1-9-89

DATA EVALUATION RECORD

1. Chemical: 2,4-DP (Dichlorprop)

2. Test Material: 33.0%

3. Study Type: 96-Hour LC_{50}

   Species Tested: Bluegill Sunfish and Rainbow Trout

4. Study ID: Union Carbide (1977) Acute Toxicity of Amchem 76-A510 to the Bluegill Sunfish (Lepomis macrochirus) Rafinesque and Rainbow Trout (Salmo gairdneri) Richardson; Project No. 11506-24-02-BT; Prepared by Union Carbide for Amchem Products, Inc.

5. Reviewed By: Curtis E. Laird, Fishery Biologist, EEB/HED — Signature: Curtis E. Laird — Date: 4-11-88

6. Approved By: Norman J. Cook, Biologist, EEB/HED — Signature: Norman J. Cook — Date: 1.9.89

7. Conclusions:

This study indicates 2,4-DP is moderately toxic to both bluegill sunfish and rainbow trout with an LC_{50} of 2.4 and 5.22 ppm respectively. This study does not fulfill the requirement in support of registration because a formulated product was used instead of technical grade material.

8. Recommendations:

The registrant should conduct another study using the technical grade material of each active ingredient in the product.

9. Background:

This study is being reviewed in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

Also in 2,4-DMCPP-(2)

11. Material and Methods:

a. Test Animals - Test animals were bluegill sunfish from Nebraska and rainbow trout from Washington; weight = 0.59 g for bluegill and 0 76 g for trout.

b. Test Design - Fish were tested in 5.0 gallon glass jars with 15 liters of test solution; temperature was 12°C and 22°C respectively.

c. Dose - Static bioassay using nominal concentration; acetone was used as a solvent.

d. Design - Ten fish per dose level; five dose levels plus positive and negative controls (0, Acetone, 1.0, 1.8, 3.2, 5.6, and 10 ppm).

e. Statistics - Spearman-Karber

12. Reported Results:

The study author found the 96-hour LC_{50}'s to be 2.4 and 5.22 ppm.

13. Study Authors' Conclusions:

The 96-hour LC_{50}'s were 2.4 ppm for bluegill sunfish and 5.22 ppm for rainbow trout.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982 except a formulated product was used instead of technical grade material.

b. Statistical Analysis - The binominal test showed the LC_{50} to be 2.4 for bluegill and 5.22 ppm for rainbow trout.

c. Discussion/Results - 2,4-DP is moderately toxic to both warm and coldwater fish with an LC_{50} of 2.4 and 5.22 ppm.

d. Adequacy of Study

1) Category - Supplementary

2) Rationale - See section 7 above

3) Reparability - Not repairable

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

Laird 2-4-DP Bluegill Sunfish 12-28-87; 73045

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
10	10	10	100	9.765625E-02
5.6	10	10	100	9.765625E-02
3.2	10	10	100	9.765625E-02
1.8	10	0	0	9.765625E-02
1	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 1.8 AND 3.2 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 2.4

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

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Laird 2-4-DP Rainbow Trout 12-28-87 73047

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
10	10	10	100	9.765625E-02
5.6	10	6	60.00001	37.69531
3.2	10	0	0	9.765625E-02
1.8	10	0	0	9.765625E-02
1	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 3.2 AND 10 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 5.216388

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

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CASE GS0096 PM 23

CHEM 2,4-DP

BRANCH EEB X DISC

FORMULATION

FICHE/MASTER ID 25809

CITATION: Gyrd-Hansen, N.; Dalgaard-Mikkelsen, S. (1974) The effect of Phenoxy-herbicides on the hatchability of eggs and the viability of the chicks. Acta Pharmacologica et Toxicologica 35(?):300-308. (Also in unpublished submission received January 2, 1980 under 2217-485; submitted by PBI-Gordon Corp., Kansas City, Kansas; CDL:241581-L).

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Validation Category: Invalid

DIRECT RVW TIME = 1.0 (MH) START DATE 10-26-87 END DATE 10-26-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biologist
ORG: EEB/EFED
LOC/TEL: Crystal City, Va.; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

This study is not pertinent to the Registration Standard.

"invalid"

TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP

BRANCH EEB ____ DISC ____

FORMULATION unknown

FICHE/MASTER ID 68083

CITATION: Davis, J.T. (1963) Variations in Toxicity to Bluegill Sunfish of Phenoxy Herbicide; Vol. II.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Validation Category: Invalid

DIRECT RVW TIME = 1.0 (MH) START DATE 12-18-87 END DATE 12-18-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biologist
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

This study is not pertinent to the Registration Standard. Also this report is not legible.

TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION 23.6%

FICHE/MASTER ID 129401

CITATION: LeBlanc, G.A. (1983) Acute Toxicity of Weedone CB to (Daphnia magna); Report No. BW-83-6-1416; Prepared by EG&G Bionomics for Union Carbide Agriculture Products Company, Inc., Research Triangle Park, North Carolina.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Validation Category: Supplementary

DIRECT RVW TIME = 3.0 (MH) START DATE 12-22-87 END DATE 12-22-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE:

APPROVED BY: Norman J. Cook
TITLE: Supv. Biologist
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

9

DATA EVALUATION RECORD

1. Chemical: 2,4-DP

2. Test Material: 23.6%

3. Study Type: 48-Hour LC_{50}

   Species Tested: Daphnia magna

4. Study ID: LeBlanc, G.A. (1983) Acute Toxicity of Weedone CB to Daphnia magna; Report No. BW-83-6-1416. Prepared by EG&G Bionomics for Union Carbide Agriculture Products Company, Inc., Research Triangle Park, North Carolina.

5. Reviewed By: Curtis E. Laird
   Fishery Biologist
   EEB/HED
   Signature: Curtis E. Laird
   Date: 4-11-88

6. Approved By: Norman J. Cook
   Biologist
   EEB/HED
   Signature: Norman J. Cook
   Date: 1.9.89

7. Conclusions:

   This study indicates 2,4-DP is moderately toxic to Daphnia magna with an LC_{50} of 5.4 (4.4 to 6.8) ppm. However, this study does not fulfill the requirement in support of registration for an aquatic invertebrate study because a formulated product was used.

8. Recommendations:

   The registrant should conduct another study using the technical grade material.

9. Background:

   This study was reviewed in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were Daphnia magna from laboratory stock; age was first instar (< 24 hours old).

b. Test Design - Daphnids were tested in a 250 mL glass beaker with 200 mLs of test solution: temperature was 21 °C.

c. Dose - Static bioassay using nominal concentration; DMF was used as a solvent.

d. Design - Fifteen daphnids per dose level; five dose levels plus control (DMF, 1.3, 2.2, 3.6, 6.0, and 10 ppm).

e. Statistics - Stephan's 1978

12. Reported Results:

The study author found the 48-hour LC_{50} to be 5.5 (4.3 to 7.5) ppm. The no-observed-effect level was < 1.3 ppm.

13. Study Authors' Conclusions:

The 48-hour LC_{50} was 5.5 ppm.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982 except a formulated product was used instead of technical grade material.

b. Statistical Analysis - Probit method showed the 48-hour LC_{50} to be 5.4 (4.4 to 6.8) ppm.

c. Discussion/Results - This study indicated 2,4-DP is moderately toxic to daphnia with an LC_{50} of 5.4 ppm.

d. Adequacy of Study

1) Category - Supplementary (core for formulated product)

2) Rationale - See section 7 above

3) Reparability - Not repairable

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

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Laird 2-4-DP Daphnia magna 01-12-88; 129401

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
10	15	12	80	1.757812
6	15	12	80	1.757812
3.6	15	1	6.666666	4.882813E-02
2.2	15	1	6.666666	4.882813E-02
1.3	15	0	0	3.051758E-03

THE BINOMIAL TEST SHOWS THAT 3.6 AND 6 CAN BE
USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 4.928358

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	.2047046	5.547098	4.285076	7.853174

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
3	.1570623	1	9.897309E-02

SLOPE = 4.48009
95 PERCENT CONFIDENCE LIMITS = 2.704582 AND 6.255599

LC50 = 5.427347
95 PERCENT CONFIDENCE LIMITS = 4.421246 AND 6.844825

LC10 = 2.825603
95 PERCENT CONFIDENCE LIMITS = 1.790926 AND 3.591186

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TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION 23.6%

FICHE/MASTER ID 129399

CITATION: LeBlanc, G.A. (1983) Acute Toxicity of Weedone CB to Bluegill Sunfish (Lepomis macrochirus); Report No. BW-83-6-1408; Prepared by EG&G Bionomics for Union Carbide Agriculture Products Company, Inc., Research Triangle Park, North Carolina.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Category: Supplementary - A formulated product was used.

