EEE BRANCH REVIEW

DATE: IN _____ OUT _____ IN 6/10/76 OUT 6/22/76 IN _____ OUT _____

FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. 677-313

PETITION OR EXP. PERMIT NO. 6F1799

DATE DIV. RECEIVED 5/26/76

DATE OF SUBMISSION 5/25/76

DATE SUBMISSION ACCEPTED _____

TYPE PRODUCT(S): I, D, H, (F) N, R, S 3C1D-2B-Yes

PRODUCT MGR. NO. E. Wilson (21)

PRODUCT NAME(S) Bravo 6F

COMPANY NAME Diamond Shamrock

SUBMISSION PURPOSE For use on Soybeans

CHEMICAL & FORMULATION Chlorothalonil Tetrachloroisophtholonitrile

1.0 Introduction

1.1 New use on Soybeans

1.2 Other names Daconil 2787, Forturf, CAS 1897-45-6, DAC 2787 Bravo W-75.

1.3 This product contains 6 lb. ai/gallon.

1.4 This is the first review for this use.

1.5 See other reviews:

6F1749 4/27/76
7F0599 5/18/67
1F1024 10/20/79, 4/19/71, 8/6/71, 4/21/71, 2/12/71
9F0743 8/7/68
4E1502 8/3/74
2F1230 7/19/72
5E1569 12/20/74

2.0 Directions for use

2.1.1 Use Brave 6F at 1 1/2 to 2 1/2 pints per acre if two applications are scheduled or 1 to 2 pints per acre if three applications are scheduled. Apply in sufficient water to obtain complete coverage. A minimum of 5 gallons of water per acre should be used for aerial application.

2.1.2 Determinant (Southern) Soybean Varieties

Two application program: Make first application at early pod set (majority of pods are 1/8 to 3/8 inch in length), and the second application 14 days later. Use 1 1/2 to 2 1/2 pints per acre. (18 to 30 ozs. ai/acre).

Three application program: BRAVO 6F should be applied at 14 day intervals starting at early to mid flowering. Use 1 to 2 pints per acre. (12 to 24 ozs. ai/acre).

2.1.3 Indeterminant (Northern) Soybean Varieties

Two application program: Make first application two to three weeks after first flowering when the largest pods are from 1 to 1 1/2 inch in length, and the second application 14 days later. Use 1 1/2 to 2 1/2 pints per acre. (18 to 30 ozs. ai/acre).

Three application program: BRAVO 6F should be applied at 14 day intervals starting one week after first flowering. Use 1 to 2 pints per acre. (12 to 24 ozs.ai/acre).

2.2 Do not apply within 30 days of harvest.

2.3 Do not reuse empty container. Destroy by perforating, crushing and burying or discarding in a safe place.

2.4 Keep out of lakes, streams or ponds. Do not apply where run-off is likely to occur. Do not contaminate water by cleaning of equipment or disposal of wastes.

3.0 Discussion of Data

3.0.1 This is a 2B submission so this is a completeness review.

3.1 Hydrolysis studies

Submitted on 2/25/76 and accepted on 4/27/76.

3.2 Photodegradation studies

3.2.1 Photodegradation of Daconil in aqueous systems submitted on 2/9/76 but not accepted.

3.2.2 Photodegradation of Daconil and its metabolite, 4-hydroxy-2,5,6 trichloroisophthals nitrile on inert surfaces.

Submitted on 2/9/76 and accepted on 4/27/76.

3.2.3 Photodegradation of Daconil and 4-hydroxy-2,5,6-trichloroisophthalonitrile on silica gel plates.

Studies submitted on 2/9/76 and accepted on 4/27/76.

3.2.4 Photodegradation and mobility of Daconil and its major metabolite on soil thin films.

Studies submitted on 2/9/76 and accepted on 4/27/76.

3.3 Soil Metabolism

3.3.1 Degradation of Daconil and its metabolite, 4-hydroxy-2,5,6-trichloroisophthalonitrile in soil.

Studies submitted on 2/5/76 reviewed on 4/29/76 but not accepted.

3.3.2 Aerobic and Anaerobic soil metabolism of Daconil.

Studies submitted on 2/12/76 reviewed on 4/27/76 but not accepted.

3.3.3 Leaching of degradation products.

Submitted on 9/18/75 and accepted on 4/27/76.

3.3.4 Bound Residue Study - Appendix I 2/5/76
Studies submitted on 2/5/76 reviewed on 4/27/76. More information is needed to support the results of this study; however, the study is not germane to the EC assessment.

3.4 Microbiological studies

Studies submitted on 2/5/76 reviewed on 4/27/76. This study is not acceptable for microbial studies but acceptable for aerobic studies.

3.5 Fish Studies

Previously reviewed and accepted on 5/29/75 but it is neither referred nor submitted for this use.

