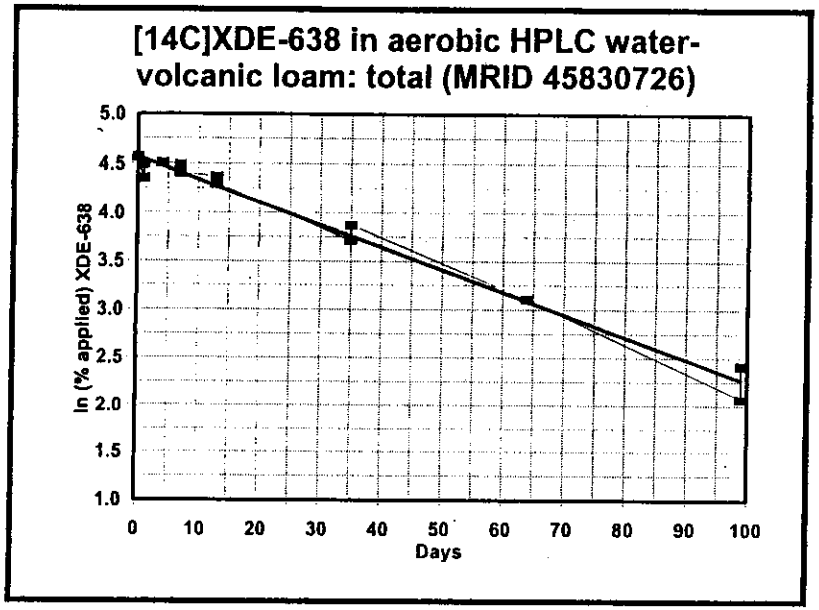
half-life 20.9 days

*AR = Applied Radioactivity
Linear regression analysis performed using Corel Quattro Pro 8.
Results from Appendix C, p. 115 of study report.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Japan HPLC water-volcanic loam soil.
[^{14}C]Penoxsulam (both labels).
Total system
Half-life Determination

Penoxsulam (XDE-638)			
Day	Label	%App	Ln(%App)
0	Ph-U	96.2	4.566429
0	Ph-U	96.9	4.57368
1	Ph-U	77.7	4.352855
1	TP-2	89.9	4.498698
4	TP-2	91.6	4.517431
7	Ph-U	89.7	4.496471
7	TP-2	82.3	4.410371
13	Ph-U	79.3	4.373238
13	TP-2	74.3	4.308111
35	Ph-U	41.1	3.716008
35	TP-2	48.2	3.875359
64	TP-2	22.4	3.109061
99	Ph-U	8.0	2.079442
99	TP-2	11.3	2.424803



0- to 99-day data

Regression Output:

Constant	4.58
Std Err of Y Est	0.107269
R Squared	0.985
No. of Observations	14
Degrees of Freedom	12
X Coefficient(s)	-0.0232
Std Err of Coef.	0.000838

*AR = Applied Radioactivity **half-life 29.9 days**

Linear regression analysis performed using Corel Quattro Pro 8.

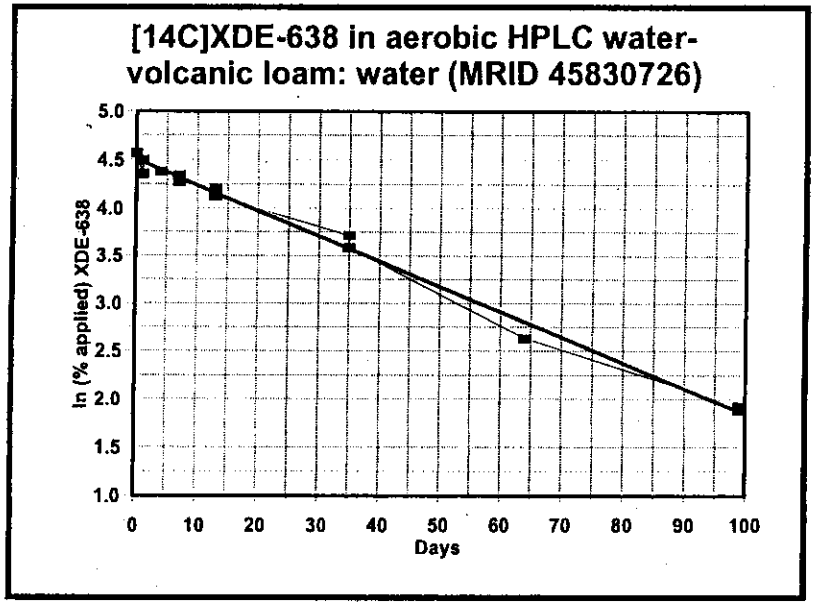
Results from Appendix C, p. 116 of study report and Attachment 1.

As worst case scenario, parent compound recovered in water layer at early sampling intervals, when sediment/soil extracts analyzed, considered equivalent to "total system".

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Japan HPLC water-volcanic loam soil.
[^{14}C]Penoxsulam (both labels).
Water layer
Half-life Determination

Penoxsulam (XDE-638)			
Day	Label	%App	Ln(%App)
0	Ph-U	96.2	4.5664294
0	Ph-U	96.9	4.5736795
1	Ph-U	77.7	4.3528553
1	TP-2	89.9	4.4986979
4	TP-2	79.9	4.3807759
7	Ph-U	76.9	4.3425059
7	TP-2	72.1	4.278054
13	Ph-U	67.8	4.2165622
13	TP-2	61.9	4.1255202
35	Ph-U	41.1	3.7160081
35	TP-2	36.1	3.5862929
64	TP-2	13.9	2.6318888
99	Ph-U	6.9	1.9315214
99	TP-2	6.6	1.8870696



0- to 99-day data

Regression Output:

Constant	4.51
Std Err of Y Est	0.083935
R Squared	0.993
No. of Observations	14
Degrees of Freedom	12
X Coefficient(s)	-0.0266
Std Err of Coef.	0.000656

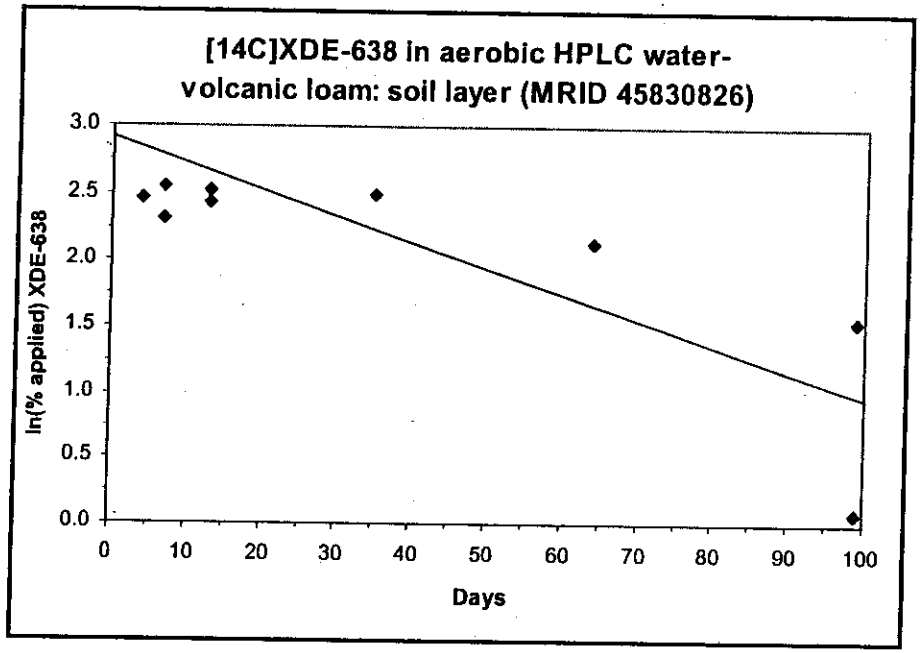
half-life 26.1 days

*AR = Applied Radioactivity
Linear regression analysis performed using Corel Quattro Pro 8.
Results from Appendix C, p. 116 of study report.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Japan HPLC water-volcanic loam soil.
[^{14}C]Penoxsulam (both labels).
Soil layer
Half-life Determination

Penoxsulam (XDE-638)			
Day	Label	%App	Ln(%App)
0	Ph-U		ERR
0	Ph-U		ERR
1	Ph-U		ERR
1	TP-2		ERR
4	TP-2	11.7	2.4595888
7	Ph-U	12.8	2.5494452
7	TP-2	10.2	2.3223877
13	Ph-U	11.5	2.442347
13	TP-2	12.4	2.5176965
35	TP-2	12.1	2.4932055
64	TP-2	8.5	2.1400662
99	Ph-U	1.1	0.0953102
99	TP-2	4.7	1.5475625



13- to 99-day data

Regression Output:

Constant	2.92
Std Err of Y Est	0.60577
R Squared	0.671
No. of Observations	6
Degrees of Freedom	4
X Coefficient(s)	-0.0195
Std Err of Coef.	0.006827

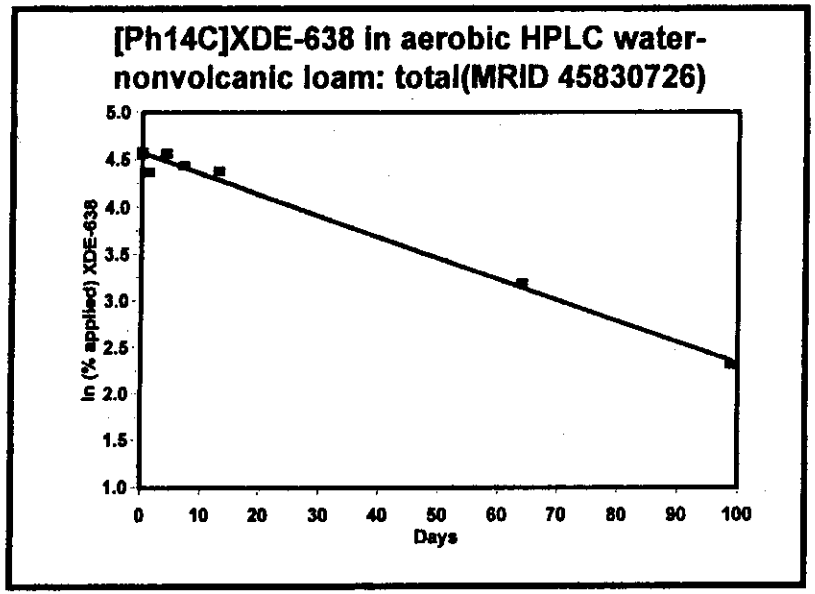
half-life **35.5 days**

*AR = Applied Radioactivity
Linear regression analysis performed using Corel Quattro Pro 8.
Results from Appendix C, p. 116 of study report.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Japan HPLC water-nonvolcanic loam soil.
[Phenyl-U-^{14}C]Penoxsulam.
Total system
Half-life Determination

Penoxsulam (XDE-638)		
Day	%App	Ln(%App)
0	95.2	4.5559799
0	98.1	4.5859874
1	78.9	4.3681812
4	96.0	4.5643482
7	84.6	4.4379343
13	79.9	4.3807759
64	24.2	3.1863526
99	10.1	2.3125354



0- to 99-day data

Regression Output:

Constant	4.58
Std Err of Y Est	0.09535
R Squared	0.989
No. of Observations	8
Degrees of Freedom	6
X Coefficient(s)	-0.0224
Std Err of Coef.	0.000967

*AR = Applied Radioactivity **half-life 30.9 days**
Linear regression analysis performed using Corel Quattro Pro 8.
Results from Appendix C, p. 117 of study report and Attachment 1.
As worst case scenario, parent compound recovered in water layer at early sampling intervals, when sediment/soil extracts wer analyzed, considered equivalent to "total system".

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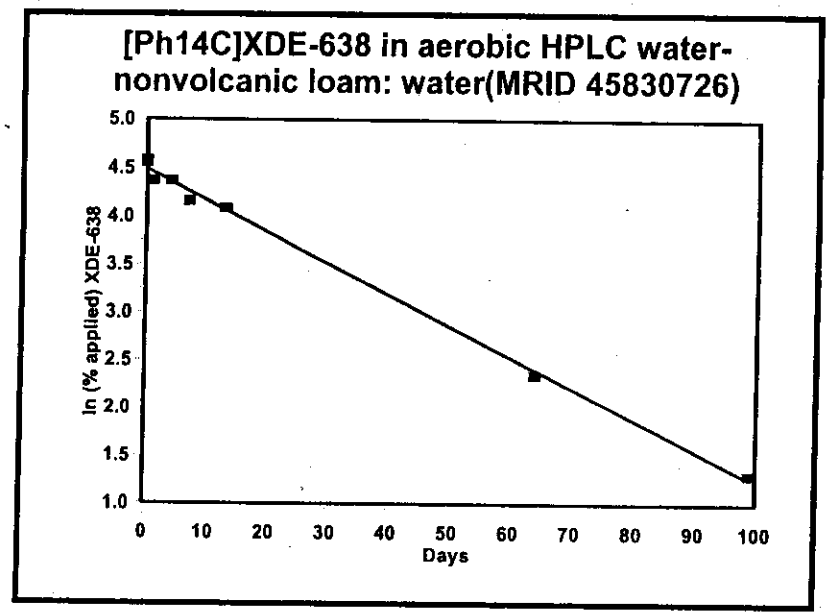
Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Japan HPLC water-nonvolcanic loam soil.
[Phenyl-U-^{14}C]Penoxsulam.
Water layer
Half-life Determination

Penoxsulam (XDE-638)		
Day	%App	Ln(%App)
0	95.2	4.5559799
0	98.1	4.5859874
1	78.9	4.3681812
4	79.0	4.3694479
7	64.0	4.1588831
13	59.6	4.0876556
64	10.5	2.3513753
99	3.7	1.3083328



0- to 99-day data

Regression Output:

Constant	4.49
Std Err of Y Est	0.078975
R Squared	0.996
No. of Observations	8
Degrees of Freedom	6
X Coefficient(s)	-0.0325
Std Err of Coef.	0.000801