DIRECT RVW TIME = 3.0 (MH) START DATE 12-21-87 END DATE 12-21-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman. J. Cook
TITLE: Supv. Biologist
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

DATA EVALUATION RECORD

1. Chemical: 2,4-DP

2. Test Material: Unknown

3. Study Type: 96-Hour LC_{50}

   Species Tested: Bluegill Sunfish (Lepomis macrochirus)

4. Study ID: LeBlanc, G.A. (1983) Acute Toxicity of Weedone CB to Bluegill Sunfish (Lepomis macrochirus); Report No. BW-83-6-1408. Prepared by EG&G Bionomics for Union Carbide Agriculture Products Company, Inc., Research Triangle Park, North Carolina.

5. Reviewed By: Curtis E. Laird, Fishery Biologist, EEB/HED — Signature: Curtis E. Laird — Date: 4-11-88

6. Approved By: Norman J. Cook, Biologist, EEB/HED — Signature: Norman J. Cook — Date: 1.9.89

7. Conclusions:

This study indicates 2,4-DP is moderately toxic to bluegill sunfish with an LC_{50} of 2.4 ppm. This study does not fulfill the requirement in support of registration for a warmwater fish study because a formulated product was used.

8. Recommendations:

This study cannot be upgraded to core. The registrant should conduct another study using the technical grade material.

9. Background:

This study was submitted in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were bluegill sunfish (Lepomis macrochirus) from a commercial supplier in Nebraska; weight = 0.75; standard length = 39 mm.

b. Test Design - Fish were tested in 19.6 liter glass jars with 15 liters of test solution; temperature was 21 °C; 16 hours of light and 8 hours of darkness.

c. Dose - Static bioassay using nominal concentrations; DMF was used as a solvent.

d. Design - Ten fish per dose level; five dose levels plus controls (0, DMF, 1.7, 2.8, 4.7, 7.8, and 13 ppm).

e. Statistics - Stephan 1978

12. Reported Results:

The study author found the 96-hour LC_{50} to be 2.4 ppm. The no-observed-effect level was not determined.

13. Study Authors' Conclusions:

The 96-hour LC_{50} was 2.4 ppm. There was no Quality Assurance statement in this report.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982 except a formulated product was used instead of technical grade material.

b. Statistical Analysis - The binomial test showed the 96-hour LC_{50} value to be approximately 2.4 ppm.

c. Discussion/Results - 2,4-DP is moderately toxic to bluegill sunfish with an LC_{50} of 2.4 ppm.

d. Adequacy of Study

1) Category - Supplementary (core for formulated product)

2) Rationale - See section 7 above

3) Reparability - Not repairable

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

1AIRD 2-4-DP BLUEGILL SUNFISH 12-21-87 ; 129399

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
13	10	10	100	9.765625E-02
7.8	10	10	100	9.765625E-02
4.7	10	10	100	9.765625E-02
2.8	10	8	80	5.46875
1.7	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 1.7 AND 4.7 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 2.393035

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

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TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION 23% ai

FICHE/MASTER ID 129400

CITATION: LeBlanc, G.A. (1983) Acute Toxicity of Weedone CB to Rainbow Trout (Salmo gairdneri); Report No. BW-83-6-1411; Prepared by EG&G Bionomics for Union Carbide Agriculture Products Company, Inc., Research Triangle Park, North Carolina.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Category: Supplementary - A formulated product was used.

DIRECT RVW TIME = 3.0 (MH) START DATE 12-21-87 END DATE 12-21-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biologist
ORG: EEB/EFED
LOC/TEL: Crystal City, Va.; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

12

DATA EVALUATION RECORD

1. Chemical: 2,4-DP

2. Test Material: 23.0% (formulated product)

3. Study Type: 96-Hour LC_{50}

   Species Tested: Rainbow Trout (*Salmo gairdneri*)

4. Study ID: LeBlanc, G.A. (1983) Acute Toxicity of Weedone CB to Rainbow Trout (*Salmo gairdneri*): Report No. BW-83-6-1411. Prepared by EG&G Bionomics for Union Carbide Agriculture Products Company, Inc., Research Triangle Park, North Carolina.

5. Reviewed By: Curtis E. Laird, Fishery Biologist, EEB/HED — Signature: Curtis E. Laird — Date: 4-11-88

6. Approved By: Norman J. Cook, Biologist, EEB/HED — Signature: Norman J. Cook — Date: 1.9.89

7. Conclusions:

This study indicates 2,4-DP is moderately nontoxic to rainbow trout with an LC_{50} of 6.1 ppm. However, this study does not fulfill the requirement in support of registration for a coldwater fish study because a formulated product was used. This study can be used to support a formulated product.

8. Recommendations:

The registrant should conduct another fish study using technical grade material of each active ingredient in the product.

9. Background:

This study was submitted in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were rainbow trout (Salmo gairdneri) from a commercial supplier in Montana; weight = 0.5 g; standard length = 38 mm.

b. Test Design - Fish were tested in 19.6 liter glass jars with 15 liters of test solution; temperature was 12 + 1 °C; photoperiod was 16 hours light and 8 hours of darkness.

c. Dose - Static bioassay using nominal concentrations; DMF was used as a solvent.

d. Design - Ten fish per dose level; five dose levels plus controls (0, DMF, 1.7, 2.8, 4.7, 7.8, and 13 ppm).

e. Statistics - The binomial test showed the 96-hour LC_{50} value to be approximately 6.1 ppm.

12. Reported Results:

The study author found the 96-hour LC_{50} to be 6.0 ppm.

13. Study Authors' Conclusions:

The 96-hour LC_{50} was 6.0 ppm. The no-observed-effect level was 1.7 ppm.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982 except a formulated product was used instead of technical grade material.

b. Statistical Analysis - The statistics were verified with Stephan's program.

c. Discussion/Results - 2,4-DP is moderately toxic to rainbow trout with an LC_{50} of 6.1 ppm.

d. Adequacy of Study

1) Category - Supplementary (core for formulated product)

2) Rationale - See section 7 above

3) Reparability - Not repairable

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

Laird 2-4-DP Rainbow trout 12-21-87; 129400

****

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
13	10	10	100	9.765625E-02
7.8	10	10	100	9.765625E-02
4.7	10	0	0	9.765625E-02
2.8	10	1	10	1.074219
1.7	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 4.7 AND 7.8 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 6.05475

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

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TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 21

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION 100%

FICHE/MASTER ID 72920

CITATION: Fink, R. (1976) Eight-Day Dietary LC_{50} Bobwhite Quail; Project No. 103-157; Prepared by Wildlife International Ltd., for Dow Chemical U.S.A.

SUBST. CLASS

OTHER SUBJECT DESCRIPTORS
PRIM:

Category: Core

DIRECT RVW TIME = 3.0 (MH) START DATE 12-18-87 END DATE 12-18-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biologist
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

DATA EVALUATION RECORD

1. Chemical: 2,4-DP

2. Test Material: 100% (technical ai)

3. Study Type: Eight-Day Dietary LC_{50}

   Species Tested: Bobwhite Quail (*Colinus virginianus*)

4. Study ID: Fink, R. (1976) Eight-Day Dietary LC_{50} Bobwhite Quail; Project No. 103-157; Prepared by Wildlife International Ltd., for Dow Chemical U.S.A.

5. Reviewed By: Curtis E. Laird, Fishery Biologist, EEB/HED — Signature: Curtis E. Laird — Date: 4-11-88

6. Approved By: Norman J. Cook, Biologist, EEB/HED — Signature: Norman J. Cook — Date: 1.9.89

7. Conclusions:

   This study indicates 2,4-DP is practically nontoxic to bobwhite quail with an LC_{50} > 10,000 ppm. This study does fulfill the requirement in support of registration for an avian dietary LC_{50} study.

8. Recommendations: N/A

9. Background:

   This study was submitted in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were bobwhite quail from production flock; age = 14 days.

b. Test Design - Birds were tested in battery brooders; temperature was 99 °F.

c. Dose - Nominal dietary concentrations were used; corn oil was used as a carrier.

d. Design - Ten birds per dose level; five dose levels plus control (0, 464, 1000, 2150, 4640, and 10,000 ppm).

e. Statistics - Litchfield and Wilcoxon

12. Reported Results:

The study author found the eight-day dietary LC_{50} to be > 10,000 ppm.

