(Sleadachall 2.4-DP Chemical:

2. Test Material: 33.0%

3. Study Type: 96-Hour LC50

> Species Tested: Bluegill Sunfish and Rainbow

Trout

Union Carbide (1977) Acute Toxicity of Amchem 4. Study ID: 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.

Curtis E. Laird 5. Reviewed By:

Fishery Biologist

EEB/HED

Signature: Curlin E. Laine

6. Approved By: Norman J. Cook

Biologist

EEB/HED

Signature: Mmun J. Cwk

Date: 1.9.89

7. Conclusions:

This study indicates 2,4-DP is moderately toxic to both bluegill sunfish and rainbow trout with an LC50 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.

Background: 9.

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

Discussion of Individual Tests: 10. N/A

Mary of the Section o

- 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. <u>Dose</u> 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 LC50'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. <u>Discussion/Results</u> 2,4-DP is moderately toxic to both warm and coldwater fish with an LC₅₀ 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

~~~~~		~~~~~~~~~~		~~~~~~~~~~~~~
CONC.	NUMBER	NUMBER	PERCENT	BINOMIAL
	EXPOSED	DEAD ·	DEAD	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.

*********************

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

****	*****	*****	*****	*********
CONC.	NUMBER	NUMBER	PERCENT	BINOMIAL
	EXPOSED	DEAD ·	DEAD	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	· · O ·	· 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.

**********************

CASE GS0096	·		PM 23
CHEM 2,4-DF			
BRANCH EEB	X DISC		
FORMULATION			
FICHE/MASTE	R ID 25809		
CITATION:	Gyrd-Hansen, N.; Dalgaar effect of Phenoxy-herbic of eggs and the viabilit Pharmacologica et Toxico in unpublished submissio under 2217-485; submitte City, Kansas; CDL:241581	ides on the hat y of the chicks logica 35(?):30 on received Janued by PBI-Gordon	cchability s. Acta 00-308. (Also uary 2, 1980
SUBST. CLAS	S =		
OTHER SUBJE	CT DESCRIPTORS		
Validation	Category: Invalid		
DIRECT RVW	TIME = 1.0 (MH) START	DATE 10-26-87	END DATE 10-26-87
REVIEWED BY TITLE ORG	E: Fishery Biologist E: EEB/HED	' <b>-</b> 1636	
SIGNATURE	: Curtia E. La	. هد	DATE: 4-11-88
APPROVED BY TITLE ORG	: Norman J. Golc S: Supr. Biologist EEB/EFED		
SIGNATURE			DATE: 1.9.89

This study is not pertinent to the Registration Standard.

CASE GS				PM 2 <b>≹</b>	
CHEM 2,4-DP					
BRANCH EEB	DISC				
FORMULATION	unknown				
FICHE/MASTER	ID 68083				
	vis, J.T. (196 nfish of Pheno			ity to B	luegill
SUBST. CLASS	=			<del>-</del>	
OTHER SUBJECT PRIM:	DESCRIPTORS				
Validation Ca	tegory: Invali	đ			
DIRECT RVW TI	ME = 1.0 (MH)	START DA	TE 12-18-87	END DAT	E 12-18-87
TITLE: ORG:	Curtis E. Lai Fishery Biolo EEB/HED Crystal City,	gist	636		
SIGNATURE:	Curtin	E. Zais		DATE: 4	4-11-88
APPROVED BY: TITLE: ORG: LOC/TEL:	Norman J. Go Supv Biologist FEB/EFFD Crystal City, Va	oK :			
SIGNATURE:	numan J. Cu	)K_		DATE:	1.9.89

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

CASE GS			PM 23.
CHEM 2,4-DP			
BRANCH EEB _2	CDISC		
FORMULATION 2	23.6%		
FICHE/MASTER	ID 129401		
( <u>I</u>	eBlanc, G.A. (1983) A Daphnia magna); Repor G&G Bionomics for Uni ompany, Inc., Researc	t No. BW-83-6-14 lon Carbide Agric	<pre>16; Prepared by ulture Products</pre>
PRIM:	T DESCRIPTORS		
Validation Ca	ategory: Supplementa	ary 	
DIRECT RVW T	IME = 3.0 (MH) STAN	RT DATE 12-22-87	END DATE 12-22-87
TITLE: ORG:	Curtis E. Laird Fishery Biologist EEB/HED Crystal City, VA;		÷
SIGNATURE:	Curtia E. Laire	2	DATE:
APPROVED BY: TITLE: ORG: LOC/TEL:	Supr. Biologist	7-0322	
SIGNATURE:	numan J. Cook		DATE: / 9 89

Chemical: 2,4-DP 1.

2. Test Material: 23.6%

3. Study Type: 48-Hour LC50

> Species Tested: Daphnia magna

4. LeBlanc, G.A. (1983) Acute Toxicity of Weedone Study ID: 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.

Reviewed By: Curtis E. Laird 5.

Fishery Biologist

EEB/HED

Signature: Curtia 8. Lans Date: 4-11-88
Signature: Numar J. Cook

Norman J. Cook Approved By:

Biologist

EEB/HED

1.9.89 Date:

7. Conclusions:

> This study indicates 2,4-DP is moderately toxic to Daphnia magna with an LC50 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:

- 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. <u>Dose</u> 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 LC₅₀ 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 LC₅₀ 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 LC₅₀ to be 5.4 (4.4 to 6.8) ppm.
- c. <u>Discussion/Results</u> This study indicated 2,4-DP is moderately toxic to daphnia with an LC₅₀ of 5.4 ppm.

# d. Adequacy of Study

- Category Supplementary (core for formulated product)
- 2) Rationale See section 7 above
- 3) Reparability Not repairable

- 15. <u>Completion of One-Liner</u>: Yes
- 16. CBI Appendix: N/A

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

****	****	*****	*****	*********
CONC.	NUMBER	NUMBER	PERCENT	BINOMIAL
	EXPOSED	DEAD	DEAD	PROB. (PERCENT)
10	15	12	80	1.757812
6	15	12	80	1.757812
3.6	15	1 .	6.66666	4.882813E-02
2.2	15	1	6.66666	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 95 PERCENT CONFIDENCE LIMITS SPAN G LC50 3 .2047046 5.547098 4.285076 7.853174

RESULTS CALCULATED USING THE PROBIT METHOD H GOODNESS OF FIT PROBABILITY ITERATIONS G 3 .1570623 1 9.897309E-02

SLOPE 4.48009 95 PERCENT CONFIDENCE LIMITS = 2.704582 AND 6.255599

5.427347 95 PERCENT CONFIDENCE LIMITS = 4.421246 AND 6.844825

LC10 =

2.825603 95 PERCENT CONFIDENCE LIMITS = 1.790926 AND 3.591186 *************************** TDMS

CASE GS	-		PM 23	
CHEM 2,4-DP				
BRANCH EEB	x DISC	ž.		
FORMULATION :	23.6%			
FICHE/MASTER	ID 129399			
