MRID No.: 439426-05

DATA EVALUATION RECORD
AVIAN EGG-SPRAY STUDY

4/29/1996

1. **CHEMICAL:** Paraquat dichloride (061601)

2. **TEST MATERIAL:** Gramoxone Super; 17.3% w/w

3. **CITATION:**

Authors:	Roberts, N.L., B. Hakin, and D.O. Chanter
Title:	The effect of paraquat on the hatchability of fertile pheasant eggs
Date:	1988
Laboratory:	Huntingdon Research Centre, Ltd., Cambridgeshire, England
Lab. Report ID:	ISN 171/881712
Sponsor:	ICI Agrochemicals
MRID No.:	439426-05

4. **REVIEWED BY:**

William Erickson
Biologist
EEB/EFED/EPA

Signature: W. Erickson
Date: 4/29/96

5. **APPROVED BY:**

Harry Craven
Section Head 4
EEB/EFED/EPA

Signature: Harry T. Craven
Date: 5/1/96

6. **CONCLUSIONS:** The study is scientifically sound. Pheasant eggs in subgroups of 10 were sprayed with Gramoxone Super (17.3% paraquat dichloride) on one of six occasions (day 0, 2, 4, 10, 14, or 20) during incubation. The number of chicks hatched and the number of 28-day-old survivors were significantly adversely affected on one spray occasion (day 4) at both 1 and 2 lb ai/acre. At the higher rate, embryonic deaths and chick body-weight gain also were adversely affected on one or more of the six spray occasions.

7. **STUDY CLASSIFICATION:** Supplemental (not a guideline requirement).

8. **MATERIALS AND METHODS:**

Test Organism:

Criteria	Reported Information
Species	Pheasant *(Phasianus colchicus)*
Egg supplier	The County Game Farms, Hothfield, Ashford, Kent
Chick food	standard HRC chick meal

Test System:

Criteria	Reported Information
Incubator: **type** **temp. (°C)** **rel. humidity (%)**	Bretagne incubator 37.6 ± 0.04 54
Chick housing	wooden pens with concrete floors
Hatcher	PH 150 hatcher
Spray equipment	manually operated box sprayer with a 1-m boom pressurized by carbon dioxide through a single even flat spray jet (Tee jet SS8002E/2)
Spray method	replicates (10 eggs each) were placed on paper plates (to imitate a clutch arrangement) and sprayed 1 repl. at a time

Test Design:

Criteria	Reported Information
Treatment doses	0, 0.5, 1, and 2 lb ai/acre
No. subgroups (spray occasions) per dose	6

Criteria	Reported Information
Day of spray treatment for each subgroup	a - day 0 b - day 2 c - day 4 d - day 10 e - day 14 f - day 20
No. replicates per subgroup	4
No. eggs per replicate	10
Control	sprayed with tap water
Measurement endpoints	infertile eggs; embryonic deaths; no. dead in shell; chick mortality; chick bodyweight
Observation period:	incubation: 25-27 days chicks: 28 days

9. **REPORTED RESULTS:**

Criteria	Reported Information
Quality assurance and GLP compliance statements were included in the report?	yes
Egg observations: **a: egg weights** **b: infertile eggs and early embryonic deaths** **c: late embryonic deaths** **d: dead in shell**	a: day -2 b: day 13 (candling) c: day 19 (candling) d: at day 31 (eggs that did not hatch)
Chick observations: **a: no. hatched** **b: clinical obs.** **c: individual bodyweights** **d: mortalities**	a: days 25-27 b: daily c: on hatching and at 28 days d: daily

Criteria	Reported Information
Post-mortem exams	all dead chicks plus 6 ♂ and 6 ♀ from each subgroup examined for: - body length - gross macroscopic abnormalities - liver weight - position, no., and abnormalities of gonads - length of vestigial right Mullerian duct - absence of oviduct in males
Raw data included?	yes

Eggs:

Egg dosage (lb ai/A)	Infertile eggs		Early embryonic deaths (day 13)		Late embryonic deaths (day 19)		Dead in shell (day 31)	
	no.	%[1]	no.	%[2]	no.	%[2]	no.	%[2]
Control	48	20.0	19	9.9	5	2.6	36	18.8
0.5	53	22.1	21	11.2	2	1.1	32	17.1
1	40	16.7	17	8.5	11	5.5	47	23.5
2	40	16.7	55	27.5*	3	1.5	42	21.0

[1] % of eggs set
[2] % of fertile eggs
* significantly different from the control on one or more of the 6 spray occasions (ANOVA and Williams test)

Chicks:

Egg dosage (lb ai/A)	Hatchlings		Surviving to 28 days		Mean bodyweight increase (g/bird)
	no.	%[1]	no.	%[2]	
Control	133	69.3	115	86.5	129.7
0.5	132	70.6	121	91.7	128.4
1	123	61.5	98	79.7	131.3
2	98	49.0*	85	86.7*	124.4

[1] % of fertile eggs
[2] % of chicks hatched
* significantly different from the control on one or more of the 6 spray occasions (ANOVA and Williams test)

Other Findings: Chicks from the highest test concentration had significantly lower body weights than the controls. Variations in the color and size of male testes and the color of female ovaries were noted, but these were not considered to be significant or related to treatment.

10. **VERIFICATION OF STATISTICAL RESULTS:**

Statistical Method: Williams' test (results attached)

Measurement endpoint	LOEC (lb ai/A)	NOEC (lb ai/A)
No. infertile eggs	2	1
No. embryonic deaths	2	1
No. dead in shell	>2	2
No. eggs hatched	1	0.5
No. 28-day-old survivors	1	0.5

11. **REVIEWER'S COMMENTS:** The study is scientifically sound. Although not reported by the study authors, the number of chicks hatched and the number of 28-day-old survivors were significantly adversely affected on one spray occasion (day 4) at both the 1- and 2-lb ai/acre application rate. At the higher rate, egg fertility, embryonic deaths, and chick body-weight gain also were adversely affected on one or more of the six spray occasions.