13. Study Authors' Conclusions:

The eight-day dietary LC_{50} was > 10,000 ppm.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982 except the photoperiod and humidity was unknown.

b. Statistical Analysis - Litchfield and Wilcoxon

c. Discussion/Results - 2,4-DP is practically nontoxic to bobwhite quail with an LC_{50} > 10,000 ppm.

d. Adequacy of Study

1) Category - Core

2) Rationale - N/A

3) Reparability - N/A

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP (2-butoxyethyl, ester)

BRANCH EEB X DISC ____

FORMULATION 59.1%

FICHE/MASTER ID 63066

CITATION: Seminara, J. (1980) The Acute Toxicity of Weedone 2,4-DP to Rainbow Trout; Project No. 11504-1415; Prepared by Union Carbide Corporation for Union Carbide Corporation, Terrytown, New York 10591.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Category: Supplenental (core for formulated product)

DIRECT RVW TIME = 4.0 (MH) START DATE 01-28-88 END DATE 01-28-88

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biologist
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

DATA EVALUATION RECORD

1. Chemical: 2,4-DP

2. Test Material: 59.1% ai

3. Study Type: 96-Hour LC_{50}

   Species Tested: Rainbow Trout (Salmo gairdneri)

4. Study ID: Seminara, J. (1980) The Acute Toxicity of Weedone 2,4-DP Rainbow Trout; Project No. 11504-14-15; Prepared by Union Carbide Corporation for Union Carbide Corporation, Terrytown, New York 10591.

5. Reviewed By: Curtis E. Laird, Fishery Biologist, EEB/HED — Signature: Curtis E. Laird — Date: 4-11-88

6. Approved By: Norman J. Cook, Biologist, EEB/HED — Signature: Norman J. Cook — Date: 1.9.89

7. Conclusions:

This study indicates 2,4-DP is moderately toxic to rainbow trout with an LC_{50} of 2.7 ppm. This study does not fulfill the requirement in support of registration because a formulated product was used instead of technical grade material. This study cannot be upgraded to core. This study can be used to support a formulated product.

8. Recommendations:

The registrant should submit another coldwater fish study using technical grade material.

9. Background:

The study was submitted to support 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were rainbow trout from UCCES Laboratory in Washington; age = 4 months; weight was 0.35 g; SL = 37 mm.

b. Test Design - Fish were tested in 19.6 liter glass jars with 15 liters of test solution; temperature was 12 °C.

c. Dose - Static bioassay using nominal concentrations; no solvent used.

d. Design - Ten fish per dose level; five dose levels plus control (0, 0.56, 1.0, 1.8, 3.2, and 5.6 ppm).

e. Statistics - Spearman-Karber

12. Reported Results:

The study author found the 96-hour LC_{50} to be 1.49 ppm.

13. Study Authors' Conclusions:

The 96-hour LC_{50} was 1.49 ppm. There was no Quality Assurance statement in this report.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982 except a formulated product was used instead of technical grade material.

b. Statistical Analysis - The binomial test showed the 96-hour LC_{50} value to be approximately 2.7 ppm.

c. Discussion/Results - 2,4-DP is moderately toxic to rainbow trout with an LC_{50} of 2.7 ppm.

d. Adequacy of Study

1) Category - Supplementary (core for formulated product).

2) Rationale - N/A

3) Reparability - N/A

15. Completion of One-Liner:

16. CBI Appendix: N/A

Laird 2-4-DP Rainbow Trout 12-15-87; 031401; Study No. 63066

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
5.6	10	10	100	9.765625E-02
3.2	10	8	80	5.46875
1.8	10	0	0	9.765625E-02
1	10	0	0	9.765625E-02
.56	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 1.8 AND 5.6 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 2.669938

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

****

TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION 100%

FICHE/MASTER ID 72919

CITATION: Batchelder, T.L. (1976) Toxicity of Dichlorprop Ethanol Ester, to Rainbow Trout; Project No. unknown; Prepared by T.L. Batchelder, Environmental Sciences Research, Dow Chemical Company.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Validation Category: Supplemental

DIRECT RVW TIME = 4.0 (MH) START DATE 12-23-87 END DATE 12-23-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA: 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biol.
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

Oh ✓

DATA EVALUATION RECORD

1. Chemical: 2,4-DP

2. Test Material: 100% (technical ai)

3. Study Type: 96-Houo LC_{50}

   Species Tested: Rainbow Trout (*Salmo gairdneri*)

4. Study ID: Batchelder, T.L. (1976) Toxicity of Dichlorprop Ethanol Ester to Rainbow Trout; Project No. unknown; Prepared by T.L. Batchelder, Environmental Sciences Research, Dow Chemical Company.

5. Reviewed By: Curtis E. Laird, Fishery Biologist, EEB/HED — Signature: Curtis E. Laird — Date: 4-11-88

6. Approved By: Norman J. Cook, Biologist, EEB/HED — Signature: Norman J. Cook — Date: 1.9.89

7. Conclusions:

This study indicates 2,4-DP is highly toxic to rainbow trout with a reported LC_{50} of 0.50 ppm. This study does not fulfill the requirement in support of registration for a coldwater fish study because one dose level was used.

8. Recommendations:

The registrant should conduct another coldwater fish study using at least five dose levels, ten fish per dose level, and submit mortality data for each dose level tested.

9. Background:

This study was submitted in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were rainbow trout from Harrison, Michigan; weight = 1.84 g; SL = 46.9 mm.

b. Test Design - Fish were tested in 10 liter glass aquariums; temperature was 12 °C, 10-hour light and 14-hour darkness.

c. Dose - Static bioassay using nominal concentrations; acetone was used as a solvent.

d. Design - Ten fish per dose level; one dose level.

e. Statistics - Probit analysis

12. Reported Results:

The study author found the 96-hour LC_{50} to be 0.50 ppm.

13. Study Authors' Conclusions:

The 96-hour LC_{50} was 0.50 ppm. The no-effect-level was not mentioned.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982 except one dosage level was used instead of four or five dosage levels.

b. Statistical Analysis - No statistics were performed due to lack of mortality data.

c. Discussion/Results - 2,4-DP appears to be highly toxic to rainbow trout with a reported LC_{50} of 0.50 ppm.

d. Adequacy of Study

1) Category - Supplementary (supplemental for formulated product)

2) Rationale - See section 7 above

3) Reparability - Not repairable to core

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION 59.1%

FICHE/MASTER ID 77321

CITATION: Browne, A.M. (1980) The Acute Toxicity of Weedone 2,4-DP to the Water Flea Daphnia magna Straus; Project No. 11504-25-18; Prepared by Union Carbide Corporation for Union Carbide, South Charleston, West Virginia 25303.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Validation Category:

DIRECT RVW TIME = 4.0 (MH) START DATE 12-22-87 END DATE 12-22-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biol.
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

OK

DATA EVALUATION RECORD

1. Chemical: 2,4-DP

2. Test Material: 59.1% (formulated), a yellow liquid

3. Study Type: 48-Hour LC_{50}

   Species Tested: Daphnia magna

4. Study ID: Browne, A.M. (1980) The Acute Toxicity of Weedone 2,4-DP to the Water Flea Daphnia magna Straus; Project No. 11504-25-18; Prepared by Union Carbide Corporation for Union Carbide, South Charleston, West Virginia 25303.

5. Reviewed By: Curtis E. Laird
   Fishery Biologist
   EEB/HED
   Signature: Curtis E. Laird
   Date: 4-11-88

6. Approved By: Norman J. Cook
   Biologist
   EEB/HED
   Signature: Norman J. Cook
   Date: 1.9.89

7. Conclusions:

This study indicates 2,4-DP is very highly toxic to Daphnia magna with an LC_{50} of 0.005 ppm. This study does not fulfill the requirement in support of registration because a formulated product was used. However, this study can be used to support a formulated product, plus a mixture of two active ingredients.

8. Recommendations:

The registrant should conduct another study using technical grade material of each active ingredient in the product.

9. Background:

This study was reviewed in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were less than 20 hours old Daphnia magna for laboratory culture.

b. Test Design - Daphnids were tested in 250 mL glass beakers with 200 mL of test solution; temperature was 20.3 °C.

c. Dose - Static bioassay using nominal concentrations; no solvent used.

d. Design - Twenty daphnids per dose level; six dose levels plus control (0, 0.48, 0.84, 1.48, 2.60, 4.56, and 8.0 ppb).

e. Statistics - Thompson

12. Reported Results:

The study author found the 48-hour LC_{50} to be 6.25 ppb. The no-effect-level was 2.60 ppb.

