108401

6-20-80

Includes reports on field studies

EE BRANCH REVIEW

IN 1/10/80 OUT 6/16/80

FILE OR REG. NO. 239-EUUO

PETITION OR EXP. PERMIT NO.

DATE DIV. RECEIVED

DATE OF SUBMISSION

DATE SUBMISSION ACCEPTED

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

DATA ACCESSION NO(S).

PRODUCT MGR. NO. 23-Garner

PRODUCT NAME(S) Bolero 10G

COMPANY NAME Chevron Chemical Company

SUBMISSION PURPOSE New registration - resubmission with data -

use on rice in California ONLY

CHEMICAL & FORMULATION thiobencarb A.I. - 10%

(1)

Bolero 10G

100 Pesticide Label Information

100.1 Pesticide Use

Control of barnyardgrass (watergrass) and sprangletop in rice fields.

100.2 Formulation Information

10% granular formulation
A.I. = S-[(4-chlorophenyl)methyl] diethylcarbamothioate

100.3 Application Methods, Directions, Rates

Rice (California Only): Weed Control in Water-Seeded Rice - Aerial application for control of Barnyardgrass (Watergrass) and Sprangletop: Apply BOLERO 10G at 40 lbs. per acre (4.0 lbs. active). Apply after flooding when rice is in the two-leaf stage (usually 7 to 14 days after seeding). Make application before the Barnyardgrass and Sprangletop have advanced beyond the 2 leaf stage. Grasses beyond this stage are tolerant to BOLERO.

100.4 Target Organisms

Barnyardgrass (watergrass)
Sprangletop

100.5 Precautionary Labeling

Precautions: Do not use in fields where fall farming of crayfish will be practiced. Do not use adjacent to catfish ponds. Water drained directly from treated fields must not be used to irrigate other crops.

This product is toxic to fish and shrimp. Keep out of lakes, streams, ponds, tidal marshes and estuaries. Do not contaminate water by cleaning of equipment or disposal of wastes.

101 Physical and Chemical Properties

Refer to EUP review, 239-EUP-78, by Ann Rosenkranz, 1/19/80.

102 Behavior in the Environment

Have not yet received data from EFB.

103 Toxicological Properties

	Test Organism	Test Type	Result	Test Compound	Validation Category	Ref. No.
1.	Bobwhite quail	Subacute 8-D dietary	LC_{50} >625 ppm	Bolero 8EC + Stam F-34	Suppl.	12
2.	Bobwhite quail	Subacute 8-wk dietary (adults)	LC_{50} >5620 ppm	Bolero Tech.	Suppl.	7
3.	Bobwhite quail	Subacute 8-wk dietary (adults)	LC_{50} >5620ppm	Bolero Tech.	Invalid	6
4.	Bobwhite quail	Reproduction	reduced body wgt. of hatchlings and 14-D old survivors at 1000 ppm	Bolero Tech.	Invalid	8,9
5.	Mallard	Subacute 8-D dietary	LC_{50} >3125 ppm	Bolero 8 EC + Stam F-34	Suppl.	13
6.	Mallard	Reproduction	NEL=100 ppm	Bolero Tech (95.5% A.I.)	Suppl.	10, 11
7.	Sheepshead minnow (juv.)	Acute 96-h static	LC_{50} - 0.9 ppm (95% C.I. - (0.7 - 1.2 ppm)	Bolero Tech (95.1% A.I.)	Core	15
8.	Sheepshead minnow	Acute 96-h static	LC_{50} - 1.4 ppm (95% C.I. - 1.1 - 1.8 ppm)	Bolero 8EC	Suppl.	16
9.	Sheepshead minnow (juv.)	Acute 96-h Intermittent flow Embryo-larvae juvenile 28-D cont. exposure	LC_{50} 659 ppb (95% C.I. - 390 - 1300 ppb) hatching success decrease at $\geq$600 ppb 28-D LC_{50} - 360.6 ppb (95% C.I. - 330.4 - 394.1 ppb) significant mortality at $\geq$280 ppb signif. decrease length $\geq$150 ppb signif. decrease wgt. $\geq$150 ppb MATC <150 ppb Appl. factor <0.23	Bolero Tech (95.1% A.I.)	Suppl.	17

