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Record No.

Review No.

128897
Shaughnessey No.

EEB REVIEW AUG 20 1990

DATE: IN 6/14/90 OUT 7/26/90

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PETITION OR EXP. NO.

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TYPE PRODUCTS(S): I, D, H, F, N, R, S

MRID NO(S). 415121-1

PRODUCT MANAGER NO. 15

PRODUCT NAME(S) Karate

COMPANY NAME ICI Americas, Inc.

SUBMISSION PURPOSE Review of Data/mallard reproduction

SHAUGHNESSEY NO.	CHEMICAL AND FORMULATION	% A.I.
128897	lambda-cyhalothrin	97

DATA EVALUATION RECORD

1. **CHEMICAL:** Karate.
Shaughnessey Number: 128897.

2. **TEST MATERIAL:** R119321 PP321 (Lambda-Cyhalothrin), a broad-spectrum pyrethroid insecticide, 96.3% purity, a buff-colored solid.

3. **STUDY TYPE:** Avian Reproduction Study.
Species Tested: Mallard Duck (Anas platyrhynchos).

4. **CITATION:** Beavers, J.B., K.A. Hoxter and M.J. Jaber. 1989. PP321: A One-Generation Reproduction Study with the Mallard (Anas platyrhynchos). Prepared by Wildlife International Ltd., Easton, Maryland. Laboratory Project No. 123-143. Submitted by ICI Americas, Inc. MRID Number: 415121-01.

5. **REVIEWED BY:**

Candy Brassard
Biologist
EEB/EFED

Signature: Candy Brassard
Date: 7/25/90

6. **APPROVED BY:**

Ann Stavola
Acting Section Head- III
EEB/ EFED

Signature: Ann Stavola
Date: 7/31/90

7. **CONCLUSIONS:**

It appears this study is scientifically sound, however, there are discrepancies that need to be addressed by the study authors. Therefore, this study is classified as Supplemental. The study authors or the registrant should report the chemical properties of Hexaconazole, since the the mallards used in this avian reproduction study were maintained in the same room as the Hexaconazole treated pens. This study design of using one control group for two studies is not recommended in the future.

The study authors should also report if indeed the residue levels in the feed of 10-05-88 were indeed lambda-cyhalothrin, or background contamination.

This study may be reclassified, depending on the information submitted by the company.

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The KBN Engineering and Applied Sciences completed the review of the Karate (PP321- or lambda cyhalothrin) in a mallard reproduction study. The review is attached.

The Ecological Effects Branch has also reviewed the avian reproduction study on the mallard exposed to lambda-cyhalothrin. The study appears to be scientifically sound. There are additional concerns identified by EEB. These discrepancies are as follows:

- ICI Americas, Inc. should report why the control and treated pens were placed with another test chemical in the same room. (Refer to Appendix XII). The study authors should report the vapor pressure of Hexaconazole, since it may have affected this study. This study design of using one control for two studies is not recommended in the future.

- The study authors should report if indeed the levels in the feed of 10-05-88 were indeed lambda- cyhalothrin, or background contamination.

- In addition to the statistical analysis conducted by Wildlife International and/ or KBN Engineering, EEB has completed the following data analysis:

- Hatchling body weight per treatment level.

- Egg shell thickness per treatment level.

- Total food consumption per pen per treatment level.

- Female Body weight change from week 0 until study termination.

- Male Body weight change from week 0 until study termination.

- Gross pathological observations noted.

- Summary of the Residues reported in the egg, liver and fat tissue.

The results of the statistical analysis are as follows:

Hatchling Body Weight

Hatchling body weight was not significantly affected at any of the doses tested. In fact, the treatment groups had a slight increase in weight when compared to the control- though not a statistical significant increase. Therefore the NOEL is 30 ppm for this parameter.

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Eggshell Thickness

Eggshell thickness did not significantly decrease at any dose tested. However, there was an increase in eggshell thickness at the 0.5 ppm treatment level. Since there was not a dose response relationship and the other doses were considered to be similar to the control, EEB believes the NOEL for this parameter is 30 ppm, as well.

Total Food Consumption/ Treatment Level

EEB also analyzed the data by calculating the total food consumption per pen/ per treatment level. Based on the data analysis, the total feed consumption is not affected at the 30 ppm. There was an actual increase in food consumption at the 15 and 30 ppm when compared to the control group. Treatment Group of 5 ppm, had the lowest reported food consumption. The NOEL is 30 ppm.

Female Body Weight Change from Week 0 to Study Termination

EEB analyzed the effect on the female body weight from study initiation to study termination. Based on the statistical analysis, the NOEL was 30 ppm. There was no significant difference in the weight of the females in any of the treatment groups when compared to the control groups.

Male Body Weight Change from Week 0 to Study Termination

EEB analyzed the effect on male body weight change from study initiation to study termination. Based on the statistical analysis, the NOEL was determined to be $\leq$ 30 ppm. There was no significant impact on the body weight of the males in any of the treatment groups when compared to the control groups.