13. Study Authors' Conclusions:

The 48-hour LC_{50} value was 6.25 ppb. There was no Quality Assurance statement mentioned in this study.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982 except a formulated product was used instead of technical grade material.

b. Statistical Analysis - Probit analysis showed the 48-hour LC_{50} to be 5.3 ppb.

c. Discussion/Results - 2,4-DP is very highly toxic to Daphnia magna with an LC_{50} of 5.3 ppb or 0.005 ppm.

d. Adequacy of Study

1) Category - Supplementary (core for formulated product)

2) Rationale - See section 7 above

3) Reparability - Not repairable

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

THIS LINE IS COMPRESSED AT 17 CHARACTERS PER INCH.
IS THIS ACCEPTABLE?
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Laird 2-4-DP Daphnia magna 01-28-88 ; 77321

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
8	20	19	95	2.002716E-03
4.56	20	5	25	2.069473
2.6	20	0	0	9.536742E-05
1.48	20	0	0	9.536742E-05
.84	20	0	0	9.536742E-05
.48	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT 4.56 AND 8 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 5.471003

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
2	6.572952E-02	5.319113	4.694134	6.159251

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
7	.1967041	1	.9999068

SLOPE = 9.633292
95 PERCENT CONFIDENCE LIMITS = 5.360799 AND 13.90579

LC50 = 5.376532
95 PERCENT CONFIDENCE LIMITS = 4.719537 AND 6.166854

LC10 = 3.968879
95 PERCENT CONFIDENCE LIMITS = 3.00184 AND 4.55346

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TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION 100%

FICHE/MASTER ID 72919

CITATION: Fink, R. (1976) Acute Oral LD_{50} Mallard Duck; Project No. 103-159; Prepared by Wildlife Internationad Ltd., for Dow Chemical U.S.A.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Validation Category: Invalid

DIRECT RVW TIME = 3.0 (MH) START DATE 12-22-87 END DATE 12-22-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biol.
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J Cook DATE: 1.9.89

DATA EVALUATION RECORD

1. Chemical: 2,4-DP

2. Test Material: 100% (technical ai)

3. Study Type: Avian Acute Oral LD_{50}

   Species Tested: Mallard Duck (Anas Platyrhynchos)

4. Study ID: Fink, R. (1976) Acute Oral LD_{50} Mallard Duck; Project No. 103-159; Prepared by Wildlife International Ltd., for Dow Chemical U.S.A.

5. Reviewed By: Curtis E. Laird, Fishery Biologist, EEB/HED — Signature: Curtis E. Laird — Date: 4-11-88

6. Approved By: Norman J. Cook, Biologist, EEB/HED — Signature: Norman J. Cook — Date: 1.9.89

7. Conclusions:

This study indicates 2,4-DP is practically nontoxic to mallard duck with an $LD_{50} > 4640$ mg/kg. However, this study does not fulfill the requirement in support of registration for an avian acute oral LD_{50} study because the birds were too young, the study period was 8 days instead of 14 days, and food was not withheld 15 hours prior to dosing.

8. Recommendations:

The registrant should conduct another study using birds at least 16 weeks old. The study period should last 14 days instead of 8.

9. Background:

This study was submitted in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were mallard ducks from Wildlife International LTD Production flock; age = 14 days.

b. Test Design - Birds were tested in beacon battery brooders; temperature was 99 °F.

c. Dose - Birds were dosed based on mg of food per kg of body weight; corn oil was used as a carrier.

d. Design - Ten birds per dose level; five dose levels plus control (0, 215, 464, 1000, 2150, and 4640 mg/kg).

e. Statistics - No statistics were performed due to lack of mortality data.

12. Reported Results:

The study author found the acute oral LD_{50} to be > 4640 mg/kg.

13. Study Authors' Conclusions:

The acute oral LD_{50} was > 4640 mg/kg.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure did not comply with the recommended EPA protocol of October 1982.

b. Statistical Analysis - No statistics were performed due to lack of mortality data.

c. Discussion/Results - 2,4-DP is practically nontoxic to mallard duck with an LD_{50} > 4640 mg/kg.

d. Adequacy of Study

1) Category - Invalid

2) Rationale - See section 7 above

3) Reparability - Not repairable

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 21

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION 100%

FICHE/MASTER ID 68084

CITATION: Fink, R. (1976) Eight-Day Dietary LC_{50} Bobwhite Quail; Project No. 103-157; Prepared by Wildlife International Ltd., for Dow Chemical U.S.A.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Validation Category: Core

DIRECT RVW TIME = 3.0 (MH) START DATE 12-22-87 END DATE 12-22-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biol.
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

DATA EVALUATION RECORD

1. Chemical: 2,4-DP

2. Test Material: 100% (technical ai), a brown liquid

3. Study Type: Eight-Day Dietary LC_{50}

   Species Tested: Bobwhite Quail (Colinus virginianus)

4. Study ID: Fink, R. (1976) Eight-Day Dietary LC_{50} Bobwhite Quail; Project No. 103-157: Prepared by Wildlife International Ltd., for Dow Chemical U.S.A.

5. Reviewed By: Curtis E. Laird, Fishery Biologist, EEB/HED — Signature: Curtis E. Laird — Date: 4-11-88

6. Approved By: Norman J. Cook, Biologist, EEB/HED — Signature: Norman J. Cook — Date: 1.9.89

7. Conclusions:

   This study indicates 2,4-DP is practically nontoxic to bobwhite quail with an LC_{50} > 10,000 ppm. This study does fulfill the requirement in support of registration for an avian dietary LC_{50} study.

8. Recommendations: N/A

9. Background:

   This study was submitted in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were bobwhite quail (Colinus virginianus) from production flock; age = 14 days.

b. Test Design - Birds were tested in beacon battery brooder; temperature was 99 °F.

c. Dose - Nominal dietary concentrations were used; no solvent was used.

d. Design - Ten birds per dose level; five dose levels plus negative control (0, 464, 1000, 2150, 4640, and 10,000 ppm).

e. Statistics - Litchfield and Wilcoxon

12. Reported Results:

The study author found the eight-day dietary LC_{50} to be greater than 10,000 ppm.

13. Study Authors' Conclusions:

The eight-day dietary LC_{50} was > 10,000 ppm.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982.

b. Statistical Analysis - No statistics were performed due lack of mortality data.

c. Discussion/Results - 2,4-DP is practically nontoxic to bobwhite quail with an LC_{50} > 10,000 ppm.

d. Adequacy of Study

1) Category - Core

2) Rationale - N/A

3) Reparability - N/A

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION 100%

FICHE/MASTER ID 680684

CITATION: Fink, R. (1976) Eight-Day Dietary Mallard Duck; Project No. 103-158; Prepared by Wildlife International Ltd., for Dow Chemical U.S.A.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Review Category: Core

DIRECT RVW TIME = 3.0 (MH) START DATE 12-24-87 END DATE 12-24-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biol.
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

DATA EVALUATION RECORD

1. Chemical: 2,4-DP

2. Test Material: 100% (technical ai)

3. Study Type: Eight-Day Dietary LC_{50}

   Species Tested: Mallard Duck (Anas platyrhynchos)

4. Study ID: Fink, R. (1976) Eight-Day Dietary LC_{50} Mallard Duck; Project No. 103-158; Prepared by Wildlife International Ltd., for Dow Chemical U.S.A.

5. Reviewed By: Curtis E. Laird, Fishery Biologist, EEB/HED — Signature: Curtis E. Laird — Date: 4-11-88

6. Approved By: Norman J. Cook, Biologist, EEB/HED — Signature: Norman J Cook — Date: 1.9.89

7. Conclusions:

   This study indicates 2,4-DP is practically nontoxic to mallard duck with an LC_{50} > 10,000 ppm. This study does fulfill the requirement in support of registration for an avian dietary LC_{50} study.

8. Recommendations: N/A

9. Background:

   This study was submitted in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were mallard ducks from Wildlife International LTD production flock; age = 14 days.

b. Test Design - Birds were tested in commercial brooders; temperature was 99 °F.

c. Dose - Nominal dietary concentrations were used; corn oil was used as a carrier.

d. Design - Ten birds per dose level; five dose levels plus control.

e. Statistics - Litchfield and Wilcoxon

12. Reported Results:

The study author found the eight-day dietary LC_{50} to be > 10,000 ppm.

13. Study Authors' Conclusions:

The eight-day dietary LC_{50} was > 10,000 ppm.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982.

b. Statistical Analysis - No statistics were performed due to lack of mortality data.

c. Discussion/Results - 2,4-DP is practically nontoxic to mallard duck with an LC_{50} > 10,000 ppm.

d. Adequacy of Study

1) Category - Core

2) Rationale - N/A

3) Reparability - N/A

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION 59.1% a.i.

FICHE/MASTER ID 117157

CITATION: Fink, R. (1976) Eight-Day Dietary LC_{50} Mallard Duck; Projeci No. 113-113; Prepared by Truslow Farm, Inc., for Amchem Products, Inc.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Category: Core for a formulated product

DIRECT RVW TIME = 3.0 (MH) START DATE 12-23-87 END DATE 12-24-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-16-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biol.
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

DATA EVALUATION RECORD

1. Chemical: 2,4-DP

2. Test Material: 59.1% (formulated product)

3. Study Type: Eight-Day Dietary LC_{50}

   Species Tested: Mallard Duck (Anas platyrhynchos)

4. Study ID: Fink, R. (1976) Eight-Day Dietary LC_{50} Mallard Duck; Projec. No. 113-113; Prepared by Truslow Farm, Inc., for Amchem Products, Inc.