B BI C	luegill Sunfish ( <u>Le</u> W-83-6-1408; Prepar	Acute Toxicity of pomis macrochirus) red by EG&G Bionomi Products Company, a Carolina.	; Report	No. nion
SUBST. CLASS	=			
OTHER SUBJECT	T DESCRIPTORS			
Category: S	upplementary - A fo	ormulated product w	as used.	
DIRECT RVW T	IME = 3.0 (MH) ST	FART DATE 12-21-87	END DAT	E 12-21-87
REVIEWED BY: TITLE: ORG: LOC/TEL:	Fishery Biologist			
SIGNATURE:	Curtia E.	Laire	DATE:	4-11-88
APPROVED BY: TITLE: ORG: LOC/TEL:				
SIGNATURE:	Suman J. Cwk		DATE:	1.9.89

1. Chemical: 2,4-DP

2. Test Material: Unknown

3. 96-Hour LC50 Study Type:

> Species Tested: Bluegill Sunfish

> > (Lepomis macrochirus)

4. LeBlanc, G.A. (1983) Acute Toxicity of Weedone Study ID: 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.

Curtis E. Laird 5. Reviewed By:

Fishery Biologist

EEB/HED

Norman J. Cook Approved By:

Biologist

EEB/HED

Signature: Chrtis E. Lais

Date: 4-11-88

Signature: Morman J. Cook

Date: /.9.89

#### 7. Conclusions:

This study indicates 2,4-DP is moderately toxic to bluegill sunfish with an LC50 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.

N/A 10. Discussion of Individual Tests:

- 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 LC₅₀ to be 2.4 ppm. The no-observed-effect level was not determined.

### 13. Study Authors 'Conclusions:

The 96-hour LC50 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 LC50 value to be approximately 2.4 ppm.
- c. Discussion/Results 2,4-DP is moderately toxic to bluegill sunfish with an LC50 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. <u>Completion of One-Liner</u>: Yes
- 16. CBI Appendix: N/A

1AIRD 2-4-DP BLUEGILL SUNFISH 12-21-87 / 293 99

CONC.	NUMBER	NUMBER	PERCENT	BINOMIAL .
	EXPOSED	DEAD	D <b>EAD</b>	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-D	Р	•	
BRANCH EEB	X DISC		
FORMULATION	N 23% ai		
FICHE/MAST	ER ID 129400		
CITATION:	LeBlanc, G.A. (1983) Rainbow Trout (Salmo of Prepared by EG&G Bione Products Company, Inc. Carolina.	gairdneri); Report omics for Union Ca	: No. BW-83-6-1411; arbide Agriculture
SUBST. CLAS	SS =		
OTHER SUBJ	ECT DESCRIPTORS		
Category:	Supplementary - A form	nulated product wa	as used.
DIRECT RVW	TIME = 3.0 (MH) STA	RT DATE 12-21-87	END DATE 12-21-87
TITL	Y: Curtis E. Laird E: Fishery Biologist G: EEB/HED L: Crystal City, VA;	557-1636	
SIGNATUR	E: Curtis E. L	url	DATE: 4-11-88
APPROVED B TITL OR LOC/TE	Y: Norman J. Cook E: Supr. Biologist G: EEB/EFED		·
SIGNATUR	E: numar J. Cook		DATE: 1.9.89

1. Chemical: 2,4-DP

2. Test Material: 23.0% (formulated product)

3. Study Type: 96-Hour LC50

> Species Tested: Rainbow Trout (Salmo gairdneri)

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 4. Study ID: Union Carbide Agriculture Products Company, Inc., Research Triangle Park, North Carolina.

5. Reviewed By: Curtis E. Laird

Fishery Biologist

EEB/HED

6. Approved By: Norman J. Cook

Biologist

EEB/HED

Date: 4-11-88
Signature: Mman J. Cook

Signature: Curtin E. Laine

Date: 1.9.89

#### 7. Conclusions:

This study indicates 2,4-DP is moderately nontoxic to rainbow trout with an LC50 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 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

- 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. <u>Dose</u> Static bioassay using nominal concentrations; <u>DMF</u> 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 LC₅₀ value to be approximately 6.1 ppm.

### 12. Reported Results:

The study author found the 96-hour LC50 to be 6.0 ppm.

#### 13. Study Authors' Conclusions:

The 96-hour LC₅₀ 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. <u>Statistical Analysis</u> The statistics were verified with <u>Stephan's program.</u>
- c. <u>Discussion/Results</u> 2,4-DP is moderately toxic to rainbow trout with an LC50 of 6.1 ppm.

# d. Adequacy of Study

- 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;/29400

*****	**************************************				
CONC.	NUMBER	NUMBER	PERCENT	BINOMIAL .	
	EXPOSED	DEAD	DEAD	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

CASE GS		PM 2 <b>3</b>
CHEM 2,4-DP	) 	
BRANCH EEB	X DISC	
FORMULATION	1 100%	
FICHE/MASTE	TR ID 72920	
CITATION:	Fink, R. (1976) Eight-Day Dietary LC50 Quail; Project No. 103-157; Prepared International Ltd., for Dow Chemical	by Wildlife
SUBST. CLAS	ss	
OTHER SUBJE PRIM:	ECT DESCRIPTORS	
Category:	Core	
DIRECT RVW	TIME = 3.0 (MH) START DATE 12-18-87	END DATE 12-18-87
TITLE	G: EEB/HED L: Crystal City, VA; 557-1636	DATE: 4-11-38
APPROVED BY TITLE ORG LOC/TEL	T: Norman J: Cook E: Supr. Bivlogist G: EEB/EFED L: Crystul City, Ve; SS7-0322	
SIGNATURE	E: Numan J. Cwk	DATE: 1.9.89

2,4-DP 1. Chemical:

100% (technical ai) 2. Test Material:

3. Study Type: Eight-Day Dietary LC50

> Bobwhite Quail Species Tested:

> > (Colinus virginianus)

4. Study ID: Fink, R. (1976) Eight-Day Dietary LC50 Bobwhite Quail; Project No. 103-157; Prepared by Wildlife

International Ltd., for Dow Chemical U.S.A.

Reviewed By: Curtis E. Laird 5.

Fishery Biologist

EEB/HED

Signature: Curtis & Lano
Date: 4-11-88
Signature: Norman J. Cook

Norman J. Cook 6. Approved By:

Biologist

EEB/HED

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 LC50 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

- a. Test Animals Test animals were bobwhite quail from production flock; age = 14 days.
- <u>Test Design</u> Birds were tested in battery brooders; temperature was 99 °F.
- c. <u>Dose</u> Nominal dietary concentrations were used; corn oil was used as a carrier.
- d. <u>Design</u> 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 LC₅₀ 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