Gross Pathological Observations

EEB reviewed the gross pathological observations (Appendix IV) submitted by the study authors. There was an increase in number of "old egg yolk peritonitis" in all treatment groups when compared to the treatment groups, especially from 5 ppm to 30 ppm groups. Specifically, 38 % in the 5 ppm group, 56 % in the 15 ppm, and 44% in the 30 ppm treatment group.

On selected gross pathological observations (Appendix IV) there was an increase of "old egg yolk peritonitis" in the treated groups when compared to the control group in four of the five sampling dates.

Residue Analysis of Egg, Liver and Fat Tissue

EEB reviewed the data submitted by the study authors with regards to the residue data required as part of the protocol. A summary of the data are attached. Based on the data, lambda-cyhalothrin primarily accumulates in the fat. There was not an increase in accumulation over time. Therefore, it appears this chemical does not bioaccumulate in mallards as it does in other nontarget species (such as the fathead minnow with a BCF of approximately 5000).

Conclusions:

It appears this study is scientifically sound, however, there are discrepancies that need to be addressed by the study authors. Therefore, this study is classified as Supplemental. The study authors or the registrant should report the chemical properties of Hexaconazole, since the the mallards used in this avian reproduction study were maintained in the same room as the Hexaconazole treated pens. This study design of using one control group for two studies is not recommended in the future.

The study authors should also report if indeed the residue levels in the feed of 10-05-88 were indeed lambda- cyhalothrin, or background contamination.

This study may be reclassified, depending on the information submitted by the company.

Treatment Level ppm	Residues (ppm) Weeks Of Egg Production 12	13	14	17	20	Liver	Fat
control	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
0.5	<0.01	0.42	<0.01	<0.01	<0.01	<0.01	0.03
	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03
		<0.01	<0.01	<0.01	<0.01	<0.01	0.03 0.05
5.0	0.08	0.07	0.05	0.09	0.05	0.03	0.45
	0.11	0.07	0.08	0.06	0.06	0.03	0.79
		0.04	0.05	0.04	0.12	<0.01	0.38
15.0	0.23	0.25	0.10	0.10	0.05	0.09	2.4
		0.10	0.21	0.16	0.35	0.12	2.0
		0.17	0.18	0.15	0.15	0.03 0.03	1.6 0.96
30.0	0.30	0.30	0.40	0.39	0.29	0.02	1.7
	0.52	0.51	0.35	0.25	0.40	0.06	4.0
			0.52	0.51	0.52	0.21 0.42	5.2 5.5

SUMMARY OF RESIDUES (ppm)

Weeks of Egg Production

Treatment Level Mean Data	12	13	14	17	20	Liver	Fat
control	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
0.5	<0.01	0.14	<0.01	<0.01	0.01	<0.01	0.035
5.0	0.095	0.06	0.06	0.063	0.076	0.02	0.54
15.0	0.23	0.17	0.16	0.14	0.18	0.07	1.74
30.0	0.41	0.41	0.42	0.38	0.40	0.18	4.1

DATA EVALUATION RECORD

1. **CHEMICAL:** Karate.
Shaughnessey Number: 128897.

2. **TEST MATERIAL:** R119321 PP321 (Lambda-Cyhalothrin), a broad-spectrum pyrethroid insecticide, 96.3% purity, a buff-colored solid.

3. **STUDY TYPE:** Avian Reproduction Study.
Species Tested: Mallard Duck (Anas platyrhynchos).

4. **CITATION:** Beavers, J.B., K.A. Hoxter and M.J. Jaber. 1989. PP321: A One-Generation Reproduction Study with the Mallard (Anas platyrhynchos). Prepared by Wildlife International Ltd., Easton, Maryland. Laboratory Project No. 123-143. Submitted by ICI Americas, Inc. MRID Number: 415121-01.

5. **REVIEWED BY:**

Pim Kosalwat, Ph.D.
Senior Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature: P. Kosalwat
Date: July 12, 1990

6. **APPROVED BY:**

Michael L. Whitten, M.S.
Wildlife Toxicologist
KBN Engineering and
Applied Sciences, Inc.

Signature: James R Newman for MLW
Date: 7/12/90

Henry T. Craven, M.S.
Supervisor, EEB/HED
USEPA

Signature:
Date:

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements for an avian reproduction study. Nominal dietary concentrations of PP321 at 0.5, 5, 15, and 30 ppm did not result in treatment-related effects upon reproduction, mortality, behavior, body weight or food consumption of mallard ducks (Anas platyrhynchos) during the 19-week exposure period. The NOEC was determined to be 30 ppm, the highest concentration tested. Residue analyses showed some accumulation of PP321 in fat, liver, and eggs of mallard ducks.

8. **RECOMMENDATIONS:** N/A.

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9. **BACKGROUND:**

10. **DISCUSSION OF INDIVIDUAL TESTS:** N/A.

11. **MATERIALS AND METHODS:**

A. **Test Animals:** The birds used in the test were pen-reared, unmated mallards and were purchased from Whistling Wings, Hanover, Illinois. All birds were acclimated to the facilities for 3 weeks prior to initiation of the test. Birds that did not appear healthy were discarded. The birds were from the same hatch and were 20 weeks of age at test initiation.