5. Reviewed By: Curtis E. Laird, Fishery Biologist, EEB/HED — Signature: Curtis E. Laird — Date: 8-16-88

6. Approved By: Norman J. Cook, Biologist, EEB/HED — Signature: Norman J. Cook — Date: 1.9.89

7. Conclusions:

This study indicates 2,4-DP is practically nontoxic to mallard duck with an LC_{50} > 10,000 ppm. This study does fulfill the requirement in support of registration for an avian dietary LC_{50} study for a formulated product.

8. Recommendations: N/A

9. Background:

This study was submitted in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were mallard ducks from Truslow Farm production flock; age = 14 days.

b. Test Design - Birds were tested in beacon (Model B755) battery brooders; temperature was 99 °F.

c. Dose - Birds were dosed based on nominal dietary concentrations; corn oil was used as a carrier.

d. Design - Ten birds per dose level; five dose levels plus control (0, 464, 1000, 2150, 4640, and 10,000 ppm).

e. Statistics - Litchfield and Wilcoxon

12. Reported Results:

The study author found the eight-day dietary LC_{50} to be > 10,000 ppm.

13. Study Authors' Conclusions:

The eight-day dietary LC_{50} was > 10,000 ppm.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982 except the photoperiod and humidity were unknown.

b. Statistical Analysis - No statistics were performed due to lack of mortality data.

c. Discussion/Results - 2,4-DP is practically nontoxic to mallard duck with LC_{50} > 10,000 ppm.

d. Adequacy of Study

1) Category - Core for a formulated product

2) Rationale - N/A

3) Reparability - N/A

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION Mixture of 2,4-DP Derivatives

FICHE/MASTER ID 52635

CITATION: Fink, R. (1977) Eight-Day Dietary LC_{50} Mallard Duck; Projeci No. 113-128; Prepared by Wildlifn International Ltd., for Amchem Products, Inc.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Category: Core (for a mixture of active ingredient)

DIRECT RVW TIME = 3.0 (MH) START DATE 12-22-87 END DATE 12-22-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 8-16-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biol.
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

not entered SUN

DATA EVALUATION RECORD

1. Chemical: 2,4-DP (Amchem 76-A510)

2. Test Material: A mixture of 2,4-DP Derivatives, a light brown liquid

3. Study Type: Eight-Day Dietary LC_{50}

   Species Tested: Mallard Duck

4. Study ID: Fink, R. (1977) Eight-Day Dietary LC_{50} Mallard Duck; Projeci No. 113-128; Prepared by Wildlife International Ltd., for Amchem Products, Inc.

5. Reviewed By: Curtis E. Laird, Fishery Biologist, EEB/HED — Signature: Curtis E. Laird — Date: 8-16-88

6. Approved By: Norman J. Cook, Biologist, EEB/HED — Signature: 1.9.89 — Date: Norman J. Cook

7. Conclusions:

This study indicates 2,4-DP is practically nontoxic to mallard duck with an LC_{50} > 10,000 ppm. This study does fulfill the requirement in support of registration for an avian dietary LC_{50} study.

8. Recommendations: N/A

9. Background:

This study was submitted in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were mallard ducks (Anas platyrhynchos) from production flock; age = 14 days.

b. Test Design - Birds were tested in beacon battery brooders; temperature was 99 °F.

c. Dose - Birds were dosed based on normal dietary concentration with the test material dissolved in 2 percent corn oil.

d. Design - Ten birds per dose level; five dose levels plus positive and negative control (corn oil, 464, 1000, 2150, 4640, and 10,000 ppm).

e. Statistics - Wilcoxon and Litchfield

12. Reported Results:

The study author found the LC_{50} to be greater than 10,000 ppm.

13. Study Authors' Conclusions:

The eight-day dietary LC_{50} was greater than 10,000 ppm. There was no Quality Assurance statement included in this study.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982.

b. Statistical Analysis - No statistics were performed due to lack of mortality data.

c. Discussion/Results - 2,4-DP is practically nontoxic to mallard duck with an LC_{50} > 10,000 ppm.

d. Adequacy of Study

1) Category - Core for a mixture of active ingredient

2) Rationale - N/A

3) Reparability - N/A

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION unknown

FICHE/MASTER ID 73762

CITATION: McCarty, W.M. (1979) Toxicity of Eleven Herbicides to Daphnia; Prepared by Dow Chemical U.S.A. for Dow Chemical U.S.A., Midland, Michigan.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Validation Category: Supplementary

DIRECT RVW TIME = 3.0 (MH) START DATE 01-07-88 END DATE 01-07-88

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biol.
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

DATA EVALUATION RECORD

1. Chemical: 2,4-DP

2. Test Material: Unknown

3. Study Type: 48-Hour LC_{50}

   Species Tested: Daphnia magna

4. Study ID: McCarty, W.M. (1979) Toxicity to Eleven Herbicides to Daphnia magna; Prepared by and for Dow Chemical U.S.A., Midland, Michigan.

5. Reviewed By: Curtis E. Laird, Fishery Biologist, EEB/HED — Signature: Curtis E. Laird — Date: 4-11-88

6. Approved By: Norman J. Cook, Biologist, EEB/HED — Signature: Norman J. Cook — Date: 1.9.89

7. Conclusions:

This study indicates 2,4-DP is practically nontoxic to Daphnia magna with an LC_{50} of 252 ppm. However, this study does not fulfill the requirement in support of registration because the percentage of active ingredient and pH are unknown.

8. Recommendations:

The registrant should submit the percentage of active ingredient and pH value. If the percentage active ingredient and pH are found acceptable to support registration, then this study can be upgraded to core.

9. Background:

The study was reviewed in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were Daphnia magna from Easton Kodak Company, Rochester, New York; age = first instar.

b. Test Design - Daphnids were tested in 250 mL beakers with 200 mL of test solution; temperature was 20 °C.

c. Dose - Static bioassay using nominal concentrations; acetone was used as a solvent.

d. Design - Thirty daphnids per dose level; six dose levels plus control (acetone, 155, 180, 210, 240, 280, and 320 ppm).

e. Statistics - Probit analysis

12. Reported Results:

The study author found the 48-hour LC_{50} to be 284 ppm.

13. Study Authors' Conclusions:

The 48-hour LC_{50} was 284 ppm. There was no Quality Assurance statement included in this report.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982 except the percentage of active ingredient and pH are unknown.

b. Statistical Analysis - Probit method showed the 48-hour LC_{50} to be 252 ppm.

c. Discussion/Results - This study indicates 2,4-DP is practically nontoxic to Daphnia magna with an LC_{50} of 252 ppm.

d. Adequacy of Study

1) Category - Supplementary

2) Rationale - See section 7 above

3) Reparability - Repairable

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

Laird 2-4-DP Daphnia magna 01-07-88; 73762

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
320	30	30	100	9.313226E-08
280	30	15	50	57.22323
240	30	9	30	2.138698
210	30	8	26.66667	.8062402
180	30	4	13.33333	2.973807E-03
155	30	0	0	9.313226E-08

THE BINOMIAL TEST SHOWS THAT 240 AND 320 CAN BE
USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 280

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
4	5.299145E-02	250.4281	239.6893	262.745

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
13	.467178	3.515328	7.102192E-03

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED
USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 10.11569
95 PERCENT CONFIDENCE LIMITS = 3.201572 AND 17.0298

LC50 = 252.5141
95 PERCENT CONFIDENCE LIMITS = 215.6669 AND 317.9816

LC10 = 189.1203
95 PERCENT CONFIDENCE LIMITS = 105.3113 AND 220.0166

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TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS0096 PM 23

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION ?

