



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

Office of Chemical Safety
and Pollution Prevention

Date: May 18, 2010
 Chemical: trifluralin
 PC Code: 036101
 Barcode: ~~D367525~~ and D372598
 DECISION: 417657, 425509
 PC code: 036101

MEMORANDUM

SUBJECT: Data Evaluation Records for trifluralin and degradate ecotoxicity studies.

FROM: Christine Hartless, Wildlife Biologist
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Christine Hartless *Anita Pease* 5-18-10

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Attached please find the DERs for the following ecotoxicity studies. A brief summary table and more detailed comments for each study are provided below. Please contact Christine Hartless at 703-305-5636 with any questions.

Guideline	Study Type	Test Material	MRID*	Study Classification
850.1075	Acute rainbow trout	Trifluralin degradate (TR-6)	478070-01	Acceptable
850.1075	Acute rainbow trout	Trifluralin degradate (TR-15)	478070-02	Acceptable
850.1010	Acute daphnid	Trifluralin degradate (TR-15)	478070-03	Acceptable
850.1010	Acute daphnid	Trifluralin degradate (TR-6)	478070-04	Acceptable
850.5400	96-hr <i>Selenastrum capricornutum</i>	Trifluralin degradate (TR-15)	478070-05	Acceptable
850.5400	96-hr <i>Selenastrum capricornutum</i>	Trifluralin degradate (TR-6)	478070-06	Supplemental
850.1010	Acute daphnid	Trifluralin	478070-07 479390-01 (DP barcode D372598)	Supplemental

Guideline	Study Type	Test Material	MRID*	Study Classification
850.6200	Acute earthworm	Trifluralin 480 EC (end use product containing 48% trifluralin)	478070-08	Supplemental
850.6200	Acute earthworm	Trifluralin	478070-09	Supplemental
850.6200	Acute earthworm	Trifluralin degradate (TR-4)	478070-10	Supplemental
NA	Reproduction earthworm	Elancolan (483 g trifluralin/L product)	478070-11	Supplemental
OECD 209	28-day chironomid	Trifluralin degradate (TR-4)	478070-12	Supplemental
OECD 209	28-day chironomid	Trifluralin	478070-13	Supplemental

* all studies submitted under DB barcode D367525 unless otherwise stated.

MRID 478070-01. Trifluralin Metabolite TR-6: An Acute Toxicity Study with the Rainbow Trout, *Oncorhynchus mykiss* Walbaum. Study completed September 5, 2001.

Results:

LC₅₀: 0.991 mg ai/L 95% C.I.: 0.769 to 1.40 mg ai/L (moving average method)
 Probit Slope: N/A 95% C.I.: N/A
 NOAEC: 0.858 mg ai/L (statistically determined based on mortality)
 NOAEC: 0.299 mg ai/L (visually determined based on sub-lethal effects and mortality)

MRID 478070-02. Trifluralin Metabolite TR-15: An Acute Toxicity Study with the Rainbow Trout, *Oncorhynchus mykiss* Walbaum. Study completed September 11, 2001.

Results:

LC₅₀: 6.04 mg ai/L 95% C.I.: 1.73-7.77 mg ai/L (binomial method)
 Probit Slope: N/A 95% C.I.: N/A
 NOAEC: 4.69 mg ai/L (statistically determined based on mortality)
 NOAEC: 1.04 mg ai/L (visually determined based on sub-lethal effects and mortality)

MRID 478070-03. Trifluralin Metabolite TR-15: An Acute Toxicity Study with the Daphnid, *Daphnia magna* Straus. Study completed August 14, 2001.

Results:

EC₅₀: 8.91 mg ai/L 95% C.I.: 7.80-10.1 mg ai/L (probit model)
 Probit Slope: 8.33 95% C.I.: 5.09-11.6
 NOAEC: 2.73 mg ai/L (visually determined, level at which no immobility observed)
 NOAEC: 7.65 mg ai/L (statistically determined based on immobility, Fisher's Exact Test)

MRID 478070-04. Trifluralin Metabolite TR-6: An Acute Toxicity Study with the Daphnid, *Daphnia magna* Straus. Study completed July 30, 2001.

