#34 ( ) 2e

7/1/82

Date out of EFB: JUL 01 1982

From: E. Regelman
Chemist
Environmental Fate Branch
Hazard Evaluation Division (TS-769c)

To: Don Stubbs
Product Manager 41
Registration Division (TS-767)

Thru: S. Creeger, Head (acting)
Review Section 1
EFB/HED

Attached please find the EFB review of...

Reg./File No.: 82-SC-07

Chemical: DBCP

Type Product: Nematocide

Product Name: NEMATOCIDE EM 12.1

Company Name: College of Agricultural Sciences, Clemson, University, SC

Submission Purpose: Section 18 - Use on peach trees in South Carolina

ZBB Code: Section 18

Date In: 6/25/82

Date Completed: 6/29/82

ACTION CODE: 510

EFB # 381

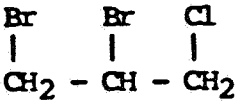
TAIS (level II)	Days
51	1

E

1.0 INTRODUCTION

On June 18, 1982, Mr. L.H. Senn, Director of the Division of Regulatory and Public Service Programs, College of Agricultural Sciences, Clemson University requested a specific exemption under Section 18 to use Nematocide EM 12.1 (DBCP) to control nematodes in established peach orchards in South Carolina during the fall of 1982.

2.0 STRUCTURE



DBCP (1,2-dibromo-3-chloropropane)

3.0 PROPOSED PROGRAM

The state of South Carolina proposes to treat established peach orchards. Certified applicators will apply up to 5 gallons of NEMATOCIDE EM 12.1/acre by standard chisel injection, with the soil to be sealed immediately to prevent escape of DBCP vapors to the air.

There will be a single treatment/site/year, during the period 9/1 to 11/15, with a total application of about 907,500 lb ai to about 20,000 infested acres (equivalent to about 46 lb ai/A).

Counties where DBCP would be used are: Edgefield, Saluda, Lexington, Spartanburg, Cherokee, Greenville, Orangeburg, Chesterfield, York, Sumter and Allendale.

Special conditions of use would be:

- Closed transfer/mixing/loading systems
- During mixing/transfer/calibration/application all personnel will wear...
  - Full-face respirator (organic filter)
  - Neoprene gloves and boots
  - Standard protective clothing (incl. long-sleeve shirts)
- Labelling to warn against contamination of wildlife areas (including runoff into streams, lakes, etc.) and groundwater.
- Labelling to prohibit reentry into a treated orchard within 7 days of treatment unless wearing suitable protective clothing and equipment.

4.0 DISCUSSION

4.1 To date, DBCP residues have been unequivocally confirmed in water samples taken in California, Arizona and Maryland[1]. EFB remains concern that this highly persistent, highly mobile chemical may enter, and thereby contaminate, groundwater in South Carolina. Despite the extreme urgency of this Section 18 request, we are extremely reluctant to concur with the proposed usage.

4.2 In his review of DBCP, Cohen[2] made the following observations:

- Southeast Coastal Plain soils are generally low in organic carbon content (favoring leaching)
- In and around Spartanburg, Chesterfield, Sumpter, Edgefield and Saluda Counties[3], the soil overburden is very conducive to recharge of the shallow aquifer systems, which are used primarily for domestic water consumption.
- DBCP is highly resistent to hydrolysis, with an estimated half-life of 141 years in distilled (pH 7) water at 15°C.
- It is theorized that hydrolysis would be considerably faster under highly alkaline conditions[4].

5.0 CONCLUSIONS

The required use of suitable respirators and protective clothing is essential to concurrence with the proposed usage, as is the supervision of a Certified Applicator. However, we are convinced that groundwater in South Carolina may become contaminated if the proposed Section 18 is granted.

However, a compromise solution may be possible, which would permit DBCP to be applied, but which would, at the same time protect South Carolina's domestic water supplies.

1/ Personal Communication, Marsha Mulkey, OGC. June 29, 1982.

2/ Cohen, S. Z. 1981. Summary Report - DBCP in Groundwater in the Southeast. Hazard Evaluation Division, OPP, USEPA. August 12, 1981

3/ Major Peach-growing areas of South Carolina

4/ Clemson U. recommends heavy and frequent liming of peach orchards in South Carolina. In a study by McKenry and Naylor (1979), fields werer limed similarly to the Clemson recommendations one day prior to DBCP application. The following observations were noted:

a. Soil pH rose from 7.2 to 11.2
b. DBCP "persistence" decreased noticeably
c. an unidentified chemical (MBCP?) appeared quickly, but disappeared within one month.

6.0 RECOMMENDATION

6.1 We concur with the Section 18, conditional to the following requirements.

6.2 Selected Orchards should be monitored, in accordance with the Proposed Guidelines for Field Dissipation (copy appended to this review). Note especially subsection (iii)(D). The registrant must submit for review a suitable experimental protocol, which must be approved prior to the issuance of the Section 18.

6.3 In addition to the preceeding, all fields to be treated must be extensively limed prior to DBCP application, following the schedule proposed by Clemson University[5].

Emil Regelman
Chemist
EFB/HED (TS-769c)
June 29, 1982

5/ Brittain, J.A. and R.W. Miller. 1976. Managing Peach Tree Short Life in South Carolina. Circular #568. Clemson University. October, 1976

Series 164: DISSIPATION STUDIES

§ 164-1 Field dissipation studies for terrestrial uses.