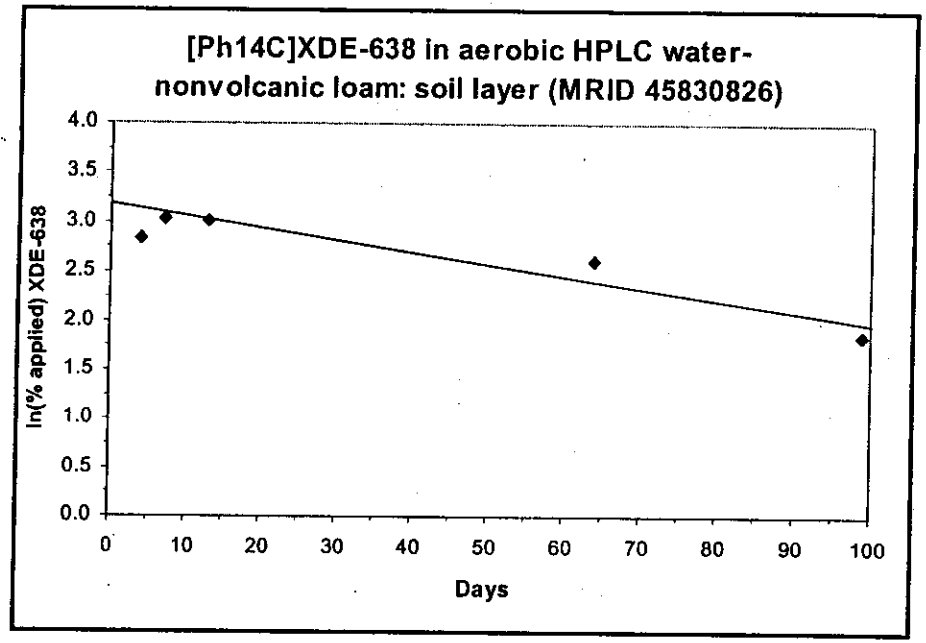
half-life 21.3 days

*AR = Applied Radioactivity
Linear regression analysis performed using Corel Quattro Pro 8.
Results from Appendix C, p. 117 of study report.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Japan HPLC water-nonvolcanic loam soil.
[Phenyl-U-^{14}C]Penoxsulam.
Soil layer
Half-life Determination

Penoxsulam (XDE-638)		
Day	%App	Ln(%App
0		ERR
0		ERR
1		ERR
4	17.0	2.833213
7	20.6	3.025291
13	20.3	3.010621
64	13.7	2.617396
99	6.4	1.856298



7- to 99-day data

Regression Output:

Constant	3.18
Std Err of Y Est	0.181265
R Squared	0.927
No. of Observations	4
Degrees of Freedom	2
X Coefficient(s)	-0.0121
Std Err of Coef.	0.002392

half-life 57.5 days

*AR = Applied Radioactivity
Linear regression analysis performed using Corel Quattro Pro 8.
Results from Appendix C, p. 117 of study report.

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Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Determination of mean/standard deviation of system parameters (pH, O_2 and redox potentials).

Arkansas water-silty clay sediment.

		Water			Sediment
			O_2	Red Pot	Red Pot
Day	Label	pH	(mg/L)	(mV)	(mV)
0	TP-2	7.4		261.6	242.8
0	Ph-U	7.3	5.08	142.3	216.3
1	TP-2	7.3		92.7	-154.0
4	Ph-U	7.4	6.55	99.2	-117.5
7	Ph-U	7.5	3.78	83.4	-171.6
7	TP-2	7.5	9.12	36.1	-83.7
13	Ph-U	7.6	4.08	91.7	-202.8
13	TP-2	7.7	4.66	69.5	-233.5
35	Ph-U	8.4		53.0	-180.9
64	Ph-U	7.2	6.95	54.2	-45.8
64	TP-2	8.2	7.21	41.9	52.6
99	Ph-U	8.7	7.97	176.4	153.5
99	TP-2	8.5	8.23	163.6	157.9
	Mean	7.7	6.4	105.0	-28.2
	std. dev.	0.5	1.8	62.4	164.3
	n =	13	10	13	13

Arkansas water-silt loam soil.

		Water			Soil
			O_2	Red Pot	Red Pot
Day	Label	pH	(mg/L)	(mV)	(mV)
0	Ph-U				
0	Ph-U				
1	Ph-U	6.7	8.87	194.4	217.2
1	TP-2	6.9		235.8	281.2
4	Ph-U	6.8	3.81	188.3	157.6
4	TP-2	6.6	3.91	186.4	162.2
8	Ph-U	7.0	2.85	154.5	-52.2
8	TP-2	6.9	9.11	138.0	0.2
13	Ph-U	7.1	5.75	180.0	101.4
13	TP-2	7.0		257.0	294.4
35	Ph-U	6.5		160.1	-227.4
64	Ph-U	6.3	8.04	162.9	-118.4
64	TP-2	7.9	9.72	13.2	27.5
99	Ph-U	7.7	8.02	42.7	-50.2
	Mean	7.0	6.7	159.4	66.1
	std. dev.	0.4	2.5	67.1	156.4
	n =	12	9	12	12

Results from Table 8, p. 57 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.

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Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Determination of mean/standard deviation of system parameters (pH, O_2 and redox potentials).

Italy water-loam sediment.

		Water			Sediment
Day	Label	pH	O_2 (mg/L)	Red Pot (mV)	Red Pot (mV)
0	Ph-U	7.7		261.6	242.8
0	TP-2	7.4	2.04	70.6	116.4
1	Ph-U	7.6	6.68	98.2	-79.0
1	TP-2	7.6	3.60	-13.4	-90.5
4	TP-2	7.4	3.98	167.8	-37.6
8	Ph-U	6.9		111.9	-102.4
8	TP-2	7.2	12.90	31.8	-80.7
13	TP-2	7.5		-10.3	-151.6
64	Ph-U	6.4	7.19	102.8	-76.1
64	TP-2	8.3	7.05	-10.2	12.6
99	TP-2	8.5	9.54	138.3	-46.1
	Mean	7.5	6.6	86.3	-26.6
	std. dev.	0.6	3.3	81.4	108.1
	n =	11	8	11	11

France water-sand sediment.

		Water			Sediment
Day	Label	pH	O_2 (mg/L)	Red Pot (mV)	Red Pot (mV)
0	Ph-U				
0	Ph-U				
4	TP-2	5.7	8.24	299.9	305.4
8	Ph-U	6.3	3.69	88.4	18.5
8	TP-2	6.1	4.65	128.8	96.3
13	Ph-U	6.5		124.8	66.0
35	TP-2	5.9		341.1	216.3
64	Ph-U	6.4	7.90	136.6	108.9
64	TP-2	5.8	9.44	176.9	199.8
99	Ph-U	6.4	10.58	129.2	327.1
	Mean	6.1	7.4	178.2	167.3
	std. dev.	0.3	2.5	85.8	105.4
	n =	8	6	8	8

Results from Table 8, p. 58 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Determination of mean/standard deviation of system parameters (pH, O_2 and redox potentials).

Japan HPLC water-volcanic loam soil.

Day	Label	Water			Soil
		pH	O_2 (mg/L)	Red Pot (mV)	Red Pot (mV)
0	Ph-U				
0	Ph-U				
4	TP-2	7.5	6.97	101.3	87.1
7	Ph-U	7.7	6.98	14.4	47.7
7	TP-2	7.8	6.75	64.0	54.2
13	Ph-U	7.8	7.98	60.5	160.4
13	TP-2	7.8	8.69	149.9	167.7
35	TP-2	8.0		148.3	161.1
64	TP-2	7.8	9.79	111.9	144.4
99	Ph-U	7.9	6.51	235.2	204.1
99	TP-2	8.0	8.17	206.2	199.2
	Mean	7.8	7.7	121.3	136.2
	std. dev.	0.1	1.1	67.2	55.6
	n =	9	8	9	9

Japan HPLC water-nonvolcanic loam soil.

Day	Label	Water			Soil
		pH	O_2 (mg/L)	Red Pot (mV)	Red Pot (mV)
0	Ph-U				
0	Ph-U				
1	Ph-U	6.3	6.45	175.7	187.4
4	Ph-U	6.6	7.09	152.6	129.1
8	Ph-U	6.9	6.90	108.1	121.8
13	Ph-U	6.6	7.36	244.8	228.4
64	Ph-U	5.4	8.22	309.0	229.5
99	Ph-U	6.8	8.91	252.3	285.3
	Mean	6.4	7.5	207.1	196.9
	std. dev.	0.5	0.8	67.8	58.0
	n =	6	6	6	6

Results from Table 8, p. 59 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Determination of overall mean/standard deviation of applied radioactivity.

Arkansas water-silty clay sediment.

					Sediment														
		Water layer			Extracts			Nonextractable			CO_2			Material Balance			Material Balance[1]		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U	83.3			0.0			0.8			0.0			84.1			89.1		
0	TP-2	95.4	89.4	6.1	1.8	0.9	0.9	0.3	0.6	0.3	0.0	0.0	0.0	97.5	90.8	6.7	97.4	93.3	4.1
1	Ph-U																		
1	TP-2	100.6	100.6	0.0	3.6	3.6	0.0	0.9	0.9	0.0	0.0	0.0	0.0	105.1	105.1	0.0	105.1	105.1	0.0
4	Ph-U	87.5			3.0			1.0			0.0			91.5			91.6		
4	TP-2		87.5	0.0		3.0	0.0		1.0	0.0		0.0	0.0		91.5	0.0		91.6	0.0
7	Ph-U	91.5			4.4			1.9			0.0			97.8			97.8		
7	TP-2	93.2	92.4	0.9	5.0	4.7	0.3	3.8	2.9	1.0	0.0	0.0	0.0	102.0	99.9	2.1	102.0	99.9	2.1
13	Ph-U	80.0			4.2			5.6			0.0			89.8			89.8		
13	TP-2	87.2	83.6	3.6	2.9	3.6	0.7	7.8	6.7	1.1	0.1	0.1	0.1	98.0	93.9	4.1	98.1	94.0	4.2
35	Ph-U	71.0			3.5			16.3			0.1			90.9			90.9		
35	TP-2		71.0	0.0		3.5	0.0		16.3	0.0		0.1	0.0		90.9	0.0		90.9	0.0
64	Ph-U																		
64	TP-2	62.1	62.1	0.0	1.0	1.0	0.0	23.6	23.6	0.0	0.7	0.7	0.0	87.4	87.4	0.0	87.3	87.3	0.0
99	Ph-U	66.9			0.5			24.5			2.3			94.2			94.2		
99	TP-2	59.4	63.2	3.7	0.8	0.7	0.2	28.6	26.6	2.0	1.6	2.0	0.4	90.4	92.3	1.9	90.4	92.3	1.9
													Overall		94.1	5.9		94.5	5.3

[1]Study authors reported results (Appendix C, p. 113).
Results (% of applied radioactivity) from Appendix C, p. 113 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.

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Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Determination of overall mean/standard deviation of applied radioactivity.

Arkansas water-silt loam soil.

					Soil													
		Water layer			Extracts			Nonextractable			CO_2			Material Balance			Material Balance[1]		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U	94.3			2.6			0.0						96.9			96.9		
0	Ph-U	92.9	93.6	0.7	2.8	2.7	0.1	0.0	0.0	0.0		ERR	ERR	95.7	96.3	0.6	95.7	96.3	0.6
1	Ph-U	100.0			6.3			0.2			0.0			106.5			106.5		
1	TP-2	88.6	94.3	5.7	4.8	5.6	0.8	0.3	0.3	0.1	0.0	0.0	0.0	93.7	100.1	6.4	93.8	100.2	6.3
4	Ph-U	103.6			5.3			0.3			0.0			109.2			109.2		
4	TP-2	81.6	92.6	11.0	14.5	9.9	4.6	0.4	0.4	0.1	0.0	0.0	0.0	96.5	102.9	6.3	96.5	102.9	6.4
8	Ph-U	79.1			5.9			1.2			0.0			86.2			86.2		
8	TP-2	100.6	89.9	10.8	5.5	5.7	0.2	1.0	1.1	0.1	0.0	0.0	0.0	107.1	96.7	10.4	107.2	96.7	10.5
13	Ph-U	35.0			4.6			2.2			0.1			91.9			91.9		
13	TP-2	86.7	85.9	0.9	9.5	7.1	2.5	1.0	1.6	0.6	0.1	0.1	0.0	97.3	94.6	2.7	97.4	94.7	2.7
35	Ph-U	78.1			0.4			14.6			0.2			93.3			93.3		
35	TP-2		78.1	0.0		0.4	0.0		14.6	0.0		0.2	0.0		93.3	0.0		93.3	0.0
64	Ph-U	79.6			5.3			9.1			0.9			94.9			94.8		
64	TP-2	64.4	72.0	7.6	1.3	3.3	2.0	20.0	14.6	5.4	0.2	0.6	0.4	85.9	90.4	4.5	86.0	90.4	4.4
99	Ph-U	60.6			3.1			22.0			1.5			87.2			87.2		
99	TP-2		60.6	0.0		3.1	0.0		22.0	0.0		1.5	0.0		87.2	0.0		87.2	0.0
													Overall		95.9	7.2		95.9	7.2

[1]Study authors reported results (Appendix C, p. 112).
Results (% of applied radioactivity) from Appendix C, p. 112 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.
Duplicate [phenyl-U-^{14}C]-label treated systems were taken at day 0.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Determination of overall mean/standard deviation of applied radioactivity.

Italy water-loam sediment.

					Sediment													
		Water layer			Extracts			Nonextractable			CO_2			Material Balance			Material Balance[1]		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U	90.6			4.9			1.1						96.6			96.6		
0	TP-2	85.2	87.9	2.7	4.3	4.6	0.3	1.2	1.2	0.1		ERR	ERR	90.7	93.7	2.9	90.7	93.7	2.9
1	Ph-U	93.7			6.9			1.6			0.0			102.2			102.2		
1	TP-2	87.0	90.4	3.4	7.3	7.1	0.2	2.0	1.8	0.2	0.0	0.0	0.0	96.3	99.3	2.9	96.3	99.3	2.9
4	Ph-U																		
4	TP-2	90.5	90.5	0.0	5.2	5.2	0.0	9.2	9.2	0.0	0.1	0.1	0.0	105.0	105.0	0.0	105.0	105.0	0.0
8	Ph-U	71.9			4.4			19.2			0.0			95.5			95.5		
8	TP-2	58.6	65.3	6.7	16.0	10.2	5.8	17.3	18.3	1.0	0.0	0.0	0.0	91.9	93.7	1.8	91.8	93.7	1.8
13	Ph-U																		
13	TP-2	50.9	50.9	0.0	5.3	5.3	0.0	36.0	36.0	0.0	0.0	0.0	0.0	92.2	92.2	0.0	92.3	92.3	0.0
64	Ph-U	33.0			4.3			47.3			0.4			85.0			85.0		
64	TP-2	26.0	29.5	3.5	5.5	4.9	0.6	57.3	52.3	5.0	0.4	0.4	0.0	89.2	87.1	2.1	89.2	87.1	2.1
99	Ph-U																		
99	TP-2	20.1	20.1	0.0	8.0	8.0	0.0	57.9	57.9	0.0	0.8	0.8	0.0	86.8	86.8	0.0	86.7	86.7	0.0
													Overall		93.8	5.8		93.8	5.9

[1]Study authors reported results (Appendix C, p. 114).
Results (% of applied radioactivity) from Appendix C, p. 114 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Determination of overall mean/standard deviation of applied radioactivity.