  - Category Core
  - Rationale N/A
  - Reparability N/A

#### 15. Completion of One-Liner: Yes

#### 16. CBI Appendix: N/A

CASE GS		PM	2 <b>3</b>	
CHEM 2,4-DP	(2-butoxyethyl, ester)			
BRANCH EEB _	X DISC			
FORMULATION	59.1%			
FICHE/MASTER	ID 63066			
2 P	eminara, J. (1980) The Acute Toxicity, 4-DP to Rainbow Trout; Project No. 1 repared by Union Carbide Corporation orporation, Terrytown, New York 10591	1504- for U	-1415	;
SUBST. CLASS	=			
OTHER SUBJECT PRIM:	T DESCRIPTORS			
Category: Su	pplenental ( core for formulated prod	luct)		
DIRECT RVW 1	'IME = 4.0 (MH) START DATE 01-28-88	END	DATE	01-28-88
REVIEWED BY: TITLE: ORG: LOC/TEL:	Fishery Biologist EEB/HED			
SIGNATURE:	Curtia E. Laire	DAT	re: 4	+ 11-83
APPROVED BY: TITLE: ORG: LOC/TEL:	Norman J. Cook Supv. Biologist EEB/EFED			
SIGNATURE:	noman J. aux	DAC	re:	1.9.89

Chemical: 2,4-DP 1.

Test Material: 59.1% a1 2.

3. Study Type: 96-Hour LC50

> 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.

Curtis E. Laird Reviewed By: 5.

Fishery Biologist

EEB/HED

6. Approved By: Norman J. Cook

Biologist

EEB/HED

Signature: Curtis E. Laine Date: 4-11-88 Signature: Woman J. Cuk

Date: 1.9.89

Conclusions: 7.

> This study indicates 2,4-DP is moderately toxic to rainbow trout with an LC50 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.

Background: 9.

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

Discussion of Individual Tests: N/A 10.

- 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. <u>Test Design</u> Fish were tested in 19.6 liter glass jars with 15 liters of test solution; temperature was 12 °C.
- <u>Dose</u> Static bioassay using nominal concentrations; no solvent used.
- d. <u>Design</u> Ten fish per dose level; five dose levels plus control (0, 0.56, I.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:

#### 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  $\overline{96}$ -hour LC₅₀ value to be approximately 2.7 ppm.
- c. <u>Discussion/Results</u> 2,4-DP is moderately toxic to rainbow trout with an LC₅₀ of 2.7 ppm.

#### d. Adequacy of Study

- 1) Category Supplementary (core for formulated product).
- 2) Rationale N/A
- Reparability N/A

#### 15. Completion of One-Liner:

16. CBI Appendix: N/A

Laird 2-4-DP Rainbow Trout 12-15-87; 03/40/; 5+vly No. 63066

CONC.	NUMBER	NUMBER	PERCENT	BINOMIAL
	EXPOSED	DEAD	DEAD	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.

*******************

CASE GS	<del>-</del>			PM 23	
CHEM 2,4-DP					
BRANCH EEB	X DISC	· ·			
FORMULATION	100%				
FICHE/MASTE	R ID 72919				
CITATION:	Ester, to R	ainbow Trout; chelder, Envi	Toxicity of Di Project No. u Pronmental Scie	nknown;	Prepared
SUBST. CLAS	S =				
OTHER SUBJE	CT DESCRIPT	ORS			
Validation	Category: S	upplemental			
DIRECT RVW	TIME = 4.0	(MH) START	DATE 12-23-87	FND DAT	E 12-23-87
REVIEWED BY TITLE ORG	E: Fishery E: EEB/HED	-	7–1636		
SIGNATURE	: Curt	is E. La	ins	DATE:	4-11-88
APPROVED BY TITLE ORC	: Norman : : Supv. Gio	J. Cook I			·
SIGNATUR	: Suman	City, Va; 557		DATE:	1.9.89

Chemical: 2,4-DP 1.

100% (technical ai) 2. Test Material:

3. Study Type: 96-Houo LC50

> Species Tested: Rainbow Trout (Salmo gairdneri)

Batchelder, T.L. (1976) Toxicity of Dichlorprop Ethanol Ester to Rainbow Trout; Project No. 4. Study ID:

unknown; Prepared by T.L. Batchelder, Environmental

Sciences Research, Dow Chemical Company.

5. Reviewed By: Curtis E. Laird

Fishery Biologist

EEB/HED

6. Approved By: Norman J. Cook

Biologist

EEB/HED

Date: 4-11-88
Signature: Suman ). Cook

Signature: Curtiz E. Fair

Date: 1.9.89

7. Conclusions:

> This study indicates 2,4-DP is highly toxic to rainbow trout with a reported LC50 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

- 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.
- 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. <u>Discussion/Results</u> 2,4-DP appears to be highly toxic to rainbow trout with a reported LC₅₀ of 0.50 ppm.

#### d. Adequacy of Study

- Category Supplementary (supplemental for formulated product)
- 2) Rationale See section 7 above
- Reparability Not repairable to core

#### 15. Completion of One-Liner: Yes

#### 16. CBI Appendix: N/A

CASE GS	·			PM 23	
CHEM 2,4-DF					
BRANCH EEB	X DISC				
FORMULATION	59.1%				
FICHE/MASTE	R ID 77321				
CITATION:	2,4-DP to th No. 11504-25	ne Water Flea 5-18; Prepare	Acute Toxicity a <u>Daphnia magna</u> ed by Union Car n Charleston, W	Straus; bide Corp	Project oration
SUBST. CLAS	SS =				
OTHER SUBJE PRIM:	CCT DESCRIPTO	ORS			
Validation	Category:				
DIRECT RVW	TIME = 4.0	(MH) START	DATE 12-22-87	END DATE	12-22-87
TITLE	Curtis E.E.: Fishery I.E.: EEB/HED Crystal (		7-1636		
SIGNATURE	: Cust	5 E. A	Jish	DATE: 4	t-11-88
APPROVED BY TITLE ORC LOC/TEI	: SURV. Bi		-0322		
SIGNATUR	: niman	_ J. COOK		DATE:	1.9.89

Chemical: 2,4-DP 1.

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

3. Study Type: 48-Hour LC50

Species Tested: Daphnia magna

Browne, A.M. (1980) The Acute Toxicity of Weedone 4. Study ID: 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.

Curtis E. Laird 5. Reviewed By:

Fishery Biologist

EEB/HED

Signature: Curtis & Laio Date: 4-11-88
Signature: Summan J. Cuk

6. Norman J. Cook Approved By:

Biologist

EEB/HED

Date: 1.9.89

7. Conclusions:

This study indicates 2,4-DP is very highly toxic to Daphnia magna with an LC50 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

- a. <u>Test Animals</u> 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. <u>Dose</u> 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  $\frac{LC_{50}}{L}$  to be 5.3 ppb.