FICHE/MASTER ID 116476

CITATION: Ross, D.; Burroughs, S.; Roberts, N. (1974) The Acute Oral Toxicity (LC_{50}) of 2,4-Dichlorophenoxy Propionic Acid to the Mallard Duck: BHY3/74652. (Unpublished study received May 12, 1975 under 11685-4; prepared by Huntingdon Research Centre, England, submitted by Burts & Harvey Ltd., Washington, DC; CDL:108513-B)

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Validation Category: Invalid

DIRECT RVW TIME = 3.0 (MH) START DATE 08-21-87 END DATE 08-21-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biol.
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J. Cook DATE: 1-9-89

"Data not entered"

56

DATA EVALUATION RECORD

1. Chemical: 2,4-DP

2. Test Material: Unknown

3. Study Type: Eight-Day Dietary LC_{50}

   Species Tested: Mallard Duck

4. Study ID: Ross, D.; Burroughs, S.; Roberts, N. (1974) The Acute Oral Toxicity (LC_{50}) of 2,4-Dichlorophenoxy Propionic Acid to the Mallard Duck: BHY3/74652. (Unpublished study received May 12, 1975 under 11685-4; prepared by Huntingdon Research Centre, England, submitted by Burts & Harvey Ltd., Washington, DC; CDL:108513-B)

5. Reviewed By: Curtis E. Laird
   Fishery Biologist
   EEB/HED
   Signature: Curtis E. Laird
   Date: 4-11-88

6. Approved By: Norman J. Cook
   Biologist
   EEB/HED
   Signature: Norman J. Cook
   Date: 1.9.89

7. Conclusions:

This study indicates 2,4-DP is practically nontoxic to mallard duck with an LC_{50} of 11,272 ppm. However, this study does not fulfill the requirement in support of registration for an upland game bird because the birds were 128 days old instead of 10 to 17 days, percentage of active ingredient, percentage of corn oil, statistical method and bird scientific name are unknown.

8. Recommendations:

The registrant should conduct another study using birds 10 to 17 days of age, and give the test bird's scientific name, statistical method used, and percentage of active ingredient.

9. Background:

This study was submitted in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were 128 day-old mallard ducks from Lincolnshire Pheasantries.

b. Test Design - Birds were tested in metal cages; size = 33 x 18 x 10 inches.

c. Dose - Nominal dietary concentrations; corn oil was used as a carrier.

d. Design - Eight birds per dose level; five dose levels plus corn oil control (corn oil, 6000, 8000, 10,000, 12,000, and 14,000 ppm).

e. Statistics - No statistical method given

12. Reported Results:

The study author found the LC_{50} to be 11,207 ppm. The no-effect-level was not given.

13. Study Authors' Conclusions:

The dietary LC_{50} was 11,207 ppm. the test method followed the protocol of Environmental Protection Agency (EPA) Guideline for Testing the Effects of Pesticides on Fish and Wildlife, March 27, 1972.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure did not follow the recommended EPA protocol of October 1982 (Part 158).

b. Statistical Analysis - Probit method showed the eight-day dietary LC_{50} to be 11,272 (9531 to 14,753) ppm.

c. Discussion/Results - 2,4-DP is practically nontoxic to mallard duck with an LC_{50} of 11,272 ppm.

d. Adequacy of Study

1) Category - Invalid

2) Rationale - See section 7 above

3) Reparability - Not repairable

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

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116476

Sht. # 031401

TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION 100% (mixture of 2,4-DP derivatives)

FICHE/MASTER ID 52637

CITATION: Fink, R. (1977) The Acute LC_{50} of Amchem (2,4-DP) in Bobwhite Quail; Projec ; No. 113-127; Prepared by Wildlife International Ltd., for Amchem Products, Inc.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Category: Core for a mixture of 2,4-DP derivatives

DIRECT RVW TIME = 3.0 (MH) START DATE 12-23-87 END DATE 12-23-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 8-16-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biol.
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

60

DATA EVALUATION RECORD

1. Chemical: 2,4-DP (Amchem 76-A510)

2. Test Material: 100% (Mixture of 2,4 DP Derivatives)

3. Study Type: Eight-Day Dietary LC_{50}

   Species Tested: Bobwhite Quail (Colinus virginianus)

4. Study ID: Fink, R. (1977) The Acute LC_{50} of Amchem (2,4-DP) in Bobwhite Quail; Projeci No. 113-127; Prepared by Wildlife International Ltd., for Amchem Products, Inc.

5. Reviewed By: Curtis E. Laird, Fishery Biologist, EEB/HED — Signature: Curtis E. Laird — Date: 8-16-88

6. Approved By: Norman J. Cook, Biologist, EEB/HED — Signature: Norman J. Cook — Date: 1.9.89

7. Conclusions:

This study indicates 2,4-DP is practically nontoxic to bobwhite quail with an LC_{50} > 10,000 ppm. This study does fulfill the requirement in support of registration for an avian dietary LC_{50} study.

8. Recommendations: N/A

9. Background:

This study was submitted in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were bobwhite quail from production flock; age = 14 days.

b. Test Design - Birds were tested in beacon battery brooders; temperature was 99 °F.

c. Dose - Nominal dietary concentrations were used; corn oil was used as a solvent.

d. Design - Ten birds per dose level; five dose levels plus control.

e. Statistics - Litchfield and Wilcoxon

12. Reported Results:

The study author found the eight-day dietary LC_{50} to be > 10,000 ppm.

13. Study Authors' Conclusions:

The eight-day dietary LC_{50} was > 10,000 ppm. There was no Quality Assurance statement mentioned in this report.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982.

b. Statistical Analysis - No statistics were performed due to lack of mortality data.

c. Discussion/Results - 2,4-DP is practically nontoxic to bobwhite quail with an LC_{50} > 10,000 ppm.

d. Adequacy of Study

1) Category - Core for a mixture of 2,4-DP Derivatives

2) Rationale - N/A

3) Reparability - N/A

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP (2-butoxyethyl, ester)

BRANCH EEB X DISC ____

FORMULATION 59.1% ai

FICHE/MASTER ID 77320

CITATION: Seminara, J. (1980) Acute Toxicity of Weedone 2,4-DP to Bluegill Sunfish (Lepomis macrochirus); Project No. 11504-1414; Prepared by Union Carbide for Union Carbide Corporation Agriculture Products Company, South Charleston, West Virginia 25303.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Validation Category: Supplemental (A formulated product was used)

DIRECT RVW TIME = 3.0 (MH) START DATE 01-07-88 END DATE 01-07-88

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biol.
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

DATA EVALUATION RECORD

1. Chemical: 2,4-DP

2. Test Material: 59.1%

3. Study Type: 96-Hour LC_{50}

   Species Tested: Bluegill Sunfish (Lepomis macrochirus)

4. Study ID: Seminara, J. (1980) Acute Toxicity of Weedone 2,4-DP to Bluegill Sunfish; Project No. 11504-1414; Prepared by Union Carbide for Union Carbide Corporation Agriculture Products Company, South Charleston, West Virginia 25303.

5. Reviewed By: Curtis E. Laird
   Fishery Biologist
   EEB/HED
   Signature: Curtis E. Laird
   Date: 4-11-89

6. Approved By: Norman J. Cook
   Biologist
   EEB/HED
   Signature: Norman J. Cook
   Date: 1.9.89

7. Conclusions:

This study indicates 2,4-DP is highly toxic to bluegill sunfish with an LC_{50} of 0.83 ppm. This study does not fulfill the requirement in support of registration because a formulated product was used instead of technical grade material.

8. Recommendations:

This study cannot be upgraded to core. The registrant should conduct another study using technical grade material.

9. Background:

This study was reviewed in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

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11. Material and Methods:

a. Test Animals - Test animals were bluegill sunfish from Connecticut; weight = 0.38 g; SL = 32 mm.

b. Test Design - Fish were tested in 19.6 liter glass vessels with 15 liters of test solution; temperature was 20 °C.

c. Dose - Static bioassay using nominal bioassay; no solvent used.

d. Design - Ten fish per dose level; five dose levels plus control.

e. Statistics - Spearman-Karber

12. Reported Results:

The study author found the 96-hour LC_{50} to be 0.84 ppm.

13. Study Authors' Conclusions:

The 96-hour LC_{50} was 0.84 ppm. There was no Quality Assurance statement in this report.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982 except a formulated product was used instead of technical grade material.

b. Statistical Analysis - The binomial test shows the 96-hour LC_{50} to be approximately 0.83 ppm.

c. Discussion/Results - 2,4-DP is highly toxic to bluegill sunfish with an LC_{50} of 0.83 ppm.

d. Adequacy of Study

1) Category - Supplementary (core for formulated product)

2) Rationale - See section 7 above

3) Reparability - Repairable

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

Laird 2-4-DP Bluegill sunfish 01-07-88 ; 77320

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
5.6	10	10	100	9.765625E-02
3.2	10	10	100	9.765625E-02
1.8	10	10	100	9.765625E-02
1	10	8	80	5.46875
.56	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT .56 AND 1.8 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS .8331868

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

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TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION 100% (mixture of 2,4-DP Derivatives)

FICHE/MASTER ID 52636

CITATION: Fink, R. (1976) Eight-Day Dietary LC_{50} in Mallard Duck (Anas platyrhynchos); Projeci No. 113-121; Prepared by Truslow Farm, Inc., for Amchem Products, Inc.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Study Validation Category: Core for mixture of active ingredients

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DIRECT RVW TIME = 3.0 (MH) START DATE 12-28-87 END DATE 12-28-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 8-16-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biol.
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

DATA EVALUATION RECORD

1. Chemical: 2,4-DP (Amchem 76-A510)

2. Test Material: 100% (mixture of 2,4-DP Derivatives)

3. Study Type: Eight-Day Dietary LC_{50}

   Species Tested: Mallard Duck

4. Study ID: Fink, R. (1976) Eight-Day Dietary LC_{50} in Mallard Duck (Anas platyrhynchos); Projec ¿ No. 113-121; Prepared by Truslow Farm, Inc., for Amchem Products, Inc.