France water-sand sediment.

					Sediment													
		Water layer			Extracts			Nonextractable			CO_2			Material Balance			Material Balance[1]		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U	92.7			3.8			0.1						96.6			96.6		
0	Ph-U[2]	93.9	93.3	0.6	3.0	3.4	0.4	0.025	0.1	0.0		ERR	ERR	96.9	96.8	0.2	96.9	96.8	0.2
4	Ph-U																		
4	TP-2	65.1	65.1	0.0	21.8	21.8	0.0	1.2	1.2	0.0	0.0	0.0	0.0	88.1	88.1	0.0	88.1	88.1	0.0
8	Ph-U[2]	83.0			18.9			1.0			0.04			102.9			102.9		
8	TP-2	74.2	78.6	4.4	17.5	18.2	0.7	0.7	0.9	0.2	0.6	0.3	0.3	93.0	98.0	5.0	92.8	97.9	5.1
13	Ph-U	84.0			15.5			1.9			0.0			101.4			101.5		
13	TP-2		84.0	0.0		15.5	0.0		1.9	0.0		0.0	0.0		101.4	0.0		101.5	0.0
35	Ph-U	35.0			40.5			9.3			2.2			87.0			87.1		
35	TP-2	45.2	40.1	5.1	40.7	40.6	0.1	6.6	8.0	1.4	0.2	1.2	1.0	92.7	89.9	2.9	92.7	89.9	2.8
64	Ph-U	50.9			26.9			23.0			4.1			104.9			105.0		
64	TP-2	25.8	38.4	12.5	46.3	36.6	9.7	13.6	18.3	4.7	0.2	2.2	2.0	85.9	95.4	9.5	85.8	95.4	9.6
99	Ph-U	23.6			47.3			20.8			2.4			94.1			94.0		
99	TP-2		23.6	0.0		47.3	0.0		20.8	0.0		2.4	0.0		94.1	0.0		94.0	0.0
													Overall		94.9	6.1		94.9	6.2

[1]Study authors reported results (Appendix C, p. 115).
[2]MQL (minimum quantifiable limit) for LSC analyses were reported as 0.05% and 0.08% of the applied for trapping solutions and sediment/soil samples following combustion, respectively (Table 7, p. 56).
Results (% of applied radioactivity) from Appendix C, p. 115 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.
Duplicate [phenyl-U-^{14}C]-label treated systems were taken at day 0.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Determination of overall mean/standard deviation of applied radioactivity.

Japan HPLC water-volcanic loam soil.

					Soil													
		Water layer			Extracts			Nonextractable			CO_2			Material Balance			Material Balance[1]		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U	96.9			3.3			0.1						100.3			100.2		
0	Ph-U	97.6	97.3	0.3	3.6	3.5	0.1	0.1	0.1	0.0		ERR	ERR	101.3	100.8	0.5	101.2	100.7	0.5
1	Ph-U[2]	79.0			6.3			1.1			0.2			86.6			86.4		
1	TP-2	90.5	84.8	5.8	5.9	6.1	0.2	1.4	1.3	0.1	0.2	0.2	0.0	98.0	92.3	5.7	98.0	92.2	5.8
4	Ph-U																		
4	TP-2	83.6	83.6	0.0	12.8	12.8	0.0	2.4	2.4	0.0	0.1	0.1	0.0	98.9	98.9	0.0	98.9	98.9	0.0
7	Ph-U	80.6			13.9			2.8			0.0			97.3			97.3		
7	TP-2	74.4	77.5	3.1	12.4	13.2	0.8	3.9	3.4	0.6	0.0	0.0	0.0	90.7	94.0	3.3	90.7	94.0	3.3
13	Ph-U	75.6			20.6			5.1			0.0			101.3			101.3		
13	TP-2	75.5	75.6	0.0	15.1	17.9	2.7	4.9	5.0	0.1	0.0	0.0	0.0	95.5	98.4	2.9	95.6	98.5	2.9
35	Ph-U																		
35	TP-2	59.3	59.3	0.0	27.4	27.4	0.0	16.4	16.4	0.0	0.2	0.2	0.0	103.3	103.3	0.0	103.2	103.2	0.0
64	Ph-U																		
64	TP-2	42.8	42.8	0.0	24.8	24.8	0.0	21.4	21.4	0.0	0.4	0.4	0.0	89.4	89.4	0.0	89.5	89.5	0.0
99	Ph-U																		
99	TP-2	35.9	35.9	0.0	20.6	20.6	0.0	28.6	28.6	0.0	1.0	1.0	0.0	86.1	86.1	0.0	86.1	86.1	0.0
													Overall		95.7	5.8		95.7	5.8

[1]Study authors reported results (Appendix C, p. 116).
[2]MQL (minimum quantifiable limit) for LSC analysis was reported as 0.2% of the applied for trapping solutions (Table 7, p. 56).
Results (% of applied radioactivity) from Appendix C, p. 116 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.
Duplicate [phenyl-U-^{14}C]-label treated systems were taken at day 0.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Determination of overall mean/standard deviation of applied radioactivity.
Japan HPLC water-nonvolcanic loam soil.

		Soil									
	Water	Extract	Nonext	Total	$^{14}CO_2$	Material Balance			Material Balance		
Day	% AR	% AR	% AR	% AR	% AR	% AR	Mean	s.d.	% AR	Mean	s.d.
[Phenyl-U-^{14}C]-label											
0	96.7	4.1	0.0	4.1		100.8			100.7		
0	98.8	3.7	0.0	3.7		102.5	101.7	0.8	102.5	101.6	0.9
1	81.9	14.3	0.4	14.7	0.0	96.6			96.7		
4	82.8	20.9	0.9	21.8	0.0	104.6			104.6		
8	73.8	22.9	2.1	25.0	0.0	98.8			97.8		
13	77.6	25.6	0.8	26.4	0.1	104.1			104.0		
64	48.3	38.8	8.3	47.1	1.7	97.1			97.1		
99	48.6	31.6	17.8	49.4	2.2	100.2			100.1		
					Mean	100.6			100.4		
					std. dev.	2.8			2.9		
					n =	8			8		

[1]Study authors reported results (Appendix C, p. 117).
Results (% of applied radioactivity) from Appendix C, p. 117 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2)
Blank cell means no result was provided for that sampling interval (intended intervals obtained from Table 5, p. 54)

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Arkansas water-silty clay sediment.

Determination of total radioactivity associated with sediment.

		Sediment				
		Ext	Nonext	Total		
Day	Label	% AR	% AR	% AR	Mean	s.d.
0	Ph-U	0.0	0.8	0.8		
0	TP-2	1.8	0.3	2.1	1.5	0.6
1	Ph-U					
1	TP-2	3.6	0.9	4.5	4.5	0.0
4	Ph-U	3.0	1.0	4.0		
4	TP-2				4.0	0.0
7	Ph-U	4.4	1.9	6.3		
7	TP-2	5.0	3.8	8.8	7.6	1.3
13	Ph-U	4.2	5.6	9.8		
13	TP-2	2.9	7.8	10.7	10.3	0.5
35	Ph-U	3.5	16.3	19.8		
35	TP-2				19.8	0.0
64	Ph-U					
64	TP-2	1.0	23.6	24.6	24.6	0.0
99	Ph-U	0.5	24.5	25.0		
99	TP-2	0.8	28.6	29.4	27.2	2.2

Results (% of applied radioactivity) from Appendix C, p. 113 of the study report and Attachment 1.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).

[14C]Residue water phase:sediment ratios.

Day	Label	Water % AR	Sed % AR	Ratio W:S	Ratio S:W	Mean W:S ratio	s.d. W:S ratio	Mean S:W ratio	s.d. S:W ratio
0	Ph-U	83.3	0.8	104	0				
0	TP-2	95.4	2.1	45	0	75	29	0	0
1	Ph-U								
1	TP-2	100.6	4.5	22	0	22	0	0	0
4	Ph-U	87.5	4.0	22	0				
4	TP-2					22	0	0	0
7	Ph-U	91.5	6.3	15	0				
7	TP-2	93.2	8.8	11	0	13	2	0	0
13	Ph-U	80.0	9.8	8	0				
13	TP-2	87.2	10.7	8	0	8	0	0	0
35	Ph-U	71.0	19.8	4	0				
35	TP-2					4	0	0	0
64	Ph-U								
64	TP-2	62.1	24.6	3	0	3	0	0	0
99	Ph-U	66.9	25.0	3	0				
99	TP-2	59.4	29.4	2	0	2	0	0	0

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Arkansas water-silt loam soil.

Determination of total radioactivity associated with sediment.

		Soil				
		Ext	Nonext	Total		
Day	Label	% AR	% AR	% AR	Mean	s.d.
0	Ph-U	2.6	0.0	2.6		
0	Ph-U	2.8	0.0	2.8	2.7	0.1
1	Ph-U	6.3	0.2	6.5		
1	TP-2	4.8	0.3	5.1	5.8	0.7
4	Ph-U	5.3	0.3	5.6		
4	TP-2	14.5	0.4	14.9	10.3	4.7
8	Ph-U	5.9	1.2	7.1		
8	TP-2	5.5	1.0	6.5	6.8	0.3
13	Ph-U	4.6	2.2	6.8		
13	TP-2	9.5	1.0	10.5	8.7	1.8
35	Ph-U	0.4	14.6	15.0		
35	TP-2				15.0	0.0
64	Ph-U	5.3	9.1	14.4		
64	TP-2	1.3	20.0	21.3	17.9	3.4
99	Ph-U	3.1	22.0	25.1		
99	TP-2				25.1	0.0

[14C]Residue water phase:soil ratios.

		Water	Soil	Ratio	Ratio	Mean	s.d.	Mean	s.d.
Day	Label	% AR	% AR	W:S	S:W	W:S ratio		S:W ratio	
0	Ph-U	94.3	2.6	36	0				
0	Ph-U	92.9	2.8	33	0	35	2	0	0
1	Ph-U	100.0	6.5	15	0				
1	TP-2	88.6	5.1	17	0	16	1	0	0
4	Ph-U	103.6	5.6	19	0				
4	TP-2	81.6	14.9	5	0	12	7	0	0
8	Ph-U	79.1	7.1	11	0				
8	TP-2	100.6	6.5	15	0	13	2	0	0
13	Ph-U	85.0	6.8	13	0				
13	TP-2	86.7	10.5	8	0	10	2	0	0
35	Ph-U	78.1	15.0	5	0				
35	TP-2					5	0	0	0
64	Ph-U	79.6	14.4	6	0				
64	TP-2	64.4	21.3	3	0	4	1	0	0
99	Ph-U	60.6	25.1	2	0				
99	TP-2					2	0	0	0

Results (% of applied radioactivity) from Appendix C, p. 112 of the study report and Attachment 1.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726
[14C]Residue water phase:sediment ratios: average of both labels.
Arkansas water-silty clay sediment.

Day	Label	Water % AR	Sed % AR	Ratio W:S	Ratio S:W	Mean W:S ratio	s.d.	Mean S:W ratio	s.d.
0	Ph-U	83.3	0.8	104	0				
0	TP-2	95.4	2.1	45	0	75	29	0	0
1	TP-2	100.6	4.5	22	0	NA	NA	NA	NA
4	Ph-U	87.5	4.0	22	0	NA	NA	NA	NA
7	Ph-U	91.5	6.3	15	0				
7	TP-2	93.2	8.8	11	0	13	2	0	0
13	Ph-U	80.0	9.8	8	0				
13	TP-2	87.2	10.7	8	0	8	0	0	0
35	Ph-U	71.0	19.8	4	0	NA	NA	NA	NA
64	TP-2	62.1	24.6	3	0	NA	NA	NA	NA
99	Ph-U	66.9	25.0	3	0				
99	TP-2	59.4	29.4	2	0	2	0	0	0

Arkansas water-loam soil.

Day	Label	Water % AR	Soil % AR	Ratio W:S	Ratio S:W	Mean W:S ratio	s.d.	Mean S:W ratio	s.d.
0	Ph-U	94.3	2.6	36	0				
0	Ph-U	92.9	2.8	33	0	35	2	0	0
1	Ph-U	100.0	6.5	15	0				
1	TP-2	88.6	5.1	17	0	16	1	0	0
4	Ph-U	103.6	5.6	19	0				
4	TP-2	81.6	14.9	5	0	12	7	0	0
8	Ph-U	79.1	7.1	11	0				
8	TP-2	100.6	6.5	15	0	13	2	0	0
13	Ph-U	85.0	6.8	13	0				
13	TP-2	86.7	10.5	8	0	10	2	0	0
35	Ph-U	78.1	15.0	5	0	NA	NA	NA	NA
64	Ph-U	79.6	14.4	6	0				
64	TP-2	64.4	21.3	3	0	4	1	0	0
99	Ph-U	60.6	25.1	2	0	NA	NA	NA	NA

Both Arkansas systems.

Day	Mean W:S ratio	s.d.	Mean S:W ratio	s.d.
0				
0	55	29	0	0
1				
1	18	3	0	0
4				
4	15	7	0	0
7/8				
7/8	13	2	0	0
13				
13	9	2	0	0
35				
35	4	1	0	0
64				
64	4	1	0	0
99				
99	2	0	0	0

Results (% of applied radioactivity) from Appendix C, pp. 112-113 of the study report and Attachment 1.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
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Italy water-loam sediment.

Determination of total radioactivity associated with sediment.

		Sediment				
		Ext	Nonext	Total		
Day	Label	% AR	% AR	% AR	Mean	s.d.
0	Ph-U	4.9	1.1	6.0		
0	TP-2	4.3	1.2	5.5	5.8	0.3
1	Ph-U	6.9	1.6	8.5		
1	TP-2	7.3	2.0	9.3	8.9	0.4
4	Ph-U					
4	TP-2	5.2	9.2	14.4	14.4	0.0
8	Ph-U	4.4	19.2	23.6		
8	TP-2	16.0	17.3	33.3	28.5	4.9
13	Ph-U					
13	TP-2	5.3	36.0	41.3	41.3	0.0
64	Ph-U	4.3	47.3	51.6		
64	TP-2	5.5	57.3	62.8	57.2	5.6
99	Ph-U					
99	TP-2	8.0	57.9	65.9	65.9	0.0

[14C]Residue water phase:sediment ratios.