B. **Dose/Diet Preparation/Food Consumption:** Test diets were prepared by mixing PP321 into a premix which was used for weekly preparation of the final diet. Control diet and four test concentrations (0.5, 5, 15, and 30 ppm) were prepared weekly and presented to the birds on Wednesday of each week. When necessary, additional feed was prepared. Dietary concentrations were not adjusted for purity of the test substance. The control diet contained an amount of the solvent (acetone) and carrier (corn oil) equal to that in the treated diets.

Adult birds were fed a game bird ration formulated for breeding birds. All offspring received a game bird ration formulated for young growing birds. The test substance was not mixed into the diet of the offspring. Food and water were supplied ad libitum during acclimation and during the test. Samples of the control diet and each of the test diets were taken weekly after mixing for analytical verification of the test concentrations. Stability and homogeneity samples were also collected. Chemical analyses of all samples were performed using gas chromatography.

Food consumption was measured for each pen for a seven day period every week throughout the study.

C. **Design:** The birds were randomly distributed into five groups as follows:

Nominal Concentration as PP321 (ppm)	Number of Pens	Birds Per Pen	
		Males	Females
Control (0)	16	1	1
0.5	16	1	1
5	16	1	1
15	16	1	1
30	16	1	1

"Treatment levels were based upon known toxicity data." Adult birds were identified by individual leg bands. The primary phases of the study and their approximate durations were as follows:

1. Acclimation - 3 weeks.
2. Pre-photostimulation - 8 weeks.
3. Pre-egg laying (with photostimulation) - 2 weeks.
4. Egg laying - 9 weeks.
5. Post-adult sacrifice (final incubation, hatching, 14-day offspring rearing period) - 5 weeks.

D. **Pen Facilities:** Adult birds were housed indoors in pens constructed of galvanized wire grid and galvanized sheeting. Pens measured approximately 75 cm x 90 cm x 45 cm high. The average temperature in the adult study room was 18.4°C ± 2.1°C (SD) with an average relative humidity of 43% ± 12% (SD).

The photoperiod during the first 8 weeks of the study was 8 hours of light per day. The photoperiod was increased to 17 hours of light per day during week 9, and was maintained at that length until sacrifice of adult birds. The birds received approximately 130 lux of illumination throughout the study.

E. **Adult Observations/Gross Pathology:** All adult birds were observed at least once daily throughout the study for signs of toxicity or abnormal behavior. All birds that died during the study were necropsied. At the conclusion of the adult exposure period, all surviving birds were sacrificed and necropsied. Samples of fat and livers were collected from four randomly selected hens from each concentration for residue analysis.

Adult birds were weighed at test initiation, during weeks 2, 4, 6, 8, and at terminal sacrifice.

F. **Eggs/Eggshell Thickness:** Eggs were collected daily from all pens, marked according to pen of origin, and washed to prevent pathogen contamination. The eggs were stored in a cold room until incubated at a mean temperature of 11.3°C ± 3.7°C (SD) with a mean relative humidity of approximately 69%. At weekly interval, eggs were removed from the cold room, counted, and eggs taken for egg shell thickness measurement. The remaining eggs were candled to detect egg shell cracks or abnormal eggs. Cracked or abnormal eggs were discarded.

All eggs that were not cracked, abnormal or used for egg shell thickness measurements were placed in an incubator at 37.5°C ± 0.3°C (SD) and 56% relative humidity. Eggs were candled again on day 14 of incubation to determine embryo viability and on day 21 to determine embryo survival. All eggs were turned automatically while in the incubator and placed in a hatcher on incubation day 24. Temperature in the hatcher was 37.2°C ± 0.2°C (SD) with a relative humidity of 79%.

Weekly throughout the egg laying period, one egg was collected, when available, from each of the odd numbered pens during the odd numbered weeks, and from each of the even numbered pens during the even numbered weeks. These eggs were opened at the waist and the contents removed for residue analysis. The average thickness of the dried shell plus membrane was determined by measuring (to the nearest 0.005 mm) five points around the waist of the egg using a micrometer.

G. **Hatchlings:** All hatchlings and unhatched eggs were removed from the hatcher on day 26 or 27 of incubation. The average body weight of the hatchlings by pen was then determined. Hatchlings were toe and web clipped for identification by pen of origin and then housed according to the appropriate parental concentration grouping in brooding pens until 14 days of age. Each brooding pen measured 72 cm x 90 cm x 24 cm high, and was constructed of galvanized wire mesh and galvanized sheeting.

Brooder temperatures were maintained at approximately 38°C from hatching until the birds were 5 to 7 days of age. Thermostats were then adjusted to maintain a temperature of approximately 26°C. Ambient room temperature during brooding was 24.6°C ± 1.7°C. The

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photoperiod was maintained at 17 hours of light per day. Hatchlings were fed untreated diet. At 14 days of age, the average body weight by parental pen of all survivors was determined.