5. Reviewed By: Curtis E. Laird
   Fishery Biologist
   EEB/HED
   Signature: Curtis E. Laird
   Date: 8-16-88

6. Approved By: Norman J. Cook
   Biologist
   EEB/HED
   Signature: Norman J. Cook
   Date: 1.9.89

7. Conclusions:

   This study indicates 2,4-DP is practically nontoxic to mallard duck with an LC_{50} > 10,000 ppm. This study does fulfill the requirement in support of registration for an avian dietary LC_{50} study for a mixture of active ingredinets.

8. Recommendations: N/A

9. Background:

   This study was submitted in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were mallard ducks from production flock; age = 14 days.

b. Test Design - Birds were tested in beacon battery brooders; temperature was 99 °F.

c. Dose - Nominal dietary concentrations; corn was used as a solvent.

d. Design - Ten birds per dose level; five dose levels plus positive and negative control (0, corn oil, 464, 1000, 2150, 4640, and 10,000 ppm).

e. Statistics - Litchfield and Wilcoxon.

12. Reported Results:

The study author found the eight-day dietary LC_{50} to be > 10,000 ppm.

13. Study Authors' Conclusions:

The eight-day dietary LC_{50} was > 10,000 ppm. There was no Quality Assurance statement mentioned.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982.

b. Statistical Analysis - No statistics performed due to lack of mortality data.

c. Discussion/Results - 2,4-DP is practically nontoxic to mallard ducks with an LC_{50} > 10,000 ppm.

d. Adequacy of Study

1) Category - Core for a mixture of 2,4-DP derivatives

2) Rationale - N/A

3) Reparability - N/A

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION 100% (mixture of 2,4-DP derivatives)

FICHE/MASTER ID 52638

CITATION: Fink, R. (1976) Eight-Day Dietary LC_{50} Bobwhite Quail; Projeci No. 113-120; Prepared by Truslow Farm, Inc., for Amchem Products, Inc.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Category: Core for a mixture of 2,4-DP derivatives

DIRECT RVW TIME = 3.0 (MH) START DATE 12-28-87 END DATE 12-28-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 8-16-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biol.
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0321

SIGNATURE: Norman J. Cook DATE: 1-9-89

DATA EVALUATION RECORD

1. Chemical: 2,4-DP (Amchem 76-A510)

2. Test Material: 100% (mixture of 2,4-DP derivatives)

3. Study Type: Eight-Day Dietary LC_{50}

   Species Tested: Bobwhite Quail (*Colinus virginianus*)

4. Study ID: Fink, R. (1976) Eight-Day Dietary LC_{50} Bobwhite Quail; Projec: No. 113-120; Prepared by Truslow Farm, Inc., for Amchem Products, Inc.

5. Reviewed By: Curtis E. Laird, Fishery Biologist, EEB/HED — Signature: Curtis E. Laird — Date: 8-16-88

6. Approved By: Norman J. Cook, Biologist, EEB/HED — Signature: Norman J. Cook — Date: 1.9.89

7. Conclusions:

This study indicates, 2,4-DP is practically nontoxic to bobwhite quail with an LC_{50} of 9907 (6938 to 52,102) ppm. This study does fulfill the requirement in support of registration for an avian dietary LC_{50} study for a mixture of active ingredients.

8. Recommendations: N/A

9. Background:

This study was submitted in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were bobwhite quail from Truslow Farm production flock; age = 14 days.

b. Test Design - Birds were tested in beacon battery brooders; temperature was 99 °F.

c. Dose - Nominal dietary concentrations were used; corn oil was used as a solvent.

d. Design - Ten birds per dose level; five dose levels plus control (0, 464, 1000, 2150, 4640, and 10,000 ppm).

e. Statistics - Litchfield and Wilcoxon

12. Reported Results:

The study author found the eight-day dietary LC_{50} to be 9907 ppm.

13. Study Authors' Conclusions:

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982.

b. Statistical Analysis - Probit analysis method showed the eight-day dietary LC_{50} value to be 9907 (6938 to 52,102) ppm.

c. Discussion/Results - 2,4-DP is practically nontoxic to bobwhite quail with an LC_{50} of 9907 ppm.

d. Adequacy of Study

1) Category - Core for a mixture of 2,4-DP derivatives

2) Rationale - N/A

3) Reparability - N/A

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

Laird 2-4-DP Bobwhite Quail 12-14-87; 52638

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
10000	10	5	50	62.30469
4640	10	1	10	1.074219
2150	10	0	0	9.765625E-02
1000	10	0	0	9.765625E-02
464	10	0	0	9.765625E-02

THE BINOMIAL TEST SHOWS THAT 0 AND +INFINITY CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 9999.998

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
1	1.07768	10000	6710.777	+INFINITY

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
11	.6928262	1	.9971074

SLOPE = 4.07941
95 PERCENT CONFIDENCE LIMITS = .6838651 AND 7.474955

LC50 = 9907.401
95 PERCENT CONFIDENCE LIMITS = 6938.236 AND 52102.97

LC10 = 4837.713
95 PERCENT CONFIDENCE LIMITS = 491.5208 AND 6911.553

****

TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS0096 PM 21

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION : Unknown

FICHE/MASTER ID 116475

CITATION: Ross, D.; Burroughs, S.; Roberts, N. (1975) The Acute Toxicity (LC_{50}) of 2,4-Dichlorophenoxy Propionic Acid to Young Japanese Quail: BHY/2/75210. (Unpublished study received May 12, 1975 under 11685-4; prepared by Huntingdon Research Centre, England, submitted by Burts & Harvey Ltd., Washington, DC; CDL:108513-A)

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Validation Category: Invalid

DIRECT RVW TIME = 3.0 (MH) START DATE 08-24-87 END DATE 08-24-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biol.
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0324

SIGNATURE: Norman J. Cook DATE: 1.9.89

DATA EVALUATION RECORD

1. Chemical: 2,4-Dichlorophenoxy Propionic Acid

2. Test Material: Unknown

3. Study Type: Eight-Day Dietary LC_{50}

   Species Tested: Japanese Quail (Colurnix Colurnix)

4. Study ID: Ross, D.; Burroughs, S.; Roberts, N. (1975) The Acute Toxicity (LC_{50}) of 2,4-Dichlorophenoxy Propionic Acid to Young Japanese Quail; BHY/2/75210. (Unpublished study received May 12, 1975 under 11685-4; prepared by Huntingdon Research Centre, England, submitted by Burts & Harvey Ltd., Washington, DC; CDL:108513-A)

5. Reviewed By: Curtis E. Laird
   Fishery Biologist
   EEB/HED
   Signature: Curtis E. Laird
   Date: 4-11-88

6. Approved By: Norman J. Cook
   Biologist
   EEB/HED
   Signature: Norman J. Cook
   Date: 1.9.89

7. Conclusions:

   This study indicates 2,4-DP is practically nontoxic to Japanese quail with an LC_{50} of 6133 (860 to 8396) ppm. However, this study does not fulfill the requirement in support of registration because Japanese quail is not an acceptable test species.

8. Recommendations:

   The registrant should conduct another study using an acceptable test species and the percentage of ai used.

9. Background:

   This study was submitted in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were 12-day-old Japanese Quail from Lincolnshire Pheasantries.

b. Test Design - Birds were tested in metal cages; size = 33 x 18 x 10 inches, temperature was 31 °C.

c. Dose - Birds were dosed on a dietary basis; corn oil was used as a carrier.

d. Design - Fifteen birds per dose level; six dose levels plus corn oil control (corn oil, 5000, 10,000, 12,000, 13,000, and 14,000 ppm).

e. Statistics - The statistical method used is unknown.

12. Reported Results:

The study author found the eight-day dietary LC_{50} to be 6133 (860 to 8396) ppm.