Day	Label	Water % AR	Sed % AR	Ratio W:S	Ratio S:W	Mean W:S ratio	s.d.	Mean S:W ratio	s.d.
0	Ph-U	90.6	6.0	15	0				
0	TP-2	85.2	5.5	15	0	15	0	0	0
1	Ph-U	93.7	8.5	11	0				
1	TP-2	87.0	9.3	9	0	10	1	0	0
4	Ph-U								
4	TP-2	90.5	14.4	6	0	6	0	0	0
8	Ph-U	71.9	23.6	3	0				
8	TP-2	58.6	33.3	2	1	2	1	0	0
13	Ph-U								
13	TP-2	50.9	41.3	1	1	1	0	1	0
64	Ph-U	33.0	51.6	1	2				
64	TP-2	26.0	62.8	0	2	1	0	2	0
99	Ph-U								
99	TP-2	20.1	65.9	0	3	0	0	3	0

Results (% of applied radioactivity) from Appendix C, p. 114 of the study report and Attachment 1.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) In Six Water-Sediment/Soil Systems.
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France water-sand sediment.

Determination of total radioactivity associated with sediment.

		Sediment				
		Ext	Nonext	Total		
Day	Label	% AR	% AR	% AR	Mean	s.d.
0	Ph-U	3.8	0.1	3.9		
0	Ph-U	3.0	0.0	3.0	3.5	0.4
4	Ph-U					
4	TP-2	21.8	1.2	23.0	23.0	0.0
8	Ph-U	18.9	1.0	19.9		
8	TP-2	17.5	0.7	18.2	19.1	0.9
13	Ph-U	15.5	1.9	17.4		
13	TP-2				17.4	0.0
35	Ph-U	40.5	9.3	49.8		
35	TP-2	40.7	6.6	47.3	48.6	1.3
64	Ph-U	26.9	23.0	49.9		
64	TP-2	46.3	13.6	59.9	54.9	5.0
99	Ph-U	47.3	20.8	68.1		
99	TP-2				68.1	0.0

[14C]Residue water phase:sediment ratios.

		Water	Sed	Ratio	Ratio	Mean s.d.		Mean s.d.	
Day	Label	% AR	% AR	W:S	S:W	W:S ratio		S:W ratio	
0	Ph-U	92.7	3.9	24	0				
0	Ph-U	93.9	3.0	31	0	28	4	0	0
4	Ph-U								
4	TP-2	65.1	23.0	3	0	3	0	0	0
8	Ph-U	83.0	19.9	4	0				
8	TP-2	74.2	18.2	4	0	4	0	0	0
13	Ph-U	84.0	17.4	5	0				
13	TP-2					5	0	0	0
35	Ph-U	35.0	49.8	1	1				
35	TP-2	45.2	47.3	1	1	1	0	1	0
64	Ph-U	50.9	49.9	1	1				
64	TP-2	25.8	59.9	0	2	1	0	2	1
99	Ph-U	23.6	68.1	0	3				
99	TP-2					0	0	3	0

Results (% of applied radioactivity) from Appendix C, p. 115 of the study report and Attachment 1.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Japan HPLC water-volcanic loam soil.

Determination of total radioactivity associated with sediment.

		Soil				
		Ext	Nonext	Total		
Day	Label	% AR	% AR	% AR	Mean	s.d.
0	Ph-U	3.3	0.1	3.4		
0	Ph-U	3.6	0.1	3.7	3.6	0.2
1	Ph-U	6.3	1.1	7.4		
1	TP-2	5.9	1.4	7.3	7.4	0.1
4	Ph-U					
4	TP-2	12.8	2.4	15.2	15.2	0.0
7	Ph-U	13.9	2.8	16.7		
7	TP-2	12.4	3.9	16.3	16.5	0.2
13	Ph-U	20.6	5.1	25.7		
13	TP-2	15.1	4.9	20.0	22.9	2.9
35	Ph-U					
35	TP-2	27.4	16.4	43.8	43.8	0.0
64	Ph-U					
64	TP-2	24.8	21.4	46.2	46.2	0.0
99	Ph-U					
99	TP-2	20.6	28.6	49.2	49.2	0.0

[14C]Residue water phase:soil ratios.

		Water	Soil	Ratio	Ratio	Mean	s.d.	Mean	s.d.
Day	Label	% AR	% AR	W:S	S:W	W:S ratio		S:W ratio	
0	Ph-U	96.9	3.4	29	0				
0	Ph-U	97.6	3.7	26	0	27	1	0	0
1	Ph-U	79.0	7.4	11	0				
1	TP-2	90.5	7.3	12	0	12	1	0	0
4	Ph-U								
4	TP-2	83.6	15.2	5	0	5	0	0	0
7	Ph-U	80.6	16.7	5	0				
7	TP-2	74.4	16.3	5	0	5	0	0	0
13	Ph-U	75.6	25.7	3	0				
13	TP-2	75.5	20.0	4	0	3	0	0	0
35	Ph-U								
35	TP-2	59.3	43.8	1	1	1	0	1	0
64	Ph-U								
64	TP-2	42.8	46.2	1	1	1	0	1	0
99	Ph-U								
99	TP-2	35.9	49.2	1	1	1	0	1	0

Results (% of applied radioactivity) from Appendix C, p. 116 of the study report and Attachment 1.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
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[Phenyl-U-14C]Residue water phase:soil ratios.

Japan HPLC water-nonvolcanic loam soil.

Day	Water % AR	Soil % AR	Ratio W:S	Ratio S:W
[Ph-U-^{14}C]-label				
0	96.7	4.1	24	0
0	98.8	3.7	27	0
1	81.9	14.7	6	0
4	82.8	21.8	4	0
8	73.8	25.0	3	0
13	77.6	26.4	3	0
64	48.3	47.1	1	1
99	48.6	49.4	1	1

Both Japan loam soils.

Day	Mean W:S ratio	s.d.	Mean S:W ratio	s.d.
0 0	26	2	0	0
1 1	10	3	0	0
4 4	5	1	0	0
7/8 7/8	4	1	0	0
13 13	3	0	0	0
35	1		1	
64 64	1	0	1	0
99 99	1	0	1	0

Both Arkansas systems.

Day	Mean W:S ratio	s.d.	Mean S:W ratio	s.d.
0 0	55	29	0	20
1 1	18	3	0	3
4 4	15	7	0	5
7/8 7/8	13	2	0	0
13 13	9	2	0	1
35 35	4	1	0	1
64 64	4	1	0	1
99 99	2	0	0	0

Results (% of applied radioactivity) from Appendix C, p. 117 of the study report and Attachment 1.
To generate combined Japan water:soil ratios, values imported from **Ratios Jp V Loam** spreadsheet.
To generate combined Arkansas water:sediment/soil ratios, values imported from **Ratios AR Silty clay** and **Ratios AR Silt loam** sheets.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Arkansas water-silty clay sediment.

Determination of penoxsulam and degradates in total system.

		Penoxsulam									5-OH-XDE-638								
		Water layer			Sediment			Total System			Water layer			Sediment			Total System		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[1]	85.1						85.1			1.2						1.2		
0	TP-2[2]	89.3	87.2	2.1		ERR	ERR		85.1	0.0	1.7	1.5	0.2		ERR	ERR		1.2	0.0
1	Ph-U																		
1	TP-2[2]	91.2	91.2	0.0		ERR	ERR		ERR	ERR	7.4	7.4	0.0		ERR	ERR		ERR	ERR
4	Ph-U	80.3			1.5			81.8			5.3			0.3			5.6		
4	TP-2		80.3	0.0		1.5	0.0		81.8	0.0		5.3	0.0		0.3	0.0		5.6	0.0
7	Ph-U	75.9			3.2			79.1			10.4			0.6			11.0		
7	TP-2	79.4	77.7	1.8	4.4	3.8	0.6	83.8	81.5	2.3	9.2	9.8	0.6	0.4	0.5	0.1	9.6	10.3	0.7
13	Ph-U[2]	51.4									17.6								
13	TP-2	53.7	52.6	1.2	1.7	1.7	0.0	55.4	55.4	0.0	19.9	18.8	1.1	0.7	0.7	0.0	20.6	20.6	0.0
35	Ph-U	15.9			0.7			16.6			30.7			1.6			32.3		
35	TP-2		15.9	0.0		0.7	0.0		16.6	0.0		30.7	0.0		1.6	0.0		32.3	0.0
64	Ph-U	4.4			0.2			4.6			21.2			0.8			22.0		
64	TP-2	1.2	2.8	1.6	0.1	0.2	0.0	1.3	3.0	1.7	27.6	24.4	3.2	0.3	0.6	0.3	27.9	25.0	2.9
99	Ph-U[2]	3.9									15.7								
99	TP-2	1.7	2.8	1.1	0.1	0.1	0.0	1.8	1.8	0.0	9.3	12.5	3.2	0.3	0.3	0.0	9.6	9.6	0.0

[1]Results for total system quantifiable because reportedly no [^{14}C]residues were recovered in the sediment extract.
[2]Results for total system not quantifiable because sediment extract was not analyzed by HPLC.
Results (% of applied radioactivity) from Appendix C, p. 113 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Arkansas water-silty clay sediment.

Determination of penoxsulam and degradates in total system (continued).

		BSTCA									Unidentified [^{14}C]								
		Water layer			Sediment			Total System			Water layer			Sediment			Total System		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[1]	0.3						0.3			0.3						0.3		
0	TP-2[2]	1.0	0.7	0.3		ERR	ERR		0.3	0.0	2.3	1.3	1.0		ERR	ERR		0.3	0.0
1	Ph-U																		
1	TP-2[2]	0.7	0.7	0.0		ERR	ERR		ERR	ERR	0.9	0.9	0.0		ERR	ERR		ERR	ERR
4	Ph-U	1.7			0.8			2.5			0.3			0.3			0.6		
4	TP-2		1.7	0.0		0.8	0.0		2.5	0.0		0.3	0.0		0.3	0.0		0.6	0.0
7	Ph-U	3.6			0.2			3.8			1.1			0.2			1.3		
7	TP-2	2.9	3.3	0.4	0.025	0.1	0.1	2.9	3.4	0.4	0.5	0.8	0.3	0.1	0.2	0.0	0.6	1.0	0.4
13	Ph-U[2]	7.0									0.2								
13	TP-2	7.9	7.5	0.4	0.3	0.3	0.0	8.2	8.2	0.0	0.5	0.4	0.2	0.0	0.0	0.0	0.5	0.5	0.0
35	Ph-U	19.9			ND			19.9			0.4			0.1			0.5		
35	TP-2		19.9	0.0		0.0	0.0		19.9	0.0		0.4	0.0		0.1	0.0		0.5	0.0
64	Ph-U	31.8			ND			31.8			0.2			0.2			0.4		
64	TP-2	26.2	29.0	2.8	ND	0.0	0.0	26.2	29.0	2.8	7.1	3.7	3.5	0.0	0.1	0.1	7.1	3.8	3.4
99	Ph-U[2]	44.4																	
99	TP-2	39.5	42.0	2.4	ND	0.0	0.0	39.5	39.5	0.0	5.6	5.6	0.0	0.0	0.0	0.0	5.6	5.6	0.0

[1]Results for total system quantifiable because reportedly no [^{14}C]residues were recovered in the sediment extract.
[2]Results for total system not quantifiable because sediment extract was not analyzed by HPLC.
Results (% of applied radioactivity) from Appendix C, p. 113 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.
MQL (minimum quantifiable limit) for HPLC analyses were reported as 0.02% and 0.04-0.05% of the applied for water layers and sediment/soil extracts, respectively (Table 7, p. 56).

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Arkansas water-silty clay sediment.

Determination of unaccounted for radioactivity following HPLC analysis.

		Total Identified + Unks									Total [^{14}C]Residues								
		Water layer			Sediment			Total System			Water layer			Sediment ext.			Total System		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[1]	86.9						86.9			83.3			0.0			83.3		
0	TP-2[2]	94.3	90.6	3.7		ERR	ERR		86.9	0.0	95.4	89.4	6.1	1.8	0.9	0.9	97.2	90.3	6.9
1	Ph-U																		
1	TP-2[2]	100.2	100.2	0.0		ERR	ERR		ERR	ERR	100.6	100.6	0.0	3.6	3.6	0.0	104.2	104.2	0.0
4	Ph-U	87.6			2.9			90.5			87.5			3.0			90.5		
4	TP-2		87.6	0.0		2.9	0.0		90.5	0.0		87.5	0.0		3.0	0.0		90.5	0.0
7	Ph-U	91.0			4.2			95.2			91.5			4.4			95.9		
7	TP-2	92.0	91.5	0.5	4.9	4.6	0.4	96.9	96.1	0.9	93.2	92.4	0.9	5.0	4.7	0.3	98.2	97.1	1.1
13	Ph-U[2]	76.2									80.0			4.2			84.2		
13	TP-2	82.0	79.1	2.9	2.7	2.7	0.0	84.7	84.7	0.0	87.2	83.6	3.6	2.9	3.6	0.7	90.1	87.2	2.9
35	Ph-U	66.9			2.4			69.3			71.0			3.5			74.5		
35	TP-2		66.9	0.0		2.4	0.0		69.3	0.0		71.0	0.0		3.5	0.0		74.5	0.0
64	Ph-U	57.6			1.2			58.8											
64	TP-2	62.1	59.9	2.2	0.4	0.8	0.4	62.5	60.7	1.9	62.1	62.1	0.0	1.0	1.0	0.0	63.1	63.1	0.0
99	Ph-U[2]	64.0									66.9			0.5			67.4		
99	TP-2	56.1	60.1	4.0	0.4	0.4	0.0	56.5	56.5	0.0	59.4	63.2	3.7	0.8	0.7	0.2	60.2	63.8	3.6

[1]Results for total system quantifiable because reportedly no [^{14}C]residues were recovered in the sediment extract.
[2]Results for total system not quantifiable because sediment extract was not analyzed by HPLC.
Results (% of applied radioactivity) imported from AR Silty clay Metab 1-2 spreadsheets.
Total [^{14}C]Residues results from Appendix C, p. 113 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
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Arkansas water-silty clay sediment.

Determination of unaccounted for radioactivity following HPLC analysis (continued).