H. **Statistics:** Upon completion of the study, Dunnett's method was used to determine statistically significant differences between the control group and each of the treatment groups. Sample units were the individual pens within each experimental group. Percentage data were examined using Dunnett's method following arcsine transformation. The pens in which mortality occurred were not used in statistical comparisons of the data.

Each of the following parameters was analyzed statistically:

Adult Body Weight
Adult Feed Consumption
Eggs Laid of Maximum Laid
Eggs Cracked of Eggs Laid
Viable Embryos of Eggs Set
Live 3-Week Embryos of Viable Embryos
Hatchlings of 3-Week Embryos
Hatchlings of Eggs Set
Offspring's Body Weight
Hatchlings of Maximum Set
14-Day-Old Survivors of Maximum Set
14-Day-Old Survivors of Eggs Set
14-Day-Old Survivors of of Hatchlings
Egg Shell Thickness

12. **REPORTED RESULTS:**

A. **Diet Analysis:** Diet analysis was included as Appendix XIII in the report. "There were no measurable changes in PP321 levels during the week that diets were offered to the mallards. PP321 was well distributed within the diets considering that the daily consumption of each bird was greater than the 10-g sample size used for chemical analyses." The measured concentrations ranged between 71% and 122% of the nominal values (Table 1-A, attached).

B. **Mortality and Behavioral Reactions:** There were no mortalities in the control group or in any treatment group during the course of study.

No overt signs of toxicity were observed at any concentration tested. Incidental clinical signs, such as high wing carriage, slight lower limb weakness, squatting, ruffled appearance and coughing, sneezing, and wheezing were noted at various concentrations during the course of the study. One hen from the 15-

ppm group was observed with a prolapsed uterus during week 20, which was subsequently reduced. Aside from those incidental signs and lesions normally associated with pen wear and/or interaction among mates, all birds at all concentrations appeared normal throughout the study.

Necropsy findings are presented in Appendix IV (attached). In both the 15-ppm and 30-ppm groups, there appeared to be a slight increase in the number in hens exhibiting lesions of egg yolk peritonitis when compared to the control group. The authors stated that the number of hens exhibiting lesions was comparable to the number seen in all treatment levels of a concurrent reproduction study with another chemical and results seen in other mallard reproduction studies run within the same time frame. All other findings observed also were considered to be incidental to treatment.

C. **Adult Body Weight and Food Consumption:** There were no statistically significant differences in mean body weight between the control group and any of the treatment groups (Table 1, attached).

There were no apparent treatment related effects upon feed consumption among birds at any concentration tested (Table 2, attached). During week 1, there was a slight, but statistically significant, increase in feed consumption at 15 ppm and 30 ppm when compared with the control. During week 8, there were slight, but statistically significant, decreases in feed consumption at all test concentrations. All of these differences were considered to be incidental to treatment.

D. **Reproduction:** When compared to the control group, there were no significant differences in reproductive parameters at any concentration tested. Reproductive data are presented in Table 3 (attached).

E. **Egg Shell Thickness:** When compared to the control group, there were no significant differences in egg shell thickness at any concentration (Table 4, attached).

F. **Offspring Body Weight:** There were no significant differences between the control and any treatment group in body weights of offspring at hatching or at 14 days of age (Table 5, attached).

G. **Tissue and Egg Residue Analysis:** A summary of tissue and egg residue analysis data is presented in the following table:

Treatment level (ppm)	Average concentration (ppm)		
	Eggs	Liver	Fat
Control	<0.01	<0.01	<0.01
0.5	<0.01	<0.01	0.04
5	0.07	0.02	0.52
15	0.17	0.07	1.74
30	0.40	0.18	4.10

Mallards treated with PP321 in their diet showed some accumulation of the compound in their fat. Lower levels of PP321 were found in mallard eggs, and there was no increase in egg residues over time with continued dietary exposure to PP321. Dietary exposure of mallards to PP321 led to little accumulation of the compound in liver.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** "Dietary concentrations of PP321 at 0.5, 5, 15 or 30 ppm did not result in treatment related mortalities, overt signs of toxicity, or effects upon body weight or feed consumption during the 20 week exposure period. There was no observable treatment related effects upon reproductive parameters at any concentration tested. Results of residue analysis of eggs, liver, and fat were not suggestive of bioaccumulation of PP321. The no-observed-effect concentration for PP321 in this study was 30 ppm, the highest concentration tested. The LOEL was greater than 30 ppm."

The report stated that the study was conducted in conformance with Good Laboratory Practice regulations (40 CFR 160). Quality assurance audits were conducted on several occasions during the study and the quality assurance statement was signed by the Quality Assurance Manager of Wildlife International Ltd.

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

A. **Test Procedure:** The test procedures were in accordance with Subdivision E - Hazard Evaluation: Wildlife and Aquatic Organisms, ASTM, and SEP guidelines except for the following deviations:

- Adult birds were maintained at approximately 18°C and 43% relative humidity; 21°C and 55% are recommended.

- Eggs were stored at a temperature of approximately 11.3°C and a relative humidity of approximately 69%; 16°C and 65% are recommended.