13. Study Authors' Conclusions:

The eight-day dietary LC_{50} was 6133 ppm. The protocol used was that of the Environmental Protection Agency EPA Guidelines for Testing the Effects of Pesticides on Fish and Wildlife, March 29, 1972.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982, except the percentage of ai is unknown and the wrong species was tested.

b. Statistical Analysis - Probit analysis

c. Discussion/Results - 2,4-DP is practically nontoxic to Japanese quail with an LC_{50} of 6133 ppm.

d. Adequacy of Study

1) Category - Supplemental

2) Rationale - See section 7 above

3) Reparability - Not repairable

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
14000	15	13	86.6667	.369262
13000	15	13	86.6667	.369262
12000	15	10	66.6667	15.0879
11000	15	10	66.6667	15.0879
10000	15	9	60	30.3619
5000	15	7	46.6667	50

THE BINOMIAL TEST SHOWS THAT 0 AND 13000 CAN BE
USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 5941.89

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
1	7.82624	5941.89	0	+INFINITY

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
5	.624961	1	.622209

SLOPE = 2.28446
95 PERCENT CONFIDENCE LIMITS = .478492 AND 4.09043

LC50 = 6133.63
95 PERCENT CONFIDENCE LIMITS = 860.59 AND 8396.33

LC10 = 1705.25
95 PERCENT CONFIDENCE LIMITS = 2.04188 AND 3838.88
****

TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS ____ PM 23

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION 100%

FICHE/MASTER ID 117158

CITATION: Fink, R. (1976) Eight-Day Dietary LC_{50} Bobwhite Quail; Project No. 113-112; Prepared by Truslow Farm, Inc., for Amchem Products, Inc., Amber, Pennsylvania 19002.

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Validation Category: Core

DIRECT RVW TIME = 3.0 (MH) START DATE 12-21-87 END DATE 12-21-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biol.
ORG: EEB/EFED
LOC/TEL: Crystal City, Va.; 557-0322

SIGNATURE: Norman J. Cook DATE: 1.9.89

DATA EVALUATION RECORD

1. Chemical: 2,4-DP

2. Test Material: 100% (technical ai)

3. Study Type: Eight-Day Dietary LC_{50}

   Species Tested: Bobwhite Quail (*Colinus virginianus*)

4. Study ID: Fink, R. (1976) Eight-Day Dietary LC_{50} Bobwhite Quail; Projeci No. 113-112; Prepared by Truslow Farm, Inc., for Amchem Products, Inc., Amber, Pennsylvania 19002.

5. Reviewed By: Curtis E. Laird
   Fishery Biologist
   EEB/HED
   Signature: Curtis E. Laird
   Date: 4-11-83

6. Approved By: Norman J. Cook
   Biologist
   EEB/HED
   Signature: Norman J. Cook
   Date: 1.9.84

7. Conclusions:

   This study indicates 2,4-DP is practically nontoxic to bobwhite quail with an LC_{50} > 10,000 ppm. This study does fulfill the requirement in support of registration for an avian dietary LC_{50} study.

8. Recommendations: N/A

9. Background:

   The study was submitted to support 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were bobwhite quail from Truslow Farm production flock; age = 14 days.

b. Test Design - Birds were tested in commercial battery brooders; temperature was 99 °F.

c. Dose - Nominal dietary concentrations were used.

d. Design - Ten birds per dose level; five dose levels plus control (0, 464, 1000, 2150, 4640, and 10,000 ppm).

e. Statistics - Litchfield and Wilcoxon

12. Reported Results:

The study author found the eight-day dietary LC_{50} to be > 10,000 ppm.

13. Study Authors' Conclusions:

The eight-day dietary LC_{50} was > 10,000 ppm.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure complied with the recommended EPA protocol of October 1982 except the photoperiod and humidity are unknown.

b. Statistical Analysis - No statistics were performed due to lack of mortality data.

c. Discussion/Results - 2,4-DP is practically nontoxic to bobwhite quail with an LC_{50} > 10,000 ppm.

d. Adequacy of Study

1) Category - Core

2) Rationale - N/A

3) Reparability - N/A

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

80

TDMS DATA EVALUATION RECORD SHEET PAGE 1 OF 1

CASE GS0096 PM 23

CHEM 2,4-DP

BRANCH EEB X DISC ____

FORMULATION: Unknown

FICHE/MASTER ID 102544

CITATION: Union Carbide Agricultural Products Co., Inc. (1970) Acute Toxicity of Several Brush Killer Formulations and Additives to Fresh Water Shiners, Notropis: Primary Bioassay Report. (Unpublished study received October 1, 1972 under 264-179; CDL:009014-E)

SUBST. CLASS =

OTHER SUBJECT DESCRIPTORS
PRIM:

Validation Category: Invalid

DIRECT RVW TIME = 3.0 (MH) START DATE 10-16-87 END DATE 10-16-87

REVIEWED BY: Curtis E. Laird
TITLE: Fishery Biologist
ORG: EEB/HED
LOC/TEL: Crystal City, VA; 557-1636

SIGNATURE: Curtis E. Laird DATE: 4-11-88

APPROVED BY: Norman J. Cook
TITLE: Supv. Biol.
ORG: EEB/EFED
LOC/TEL: Crystal City, Va; 557-0322

SIGNATURE: Norman J Cook DATE: 1.9.89

DATA EVALUATION RECORD

1. Chemical: 2,4-DP

2. Test Material: Unknown

3. Study Type: 96-Hour LC_{50}

   Species Tested: Notropis Shiner

4. Study ID: Amchem Research Farm (1970) Acute Toxicity of several Brush Killer Formulations and Additives to Freshwater Shiners, Notropis: Primary Bioassay Report. (Unpublished study received October 1, 1972 under 264-179; CDL:009014-E)

5. Reviewed By: Curtis E. Laird
   Fishery Biologist
   EEB/HED
   Signature: Curtis E. Laird
   Date: 4-11-88

6. Approved By: Norman J. Cook
   Biologist
   EEB/HED
   Signature: Norman J. Cook
   Date: 1-9-89

7. Conclusions:

This study indicates 2,4-DP is moderately toxic to shiner with an $LC_{50} > 1 < 5$ ppm. This study does not fulfill the requirement in support of registration for a fishy study because the percentage ai, pH, D.O., and statistical methods are unknown; test solutions were aerated; the holding period was 96 hours instead of 14 days; and food was withheld for 24 hours instead of 96 hours.

8. Recommendations:

The registrant should conduct another warmwater fish study following EPA recommended protocol of October 1982 (Part 158).

9. Background:

This study was submitted in support of 2,4-DP Registration Standard.

10. Discussion of Individual Tests: N/A

11. Material and Methods:

a. Test Animals - Test animals were notropis shiners from a local stream; weight = 1.5 g and SL ranged from 0.75 to 1.25 inch.

b. Test Design - Fish were tested in 1.0 gallon glass vessels; temperature was 74 °F.

c. Dose - Bioassay using nominal concentrations and no solvent was mentioned.

d. Design - Six fish per dose level; two dose levels plus control (0, 1.0, and 5.0 ppm).

e. Statistics - No statistics were mentioned

12. Reported Results:

The study author found the 96-hour LC_{50} to be > 1.0 and < 5.0 ppm.

13. Study Authors' Conclusions:

The 96-hour LC_{50} was > 1.0 and < 5.0 ppm.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure did not comply with the recommended EPA protocol of October 1982.

b. Statistical Analysis - No statistics were performed.

c. Discussion/Results - 2,4-DP is moderately toxic to shiners, notropis with an LC_{50} > 1.0 and < 5.0 ppm.

d. Adequacy of Study

1) Category - Invalid

2) Rationale - See section 7 above

3) Reparability - Not repairable

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A

11. Material and Methods:

a. Test Animals - Test animals were notropis shiners from a local stream; weight = 1.5 g and SL ranged from 0.75 to 1.25 inch.

b. Test Design - Fish were tested in 1.0 gallon glass vessels; temperature was 74 °F.

c. Dose - Bioassay using nominal concentrations and no solvent was mentioned.

d. Design - Six fish per dose level; two dose levels plus control (0, 1.0, and 5.0 ppm).

e. Statistics - No statistics were mentioned

12. Reported Results:

The study author found the 96-hour LC_{50} to be > 1.0 and < 5.0 ppm.

13. Study Authors' Conclusions:

The 96-hour LC_{50} was > 1.0 and < 5.0 ppm.

14. Reviewer's Discussion and Interpretation of the Study:

a. Test Procedures - The test procedure did not comply with the recommended EPA protocol of October 1982.

b. Statistical Analysis - No statistics were performed.

c. Discussion/Results - 2,4-DP is moderately toxic to shiners, notropis with an LC_{50} > 1.0 and < 5.0 ppm.

d. Adequacy of Study

1) Category - Invalid

2) Rationale - See section 7 above

3) Reparability - Not repairable

15. Completion of One-Liner: Yes

16. CBI Appendix: N/A