		Unaccounted [^{14}C][1]								
		Water layer			Sediment			Total System[2]		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U	-3.6			0.0			-3.6		
0	TP-2	1.1	-1.2	2.4	1.8	0.9	0.9	2.9	-0.3	3.3
1	Ph-U									
1	TP-2	0.4	0.4	0.0	3.6	3.6	0.0	4.0	4.0	0.0
4	Ph-U	-0.1			0.1			0.0		
4	TP-2		-0.1	0.0		0.1	0.0		0.0	0.0
7	Ph-U	0.5			0.2			0.7		
7	TP-2	1.2	0.8	0.3	0.1	0.1	0.1	1.3	1.0	0.3
13	Ph-U	3.8			4.2			8.0		
13	TP-2	5.2	4.5	0.7	0.2	2.2	2.0	5.4	6.7	1.3
35	Ph-U	4.1			1.1			5.2		
35	TP-2		4.1	0.0		1.1	0.0		5.2	0.0
64	Ph-U									
64	TP-2	0.0	0.0	0.0	0.6	0.6	0.0	0.6	0.6	0.0
99	Ph-U	2.9			0.5			3.4		
99	TP-2	3.3	3.1	0.2	0.4	0.5	0.1	3.7	3.6	0.1

[1]Total [^{14}C]residues - total identified + unknown [^{14}C]compounds (imported from AR Silty clay Unact 1 spreadsheet).
[2]Includes [^{14}C]residues in sediment/soil extract not analyzed by HPLC.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2)
Blank cell means no result was provided for that sampling interval.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Arkansas water-silt loam soil.

Determination of penoxsulam and degradates in total system.

		Penoxsulam									5-OH-XDE-638								
		Water layer			Soil			Total System			Water layer			Soil			Total System		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[1]	94.3									0.01								
0	Ph-U[1]	90.1	92.2	2.1		ERR	ERR		ERR	ERR	2.8	1.4	1.4		ERR	ERR		ERR	ERR
1	Ph-U[1]	99.1									ND								
1	TP-2[1]	87.9	93.5	5.6		ERR	ERR		ERR	ERR	ND	0.0	0.0		ERR	ERR		ERR	ERR
4	Ph-U	98.8			5.0			103.8			3.2			0.3			3.5		
4	TP-2	79.8	89.3	9.5	13.2	9.1	4.1	93.0	98.4	5.4	1.4	2.3	0.9	0.6	0.5	0.2	2.0	2.8	0.8
8	Ph-U	72.2			5.2			77.4			4.7			0.3			5.0		
8	TP-2	94.7	83.5	11.3	4.0	4.6	0.6	98.7	88.1	10.6	3.9	4.3	0.4	0.9	0.6	0.3	4.8	4.9	0.1
13	Ph-U	78.3			3.9			82.2			4.8			0.4			5.2		
13	TP-2	77.5	77.9	0.4	7.8	5.9	2.0	85.3	83.8	1.5	7.6	6.2	1.4	1.1	0.8	0.4	8.7	7.0	1.8
35	Ph-U	43.4			0.2			43.6			21.1			0.1			21.2		
35	TP-2		43.4	0.0		0.2	0.0		43.6	0.0		21.1	0.0		0.1	0.0		21.2	0.0
64	Ph-U	43.9			1.9			45.8			17.1			2.2			19.3		
64	TP-2	11.3	27.6	16.3	0.2	1.1	0.9	11.5	28.7	17.2	25.5	21.3	4.2	0.6	1.4	0.8	26.1	22.7	3.4
99	Ph-U	8.7			0.4			9.1			19.4			1.2			20.6		
99	TP-2		8.7	0.0		0.4	0.0		9.1	0.0		19.4	0.0		1.2	0.0		20.6	0.0

[1]Results for total system not quantifiable because soil extract was not analyzed by HPLC.
Results (% of applied radioactivity) from Appendix C, p. 112 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.
Duplicate [phenyl-U-^{14}C]-label treated systems were taken at day 0.
MQL (minimum quantifiable limit) for HPLC analyses were reported as 0.02% and 0.04-05% of the applied for water layers and sediment/soil extracts, respectively (Table 7, p. 56).

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Arkansas water-silt loam soil.

Determination of penoxsulam and degradates in total system (continued).

		BSTCA									Unidentified [^{14}C]								
		Water layer			Soil			Total System			Water layer			Soil			Total System		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[1]	ND									0.0								
0	Ph-U[1]	ND	0.0	0.0		ERR	ERR		ERR	ERR	0.0	0.0	0.0		ERR	ERR		ERR	ERR
1	Ph-U[1]	ND									0.9								
1	TP-2[1]	ND	0.0	0.0		ERR	ERR		ERR	ERR	0.7	0.8	0.1		ERR	ERR		ERR	ERR
4	Ph-U	ND			ND			0.0			1.6			0.0			1.6		
4	TP-2	ND	0.0	0.0	ND	0.0	0.0	0.0	0.0	0.0	0.4	1.0	0.6	0.3	0.2	0.2	0.7	1.2	0.5
8	Ph-U	ND			0.025			0.0			2.3			0.0			2.3		
8	TP-2	ND	0.0	0.0	0.3	0.2	0.1	0.3	0.2	0.1	2.0	2.2	0.1	0.1	0.1	0.1	2.1	2.2	0.1
13	Ph-U	1.4			0.1			1.5			0.4			0.0			0.4		
13	TP-2	1.3	1.4	0.0	0.025	0.1	0.0	1.3	1.4	0.1	0.3	0.4	0.1	0.2	0.1	0.1	0.5	0.5	0.1
35	Ph-U	9.4			ND			9.4			1.7			0.0			1.7		
35	TP-2		9.4	0.0		0.0	0.0		9.4	0.0		1.7	0.0		0.0	0.0		1.7	0.0
64	Ph-U	15.4			ND			15.4			0.3			0.0			0.3		
64	TP-2	22.9	19.2	3.8	ND	0.0	0.0	22.9	19.2	3.8	0.6	0.5	0.2	0.0	0.0	0.0	0.6	0.5	0.2
99	Ph-U	29.5			0.2			29.7			0.2			0.0			0.2		
99	TP-2		29.5	0.0		0.2	0.0		29.7	0.0		0.2	0.0		0.0	0.0		0.2	0.0

[1]Results for total system not quantifiable because soil extract was not analyzed by HPLC.
Results (% of applied radioactivity) from Appendix C, p. 112 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.
Duplicate [phenyl-U-^{14}C]-label treated systems were taken at day 0.
MQL (minimum quantifiable limit) for HPLC analyses were reported as 0.02% and 0.04-05% of the applied for water layers and sediment/soil extracts, respectively (Table 7, p. 56).

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Arkansas water-silt loam soil.

Determination of unaccounted for radioactivity following HPLC analysis.

		Total Identified + Unks									Total [^{14}C]Residues								
		Water layer			Soil			Total System			Water layer			Soil ext.			Total System		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[1]	94.3									94.3			2.6			96.9		
0	Ph-U[1]	92.9	93.6	0.7		ERR	ERR		ERR	ERR	92.9	93.6	0.7	2.8	2.7	0.1	95.7	96.3	0.6
1	Ph-U[1]	100.0									100.0			6.3			106.3		
1	TP-2[1]	88.6	94.3	5.7		ERR	ERR		ERR	ERR	88.6	94.3	5.7	4.8	5.6	0.8	93.4	99.9	6.4
4	Ph-U	103.6			5.3			108.9			103.6			5.3			108.9		
4	TP-2	81.6	92.6	11.0	14.1	9.7	4.4	95.7	102.3	6.6	81.6	92.6	11.0	14.5	9.9	4.6	96.1	102.5	6.4
8	Ph-U	79.2			5.5			84.7			79.1			5.9			85.0		
8	TP-2	100.6	89.9	10.7	5.3	5.4	0.1	105.9	95.3	10.6	100.6	89.9	10.8	5.5	5.7	0.2	106.1	95.6	10.5
13	Ph-U	84.9			4.4			89.3			85.0			4.6			89.6		
13	TP-2	86.7	85.8	0.9	9.1	6.8	2.4	95.8	92.6	3.3	86.7	85.9	0.9	9.5	7.1	2.5	96.2	92.9	3.3
35	Ph-U	75.6			0.3			75.9			78.1			0.4			78.5		
35	TP-2		75.6	0.0		0.3	0.0		75.9	0.0		78.1	0.0		0.4	0.0		78.5	0.0
64	Ph-U	76.7			4.1			80.8			79.6			5.3			84.9		
64	TP-2	60.3	68.5	8.2	0.8	2.5	1.7	61.1	71.0	9.9	64.4	72.0	7.6	1.3	3.3	2.0	65.7	75.3	9.6
99	Ph-U	57.8			1.8			59.6			60.6			3.1			63.7		
99	TP-2		57.8	0.0		1.8	0.0		59.6	0.0		60.6	0.0		3.1	0.0		63.7	0.0

[1]Results for total system not quantifiable because soil extract was not analyzed by HPLC.
Results (% of applied radioactivity) imported from AR Silt loam Metab 1-2 spreadsheets.
Total [^{14}C]Residues results from Appendix C, p. 112 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.
Duplicate [phenyl-U-^{14}C]-label treated systems were taken at day 0.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Arkansas water-silt loam soil.

Determination of unaccounted for radioactivity following HPLC analysis (continued).

		Unaccounted [^{14}C][1]								
		Water layer			Soil			Total System[2]		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[2]	-0.0			2.6			2.6		
0	Ph-U[2]	0.0	-0.0	0.0	2.8	2.7	0.1	2.8	2.7	0.1
1	Ph-U[2]	0.0			6.3			6.3		
1	TP-2[2]	0.0	0.0	0.0	4.8	5.6	0.8	4.8	5.6	0.8
4	Ph-U	0.0			0.0			0.0		
4	TP-2	0.0	0.0	0.0	0.4	0.2	0.2	0.4	0.2	0.2
8	Ph-U	-0.1			0.4			0.3		
8	TP-2	0.0	-0.1	0.1	0.2	0.3	0.1	0.2	0.2	0.0
13	Ph-U	0.1			0.2			0.3		
13	TP-2	0.0	0.0	0.0	0.4	0.3	0.1	0.4	0.3	0.0
35	Ph-U	2.5			0.1			2.6		
35	TP-2		2.5	0.0		0.1	0.0		2.6	0.0
64	Ph-U	2.9			1.2			4.1		
64	TP-2	4.1	3.5	0.6	0.5	0.9	0.4	4.6	4.4	0.3
99	Ph-U	2.8			1.3			4.1		
99	TP-2		2.8	0.0		1.3	0.0		4.1	0.0

[1]Total [^{14}C]residues - total identified + unknown [^{14}C]compounds (imported from AR Silty loam Unact 1 spreadsheet)
[2]Includes [^{14}C]residues in sediment/soil extract not analyzed by HPLC.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2)
Blank cell means no result was provided for that sampling interval.
Duplicate [phenyl-U-^{14}C]-label treated systems were taken at day 0.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Italy water-loam sediment.

Determination of penoxsulam and degradates in total system.

		Penoxsulam									5-OH-XDE-638								
		Water layer			Sediment			Total System			Water layer			Sediment			Total System		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[1]	90.3									0.025								
0	TP-2[1]	84.6	87.5	2.9		ERR	ERR		ERR	ERR	0.3	0.2	0.1		ERR	ERR		ERR	ERR
1	Ph-U[1]	69.5									16.2								
1	TP-2[1]	84.0	76.8	7.3		ERR	ERR		ERR	ERR	2.5	9.4	6.9		ERR	ERR		ERR	ERR
4	Ph-U																		
4	TP-2	69.8	69.8	0.0	2.5	2.5	0.0	72.3	72.3	0.0	14.5	14.5	0.0	1.6	1.6	0.0	16.1	16.1	0.0
8	Ph-U	38.0			2.1			40.1			18.6			1.4			20.0		
8	TP-2	30.2	34.1	3.9	6.7	4.4	2.3	36.9	38.5	1.6	18.5	18.6	0.0	5.4	3.4	2.0	23.9	22.0	2.0
13	Ph-U																		
13	TP-2	13.0	13.0	0.0	1.3	1.3	0.0	14.3	14.3	0.0	18.5	18.5	0.0	2.2	2.2	0.0	20.7	20.7	0.0
64	Ph-U	0.6			2.1			2.7			0.8			1.3			2.1		
64	TP-2	0.6	0.6	0.0	0.02	1.1	1.0	0.6	1.7	1.0	0.9	0.9	0.0	0.02	0.7	0.6	0.9	1.5	0.6
99	Ph-U													ND					
99	TP-2	0.4	0.4	0.0	ND	0.0	0.0	0.4	0.4	0.0	ND	0.0	0.0	ND	0.0	0.0	0.0	0.0	0.0

[1]Results for total system not quantifiable because sediment extract was not analyzed by HPLC.
Results (% of applied radioactivity) from Appendix C, p. 114 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.
MQL (minimum quantifiable limit) for HPLC analyses were reported as 0.02% and 0.04-05% of the applied for water layers and sediment/soil extracts, respectively (Table 7, p. 56).

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Italy water-loam sediment.

Determination of penoxsulam and degradates in total system (continued).

		BSTCA									Unidentified [^{14}C]								
		Water layer			Sediment			Total System			Water layer			Sediment			Total System		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[1]	ND									0.4								
0	TP-2[1]	ND	0.0	0.0		ERR	ERR		ERR	ERR	0.2	0.3	0.1		ERR	ERR		ERR	ERR
1	Ph-U[1]	2.8									1.0								
1	TP-2[1]	0.5	1.7	1.2		ERR	ERR		ERR	ERR	0.0	0.5	0.5		ERR	ERR		ERR	ERR
4	Ph-U																0.0		
4	TP-2	2.4	2.4	0.0	0.3	0.3	0.0	2.7	2.7	0.0	0.0	0.0	0.0	0.5	0.5	0.0	0.5	0.3	0.3
8	Ph-U	4.0			0.3			4.3			3.2			0.1			3.3		
8	TP-2	3.3	3.7	0.3	1.4	0.9	0.6	4.7	4.5	0.2	0.0	1.6	1.6	0.1	0.1	0.0	0.1	1.7	1.6
13	Ph-U																0.0		
13	TP-2	5.1	5.1	0.0	0.6	0.6	0.0	5.7	5.7	0.0	1.5	1.5	0.0	0.0	0.0	0.0	1.5	0.8	0.8
64	Ph-U	26.9			0.2			27.1			0.2			0.2			0.4		
64	TP-2	20.6	23.8	3.1	0.3	0.3	0.1	20.9	24.0	3.1	0.4	0.3	0.1	0.1	0.2	0.0	0.5	0.5	0.1
99	Ph-U																0.0		
99	TP-2	16.7	16.7	0.0	1.7	1.7	0.0	18.4	18.4	0.0	1.0	1.0	0.0	0.2	0.2	0.0	1.2	0.6	0.6

[1]Results for total system not quantifiable because sediment extract was not analyzed by HPLC.
Results (% of applied radioactivity) from Appendix C, p. 114 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.
MQL (minimum quantifiable limit) for HPLC analyses were reported as 0.02% and 0.04-05% of the applied for water layers and sediment/soil extracts, respectively (Table 7, p. 56).