Results:

EC₅₀: 3.52 mg ai/L 95% C.I.: 2.93-4.25 mg ai/L (probit method)
 Probit Slope: 3.87 95% C.I.: 2.71-5.03
 NOAEC: 0.755 mg ai/L (visually determined, level at which no mortality/immobility)
 NOAEC: 2.04 mg ai/L (statistically determined based on immobility, Fisher's Exact Test)

MRID 478070-05 Trifluralin metabolite TR-15: Growth inhibition test with the freshwater green alga, *Selenastrum capricornutum* PRINTZ. Study completed December 10, 2001.

Results (most sensitive parameter):

Biomass (Area Under the Growth Curve)

IC₀₅: 4.8 mg ai/L 95% C.I.: 4.0 to 5.7 mg ai/L

IC₅₀: 6.7 mg ai/L 95% C.I.: 6.3 to 7.2 mg ai/L

Slope: 11.0 ± 1.89

NOAEC: 0.952 mg ai/L

MRID 478070-06. Trifluralin metabolite TR-6: Growth inhibition test with the freshwater green alga, *Selenastrum capricornutum* PRINTZ. Study completed January 15, 2002.

Results (most sensitive parameter):

Biomass (Area Under the Growth Curve)

IC₀₅: NA* 95% C.I.: NA

IC₅₀: 4.6 mg ai/L 95% C.I.: 4.1 to 5.1 mg ai/L

Slope: 3.39 ± 0.624

NOAEC: <0.065 mg ai/L

*NA – value estimated by the Bruce-Versteeg method was not representative of the data and the reviewer recommends not reporting or using this value

Reason for supplemental classification:

The reviewer's analysis detected a significant effect ($p < 0.05$) of the solvent on algal cell density and biomass parameters and noted that the fit of the Bruce-Versteeg model to the data for cell density and biomass was poor and not representative of the raw data. Neither a NOAEC nor an IC₀₅ could be established for this parameter. Reported results can be used qualitatively in risk characterization but cannot be used quantitatively for risk estimation.

MRID 478070-07 (DP barcode D367525)

MRID 479390-01 (DP barcode D372598)

Evaluation of the Acute Toxicity of Trifluralin Technical to Exposed Daphnia (*Daphnia magna*). Study completed May 25, 1999

Results:

EC₅₀: 251 µg ai/L 95% C.I.: (219, 288) µg ai/L (moving average method)

NOAEC: 130 µg ai/L

Probit Slope: NA

Reason for supplemental classification:

Poor husbandry caused loss of two daphnids during the test (lost during transfer to renewal test solutions). This study is scientifically sound and is classified as Supplemental; however, it is suitable for use in risk estimation.

MRID 478070-08

EF-1521 (Trifluralin 480 EC) Acute Toxicity (LC₅₀) to the Earthworm (*Eisenia foetida*). Study completed November 1, 1999.

Results:

Mortality

LC₅₀: ≥480 mg ai/kg dw soil 95% C.I.: N/A

NOAEC: 267 mg ai/kg dw soil

Sublethal (weight gain)

IC₅₀: ≥480 mg ai/kg dw soil 95% C.I.: N/A

NOAEC: 82 mg ai/kg dw soil; based on % weight gain

Reason for supplemental classification:

This study is scientifically sound and classified as a Supplemental non-guideline study (although it follows OECD 207, EPA does not have a guideline for a 14-day earthworm test, 850.6200 is a 28-day test).

MRID 478070-09 Trifluralin Technical: Acute Toxicity (LC₅₀) to the Earthworm (*Eisenia foetida*). Study completed April 29, 1999.

Results:

Mortality

LC₅₀: >1000 mg ai/kg dw soil 95% C.I.: N/A

NOAEC: 1000 mg ai/kg dw soil

Sublethal (weight gain)

IC₅₀: >1000 mg ai/kg dw soil 95% C.I.: N/A

NOAEC: <95 mg ai/kg dw soil; based on % weight gain

Reason for supplemental classification:

This study is scientifically sound and classified as a Supplemental non-guideline study (although it follows OECD 207, EPA does not have a guideline for a 14-day earthworm test, 850.6200 is a 28-day test).