(a) Purpose. The purpose of field dissipation studies for pesticides with terrestrial uses is to determine the extent of pesticide residue dissipation under actual use conditions. These studies will generate data required for the on-site evaluation of mobility, degradation, and dissipation of residues. These studies are also required because pesticide dissipation may proceed at a different rate under field conditions and therefore result in the formation of degradates differing from those observed in laboratory studies.

(b) When required. Data from a terrestrial field dissipation study must be submitted by each applicant for registration of an end-use product intended for any terrestrial use (except greenhouse use), and by each applicant for registration of a manufacturing-use product which legally could be used to make such an end-use product.

(c) Test standards. Data sufficient to satisfy the requirements of paragraph (b) of this section must be derived from testing which complies with the general test standards in § 160-4 and all of the following test standards:

(1) Test substance. The test substance shall be a typical end-use product.

(i) If an applicant's product is an end-use product, the test substance shall be a product whose formulation is typical of the formulation category (e.g., wettable powder, emulsifiable concentrate, granular product) to which the product belongs.

(ii) If the applicant's product is a manufacturing-use product that legally could be used to make an end-use product for which terrestrial field dissipation data are required, the test substance shall be a product representative of the major formulation category which includes that end-use product. (If the manufacturing-use product is usually formulated into end-use products comprising two or more major formulation categories, a separate study must be performed with a typical end-use product for each such category.)

(2) Test procedures. (i) Sites. Field dissipation studies must be conducted in at least two different sites which are representative of the areas where the pesticide is expected to be used. For restricted use patterns where only one typical area is involved, data from two similar sites are required. Studies at additional locations may be required if the product is intended for a terrestrial crop use, and the sites of application vary appreciably in climate, terrain, or other pertinent characteristics.

(ii) Application. The test substance shall be applied using the method of application stated in the directions for use specified on the product label and at the highest rate recommended on the product label.

(iii) Soil sampling. Soil from the treated area shall be sampled following treatment for the purpose of ascertaining the extent of pesticide dissipation.

(A) Soil samples serving as test controls shall be obtained from the intended application sites immediately prior to application of the test substance and, to the extent possible, from adjacent untreated areas at intervals during the course of the study and at the termination of the study.

(B) Sampling times shall include pre-application (control), date of application, and immediate post-application for each single or multiple application of the test substance.

(C) Soil samples shall be taken in increments, to a maximum depth of 15 cm, provided that the results of studies on pesticide leaching indicate that the test substance is not likely to leach into soil to a depth greater than 15 cm; and

(D) If data on leaching indicate that the test substance is likely to leach into soil to a depth greater than 15 cm, or if the pesticide is incorporated into soil, then samples shall be taken to a depth sufficient to define the extent of leaching.

(iv) Test duration. Residue data shall be collected until patterns of decline of the test substance and patterns of formation and decline of degradation products are established in soil, or to the time periods specified below, whichever comes first:

(A) Field and vegetable crop uses: 18 months;

(B) Orchard crop and pastureland uses: 12 months;

(C) Domestic outdoor, park, ornamental, and turf uses: four months; and

(D) Rights-of-way, shelter belts, and related uses: two months.

(d) Reporting and evaluation of data. In addition to the basic reporting requirements specified in § 160-5, the test report shall include the following specific information:

(1) Decline curves of residues in each major substrate analyzed; and

(2) Field test data, including:

(i) Amount of rainfall and irrigation water (accumulated from first application to each sampling);

(ii) Water table;

(iii) Grade (slope);

(iv) Soil and air temperature data;

(v) Techniques and times of planting and harvesting;

(vi) Application time and method;

(vii) Sampling times and techniques;

(viii) Dates and stages of crop and pest development;

(ix) Application-to-harvest (if applicable) and application-to-sampling intervals for each treatment; and

(x) Depth, weight, or volume of each sample taken for analysis.

(e) References. (1) The following references contain information that could be useful for development of a protocol for conducting field dissipation studies:

(i) Caro, J.H., H.P. Freeman, and B.C. Turner. 1974. Persistence in soil and losses in runoff of soil-incorporated carbaryl in a small watershed. J. Agr. Food Chem. 22:860-863. [This is a well-planned and well-executed field dissipation study.]

(ii) Miller, C.H., T.J. Monaco, and T.J. Sheets. 1976. Studies on nitralin residues in soils. Weed Sci. 24:288-291. [The experimental design and sampling procedures in this paper are well devised.]

(iii) Polzin, W.J., I.F. Brown, Jr., J.A. Manthey, and G.W. Probst. 1971. Soil persistence of fungicides - Experimental design, sampling, chemical analysis, and statistical evaluation. Pest. Monit. J. 4:209-215. [The factors causing variability in field dissipation studies are considered and analyzed in this paper. However, this study is more detailed than required for pesticide registration.]

(iv) Smith, A.E., and A. Walker. 1977. A quantitative study of asulam persistence in soil. Pestic. Sci. 8:449-456. [The experimental design and statistical analyses of data in this paper are described in detail for field dissipation studies.]

(2) The following reference contains supplemental information for developing a protocol for field dissipation studies:

(i) Goring, C.A.I., D.A. Laskowski, J.W. Hamaker, and R.W. Meikle. year? Principles of Pesticide Degradation in Soil. Pp. 135-172 in Environmental Dynamics of Pesticides. R. Haque and V.H. Freed (eds.). Plenum Press. New York. [This is an excellent review for analyses of data and for an understanding of factors affecting persistence of pesticides in soil.]

(ii) (Reserved.)