- c. <u>Discussion/Results</u> 2,4-DP is very highly toxic to <u>Daphnia magna</u> with an LC₅₀ of 5.3 ppb or 0.005 ppm.

#### d. Adequacy of Study

- Category Supplementary (core for formulated product)
- 2) Rationale See section 7 above
- Reparability Not repairable

#### 15. Completion of One-Liner: Yes

#### 16. CBI Appendix: N/A

Laird 2-4-DP Daphnia magna 01-28-88 77331

*****	*****	******	*****	* <del>************</del>
CONC.	NUMBER	NUMBER	PERCENT	BINOMIAL
	EXPOSED	DEAD	DEAD	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

CASE GS	PM	2 <b>3</b>
CHEM 2,4-DP	)	
BRANCH EEB	X DISC	
FORMULATION	1 100%	
FICHE/MASTE	CR ID 72919	
•	Fink, R. (1976) Acute Oral LD ₅₀ Mallard Du No. 103-159; Prepared by Wildlife Internat for Dow Chemical U.S.A.	
SUBST. CLAS	3S =	
OTHER SUBJE PRIM:	ECT DESCRIPTORS	
Validation	Category: Invalid	
DIRECT RVW	TIME = 3.0 (MH) START DATE 12-22-87 END	DATE 12-22-87
	G: Crystal City, VA; 557-1636	
SIGNATURE	E: Curtis Ee. Laise DA	ATF: 4-11-88
APPROVED BY TITLE ORG LOC/TEL	I: Norman J. Cook E: Supr., Biol	
SIGNATURE	E: EEB/EFED  L: Cuptul City, Va; 557-0322  E: Noman   CWK DA	ATE: 1.9.69

Chemical: 2,4-DP 1.

2. Test Material: 100% (technical ai)

3. Study Type: Avian Acute Oral LD50

> Species Tested: Mallard Duck

> > (Anas Platyrhynchos)

Fink, R. (1976) Acute Oral LD50 Mallard Duck; 4. Study ID: Project No. 103-159; Prepared by Wildlife

International Ltd., for Dow Chemical U.S.A.

Reviewed By: Curtis E. Laird 5.

Fishery Biologist

EEB/HED

6. Norman J. Cook Approved By:

Biologist

EEB/HED

Date: 4-11-88
Signature: Numar J. Cwk

Signature: Curtiz E. Land

Date: 1.9.89

Conclusions: 7.

> This study indicates 2,4-DP is practically nontoxic to mallard duck with an  $\rm LD_{50}$  > 4640 mg/kg. However, this study does not fulfill the requirement in support of registration for an avian acute oral  ${\rm LD}_{50}$  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.

Discussion of Individual Tests: 10. N/A

- 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 LD50 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. <u>Discussion/Results</u> 2,4-DP is practically nontoxic to mallard duck with an LD₅₀ > 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	23	
CHEM 2,4-DP		·					
BRANCH EEB	X DISC _						
FORMULATION	100%						
FICHE/MASTER	ID 68084						
CITATION: F	ink, R. (19 uail; Proje nternationa	76) Eight- ct No. 103 1 Ltd., fo	Day Die	etary LC ₅₀ Prepared b Chemical U	Bobwl y Wild	hite dlife	<b>:</b>
SUBST. CLASS	=						
OTHER SUBJECT PRIM:	r DESCRIPTO	RS					
Validation C	ategory: C	ore					
DIRECT RVW T	IME = 3.0	(MH) STAI	RT DATE	12-22-87	END I	DATE	12-22-87
ORG:	Curtis E. Fishery B EEB/HED Crystal C	iologist	557-1636	5			
SIGNATURE:	Custia	E. Zan	D		DAT	E: 4	1-11-88
APPROVED BY: TITLE: ORG: LOC/TEL:	Numon J. Supv. Bisl EEB/EFED (Mntw)	•	557 -03	<i>ı</i>			
SIGNATURE:	Suman	aty, va;			DAT	E: /	1,9.89

Chemical: 2,4-DP 1.

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

Study Type: Eight-Day Dietary LC50 3.

> Species Tested: Bobwhite Quail

(Colinus virginianus)

Fink, R. (1976) Eight-Day Dietary LC50 Bobwhite Quail; Project No. 103-157: Prepared by Wildlife 4. Study ID: International Ltd., for Dow Chemical U.S.A.

Reviewed By: Curtis E. Laird 5.

Fishery Biologist

EEB/HED

Norman J. Cook 6. Approved By:

Biologist

EEB/HED

Signature: Curtis E. Laina

Date: 4-11-82

Signature: Number J. W.K.

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 LC50 study.

8. Recommendations:

9. Background:

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

10. Discussion of Individual Tests: N/A

- a. <u>Test Animals</u> Test animals were bobwhite quail (<u>Colinus</u> virginianus) from production flock; age = 14 days.
- b. <u>Test Design</u> Birds were tested in beacon battery brooder; temperature was 99 °F.
- c. <u>Dose</u> 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. <u>Test Procedures</u> 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
- Reparability N/A

#### 15. Completion of One-Liner: Yes

CASE GS	PM 23
CHEM 2,4-DP	
BRANCH EEB	X DISC
FORMULATION	100%
FICHE/MASTE	R ID 680684
	Fink, R. (1976) Eight-Day Dietary Mallard Duck; Project No. 103-158; Prepared by Wildlife International Ltd., for Dow Chemical U.S.A.
SUBST. CLAS	s =
OTHER SUBJE PRIM:	CT DESCRIPTORS
Review Cate	gory: Core
DIRECT RVW	TIME = 3.0 (MH) START DATE 12-24-87 END DATE 12-24-87
TITLE	
SIGNATURE	11 30 1 11 30
APPROVED BY TITLE ORG LOC/TEL	: SUAV. BIOJ. : EEB/EFED
SIGNATURE	: numar J. W/C DATE: 1.9.89

Chemical: 2,4-DP 1.

2. Test Material: 100% (technical ai)

3. Study Type: Eight-Day Dietary LC50

> Species Tested: Mallard Duck

> > (Anas platyrhynchos)

Fink, R. (1976) Eight-Day Dietary LC50 Mallard Duck; Project No. 103-158; Prepared by Wildlife 4. Study ID:

International Ltd., for Dow Chemical U.S.A.

5. Reviewed By: Curtis E. Laird

Fishery Biologist

EEB/HED

Signature: Curtis & Lais

Date: 4-11-88

Signature: ruman | WK

6. Norman J. Cook Approved By:

Biologist

EEB/HED

Date: 1.9.89

Conclusions: 7.

> 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 LC50 study.

8. Recommendations:

9. Background:

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

Discussion of Individual Tests: N/A 10.

- 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 LC50 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. <u>Discussion/Results</u> 2,4-DP is practically nontoxic to mallard duck with an LC₅₀ > 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

CASE GS			PM 2 <b>3</b>
CHEM 2,4-DP	<u> </u>		
BRANCH EEB _>	C DISC		
FORMULATION 5	59.1% a.i.		
FICHE/MASTER	ID 117157		
Pı		ight-Day Dietary LC ₅₀ 13; Prepared by Trusle ts, Inc.	
SUBST. CLASS	=		