- Ambient room temperature during brooding was approximately 24.6°C; 21°C is recommended.

- Behavioral observations of offspring were not reported.

B. **Statistical Analysis:** Some statistical procedures differed from recommended methods. Specifically, there is no basis for transforming the number of eggs laid, hatchlings, and 14-day surviving chicks to percentile values of the maximum number of eggs laid or set in any test group.

Statistical analyses on reproductive parameters were conducted by the reviewer using analysis of variance with a multiple comparison test following square-root transformation of the count data and arcsine square-root transformation of the ratio data. The computer program used was based on the EEB Bigbird program. The results (attached) confirmed those performed by the authors (i.e., no significant differences were detected between the control group and any treatment level for any reproductive parameter measured), with three exceptions:

1) Diet concentrations of 5 and 15 ppm significantly affected live 3-week embryos as percentage of viable embryos (i.e., le21/ve) when compared to the control; the authors found no significant differences between the control and any treatment level.

2) Diet concentration of 5 ppm significantly affected hatchlings as percentage of live 3-week embryos (i.e., hat/le21) when compared to the control; the authors found no significant differences between the control and any treatment level.

3) Diet concentration of 5 ppm significantly affected hatchlings as percentage of eggs set (i.e., hat/es) when compared to the control; the authors

found no differences between the control and any treatment level.

These differences, however, are not considered treatment related since the highest diet concentration (30 ppm) did not have any effects on the parameters tested.

C. **Discussion/Results:** Low levels of PP321 (0.04 and 0.05 ppm) were found in the control diet sample number 3/first day of preparation and control diet sample number 2/seven day after preparation (Appendices A and B, attached). In the reviewer's opinion, these concentrations found were probably background noises since they were very close to the minimum detection limit (0.03 ppm).

Minor deviations from the recommended protocols observed in the test probably did not significantly affect the toxicity results of the test.

Nominal dietary concentrations of PP321 at 0.5, 5, 15, and 30 ppm had no effects upon reproduction, mortality, and behavior of adult mallards during the 19-week exposure period. The reviewer agrees with the author that the reduction in feed consumption during week 8 was probably not treatment related (Table 2, attached). The NOEC was determined to be 30 ppm, the highest concentration tested. Exposure of mallard ducks to PP321 through their diet resulted in an accumulation of the test material in the following order: fat > eggs > liver.

This study is scientifically sound and fulfills the guideline requirements for an avian reproduction toxicity test using mallard ducks.

D. **Adequacy of the Study:**

(1) Classification: Core.

(2) Rationale: The test followed the recommended protocols.

(3) Repairability: N/A.

15. **COMPLETION OF ONE-LINER:** Yes, July 11, 1990.

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Shaughnessey No. 128897 Chemical Name PP321 (Karate) Chemical Class _____ Page 1 of 1

Study/Species/Lab/ Succession _____ Chemical % Active 96.3

Avian Reproduction,

Species: Anas platyrhynchos

Lab: Wildlife International Ltd.

Acc

MRID # 415121-01

Results

Group	Dose(ppm)*	Effected/Parameters	Mort.(%)	%Cho Inh.
Control	0	None	None	N/A
Treatment I	0.5	"	"	"
Treatment II	5	"	"	"
Treatment III	15	"	"	"
Treatment IV	30	"	"	"

Study Duration: 19-wk exposure period

Comments: * Based on nominal dietary concentrations NOEC = 30 ppm.

Reviewer/ Date: PK 7-11-90

Validation Status: Cor.

Field Study (Simulated/Actual)

Species: _____

Lab: _____

Acc. _____

Group	Rate(ai/a)	Treatment Interval	Total # Treatments	Mor.(%)
Control				
Treatment I				
Treatment II				
Treatment III				

Crop/Site: Study Duration:

Comments:

Chronic fish,

Species _____

Lab: _____

Acc. _____

Concentrations Tested (pp__)= _____

MATC = >____ <____ pp__. Effected Parameter = _____

Contr. Mort.(%)= _____ Sol. Contr. Mort.(%)= _____

Comments:

Chronic invertebrate

Species _____

Lab _____

Acc. _____

Concentrations Tested (pp__)= _____

MATC =>____< ____pp__. Effected Parameter(s) _____

Contr. Mort.(%)= _____ Sol. Contr. Mort.(%)= _____

Comments:

ANOVA on SQR(21-day Live Embryos)

DEP VAR: SLE21 N: 80 MULTIPLE R: .090 SQUARED MULTIPLE R: .008

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	2.115	4	0.529	0.152	0.961
ERROR	260.496	75	3.473		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.059	1	0.059	0.017	0.897
ERROR	260.496	75	3.473		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.821	1	0.821	0.236	0.628
ERROR	260.496	75	3.473		

Page _____ is not included in this copy.

Pages 19 through 30 are not included in this copy.