3.6 Soil Metabolism Studies

3.6.1 The Fate of 2,4,5,6-Tetrachloro isophthalonitrile (Daconil 2787 In Soil

Section I: Determination of DACONIL 2787 in Soil.

Section II: Degradation of DACONIL 2787 in Soil.

Section III: Isolation of DACONIL 2787 Degradation Products from Soil-Laboratory Test.

Section IV: Degradation Rate of DACONIL 2787 in Soil-Field test.

Reviewed but not entirely accepted due to poor analytical techniques in sufficient experimental details and incomplete analysis. (7/15/71).

3.6.2 The Fate of DAC-3701 (4-hydroxy-2,5,6-trichloroisophthalonitrile in Soil

Reviewed and accepted 8/7/68.

3.6.3 Daconil 3787 Degradation in Soil. Reviewed and accepted 8/6/71.

3.7 Leaching Studies

3.7.1 Evaluation of the Leaching of Chlorothalonil Under Field Conditions and Its Potential to Contaminate Underground Water Supplies. Reviewed and accepted 5/29/75.

3.8 Microbiological Studies

3.8.1 Biodegradation of DACONIL 2787

(Bacteria isolated by soil column perfusion enrichment technique cometabolize DACONIL 2787 in shake flask culture). Reviewed and accepted 8/6/71.

4.0 Recommendations:

4.1 We cannot concur with the proposed use on soybeans.

4.2 The following required data have not been submitted or referenced.

4.2.1 Fish accumulation study.

4.2.2 Effect of pesticide on micro-organism

To assess the impact of pesticides on soil microbes the following are needed.

a. Population analyses using a variety of selective procedures including the use of restrictive growth media, the use of special isolation techniques (i.e., Anaerobic isolation, thermophilic isolation) and direct counting procedures are to be made to determine the effect of the chemical on normal soil microflora.

b. Effects on the enzyme activity of microbes that degrade the pesticide should be determined. Additionally, effects on general soil enzyme activities such as soil dehydrogenase and phsophatase may be determined.

Changes in population of common pesticide degraders such as Bacillus sp., actionomycetes, pseudomonads, coryneform bacteria, Trichoderma, Aspergillus etc. should be determined.

c. The effects on the transformations of nitrogen compounds should be determined.

Effects on carbohydrate transformations should be determined.

4.2.3 Rotational crop residue studies

(Radiolabeled study)

1. For crops rotated immediately after harvest of a crop in the treated area, the pesticide is to be aged in a sandy loam soil under aerobic conditions for about 120 days, then the soil planted to a root crop, small grain, and a vegetable. The root crop is required; however, crops in two other crop groupings may be substituted for the small grain and vegetable.

2. For crops rotated the following year after treatment, the pesticide is to be aged in the soil for one year prior to planting. Crops should be as above.

3. If significant residues are found, then actual field studies using non-labeled pesticide will be required. Such data must be obtained under actual agricultural pesticide.

4. If residues are found in rotational and/or subsequent crops in the field, then a labeling restriction will be needed. This restriction will take the form of a time interval from application to planting of rotational crops such that residues will not occur in the rotational crop.

5. Cover crops can be rotated if label restrictions are such that the cover crop is plowed under and not grazed.

6. If the agricultural practice is such that a treated crop area is rotated with another crop that will result in another treatment of the pesticide to the same area, residue data will be required on the second crop. The rotational crop is to be grown under actual use conditions.

4.3 In addition, the following submitted studies are insufficient to assess the environmental chemistry hazard.

4.3.1 Photodegradation of Daconil in Aqueous solutions. Submit an explanation for the reactivity of Daconil in buffered solution suggested by this study, and the stability of Daconil in the identical buffers in the hydrolysis study.

4.3.2 Degradation of Daconil and its Metabolite, 4-hydroxy 2,5,6-trichloroisophthalonitrile, in soil: in order to determine the rate of pesticide degradation, more than two data points are needed. Soil should be aged at 25°C. Data should be sufficient to estimate the half life of total ^{14}C and its composition in soil.

4.3.3 Aerobic and Anaerobic Soil Metabolism of Daconil: aerobic soil metabolism requires the use of an apparatus that can monitor volatilization products; however, the appartus used must allow sufficient airflow so that the atmosphere doesn't become saturated with CO_2. It is preferable that soil samples be aged in containers larger than test tubes.

4.3.4 Bound Residue Study - Appendix I: soils should not be extracted with .3N HCl prior to removal of the extractable residues (i.e., acidified acetone wash). This is not the procedure used elsewhere in this report.

4.3.5 An anaerobic soil metabolism study, using soil aged at 25°C, will be required.

Arthur O. Schlosser 6/29/76

Arthur O. Schlosser 6/21/76

Bipin C. Gandhi 6/29/76

Bipin C. Gandhi 6/20/76
Environmental Chemistry Section
EEEB