OTHER SUBJECT PRIM:	T DESCRIPTORS		•
Category: Co	ore for a formula	ated product	
DIRECT RVW T	IME = 3.0 (MH)	START DATE 12-23-87	END DATE 12-24-87
TITLE: ORG:	Curtis E. Laire Fishery Biolog EEB/HED Crystal City,	ist	
SIGNATURE:	Curtis E.	Lail	DATE: 4-16-SP
APPROVED BY: TITLE: ORG: LOC/TEL:	Norman J. Cook Supv. Biol.		
SIGNATURE:	numan J. Cw.	<b>K</b>	DATE: 1.9.89

- Chemical: 2,4-DP 1.
- 2. Test Material: 59.1% (formulated product)
- Eight-Day Dietary LC50 з. Study Type:

Species Tested: Mallard Duck

(Anas platyrhynchos)

- Fink, R. (1976) Eight-Day Dietary LC50 Mallard 4. Study ID: Duck; Project No. 113-113; Prepared by Truslow Farm, Inc., for Amchem Products, Inc.
- Curtis E. Laird 5. Reviewed By:

Signature: Cutto E. Laira

Fishery Biologist EEB/HED

Approved By: Norman J. Cook

Biologist

EEB/HED

Date: 8-16-28
Signature: Numan J. W.K.
Date:

Date:

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 LC50 study for a formulated product.

- 8. Recommendations: N/A
- Background: 9.

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

Discussion of Individual Tests: 10. N/A

- 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. <u>Dose</u> 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 LC50 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 froduct
- 2) Rationale N/A
- Reparability N/A

# 15. Completion of One-Liner: Yes

CASE GS	·	PM	2 <b>3</b>	
CHEM <u>2,4-DP</u>				
BRANCH EEB _	X DISC			
FORMULATION	Mixture of 2,4-DP Derivatives	٠.		
FICHE/MASTER	ID 52635			
P	ink, R. (1977) Eight-Day Dietary LC ₅₀ rojeci No. 113-128; Prepared by Wildlind., for Amchem Products, Inc.			al
SUBST. CLASS	=			<del></del>
OTHER SUBJEC PRIM:	T DESCRIPTORS			
Category: C	ore (for a mixture of active ingredier	nt)		
DIRECT RVW T	IME = 3.0 (MH) START DATE 12-22-87	END I	OATE 12-22	-87
TITLE: ORG:	Curtis E. Laird Fishery Biologist EEB/HED Crystal City, VA; 557-1636			
SIGNATURE:	Curtis E. Zaina	DATI	E: 8-16-8	ોઉ
APPROVED BY: TITLE: ORG: LOC/TEL:	Norman J. Cook. Supr. Biol.			
SIGNATURE:	Cuptof City, Va; 557-0322 Suman J. CWK	DATI	E: /.9.89	

Na consoly

- 1. Chemical: 2,4-DP (Amchem 76-A510)
- 2. Test Material: A mixture of 2,4-DP Derivatives, a light brown liquid
- Study Type: Eight-Day Dietary LC₅₀

Species Tested: Mallard Duck

- 4. Study ID: Fink, R. (1977) Eight-Day Dietary LC₅₀ Mallard Duck; Projeci No. 113-128; Prepared by Wildlife International Ltd., for Amchem Products, Inc.
- 5. Reviewed By: Curtis E. Laird Fishery Biologist

Signature: Cutia E. Laio

Date: 8-16-83

6. Approved By: Norman J. Cook

Signature: /.9.89

Biologist EEB/HED

EEB/HED

Date: Norman J. CWK

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

- a. <u>Test Animals</u> Test animals were mallard ducks (<u>Anas platyrhynchos</u>) from production flock; age = 14 days.
- b. <u>Test Design</u> Birds were tested in beacon battery brooders; temperature was 99 °F.
- c. <u>Dose</u> Birds were dosed based on normal dietary concentration with the test material dissolved in 2 percent corn oil.
- d. <u>Design</u> 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. <u>Test Procedures</u> The test procedure complied with the recommended EPA protocol of October 1982.
- 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
- Rationale N/A
- 3) Reparability N/A
- 15. Completion of One-Liner: Yes
- 16. CBI Appendix: N/A

TDMS

PAGE 1 OF 1

CASE GS		PM 23
CHEM 2,4-DP		
BRANCH EEB	X DISC	
FORMULATION	unknown	
FICHE/MASTER	ID 73762	
te	cCarty, W.M. (1979) Toxicity of Eleve o Daphnia; Prepared by Dow Chemical U hemical U.S.A., Midland, Michigan.	
SUBST. CLASS	=	
OTHER SUBJEC' PRIM:	T DESCRIPTORS	
Validation C	ategory: Supplementary	
DIRECT RVW T	IME = 3.0 (MH) START DATE 01-07-88	END DATE 01-07-88
TITLE:	Curtis E. Laird Fishery Biologist EEB/HED Crystal City, VA; 557-1636	
SIGNATURE:	Curtis E. Laira	DATE: 4-11-88
APPROVED BY: TITLE: ORG: LOC/TEL:	Norman J. avok Supv. Biol. EEB/EFED Crystal City, Va; 557-0322 Numan J. Cwk	,
SIGNATURE:	numan J. Cwk	DATE: 1.9.89

Chemical: 2.4-DP 1.

2. Test Material: Unknown

Study Type: 48-Hour LC50 3.

Species Tested: Daphnia magna

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

U.S.A., Midland, Michigan.

Reviewed By: Curtis E. Laird 5.

Fishery Biologist

EEB/HED

Approved By: Norman J. Cook 6.

Biologist

EEB/HED

Date: 4-11-88
Signature: Summan ). (wk

Signature: Curtis E. Laire

Date: 1.9.89

7. Conclusions:

> This study indicates 2,4-DP is practically nontoxic to Daphnia magna with an LC50 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.

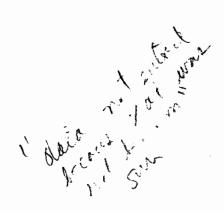
8. Recommendations:

> 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.

Discussion of Individual Tests: 10. N/A



- a. <u>Test Animals</u> Test animals were <u>Daphnia magna</u> 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. <u>Dose</u> Static bioassay using nominal concentrations; acetone was used as a solvent.
- d. <u>Design</u> 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. <u>Test Procedures</u> 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.
- Discussion/Results This study indicates 2,4-DP is practically nontoxic to <u>Daphnia</u> magna with an LC₅₀ of 252 ppm.

#### d. Adequacy of Study

- 1) Category Supplementary
- 2) Rationale See section 7 above
- Reparability Repairable
- 15. Completion of One-Liner: Yes
- 16. CBI Appendix: N/A

Laird 2-4-DP Daphnia magna 01-07-88; 73 762

*****	******	******	*********	********
CONC.	NUMBER	NUMBER	PERCENT	BINOMIAL
	EXPOSED	DEAD	DEAD	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

CASE GS0096	·	PM	23
CHEM 2,4-DP			
BRANCH EEB _	X DISC		
FORMULATION	2		