The material not included contains the following type of information:

_____ Identity of product inert ingredients.

_____ Identity of product impurities.

_____ Description of the product manufacturing process.

_____ Description of quality control procedures.

_____ Identity of the source of product ingredients.

_____ Sales or other commercial/financial information.

_____ A draft product label.

_____ The product confidential statement of formula.

_____ Information about a pending registration action.

X FIFRA registration data.

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

_____ The document is not responsive to the request.

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

PP321/Mallard Reproduction
Sorted by Treatment Levels

TREATMENT LEVEL 0 PPM

		PENNO	EL	EC	ES	VE	LE21	HAT	TWOWK
CASE	1	1	55	4	47	44	44	29	29
CASE	2	2	32	1	29	29	29	23	23
CASE	3	3	32	1	27	14	14	11	8
CASE	4	4	39	0	35	32	31	22	21
CASE	5	5	24	0	19	19	18	16	15
CASE	6	6	41	2	35	34	34	30	30
CASE	7	7	46	0	39	38	38	35	35
CASE	8	8	67	0	62	59	58	52	50
CASE	9	9	22	1	19	17	17	15	15
CASE	10	10	15	0	12	12	12	10	10
CASE	11	11	41	0	36	34	34	26	24
CASE	12	12	34	1	28	27	27	22	21
CASE	13	13	44	1	37	36	36	18	17
CASE	14	14	1	0	1	1	1	0	0
CASE	15	15	35	6	24	22	21	11	11
CASE	16	16	39	0	36	36	36	30	28
			567	17	486	454	450	350	337

TREATMENT LEVEL 0.5 PPM

CASE	17	1	43	0	38	36	36	26	25
CASE	18	2	40	0	36	36	34	24	22
CASE	19	3	1	0	0	0	0	0	0
CASE	20	4	37	1	33	33	33	8	8
CASE	21	5	49	0	44	41	41	22	22
CASE	22	6	41	0	37	33	33	26	25
CASE	23	7	38	0	34	31	30	15	13
CASE	24	8	37	1	33	33	33	18	18
CASE	25	9	27	0	23	18	17	6	6
CASE	26	10	4	1	1	1	1	1	1
CASE	27	11	51	0	47	47	47	38	38
CASE	28	12	17	0	15	12	12	6	6
CASE	29	13	54	0	50	48	48	33	33
CASE	30	14	51	1	46	44	38	15	15
CASE	31	15	53	1	48	47	46	29	29
CASE	32	16	21	0	16	14	14	7	7
			564	5	501	474	463	274	268

TREATMENT LEVEL 5 PPM

		PENNO	EL	EC	ES	VE	LE21	HAT	TWOWK
CASE	33	1	43	1	39	34	33	22	22
CASE	34	2	13	0	11	9	8	4	4
CASE	35	3	31	0	27	25	25	13	13
CASE	36	4	51	0	46	43	40	26	26
CASE	37	5	36	1	32	30	30	26	23
CASE	38	6	38	0	34	30	30	22	18
CASE	39	7	43	1	38	31	30	13	13
CASE	40	8	54	0	50	50	50	32	32
CASE	41	9	50	0	44	43	43	35	35
CASE	42	10	61	1	56	44	43	18	17
CASE	43	11	26	0	24	21	21	16	16
CASE	44	12	40	0	37	34	21	3	2
CASE	45	13	37	0	33	31	31	19	17
CASE	46	14	52	0	48	47	47	36	35
CASE	47	15	25	1	21	12	5	0	0
CASE	48	16	45	1	41	40	38	10	9
			645	6	581	524	495	295	282

TREATMENT LEVEL 15 PPM

CASE	49	1	43	0	39	37	37	28	27
CASE	50	2	39	0	36	35	32	18	15
CASE	51	3	60	1	53	45	44	37	35
CASE	52	4	7	0	5	5	4	4	4
CASE	53	5	37	2	31	0	0	0	0
CASE	54	6	41	0	38	34	33	30	27
CASE	55	7	47	0	42	41	38	12	10
CASE	56	8	41	0	38	38	34	4	4
CASE	57	9	49	1	44	44	43	38	35
CASE	58	10	34	0	29	26	25	24	21
CASE	59	11	38	0	34	27	23	11	10
CASE	60	12	64	0	60	59	56	41	40
CASE	61	13	1	0	0	0	0	0	0
CASE	62	14	42	2	37	37	37	32	28
CASE	63	15	32	0	28	25	25	16	14
CASE	64	16	57	0	53	46	46	42	41
			632	6	567	499	477	337	311

TREATMENT LEVEL 30 PPM

		PENNO	EL	EC	ES	VE	LE21	HAT	TWOWK
CASE	65	1	53	0	49	45	45	37	35
CASE	66	2	5	0	4	4	4	2	2
CASE	67	3	47	0	42	34	33	30	30
CASE	68	4	39	0	36	36	32	9	9
CASE	69	5	22	1	18	17	16	12	12
CASE	70	6	34	0	32	27	27	22	20
CASE	71	7	44	1	38	38	38	22	22
CASE	72	8	57	0	51	50	49	38	36
CASE	73	9	1	0	0	0	0	0	0
CASE	74	10	31	0	28	26	24	20	20
CASE	75	11	48	0	42	41	41	33	33
CASE	76	12	14	0	12	12	11	3	3
CASE	77	13	54	3	46	44	44	39	36
CASE	78	14	51	0	46	43	43	39	39
CASE	79	15	36	2	30	30	28	10	10
CASE	80	16	27	0	25	16	16	8	8
			563	7	499	463	451	324	315