MRID 478070-10. Trifluralin Metabolite TR-4: 14 Day Soil Exposure Acute Toxicity Test in the Earthworm, *Eisenia foetida*. Study completed October 9, 2003.

Results:

Mortality*

LC₅₀: 186 mg ai/kg dw soil 95% C.I.: (100, 320) mg ai/kg dw soil

NOAEC: 100 mg ai/kg dw soil

LOAEC: 180 mg ai/kg dw soil

*LC₅₀ determined via binomial method, CI determined visually

Percent weight gain

IC₅₀: >180 mg ai/kg dw soil 95% C.I.: N/A

NOAEC: 100 mg ai/kg dw soil

LOAEC: 180 mg ai/kg dw soil

Reason for supplemental classification:

This study is scientifically sound and classified as a Supplemental non-guideline study (although it follows OECD 207, EPA does not have a guideline for a 14-day earthworm test, 850.6200 is a 28-day test).

MRID 478070-11. Effects of Elancolan Regarding Reproduction and Development of *Eisenia fetida*. Study completed December 19, 1994.

Results:

Mortality

LC₅₀: > 28.98 mg trifluralin/kg-dry soil 95% C.I.: N/A

NOAEC = 28.98 mg trifluralin/kg-dry soil

Sub-lethal (weight change and reproduction)

IC₅₀: >28.98 mg trifluralin/kg-dry soil 95% C.I.: N/A

NOAEC: 28.98 mg trifluralin/kg-dry soil

Reason for supplemental classification:

This study is scientifically sound and classified as a Supplemental non-guideline study (although it follows BBA SOP No. RAS03, EPA does not have a guideline earthworm reproduction test). It was conducted using an end-use product not registered in the United States.

MRID 478070-12. Revised Report for Trifluralin TR-4 Metabolite: Chronic Toxicity Study with the Midge, *Chironomus riparius*, Using Spiked Water in a Sediment-Water Exposure System. May 17, 2004 (revised)

Results: (reported as nominal concentrations in overlying water)

Percent Emergence

EC₅₀: 3.8 mg/L (probit) 95% C.I.: 3.5 to 4.2 mg/L

Slope: 5.70±0.612

NOAEC: 0.8305 mg/L

LOAEC: 2.077 mg/L

Development Rate (♂ & ♀)

IC₅₀: >5.195 mg/L 95% C.I.: N/A

Slope: N/A

NOAEC: 2.077 mg/L

LOAEC: 5.195 mg/L

Reason for supplemental classification:

This study is scientifically sound and classified as a Supplemental non-guideline study (study followed OECD 219). It is suitable for use in risk assessment and characterization

MRID 478070-13. Assessment of Side Effects of Trifluralin Technical on the Larvae of the Midge, *Chironomus riparius* with the Laboratory Test Method. November 11, 1996

Results (reported as nominal concentrations in overlying water):

Emergence Percentage (nominal concentrations)

NOAEC: 2.0 mg ai/L

LOAEC: 4.0 mg ai/L

EC₅₀: 6.9 mg ai/L

95% C.I.: (4.6 to 10 mg ai/L)

Development Rate (nominal concentrations)

NOAEC: 0.25 mg ai/L

LOAEC: 0.5 mg ai/L

IC₅₀: >8.0 mg ai/L

Reason for supplemental classification.

This study is classified as a Supplemental non-guideline study (study followed OECD 219). This study can be used in risk characterization, but it should not be used in risk estimation as there were concerns regarding the actual exposure concentrations. Some reasons this study should not be used for risk estimation:

- concentration in pore water was not measured
- concentrations in sediment were reported as mg/vessel and it was not possible to convert those values to mg/kg-dry wt of sediment
- trifluralin was detected on the film over the vessels, indicating material volatilized out of the water
- measured concentrations in overlying water did not increase consistently as nominal concentrations increased (*e.g.*, in the nominal concentrations of 1.0 and 2.0 mg/L, the measured concentrations were 0.107 and 0.058 mg/L, respectively). There was uncertainty regarding the actual exposure concentrations in the study vessels.