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Italy water-loam sediment.

Determination of unaccounted for radioactivity following HPLC analysis.

		Total Identified + Unks									Total [^{14}C]Residues								
		Water layer			Sediment			Total System			Water layer			Sediment ext.			Total System		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[1]	90.7									90.6			4.9			95.5		
0	TP-2[1]	85.1	87.9	2.8		ERR	ERR		ERR	ERR	85.2	87.9	2.7	4.3	4.6	0.3	89.5	92.5	3.0
1	Ph-U[1]	89.5									93.7			6.9			100.6		
1	TP-2[1]	87.0	88.3	1.3		ERR	ERR		ERR	ERR	87.0	90.4	3.4	7.3	7.1	0.2	94.3	97.5	3.2
4	Ph-U																		
4	TP-2	86.7	86.7	0.0	4.9	4.9	0.0	91.6	91.6	0.0	90.5	90.5	0.0	5.2	5.2	0.0	95.7	95.7	0.0
8	Ph-U	63.8			3.9			67.7			71.9			4.4			76.3		
8	TP-2	52.0	57.9	5.9	13.6	8.8	4.9	65.6	66.7	1.0	58.6	65.3	6.7	16.0	10.2	5.8	74.6	75.5	0.8
13	Ph-U																		
13	TP-2	38.1	38.1	0.0	4.1	4.1	0.0	42.2	42.2	0.0	50.9	50.9	0.0	5.3	5.3	0.0	56.2	56.2	0.0
64	Ph-U	28.5			3.8			32.3			33.0			4.3			37.3		
64	TP-2	22.5	25.5	3.0	0.4	2.1	1.7	22.9	27.6	4.7	26.0	29.5	3.5	5.5	4.9	0.6	31.5	34.4	2.9
99	Ph-U																		
99	TP-2	18.1	18.1	0.0	1.9	1.9	0.0	20.0	20.0	0.0	20.1	20.1	0.0	8.0	8.0	0.0	28.1	28.1	0.0

[1]Results for total system not quantifiable because sediment extract was not analyzed by HPLC.
Results (% of applied radioactivity) imported from It Loam Metab 1-2 spreadsheets.
Total [^{14}C]Residues results from Appendix C, p. 114 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) In Six Water-Sediment/Soil Systems.
MRID 45830726

Italy water-loam sediment.

Determination of unaccounted for radioactivity following HPLC analysis (continued).

		Unaccounted [^{14}C][1]								
		Water layer			Sediment			Total System[2]		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[2]	-0.1			4.9			4.8		
0	TP-2[2]	0.1	-0.0	0.1	4.3	4.6	0.3	4.4	4.6	0.2
1	Ph-U[2]	4.2			6.9			11.1		
1	TP-2[2]	0.0	2.1	2.1	7.3	7.1	0.2	7.3	9.2	1.9
4	Ph-U									
4	TP-2	3.8	3.8	0.0	0.3	0.3	0.0	4.1	4.1	0.0
8	Ph-U	8.1			0.5			8.6		
8	TP-2	6.6	7.4	0.8	2.4	1.4	0.9	9.0	8.8	0.2
13	Ph-U									
13	TP-2	12.8	12.8	0.0	1.2	1.2	0.0	14.0	14.0	0.0
64	Ph-U	4.5			0.5			5.0		
64	TP-2	3.5	4.0	0.5	5.1	2.8	2.3	8.6	6.8	1.8
99	Ph-U									
99	TP-2	2.0	2.0	0.0	6.1	6.1	0.0	8.1	8.1	0.0

[1]Total [^{14}C]residues - total identified + unknown [^{14}C]compounds (imported from It Loam Unact 1 spreadsheet).
[2]Includes [^{14}C]residues in sediment/soil extract not analyzed by HPLC.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2)
Blank cell means no result was provided for that sampling interval.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

France water-sand sediment.

Determination of penoxsulam and degradates in total system.

		Penoxsulam									5-OH-XDE-638								
		Water layer			Sediment			Total System			Water layer			Sediment			Total System		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[1]	89.2									2.3								
0	Ph-U[1]	93.9	91.6	2.3		ERR	ERR		ERR	ERR	0.01	1.2	1.1		ERR	ERR		ERR	ERR
4	Ph-U																		
4	TP-2	61.2	61.2	0.0	20.9	20.9	0.0	82.1	82.1	0.0	1.5	1.5	0.0	0.7	0.7	0.0	2.2	2.2	0.0
8	Ph-U	75.9			15.4			91.3			5.2			1.7			6.9		
8	TP-2	66.9	71.4	4.5	14.7	15.1	0.3	81.6	86.5	4.8	4.7	5.0	0.3	1.3	1.5	0.2	6.0	6.5	0.5
13	Ph-U	72.1			9.2			81.3			8.1			1.6			9.7		
13	TP-2		72.1	0.0		9.2	0.0		81.3	0.0		8.1	0.0		1.6	0.0		9.7	0.0
35	Ph-U																		
35	TP-2	22.3	22.3	0.0	11.0	11.0	0.0	33.3	33.3	0.0	14.1	14.1	0.0	15.6	15.6	0.0	29.7	29.7	0.0
64	Ph-U	7.5			5.8			13.3			16.5			6.7			23.2		
64	TP-2	11.8	9.7	2.2	21.9	13.9	8.1	33.7	23.5	10.2	6.7	11.6	4.9	10.8	8.8	2.1	17.5	20.4	2.8
99	Ph-U	3.9			17.9			21.8			2.4			9.5			11.9		
99	TP-2		3.9	0.0		17.9	0.0		21.8	0.0		2.4	0.0		9.5	0.0		11.9	0.0

[1]Results for total system not quantifiable because sediment extract was not analyzed by HPLC.
Results (% of applied radioactivity) from Appendix C, p. 115 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.
Duplicate [phenyl-U-^{14}C]-label treated systems were taken at day 0.
MQL (minimum quantifiable limit) for HPLC analyses were reported as 0.02% and 0.04-05% of the applied for water layers and sediment/soil extracts, respectively (Table 7, p. 56).

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
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France water-sand sediment.

Determination of penoxsulam and degradates in total system (continued).

		BSTCA									Composite 4/Metabolite 5								
		Water layer			Sediment			Total System			Water layer			Sediment			Total System		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[1]	0.4									ND								
0	Ph-U[1]	0.01	0.2	0.2		ERR	ERR		ERR	ERR	ND	0.0	0.0		ERR	ERR		ERR	ERR
4	Ph-U																		
4	TP-2	0.3	0.3	0.0	ND	0.0	0.0	0.3	0.3	0.0	1.0	1.0	0.0	ND	0.0	0.0	1.0	1.0	0.0
8	Ph-U	1.7			0.9			2.6			ND			0.2			0.2		
8	TP-2	1.8	1.8	0.0	0.8	0.9	0.0	2.6	2.6	0.0	ND	0.0	0.0	0.3	0.3	0.1	0.3	0.3	0.1
13	Ph-U	2.5			0.9			3.4			0.4			0.4			0.8		
13	TP-2		2.5	0.0		0.9	0.0		3.4	0.0		0.4	0.0		0.4	0.0		0.8	0.0
35	Ph-U																		
35	TP-2	6.0	6.0	0.0	1.2	1.2	0.0	7.2	7.2	0.0	0.6	0.6	0.0	8.5	8.5	0.0	9.1	9.1	0.0
64	Ph-U	18.4			1.2			19.6			4.4			10.7			15.1		
64	TP-2	5.8	12.1	6.3	0.3	0.8	0.5	6.1	12.8	6.8	0.8	2.6	1.8	10.5	10.6	0.1	11.3	13.2	1.9
99	Ph-U	5.5			2.2			7.7			1.3			15.7			17.0		
99	TP-2		5.5	0.0		2.2	0.0		7.7	0.0		1.3	0.0		15.7	0.0		17.0	0.0

[1]Results for total system not quantifiable because sediment extract was not analyzed by HPLC.
Results (% of applied radioactivity) from Appendix C, p. 115 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.
Duplicate [phenyl-U-^{14}C]-label treated systems were taken at day 0.
MQL (minimum quantifiable limit) for HPLC analyses were reported as 0.02% and 0.04-05% of the applied for water layers and sediment/soil extracts, respectively (Table 7, p. 56).

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

France water-sand sediment.

Determination of penoxsulam and degradates in total system (continued).

		Unidentified [^{14}C]								
		Water layer			Soil			Total System		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[2]	0.4								
0	Ph-U[2]	0.0	0.2	0.2		ERR	ERR		ERR	ERR
4	Ph-U									
4	TP-2	1.0	1.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0
8	Ph-U	0.2			0.4			0.6		
8	TP-2	0.2	0.2	0.0	0.1	0.3	0.2	0.3	0.5	0.1
13	Ph-U	0.4			2.5			2.9		
13	TP-2		0.4	0.0		2.5	0.0		2.9	0.0
35	Ph-U	NA[1]						0.0		
35	TP-2	0.6	0.3	0.3	1.8	1.8	0.0	2.4	1.2	1.2
64	Ph-U	1.4			0.2			1.6		
64	TP-2	0.0	0.7	0.7	0.6	0.4	0.2	0.6	1.1	0.5
99	Ph-U	8.3			0.5			8.8		
99	TP-2		8.3	0.0		0.5	0.0		8.8	0.0

[1]Although there is a value of 0.4% in Appendix C(p. 115), this water layer
[2]Results for total system not quantifiable because sediment extract was not analyzed by HPLC.
Results (% of applied radioactivity) from Appendix C, p. 115 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2)
Blank cell means no result was provided for that sampling interval.
Duplicate [phenyl-U-^{14}C]-label treated systems were taken at day 0.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

France water-sand sediment.

Determination of unaccounted for radioactivity following HPLC analysis.

		Total Identified + Unks									Total [^{14}C]Residues								
		Water layer			Sediment			Total System			Water layer			Sediment ext.			Total System		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[1]	92.3			0.0						92.7			3.8			96.5		
0	Ph-U[1]	93.9	93.1	0.8	0.0	0.0	0.0		ERR	ERR	93.9	93.3	0.6	3.0	3.4	0.4	96.9	96.7	0.2
4	Ph-U																		
4	TP-2	65.0	65.0	0.0	21.6	21.6	0.0	86.6	86.6	0.0	65.1	65.1	0.0	21.8	21.8	0.0	86.9	86.9	0.0
8	Ph-U	83.0			18.6			101.6			83.0			18.9			101.9		
8	TP-2	73.6	78.3	4.7	17.2	17.9	0.7	90.8	96.2	5.4	74.2	78.6	4.4	17.5	18.2	0.7	91.7	96.8	5.1
13	Ph-U	83.5			14.6			98.1			84.0			15.5			99.5		
13	TP-2		83.5	0.0		14.6	0.0		98.1	0.0		84.0	0.0		15.5	0.0		99.5	0.0
35	Ph-U										35.0			40.5			75.5		
35	TP-2	43.6	43.6	0.0	38.1	38.1	0.0	81.7	81.7	0.0	45.2	40.1	5.1	40.7	40.6	0.1	85.9	80.7	5.2
64	Ph-U	48.2			24.6			72.8			50.9			26.9			77.8		
64	TP-2	25.1	36.7	11.6	44.1	34.4	9.7	69.2	71.0	1.8	25.8	38.4	12.5	46.3	36.6	9.7	72.1	75.0	2.9
99	Ph-U	21.4			45.8			67.2			23.6			47.3			70.9		
99	TP-2		21.4	0.0		45.8	0.0		67.2	0.0		23.6	0.0		47.3	0.0		70.9	0.0

[1]Results for total system not quantifiable because sediment extract was not analyzed by HPLC.
Results (% of applied radioactivity) imported from Fr Sand Metab 1-3 spreadsheets.
Total [^{14}C]Residues results from Appendix C, p. 115 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.
Duplicate [phenyl-U-^{14}C]-label treated systems were taken at day 0.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

France water-sand sediment.

Determination of unaccounted for radioactivity following HPLC analysis (continued).

		Unaccounted [^{14}C][1]								
		Water layer			Sediment			Total System[2]		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U	0.4			3.8			4.2		
0	Ph-U	-0.0	0.2	0.2	3.0	3.4	0.4	3.0	3.6	0.6
4	Ph-U									
4	TP-2	0.1	0.1	0.0	0.2	0.2	0.0	0.3	0.3	0.0
8	Ph-U	0.0			0.3			0.3		
8	TP-2	0.6	0.3	0.3	0.3	0.3	0.0	0.9	0.6	0.3
13	Ph-U	0.5			0.9			1.4		
13	TP-2		0.5	0.0		0.9	0.0		1.4	0.0
35	Ph-U[3]	35.0			40.5			75.5		
35	TP-2	1.6	18.3	16.7	2.6	21.6	18.9	4.2	39.9	35.6
64	Ph-U	2.7			2.3			5.0		
64	TP-2	0.7	1.7	1.0	2.2	2.2	0.1	2.9	3.9	1.1
99	Ph-U	2.2			1.5			3.7		
99	TP-2		2.2	0.0		1.5	0.0		3.7	0.0

[1]Total [^{14}C]residues - total identified + unknown [^{14}C]compounds (imported from Fr Sand Unact 1 spreadsheet).
[2]Includes [^{14}C]residues in sediment/soil extract not analyzed by HPLC.
[3]Water layer and sediment extract not analyzed by HPLC.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2)
Blank cell means no result was provided for that sampling interval.
Duplicate [phenyl-U-^{14}C]-label treated systems were taken at day 0.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Japan HPLC water-volcanic loam soil.

Determination of penoxsulam and degradates in total system.