ANOVA on SQR(Eggs Laid)

DEP VAR: SEL N: 80 MULTIPLE R: .149 SQUARED MULTIPLE R: .022

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	4.837	4	1.209	0.427	0.788
ERROR	212.183	75	2.829		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.062	1	0.062	0.022	0.883
ERROR	212.183	75	2.829		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	2.212	1	2.212	0.782	0.379
ERROR	212.183	75	2.829		

ANOVA on SQR(Eggs Laid)

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.716	1	0.716	0.253	0.616
ERROR	212.183	75	2.829		

Post-hoc contrast of treatment 4 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.079	1	0.079	0.028	0.868
ERROR	212.183	75	2.829		

ANOVA on SQR(Eggs Cracked)

DEP VAR: SEC N: 80 MULTIPLE R: .240 SQUARED MULTIPLE R: .058

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	1.630	4	0.408	1.145	0.342
ERROR	26.699	75	0.356		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.074	1	1.074	3.018	0.086
ERROR	26.699	75	0.356		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.739	1	0.739	2.077	0.154
ERROR	26.699	75	0.356		

ANOVA on SQR(Eggs Cracked)

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.138	1	1.138	3.198	0.078
ERROR	26.699	75	0.356		

Post-hoc contrast of treatment 4 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.022	1	1.022	2.870	0.094
ERROR	26.699	75	0.356		

ANOVA on SQR(Eggs Set)

DEP VAR: SES N: 80 MULTIPLE R: .162 SQUARED MULTIPLE R: .026

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	6.274	4	1.569	0.506	0.732
ERROR	232.713	75	3.103		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.056	1	0.056	0.018	0.894
ERROR	232.713	75	3.103		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	3.237	1	3.237	1.043	0.310
ERROR	232.713	75	3.103		

ANOVA on SQR(Eggs Set)

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.961	1	0.961	0.310	0.580
ERROR	232.713	75	3.103		

Post-hoc contrast of treatment 4 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.024	1	0.024	0.008	0.930
ERROR	232.713	75	3.103		

ANOVA on SQR(Viable Embryos)

DEP VAR: SVE N: 80 MULTIPLE R: .118 SQUARED MULTIPLE R: .014

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	3.664	4	0.916	0.267	0.898
ERROR	257.263	75	3.430		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.022	1	0.022	0.006	0.937
ERROR	257.263	75	3.430		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	2.021	1	2.021	0.589	0.445
ERROR	257.263	75	3.430		

ANOVA on SQR(Viable Embryos)

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.000	1	0.000	0.000	0.996
ERROR	257.263	75	3.430		

Post-hoc contrast of treatment 4 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.033	1	0.033	0.010	0.922
ERROR	257.263	75	3.430		

ANOVA on SQR(21-day Live Embryos)

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.076	1	0.076	0.022	0.882
ERROR	260.496	75	3.473		

Post-hoc contrast of treatment 4 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.102	1	0.102	0.029	0.864
ERROR	260.496	75	3.473		

ANOVA on SQR(Hatched)

DEP VAR: SHAT N: 80 MULTIPLE R: .116 SQUARED MULTIPLE R: .013

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	3.393	4	0.848	0.255	0.906
ERROR	249.398	75	3.325		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	3.258	1	3.258	0.980	0.325
ERROR	249.398	75	3.325		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.443	1	1.443	0.434	0.512
ERROR	249.398	75	3.325		

ANOVA on SQR(Hatched)

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.837	1	0.837	0.252	0.617
ERROR	249.398	75	3.325		

Post-hoc contrast of treatment 4 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.858	1	0.858	0.258	0.613
ERROR	249.398	75	3.325		

ANOVA on SQR(Two week Survivors)

DEP VAR: STWOWK N: 80 MULTIPLE R: .112 SQUARED MULTIPLE R: .013

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	3.091	4	0.773	0.240	0.915
ERROR	241.728	75	3.223		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	2.766	1	2.766	0.858	0.357
ERROR	241.728	75	3.223		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.526	1	1.526	0.474	0.493
ERROR	241.728	75	3.223		

ANOVA on SQR(Two week Survivors)

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.285	1	1.285	0.399	0.530
ERROR	241.728	75	3.223		

Post-hoc contrast of treatment 4 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	0.649	1	0.649	0.202	0.655
ERROR	241.728	75	3.223		

ANOVA on EC/EL

DEP VAR: RESP1 N: 80 MULTIPLE R: .222 SQUARED MULTIPLE R: .049

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	151.979	4	37.995	0.973	0.427
ERROR	2927.918	75	39.039		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	48.016	1	48.016	1.230	0.271
ERROR	2927.918	75	39.039		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	76.446	1	76.446	1.958	0.166
ERROR	2927.918	75	39.039		