FICHE/MASTER	ID 116476		
C A s b	coss, D.; Burroughs, S.; Robert ral Toxicity (LC ₅₀ ) of 2,4-Dic cid to the Mallard Duck: BHY3, study received May 12, 1975 und by Huntingdon Research Centre, urts & Harvey Ltd., Washington	chlorophenoxy /74652. (Unpu der 11685-4; p England, subm	Propionic ablished orepared aitted by
SUBST. CLASS	=		
OTHER SUBJECT PRIM:	T DESCRIPTORS		
Validation C	Category: Invalid		
DIRECT RVW T	TIME = 3.0 (MH) START DATE 0	8-21-87 END I	OATE 08-21-87
REVIEWED BY: TITLE: ORG: LOC/TEL:	Fishery Biologist EEB/HED		
SIGNATURE:	Curtis E. Laird	DATI	e: 4-11-88
APPROVED BY: TITLE: ORG: LOC/TEL:	Supu. Biol- EEB/EFED		
SIGNATURE		DATE	E: 1-9-89
	1 1		5

Chemical: 2,4-DP 1.

2. Test Material: Unknown

3. Study Type: Eight-Day Dietary LC50

> Species Tested: Mallard Duck

4. Ross, D.; Burroughs, S.; Roberts, N. (1974) The Study ID: Acute Oral Toxicity (LC50) 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: Curtiz & Lairo Date: 4-11-88 Signature: Numan A Cook

б. Approved By: Norman J. Cook

Biologist

EEB/HED

Date: 1.9.89

#### 7. Conclusions:

This study indicates 2,4-DP is practically nontoxic to mallard duck with an LC50 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

- a. <u>Test Animals</u> Test animals were 128 day-old mallard ducks from Lincolnshire Pheasantries.
- b. <u>Test Design</u> Birds were tested in metal cages; size = 33 x 18 x 10 inches.
- <u>Dose</u> Nominal dietary concentrations; corn oil was used as a carrier.
- d. <u>Design</u> 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 LC₅₀ 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. <u>Statistical Analysis</u> Probit method showed the eight-day dietary LC₅₀ to be 11,272 (9531 to 14,753) ppm.
- c. <u>Discussion/Results</u> 2,4-DP is practically nontoxic to mallard duck with an LC₅₀ 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

116476 . and appropriate to the summary comparing the following contraction on the date on the date of the date e i da ja sa off offi .. * . * 2 * 1 1 <u>...</u> : " . .... 1000 gas details The large of the terms of the large transfer of the state of the large transfer of the l 1999 - PROTETTIONLY BOARD CONSERVATION - F FENCERT come depote contre. Escapes tem ectual communeus cavel ASSOCIATE ADA THESE CIMITS IS BEGATES THAN 45 AGRICUL. AND CONTROL OF CASE WITH THE BETTER OF COLUMN ARRALIE S ALLEATER LEINE DAE MOVING AVERAGE RETROP t - 414 La Figure ST MERIEND CONFIDENCE CIMITS 11177 + I taF 104 ( T /

FRESULTE LAST CONTENDED THE CHOOSE SHETHED THE CHOOSE SHETHED TO CONTENDED TO CONTENDED TO CONTENDED TO CONTENDED TO CONTENDE TO CONTENDE

CASE GS	-			PM 2 <b>3</b>	
CHEM 2,4-DP		_			
BRANCH EEB	X DISC				
FORMULATION	100% (mixt	cure of 2,4-DE	e derivatives)		
FICHE/MASTE	R ID 52637				
CITATION:	in Bobwhite	e Quail; Proje	te LC ₅₀ of Amch ec: No. 113-127 Ltd., for Amche	; Prepared	d by
SUBST. CLAS	ss =				
OTHER SUBJE PRIM:	CCT DESCRIPT	TORS			
Category:	Core for a	mixture of 2	,4-DP derivativ	res	
DIRECT RVW	TIME = 3.0	(MH) START	DATE 12-23-87	END DATE	12-23-87
ORG	Fishery EEB/HED		7-1636		
SIGNATURE	: Curtis	E. Lais		DATE: &	-16-29
APPROVED BY TITLE ORG LOC/TEI SIGNATURE	E: Supu Bi E: EEB/EFE E: Cuptul			DATE (	19.89
			Sign in the second seco		

- Chemical: 2,4-DP (Amchem 76-A510) 1.
- 2. Test Material: 100% (Mixture of 2,4 DP Derivatives)
- 3. Study Type: Eight-Day Dietary LC₅₀

Species Tested: Bobwhite Quail (Colinus virginianus)

- Fink, R. (1977) The Acuta LC50 of Amchem 4. Study ID: (2,4-DP) in Bobwhite Quail; Projeci No. 113-127; Prepared by Wildlife International Ltd., for Amchem Products, Inc.
- Signature: Curtie E. Lans 5. Reviewed By: Curtis E. Laird Fishery Biologist EEB/HED
- Date: 8-16-88
  Signature: Number J. Culk 6. Approved By: Normani J. Cook Biologist 1.9.89 EEB/HED Date:
- 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 LC50 study.

- Recommendations: N/A 8.
- 9. Background:

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

Discussion of Individual Tests: 10.

- 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. <u>Design</u> 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. <u>Test Procedures</u> The test procedure complied with the recommended EPA protocol of October 1982.
- 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

- Category Core for a mixture of 2,4-DP Derivatives
- 2) Rationale N/A
- 3) Reparability N/A

# 15. Completion of One-Liner: Yes

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 o to Bluegill Sunfish ( <u>Lepomis macroch</u> 11504-1414; Prepared by Union Carbid Carbide Corporation Agriculture Prod South Charleston, West Virginia 2530	irus); Project No. e for Union ucts Company,
SUBST. CLASS = OTHER SUBJECT DESCRIPTORS PRIM:	
Validation Category: Supplemental (A formulate	d product was used)
DIRECT RVW TIME = 3.0 (MH) START DATE 01-07-8	8 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. Laire	DATE: 4-11-88
APPROVED BY: Norman J. Cook.  TITLE: Supv. Biul.  ORG: FEB/EFED	
SIGNATURE: Numar J. CWK	DATE: 1.9.89

2,4-DP Chemical: 1.

2. Test Material: 59.1%

96-Hour LC50 3. Study Type:

> Species Tested: Bluegill Sunfish (Lepomis macrochirus)

4. Seminara, J. (1980) Acute Toxicity of Weedone Study ID: 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.

Curtis E. Laird 5. Reviewed By:

Fishery Biologist

EEB/HED

Norman J. Cook 6. Approved By:

Biologist

EEB/HED

Date: 4-11-88
Signature: Numar J. Culk

Signature: Curtis E. Lairi

Date:

#### 7. Conclusions:

This study indicates 2,4-DP is highly toxic to bluegill sunfish with an LC50 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