		Penoxsulam									5-OH-XDE-638								
		Water layer			Soil			Total System			Water layer			Soil			Total System		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[1]	96.2									ND								
0	Ph-U[1]	96.9	96.6	0.3		ERR	ERR		ERR	ERR	ND	0.0	0.0		ERR	ERR		ERR	ERR
1	Ph-U[1]	77.7									0.6								
1	TP-2[1]	89.9	83.8	6.1		ERR	ERR		ERR	ERR	0.6	0.6	0.0		ERR	ERR		ERR	ERR
4	Ph-U																		
4	TP-2	79.9	79.9	0.0	11.7	11.7	0.0	91.6	91.6	0.0	3.8	3.8	0.0	0.4	0.4	0.0	4.2	4.2	0.0
7	Ph-U	76.9			12.8			89.7			3.7			1.1			4.8		
7	TP-2	72.1	74.5	2.4	10.2	11.5	1.3	82.3	86.0	3.7	2.4	3.1	0.7	1.0	1.1	0.1	3.4	4.1	0.7
13	Ph-U	67.8			11.5			79.3			7.1			5.4			12.5		
13	TP-2	61.9	64.9	3.0	12.4	12.0	0.5	74.3	76.8	2.5	10.7	8.9	1.8	2.6	4.0	1.4	13.3	12.9	0.4
35	Ph-U[1]	41.1									19.3								
35	TP-2	36.1	38.6	2.5	12.1	12.1	0.0	48.2	48.2	0.0	18.4	18.9	0.4	11.0	11.0	0.0	29.4	29.4	0.0
64	Ph-U																		
64	TP-2	13.9	13.9	0.0	8.5	8.5	0.0	22.4	22.4	0.0	20.0	20.0	0.0	12.2	12.2	0.0	32.2	32.2	0.0
99	Ph-U	6.9			1.1			8.0			19.9			4.9			24.8		
99	TP-2	6.6	6.8	0.2	4.7	2.9	1.8	11.3	9.7	1.7	19.2	19.6	0.4	12.5	8.7	3.8	31.7	28.3	3.4

[1]Results for total system not quantifiable because soil extract was not analyzed by HPLC.
Results (% of applied radioactivity) from Appendix C, p. 116 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.
Duplicate [phenyl-U-^{14}C]-label treated systems were taken at day 0.
MQL (minimum quantifiable limit) for HPLC analyses were reported as 0.05% and 0.11-0.12% of the applied for water layers and sediment/soil extracts, respectively (Table 7, p. 56).

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Japan HPLC water-volcanic loam soil.

Determination of penoxsulam and degradates in total system (continued).

		BSTCA									Unidentified [^{14}C]								
		Water layer			Soil			Total System			Water layer			Soil			Total System		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[1]	ND									0.7								
0	Ph-U[1]	ND	0.0	0.0		ERR	ERR		ERR	ERR	0.7	0.7	0.0		ERR	ERR		ERR	ERR
1	Ph-U[1]	ND									0.7								
1	TP-2[1]	ND	0.0	0.0		ERR	ERR		ERR	ERR	0.0	0.4	0.4		ERR	ERR		ERR	ERR
4	Ph-U																		
4	TP-2	ND	0.0	0.0	ND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.7	0.0	0.7	0.7	0.0
7	Ph-U	ND			ND			0.0			0.0			0.0			0.0		
7	TP-2	ND	0.0	0.0	ND	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.3	0.3	0.6	0.3	0.3
13	Ph-U	0.7			1.9			2.6			0.0			0.6			0.6		
13	TP-2	0.025	0.4	0.3	0.055	1.0	0.9	0.1	1.3	1.3	0.1	0.1	0.1	0.0	0.3	0.3	0.1	0.4	0.3
35	Ph-U[1]	3.1									1.0								
35	TP-2	4.4	3.8	0.7	ND	0.0	0.0	4.4	4.4	0.0	0.0	0.5	0.5	0.2	0.2	0.0	0.2	0.2	0.0
64	Ph-U																		
64	TP-2	8.3	8.3	0.0	ND	0.0	0.0	8.3	8.3	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.2	0.2	0.0
99	Ph-U	10.7			1.2			11.9			0.0			0.1			0.1		
99	TP-2	8.8	9.8	0.9	0.055	0.6	0.6	8.9	10.4	1.5	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.1	0.1

[1]Results for total system not quantifiable because soil extract was not analyzed by HPLC.
Results (% of applied radioactivity) from Appendix C, p. 116 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.
Duplicate [phenyl-U-^{14}C]-label treated systems were taken at day 0.
MQL (minimum quantifiable limit) for HPLC analyses were reported as 0.05% and 0.11-0.12% of the applied for water layers and sediment/soil extracts, respectively (Table 7, p. 56).

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Japan HPLC water-volcanic loam soil.

Determination of unaccounted for radioactivity following HPLC analysis.

		Total Identified + Unks									Total [^{14}C]Residues								
		Water layer			Soil			Total System			Water layer			Soil ext.			Total System		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U[1]	96.9			0.0						96.9			3.3			100.2		
0	Ph-U[1]	97.6	97.3	0.4	0.0	0.0	0.0		ERR	ERR	97.6	97.3	0.3	3.6	3.5	0.1	101.2	100.7	0.5
1	Ph-U[1]	79.0			0.0						79.0			6.3			85.3		
1	TP-2[1]	90.5	84.8	5.8	0.0	0.0	0.0		ERR	ERR	90.5	84.8	5.8	5.9	6.1	0.2	96.4	90.9	5.6
4	Ph-U																		
4	TP-2	83.7	83.7	0.0	12.8	12.8	0.0	96.5	96.5	0.0	83.6	83.6	0.0	12.8	12.8	0.0	96.4	96.4	0.0
7	Ph-U	80.6			13.9			94.5			80.6			13.9			94.5		
7	TP-2	74.5	77.6	3.0	11.8	12.9	1.0	86.3	90.4	4.1	74.4	77.5	3.1	12.4	13.2	0.8	86.8	90.7	3.9
13	Ph-U	75.6			19.4			95.0			75.6			20.6			96.2		
13	TP-2	72.7	74.2	1.4	15.1	17.2	2.2	87.8	91.4	3.6	75.5	75.6	0.0	15.1	17.9	2.7	90.6	93.4	2.8
35	Ph-U[1]	64.5			0.0												0.0		
35	TP-2	58.9	61.7	2.8	23.3	11.7	11.7	82.2	82.2	0.0	59.3	59.3	0.0	27.4	27.4	0.0	86.7	43.4	43.4
64	Ph-U																		
64	TP-2	42.2	42.2	0.0	20.9	20.9	0.0	63.1	63.1	0.0	42.8	42.8	0.0	24.8	24.8	0.0	67.6	67.6	0.0
99	Ph-U[2]	37.5			7.3			44.8									0.0		
99	TP-2	34.6	36.1	1.5	17.3	12.3	5.0	51.9	48.3	3.5	35.9	35.9	0.0	20.6	20.6	0.0	56.5	28.3	28.3

[1]Results for total system not quantifiable because soil extract was not analyzed by HPLC.
[2]Although water layers and soil extracts were analyzed by HPLC, total percent recovery of [^{14}C]residues were not reported.
Results (% of applied radioactivity) imported from Jp V Loam Metab 1-2 spreadsheets.
Total [^{14}C]Residues results from Appendix C, p. 116 of the study report.
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2).
Blank cell means no result was provided for that sampling interval.
Duplicate [phenyl-U-^{14}C]-label treated systems were taken at day 0.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Japan HPLC water-volcanic loam soil.

Determination of unaccounted for radioactivity following HPLC analysis (continued).

		Unaccounted [^{14}C][1]								
		Water layer			Soil			Total System[2]		
Day	Label	% AR	Mean	s.d.	% AR	Mean	s.d.	% AR	Mean	s.d.
0	Ph-U	0.0			3.3			3.3		
0	Ph-U	0.0	0.0	0.0	3.6	3.5	0.1	3.6	3.5	0.1
1	Ph-U	0.0			6.3			6.3		
1	TP-2	0.0	0.0	0.0	5.9	6.1	0.2	5.9	6.1	0.2
4	Ph-U									
4	TP-2	-0.1	-0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0
7	Ph-U	0.0			0.0			0.0		
7	TP-2	-0.1	-0.0	0.0	0.6	0.3	0.3	0.5	0.3	0.3
13	Ph-U	0.0			1.2			1.2		
13	TP-2	2.8	1.4	1.4	0.0	0.6	0.6	2.8	2.0	0.8
35	Ph-U[3]	-64.5			0.0			-64.5		
35	TP-2	0.4	-32.1	32.5	4.1	2.0	2.0	4.5	-30.0	34.5
64	Ph-U									
64	TP-2	0.6	0.6	0.0	3.9	3.9	0.0	4.5	4.5	0.0
99	Ph-U[3]	-37.5			-7.3			-44.8		
99	TP-2	1.3	-18.1	19.4	3.3	-2.0	5.3	4.6	-20.1	24.7

[1]Total [^{14}C]residues - total identified + unknown [^{14}C]compounds (imported from Jp V Loam Unact 1 spreadsheet).
[2]Includes [^{14}C]residues in sediment/soil extract not analyzed by HPLC.
[3]Although water layers and soil extract (99-day only) were analyzed by HPL
Means and standard deviations calculated using Corel Quattro Pro 8 program functions @avg(A1..A2), @std(A1..A2)
Blank cell means no result was provided for that sampling interval.
Duplicate [phenyl-U-^{14}C]-label treated systems were taken at day 0.

Aerobic Aquatic Metabolism of [^{14}C]Penoxsulam (XDE-638) in Six Water-Sediment/Soil Systems.
MRID 45830726

Determination of [phenyl-U-^{14}C]penoxsulam and degradates in total system.

Japan HPLC water-nonvolcanic loam soil.

	Penoxsulam			5-OH-XDE-638			BSTCA		
	H_2O	Soil	T.S.	H_2O	Soil	T.S.	H_2O	Soil	T.S.
Day	% AR	% AR	% AR	% AR	% AR	% AR	% AR	% AR	% AR
0[1]	95.2			nd			nd		
0[1]	98.1			nd			nd		
1[1]	78.9			1.8			0.7		
4	79.0	17.0	96.0	3.8	2.0	5.8	nd	nd	0.0
7	64.0	20.6	84.6	8.3	2.4	10.7	0.8	nd	0.8
13	59.6	20.3	79.9	15.6	5.1	20.7	1.6	nd	1.6
64	10.5	13.7	24.2	22.9	17.4	40.3	13.6	nd	13.6
99	3.7	6.4	10.1	14.3	16.6	30.9	25.4	0.3	25.7

	Unidentified			Total I.D.ed + Unks			Total [^{14}C]Residues			Unaccounted [^{14}C][3]		
	H_2O	Soil	T.S.	H_2O	Soil	T.S.	H_2O	Soil[2]	T.S.	H_2O	Soil	T.S.[4]
Day	% AR	% AR	% AR	% AR	% AR	% AR	% AR	% AR	% AR	% AR	% AR	% AR
0	1.4			96.6	0.0	96.6	96.7	4.1	100.8	0.1	4.1	4.2
0	0.7			98.8	0.0	98.8	98.8	3.7	102.5	0.0	3.7	3.7
1	0.6			82.0	0.0	82.0	81.9	14.3	96.2	-0.1	14.3	14.2
4	0.0	1.2	1.2	82.8	20.2	103.0	82.8	20.9	103.7	0.0	0.7	0.7
7	0.7	0.0	0.7	73.8	23.0	96.8	73.8	22.9	96.7	0.0	-0.1	-0.1
13	0.8	0.0	0.8	77.6	25.4	103.0	77.6	25.6	103.2	0.0	0.2	0.2
64	0.5	0.0	0.5	47.5	31.1	78.6	48.3	38.8	87.1	0.8	7.7	8.5
99	3.7	0.0	3.7	47.1	23.3	70.4	48.6	31.6	80.2	1.5	8.3	9.8

[1]Results for total system not quantifiable because sediment extract was not analyzed by HPLC.
[2]Soil extract.
[3]Unaccounted for radioactivity following HPLC analysis.
[4]Includes [^{14}C]residues in sediment/soil extract not analyzed by HPLC.
Results (% of applied radioactivity) from Appendix C, p. 117 of the study report.
Blank cell means no result was provided for that sampling interval.

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Attachment 2

Structures of Parent and Transformation Products

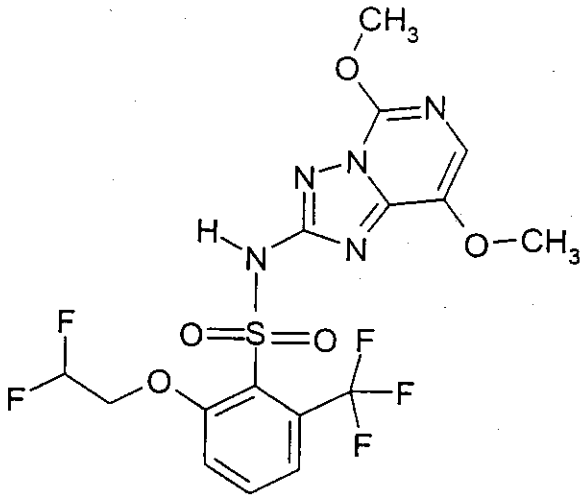
Penoxsulam

IUPAC name: 3-(2,2-Difluoroethoxy)-N-(5,8-dimethoxy[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-α,α,α-trifluorotoluene-2-sulfonamide

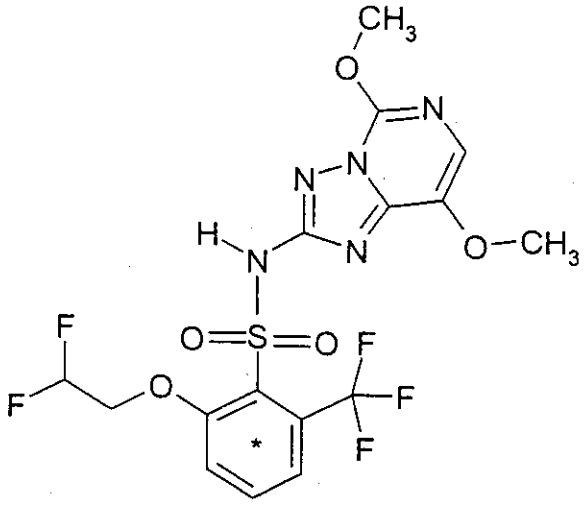
CAS name: 2-(2,2-Difluoroethoxy)-N-(5,8-dimethoxy[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)benzenesulfonamide

CAS No: 219714-96-2

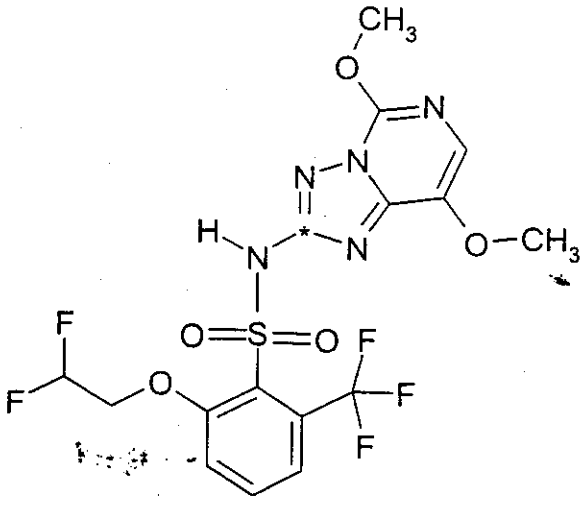
Unlabeled



[Phenyl-U-^{14}C] label



[Triazolopyrimidine-2-^{14}C] label



* Position of the radiolabel.