ANOVA on EC/EL

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	121.599	1	121.599	3.115	0.082
ERROR	2927.918	75	39.039		

Post-hoc contrast of treatment 4 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	97.351	1	97.351	2.494	0.119
ERROR	2927.918	75	39.039		

ANOVA on VE/ES

3 CASES DELETED DUE TO MISSING DATA.

DEP VAR: RESP2 N: 77 MULTIPLE R: .221 SQUARED MULTIPLE R: .049

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	673.831	4	168.458	0.921	0.457
ERROR	13174.902	72	182.985		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1.204	1	1.204	0.007	0.936
ERROR	13174.902	72	182.985		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	349.106	1	349.106	1.908	0.171
ERROR	13174.902	72	182.985		

ANOVA on VE/ES

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	284.981	1	284.981	1.557	0.216
ERROR	13174.902	72	182.985		

Post-hoc contrast of treatment 4 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	3.191	1	3.191	0.017	0.895
ERROR	13174.902	72	182.985		

ANOVA on LE21/VE

4 CASES DELETED DUE TO MISSING DATA.

DEP VAR: RESP3 N: 76 MULTIPLE R: .332 SQUARED MULTIPLE R: .110

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	773.209	4	193.302	2.203	0.077
ERROR	6230.429	71	87.753		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	25.321	1	25.321	0.289	0.593
ERROR	6230.429	71	87.753		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	459.869	1	459.869	5.241	0.025
ERROR	6230.429	71	87.753		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	498.881	1	498.881	5.685	0.020
ERROR	6230.429	71	87.753		

Post-hoc contrast of treatment 4 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	118.965	1	118.965	1.356	0.248
ERROR	6230.429	71	87.753		

ANOVA on HAT/LE21

4 CASES DELETED DUE TO MISSING DATA.

DEP VAR: RESP4 N: 76 MULTIPLE R: .284 SQUARED MULTIPLE R: .081

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	1728.261	4	432.065	1.559	0.195
ERROR	19672.198	71	277.073		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	394.380	1	394.380	1.423	0.237
ERROR	19672.198	71	277.073		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1108.528	1	1108.528	4.001	0.049
ERROR	19672.198	71	277.073		

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	7.834	1	7.834	0.028	0.867
ERROR	19672.198	71	277.073		

Post-hoc contrast of treatment 4 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	74.335	1	74.335	0.268	0.606
ERROR	19672.198	71	277.073		

ANOVA on TWOWK/HAT

6 CASES DELETED DUE TO MISSING DATA.

DEP VAR: RESP5 N: 74 MULTIPLE R: .414 SQUARED MULTIPLE R: .171

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	1117.103	4	279.276	3.562	0.011
ERROR	5409.223	69	78.395		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	144.086	1	144.086	1.838	0.180
ERROR	5409.223	69	78.395		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	6.875	1	6.875	0.088	0.768
ERROR	5409.223	69	78.395		

ANOVA on TWOWK/HAT

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	277.212	1	277.212	3.536	0.064
ERROR	5409.223	69	78.395		

Post-hoc contrast of treatment 4 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	146.099	1	146.099	1.864	0.177
ERROR	5409.223	69	78.395		

ANOVA on HAT/ES

3 CASES DELETED DUE TO MISSING DATA.

DEP VAR: RESP6 N: 77 MULTIPLE R: .231 SQUARED MULTIPLE R: .053

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	1143.703	4	285.926	1.012	0.407
ERROR	20339.332	72	282.491		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	272.029	1	272.029	0.963	0.330
ERROR	20339.332	72	282.491		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1099.458	1	1099.458	3.892	0.052
ERROR	20339.332	72	282.491		

ANOVA on HAT/ES

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	243.391	1	243.391	0.862	0.356
ERROR	20339.332	72	282.491		

Post-hoc contrast of treatment 4 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	119.072	1	119.072	0.422	0.518
ERROR	20339.332	72	282.491		

ANOVA on TWOWK/ES

3 CASES DELETED DUE TO MISSING DATA.

DEP VAR: RESP7 N: 77 MULTIPLE R: .242 SQUARED MULTIPLE R: .058

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
TRT	1192.925	4	298.231	1.116	0.356
ERROR	19241.649	72	267.245		

Post-hoc contrast of treatment 1 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	190.586	1	190.586	0.713	0.401
ERROR	19241.649	72	267.245		

Post-hoc contrast of treatment 2 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	1073.746	1	1073.746	4.018	0.049
ERROR	19241.649	72	267.245		

ANOVA on TWOWK/ES

Post-hoc contrast of treatment 3 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	381.238	1	381.238	1.427	0.236
ERROR	19241.649	72	267.245		

Post-hoc contrast of treatment 4 with control.

TEST FOR EFFECT CALLED: TRT

TEST OF HYPOTHESIS

SOURCE	SS	DF	MS	F	P
HYPOTHESIS	79.565	1	79.565	0.298	0.587
ERROR	19241.649	72	267.245		