- a. <u>Test Animals</u> Test animals were bluegill sunfish from Connecticut; weight = 0.38 g; SL = 32 mm.
- b. <u>Test Design</u> 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. <u>Design</u> 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  ${\rm LC}_{50}$  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

- Category Supplementary (core for formulated product)
- 2) Rationale See section 7 above
- 3) Reparability Repairable

## 15. Completion of One-Liner: Yes



10001

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

****	*****	*****	******	********
CONC.	NUMBER	NUMBER	PERCENT	BINOMIAL .
	EXPOSED	DEAD	DEAD	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.

************************

CASE GS	PM 23.
CHEM 2,4-DP	
BRANCH EEB	X DISC
FORMULATION	100% (mixture of 2,4-DP Derivatives)
FICHE/MASTE	ID 52636
] ]	rink, 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 SUBJEO	T DESCRIPTORS
Study Valida	tion Category: Core for mixture of active ingredients
DIRECT RVW	TIME = 3.0 (MH) START DATE 12-28-87 END DATE 12-28-8
TITLE ORG	Curtis E. Laird Fishery Biologist EEB/HED Crystal City, VA; 557-1636
SIGNATURE	Curtie E. Zarih DATE: 8-16-28
APPROVED BY TITLE ORG LOC/TEL	Supr. Biol. EFB/EFFD Cuptal City, Va; 557-0322
SIGNATURE	Suman J. Cook DATE: 1.9.89

- Chemical: 2,4-DP (Amchem 76-A510) 1.
- Test Material: 100% (mixture of 2,4-DP Derivatives) 2.
- Study Type: Eight-Day Dietary LC50 3.

Species Tested: Mallard Duck

- Fink, R. (1976) Eight-Day Dietary LC₅₀ in Mallard Duck (Anas platyrhynchos); Projec & No. 113-121; 4. Study ID: Prepared by Truslow Farm, Inc., for Amchem Products, Inc.
- Curtis E. Laird 5. Reviewed By: Fishery Biologist EEB/HED

Date: 8-16-83 Signature: numar . Wk

Signature: Curtis E. Lane

Approved By: Norman J. Cook 6. Biologist

EEB/HED

Date: 1.9.89

Conclusions: 7.

> 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 LC50 study for a mixture of active ingredinets.

- Recommendations: N/A 8.
- 9. Background:

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

Discussion of Individual Tests: N/A10.

- 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. <u>Dose</u> Nominal dietary concentrations; corn was used as a solvent.
- d. <u>Design</u> 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 LC50 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.
- 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 LC₅₀ > 10,000 ppm.

#### d. Adequacy of Study

- 1) Category Core for a mixture of 2,4-DP derivatives
- 2) Rationale N/A
- Reparability N/A

#### 15. Completion of One-Liner: Yes

CASE GS	·	PM 2 <b>3</b>	
CHEM 2,4-DP			
BRANCH EEB _	X DISC		
FORMULATION	100% (mixture of 2,4-DP derivatives)		
FICHE/MASTER	ID 52638		
Q	rink, R. (1976) Eight-Day Dietary LC ₅₀ Quail; Projeci No. 113-120; Prepared by Inc., for Amchem Products, Inc.	Bobwhite Truslow	Farm,
SUBST. CLASS	: =		
OTHER SUBJECT DESCRIPTORS PRIM:  Category: Core for a mixture of 2,4-DP derivatives			
DIRECT RVW T	TIME = 3.0 (MH) START DATE 12-28-87	END DATE	12-28-87
TITLE:	Curtis E. Laird Fishery Biologist EEB/HED Crystal City, VA; 557-1636		
SIGNATURE:	Curtis & Laine	DATE: 8	-16-88
APPROVED BY: TITLE: ORG: LOC/TEL: SIGNATURE:	Norman J. Cook Supv. Biol: EEB/EFED Crystal City, la; 557-0312	DATE:	1.9.fq
	Troman J. Com	,	•

- 2,4-DP (Amchem 76-A510) Chemical: 1.
- 2. Test Material: 100% (mixture of 2,4-DP derivatives)
- 3. Study Type: Eight-Day Dietary LC50

Species Tested: Bobwhite Quail

(Colinus virginianus)

Fink, R. (1976) Eight-Day Dietary LC50 Bobwhite 4. Study ID: Quail; Projec & No. 113-120; Prepared by Truslow Farm, Inc., for Amchem Products, Inc.

5. Reviewed By: Curtis E. Laird Signature: Curtin & Lain

Fishery Biologist EEB/HED

Date: 8-/6-88
Signature: Numar A Cuk

Norman J. Cook Approved By:

Biologist EEB/HED

Date: 1.9.84

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 LC50 study for a mixture of active ingredients.

- 8. Recommendations:
- 9. Background:

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

10. Discussion of Individual Tests: N/A

- 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. <u>Dose</u> 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 LC₅₀ value to be 9907 (6938 to 52,102) ppm.
- c. <u>Discussion/Results 2,4-DP</u> is practically nontoxic to bobwhite quail with an LC₅₀ of 9907 ppm.

#### d. Adequacy of Study

- Category Core for a mixture of 2,4-DP derivatives
- 2) Rationale N/A
- 3) Reparability N/A

# 15. Completion of One-Liner: Yes

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

CONC.	NUMBER	NUMBER	PERCENT	BINOMIAL	
	EXPOSED	DEAD	DEAD	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

CASE GS0096				PM 23	
CHEM 2,4-DP		-			
BRANCH EEB	X DISC				
FORMULATION	: Unknown				
FICHE/MASTE	R ID 116475	)	<u></u>		
, , ,	Poxicity (I Acid to You study recei by Huntinga	LC50) of 2,4- ing Japanese Lved May 12, don Research	; Roberts, N. (Dichlorophenoxy Quail: BHY/2/75 1975 under 1168 Centre, England shington, DC; C	Propion: 210. (Un 5-4; prep , submit	ic npublished pared ted by
SUBST. CLAS	S =				
OTHER SUBJE PRIM:	CT DESCRIPT	ORS			
Validation (	Category:	Invalid		•	
DIRECT RVW	TIME = 3.0	(MH) START	DATE 08-24-87	END DAT	E 08-24-87
	: Fishery : EEB/HED	Biologist City, VA; 55	^		
SIGNATURE	: Curt	is & J	aish	DATE: 4	4-11-39
APPROVED BY TITLE ORG LOC/TEL	: Supr. Blo	1.	0324		
SIGNATURE	: ruma	n). Cwk		DATE:	1.9.89

#### DATA EVALUATION RECORD

- 2.4-Dichlorophenoxy Propionic Acid Chemical: 1.
- Test Material: Unknown 2.
- Study Type: Eight-Day Dietary LC50 3.

Species Tested: Japanese Quail (Colurnix Colurnix)

- Ross, D.; Burroughs, S.; Roberts, N. (1975) The 4. Study ID: Acute Toxicity (LC50) 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)