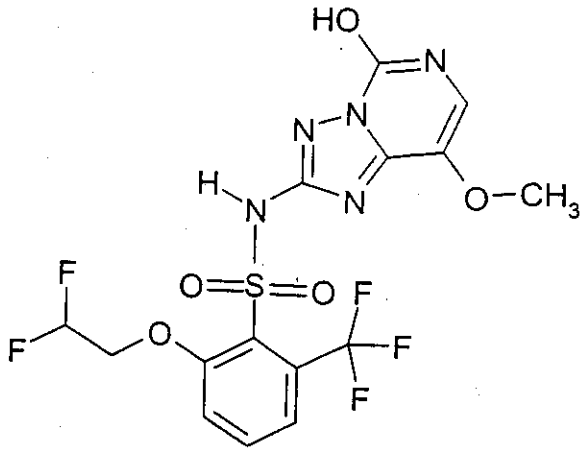
5-OH-XDE-638

IUPAC name: 6-(2,2-Difluoroethoxy)-N-(5,6-dihydro-8-methoxy-5-oxo-s-triazolo[1,5-c]pyrimidin-2-yl)-α,α,α-trifluoro-o-toluenesulfonamide

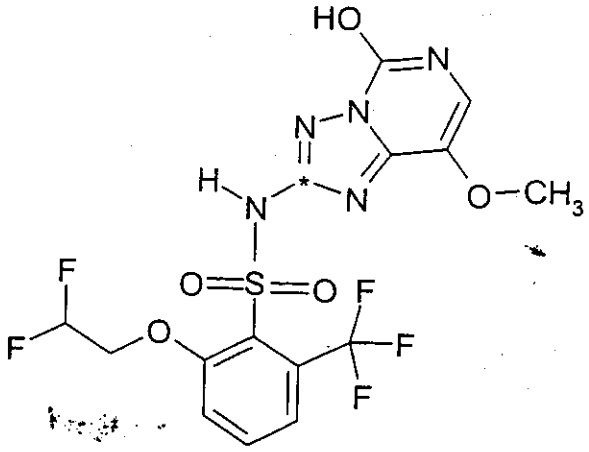
CAS name: 2-(2,2-Difluoroethoxy)-N-(5,6-dihydro-8-methoxy-5-oxo[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)-6-(trifluoromethyl)benzenesulfonamide

CAS No: NA

Unlabeled



[Triazolopyrimidine-2-^{14}C] label



* Position of the radiolabel.

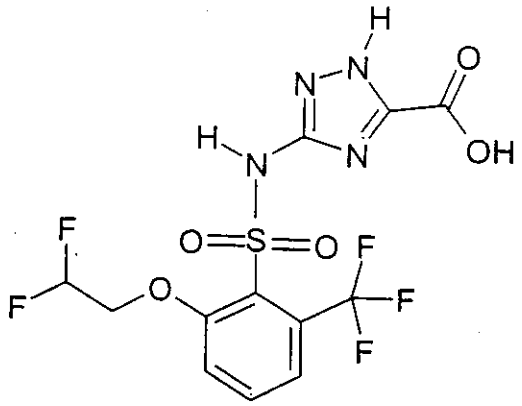
BSTCA

IUPAC name: 3-[6-(2,2-Difluoroethoxy)-α,α,α-(trifluoro-o-toluenesulfonamido]-s-triazole-5-carboxylic acid

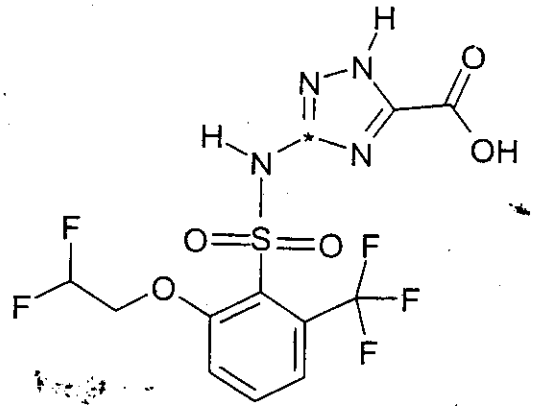
CAS name: 3-[[[2-(2,2-Difluoroethoxy)-6-(trifluoromethyl)phenyl]-sulfonyl]amino]-1H-1,2,4-triazole-5-carboxylic acid

CAS No: NA

Unlabeled



[Triazolopyrimidine-2-^{14}C] label



* Position of the radiolabel.

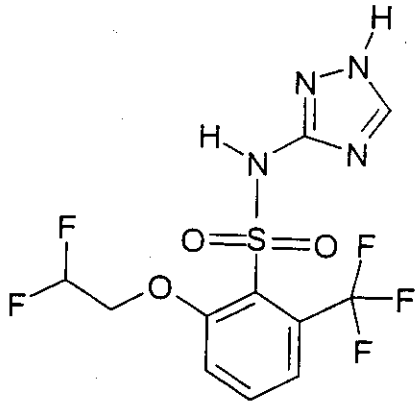
BST

IUPAC name: 6-(2,2-Difluoroethoxy)-α,α,α-trifluoro-N-s-triazol-3-yl-o-toluenesulfonamide

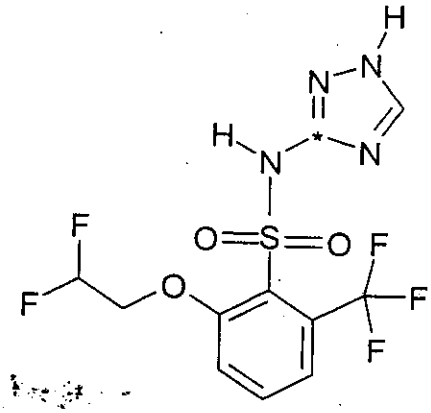
CAS name: 2-(2,2-Difluoroethoxy)-N-1H-1,2,4-triazole-3-yl-6-(trifluoromethyl)benzenesulfonamide

CAS No: NA

Unlabeled



[Triazolopyrimidine-2-^{14}C] label



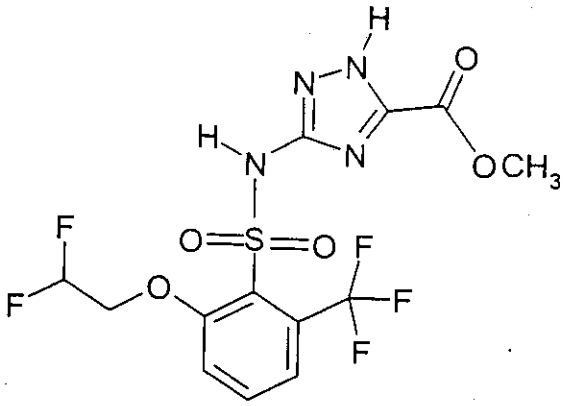
* Position of the radiolabel.

BSTCA-methyl

IUPAC name: Methyl 3-[6-(2,2-difluoroethoxy)-α,α,α-trifluoro-o-toluenesulfonamido]-s-triazole-5-carboxylate

CAS name: Methyl 3-[[[2-(2,2-difluoroethoxy)-6-(trifluoromethyl)phenyl]sulfonyl]amino]-1H-1,2,4-triazole-5-carboxylate

CAS No: NA

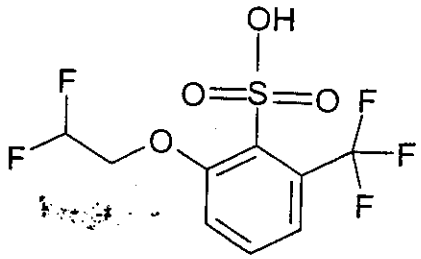


BSA

IUPAC name: 6-(2,2-Difluoroethoxy)-α,α,α-trifluoro-o-toluenesulfonic acid

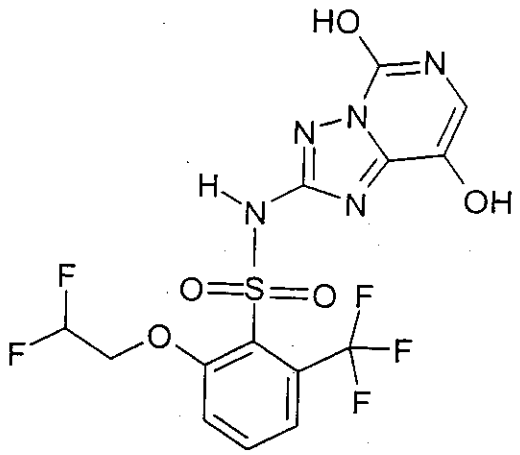
CAS name: 2-(2,2-Difluoroethoxy)-6-(trifluoromethyl)benzenesulfonic acid

CAS No: NA



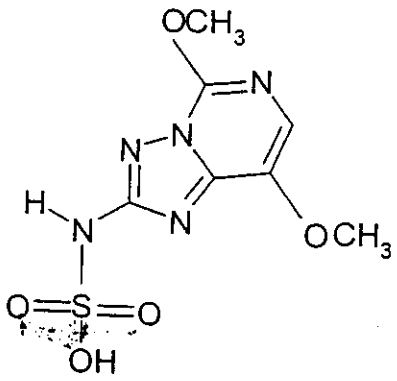
5,8-diOH

IUPAC name: NA
CAS name: 2-(2,2-Difluoroethoxy)-6-trifluoromethyl-N-(5,8-dihydroxy-[1,2,4]triazolo[1,5-c]pyrimidin-2-yl)benzenesulfonamide
CAS No: NA



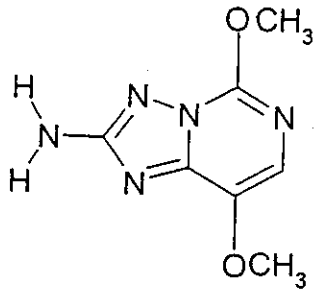
TPSA

IUPAC name: NA
CAS name: 5,8-Dimethoxy[1,2,4]triazolo-[1,5-c]pyrimidin-2-yl-sulfamic acid
CAS No: NA



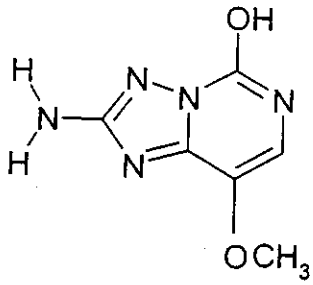
2-Amino TP

IUPAC name: 2-Amino-5,8-dimethoxy-s-triazolo[1,5-c]pyrimidine
CAS name: 5,8-Dimethoxy[1,2,4]triazolo[1,5-c]pyrimidin-2-amine
CAS No: NA



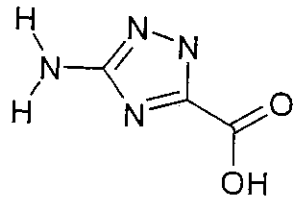
5-OH, 2-Amino TP

IUPAC name: NA
CAS name: 8-Methoxy[1,2,4]triazolo-[1,5-c]pyrimidin-5-ol-2-amine
CAS No: NA



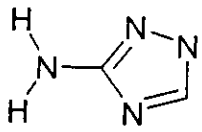
2-Amino TCA

IUPAC name:	NA
CAS name:	2-Amino-1,3,4-triazole-5-carboxylic acid
CAS No:	NA



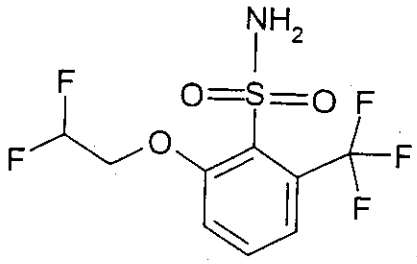
2-Amino-1,3,4-triazole

IUPAC name:	NA
CAS name:	2-Amino-1,3,4-triazole
CAS No:	NA



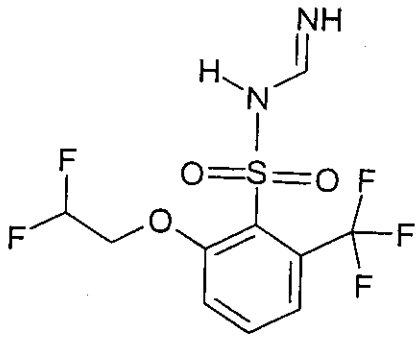
Sulfonamide

IUPAC name: 2-(2,2-Difluoroethoxy)-6-(trifluoromethyl)-benzenesulfonamide
CAS name: 2-(2,2-Difluoroethoxy)-6-(trifluoromethyl)-benzenesulfonamide
CAS No: NA



Sulfonylformamidine

IUPAC name: 2-(2,2-Difluoroethoxy)-N-[(E)iminomethyl-6-(trifluoromethyl)benzenesulfonamide
CAS name: 2-(2,2-Difluoroethoxy)-N-(iminomethyl-6-(trifluoromethyl)-benzenesulfonamide
CAS No: NA



Attachment 3

Transformation Pathway Presented by Registrant
Illustration of Test System

EFED Environmental Fate Data Base Reports in Support of

Page____ is not included in this copy.

Pages 111 through 112 are not included.

The material not included contains the following type of information:

____ Identity of product inert ingredients.

____ Identity of product impurities.

____ Description of the product manufacturing process.

____ Description of quality control procedures.

____ Identity of the source of product ingredients.

____ Sales or other commercial/financial information.

____ A draft product label.

____ The product confidential statement of formula.

✓ Information about a pending registration action.

____ FIFRA registration data.

____ The document is a duplicate of page(s) _____.

____ The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.