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10.	Bluegill	Acute 96-h static	LC_{50} - 4.7 ppm (95% CI - 4 - 5.4 ppm)	Bolero 8EC + StamF - 34	Suppl.	18
11.	Channel catfish	Acute 96-h static	LC_{50}-6.4 ppm (95% CI - 5.7 - 7.2 ppm)	Bolero 8EC + StamF - 34	Invalid	18
12.	Fiddler crab	Acute 96-h static	LC_{50} - 4.4 ppm (95% CI - 3.5 - 5.8 ppm	Bolero 8EC	Suppl.	19
13.	Eastern oyster	Embryo - larvae	48h EC_{50} - 560 ppb (95% CI - 230 - 1300 ppb)	Bolero Tech. (95.1% A.I.)	Core	20
14.	Eastern oyster	Embryo - larvae	48h EC_{50} - 320 ppb (95% CI - 200 - 510 ppb)	Bolero 8EC	Suppl.	21
15.	Grass shrimp	Acute 96-h Static (field)	LC_{50} - 564 ppb (95% CI - 498 - 670 ppb)	Bolero 8EC	Invalid	22
16.	Mysid shrimp	Acute 96-h intermittent-flow	LC_{50}-288 ppb (95% CI - 237-356 ppb)	Bolero Tech., (95.1% A.I.)	Core	23
		Chronic study (28 day exposure) (intermittent flow)	signif. Mort. at $\geq$30 ppb		Suppl.	23
			time to brood pouch form. signif. increased at 96 ppb.			
			number of off-spring signif. reduced at $\geq$50 ppb.			
			MATC - between 19 ppb and 30 ppb. Appl. factor-0.07-0.10			

17.	Daphnia magna	Acute 48-h static	LC_{50} -0.101 ppm (95% CI - 0.074-0.139 ppm)	Bolero Tech (94.4% A.I.)	Core	24
18.	Daphnia magna	Acute 48-h static	LC_{50} - 0.211 ppm (95% CI - 0.176-0.253 ppm)	Bolero 8EC	Suppl.	25

104. Hazard Assessment - Refer to EUP review, 239-EUP-78, by Ann Rosenkranz, January 19, 1980.

104.4 Adequacy of Toxicity Data

References 26 through 35 must still be reviewed and validated. Of the studies that have been validated to date, the following are unacceptable for these reasons:

1. Bobwhite quail and mallard duck subacute dietary studies (Ref. 12 and 13) - technical grade of each pesticide alone was not used. Additionally, the test animals rejected the treated food at dose levels greater than 600 ppm for the quail and 300 ppm for the mallard.

2. Bobwhite quail reproduction study (Ref. 8, 9) - the birds were in poor health; consequently, the recorded effects cannot be attributed to exposure to Bolero.

3. Mallard duck reproduction study (Ref. 10, 11) - the statistical analysis used must be clarified since we cannot duplicate their results.

4. Sheepshead minnow chronic toxicity study (Ref. 17) - the time to hatch data was omitted and must be submitted as required by EPA in Bioassay Procedures for the Ocean Disposal Permit Program, EPA-600/9-78-010, March 1978.

5. Bluegill acute toxicity study (Ref. 18) - technical grade of each pesticide alone was not used.

6. Channel catfish acute toxicity study (Ref. 18) - technical grade of each pesticide alone was not used. Additionally, the test containers were aerated, which is not acceptable.

7. Grass shrimp acute toxicity study (Ref. 22) - the technical grade of the pesticide was not used. Additionally, the test procedure did not follow any protocols recommended by EPA for a 96-hour acute toxicity test for aquatic organisms. Furthermore, significant amounts of data that are needed to make a valid interpretation of this study are missing. These data include: size and age of the shrimp, acclimation conditions, loading factor, dissolved oxygen concentration, pH, salinity and temperature.

8. Fiddler crab acute toxicity study (Ref. 19) - the technical grade of the pesticide was not used. Additionally, fiddler crabs are amphibious and are not truly representative of commercial (aquatic) crabs.

9. Mysid shrimp chronic toxicity study (Ref. 23) - We need an explanation of why Williams' procedure was used since it assumes equal replication at all treatment levels which was not the case in this study. Also, the data should be submitted in terms of the individual replicates/treatment level so the results can be verified.

104.5 Additional Data Required

Although a considerable volume of data has been submitted by Chevron, five of the six basic studies were not submitted. These are: an avian single dose LD_{50} study (preferably mallard duck), two avian subacute dietary LC_{50} studies and fish acute toxicity studies on bluegills and rainbow trout. Also the bobwhite reproduction study, channel catfish acute toxicity study and grass shrimp acute toxicity study should be done again. The registrant must follow one of the protocols recommended by EPA's 1978 proposed guidelines.

We also need the results from the data collected in California through the experimental use permit. Without this data a hazard assessment cannot be made.

Finally, pending completion of the review of data submitted additional data may be required.

107 Conclusions

The Ecological Effects Branch does not concur with the registration of Bolero 10G herbicide for use on rice until all the data requirements as outlined in section 104 of this review have been fulfilled. Also, note that EEB is still validating the remainder of Chevron's data and will forward its conclusions upon completion.

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