- Curtis E. Laird Reviewed By: Fishery Biologist

EEB/HED

Signature: Curtis & Lains

Date: 4-11-89

Signature: Norman J. Cook

Norman J. Cook Approved By:

Biologist EEB/HED

Date: 1.9.89

7. Conclusions:

> This study indicates 2,4-DP is practically nontoxic to Japanese quail with an LC50 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.

Background: 9.

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

Discussion of Individual Tests: N/A 10.

- a. <u>Test Animals</u> 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. <u>Design</u> 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 LC₅₀ 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. <u>Discussion/Results</u> 2,4-DP is practically nontoxic to Japanese quail with an LC₅₀ of 6133 ppm.

## d. Adequacy of Study

- Category Supplemental
- Rationale See section 7 above
- Reparability Not repairable
- 15. Completion of One-Liner: Yes
- 16. CBI Appendix: N/A

# 

CONC.	NUMBER	NUMBER	PERCENT	BINOMIAL
	<b>EXPOSED</b>	DEAD	DEAD .	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

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

RESULTS CALCULATED USING THE PROBIT METHOD

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

2,28446 SLOPE

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

**************************************

CASE GS	<del>_</del>	PM	2 <b>3</b>	
CHEM <u>2,4-DF</u>	) 			_
BRANCH EEB	X DISC			
FORMULATION	1 100%			
FICHE/MASTE	ER ID 117158			. –
CITATION:	Fink, R. (1976) Eight-Day Dietary LC ₅₀ Quail; Project No. 113-112; Prepared by Inc., for Amchem Products, Inc., Amber, 19002.	Tru	slow Farm,	
SUBST. CLAS	SS =			-
OTHER SUBJE PRIM:	ECT DESCRIPTORS			
Validation	Category: Core			
DIRECT RVW	TIME = 3.0 (MH) START DATE 12-21-87	END	DATE 12-21-8	37
TITLE	Y: Curtis E. Laird E: Fishery Biologist G: EEB/HED L: Crystal City, VA; 557-1636			
SIGNATURE	: Curtin E. Land	DAT	F: 4-11-88	>
APPROVED BY TITLE ORG LOC/TEI	Y: Norman J. Cook E: Supv. Bibl G: EEB/EFED			
SIGNATUR	E: Wman J. WIL	DAT	'E: 1.9.89	

#### DATA EVALUATION RECORD

2,4-DP Chemical: 1.

100% (technical ai) 2. Test Material:

Eight-Day Dietary LC50 3. Study Type:

> Bobwhite Quail Species Tested:

> > (Colinus virginianus)

Fink, R. (1976) Eight-Day Dietary LC50 Bobwhite 4. Study ID: Quail; Project No. 113-112; Prepared by Truslow Farm, Inc., for Amchem Products, Inc., Amber,

Pennsylvania 19002.

Reviewed By: Curtis E. Laird 5.

Fishery Biologist

EEB/HED

Signature: Curtis & Lains

Norman J. Cook Approved By: 6.

Biologist

EEB/HED

Date: H-11-83
Signature: Wman 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 LC50 study.

- 8. Recommendations: N/A
- Background: 9.

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

N/A 10. Discussion of Individual Tests:

- a. <u>Test Animals</u> Test animals were bobwhite quail from Truslow Farm production flock; age = 14 days.
- b. <u>Test Design</u> 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

CASE GS0096	·			PM 2	23
CHEM 2,4-DP					
BRANCH EEB _	X DISC				
FORMULATION:	Unknown				
FICHE/MASTER	ID 102544				
A A B	nion Carbide A cute Toxicity dditives to Fr ioassay Report 972 under 264-	of Severesh Wate	al Brush Kill r Shiners, No blished study	ler Formul otropis:	lations and Primary
SUBST. CLASS OTHER SUBJEC PRIM:	= T DESCRIPTORS				
Validation C	ategory: Inva	.lid			
DIRECT RVW T	IME = 3.0 (MH	) START	DATE 10-16-	87 END DA	ATE 10-16-87
TITLE: ORG:	Curtis E. La Fishery Biol EEB/HED Crystal City	ogist	7-1636		
SIGNATURE:	Clistia	E. I	disp	DATE	: 4-11-88
APPROVED BY: TITLE: ORG: LOC/TEL:	Normon J. Co Supr. Biol. EEB/EFED Cuptul City Numan		7-0322		
SIGNATURE:	numar J	(wk		DATE	: 19.89

#### DATA EVALUATION RECORD

2,4-DP 1. Chemical:

2. Test Material: Unknown⁻

Study Type: 96-Hour LC50

Species Tested: Notropis Shiner

Amchem Research Farm (1970) Acute Toxicity of 4. Study ID: 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)

Reviewed By: Curtis E. Laird

Fishery Biologist

EEB/HED

Signature: Curtis E. Lains

6. Approved By: Norman J.Cook

Biologist

EEB/HED

Date: 4-11-88

Signature: Numar J. Cwk.

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).

Background: 9.

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

10. Discussion of Individual Tests: N/A

- 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. <u>Test Design</u> Fish were tested in 1.0 gallon glass vessels; temperature was 74 °F.
- Dose Bioassay using nominal concentrations and no solvent was mentioned.
- d. <u>Design</u> 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 LC₅₀ was > 1.0 and < 5.0 ppm.

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

- a. <u>Test Procedures</u> The test procedure did not comply with the recommended EPA protocol of October 1982.
- b. Statistical Analysis No statistics were performed.
- 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
  - Category Invalid
  - 2) Rationale See section 7 above
  - 3) Reparability Not repairable
- 15. Completion of One-Liner: Yes
- 16. CBI Appendix: N/A

- 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. <u>Test Design</u> Fish were tested in 1.0 gallon glass vessels; temperature was 74 °F.
- c. <u>Dose</u> Bioassay using nominal concentrations and no solvent was mentioned.
- d. <u>Design</u> 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 LC₅₀ 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. <u>Statistical Analysis</u> 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
  - Rationale See section 7 above
  - Reparability Not repairable
- 15. Completion of One-Liner: Yes
- 16. CBI Appendix: N/A