#227301

Date Out EFB: 2/9/82

To: Product Manager 21 Jacoby
TS-767

From: Dr. Willa Garner
Chief, Review Section No. 1
Environmental Fate Branch

Attached please find the environmental fate review of:

Reg./File No.: 352-312, 352-386, 352-344

Chemical: Chloroneb

Type Product: Fungicide

Product Name: Demosan

Company Name: DuPont

Submission Purpose: Soil mobility study & waiver request for remaining EC data gaps listed in registration standard

ZBB Code: Other

Date in: 1/28/82

Date Completed: 2/9/82

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

ACTION CODE: 601

EFB # 150, 151, 152

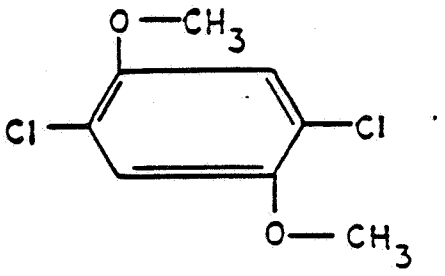
TAIS (level II)	Days
66	2

1.0 Introduction

Chemical Name: Chloroneb -
1,4-dichloro - 2,5 - dimethoxybenzene

Trade Names: Demosan, Tersan

Chemical Structure:



Letter from E.I. duPont:

1. Request for review of study by Joseph G. Dulka
2. Request for waiver of all other data required by registration Standard.
3. Agreement to restrict crop uses to seed treatment of beans, soybeans and cotton only.
4. Agreement to cancel sugar beet uses.
5. Agreement to cancel Demosan 10D, Demosan 10G Tersan SP-G and Demosan T.

2.0 Discussion of Data

1. Mobility of ^{14}C-Labeled Chloroneb in soil; Soil TLC Studies.

Joseph G. Dulka

Procedure:

Soils were air dried and sieved through a 2 mm mesh screen. Aliquots of soil were then hammer milled to less than 10 μm particles and applied to glass plates as a water slurry at 400 μm thickness. Duplicate plates were spotted with ^{14}C-phenyl chloroneb and standards of terbacil and diuron, ~~as standards~~. Four soil types were evaluated: Fallsington sandy loam, Flanogan silt loam, Keyport silt loam, and Cecil sand.

Plates were developed to 10 cm in distilled deionized water. The aged study was performed using Fallsington sandy loam and ^{14}C - phenyl chloroneb at a rate of 3 pounds of ai per acre and aged for 4 weeks under controlled conditions. The aged sample was ultrasonically extracted with methanol followed by a rigorous extraction with 4 N phosphoric acid. Extracts were pooled and co-chromatographed on thin layer with terbacil and diuron as standards.

Results:

Chloroneb was shown to be immobile on all soils studied including the aged test, as shown below in comparison to terbacil (mobile standard) and diuron (non-mobile standard).

	R_f Values		
Soil Type	Diuron	Chlorneb	Terbacil
Cecil sand	0.40	0.09	0.86
Keyport silt loam	0.26	0.06	0.63
Flanagan silt loam	0.28	0.05	0.62
Fallsington sandy loam	0.31	0.06	0.68
	Aged		
Fallsington sandy loam	0.42	0.07*	0.77

*includes primary degradation product.

2. Fate of C^{14} - Labeled Chloroneb in Plants and Soil
Rhodes, Robert C., et al
Agric. Fd. Chem. 19 (4) P. 745 (1971)

Procedure - Soil:

Four inch diameter stainless steel tubes were driven into Keyport silt loam soil to a depth of 11.5 inches (0.5 inch left above ground to protect against runoff) The upper 3 inches of soil was removed and ring labeled chloroneb was incorporated at a rate equivalent to 2 pounds of ai per acre. Soil and chloroneb was then placed back in the cylinder. One each cylinder was removed from the soil at 1,3, 6, and 12 months and analyzed at 0-1, 1-3, 3-5, 5-8, and 8-12 inch depths.

Samples were heated under reflux for 36 hours with 2n Hcl and N-butanol. Extracts were subjected to liquid scintillation and radioautographic analyses.

Results

Scintillation analysis determined that 88% of applied C^{14} had been extracted. Radioautographic analysis showed that

90% of the recovered C^{14} was associated with chloroneb and the remaining 10% with an unidentified compound that remained at the origin of the chromatogram.

Almost all of the C^{14} activity was found at the 1-3 inch soil level. The half-life of chloroneb in soil was determined to be 3-6 months.

Procedure - cotton and beans

C^{14}-labeled chloroneb was applied as a seed overcoat at rates of 6.75 oz ai/100 pounds (cotton) and 3 oz ai/100 pounds (snapbeans). Seeds were then planted in pots containing Keyport silt loam soil, in a green house and plants were analyzed periodically from one week of age to harvest age. One plant at each age was analyzed by radioautography and a duplicate was combusted for analysis by liquid scintillation spectrometry.

Results

At harvest age, the total C^{14} residue in cotton plants was determined to be 0.12 ppm, almost all of which was contained in the lower portion of the plant (all but <0.01 ppm). Bean plants, at harvest, contained total C^{14} residues of 0.32 ppm and again all but 0.05 ppm was contained in the lower portion.

Radioautographic analysis disclosed that of the 84.3% extracted, approximately 90% was chloroneb and 10% was 2,5-dichloro-4 methoxyphenol and traces of 2,5-dichloro-hydroquinone and 2,5-dichloroquinone.

3.0 Recommendations

The following recommendations are made on the basis of the registrants agreement to restrict the uses of chloroneb to seed treatment for cotton, snapbeans, and soybeans, and foliar application to turf, and to cancel registrations for dust and granular formulations.

1. Leaching requirement

   This requirement has been met by the study of Dulka, which shows that chloroneb and its primary degradation product are both immobile.

2. Field Dissipation - Seed treatment

   The study by Rhodes et al J. Agr. Fd. Chem. (1971) provides sufficient information on soil incorporated chloroneb to meet registration requirements. These data show

that the half life of chloroneb and its major metabolite

in soil is 3-6 months and that the major portion of both compounds are associated with the root portions of the target plant. Consequently, we will not need further data on field dissipation of soil incorporated chloroneb resulting from treatment of seeds.

3. Soil Metabolism

On the basis of the above field dissipation data from soil incorporated chloroneb resulting from seed treatment, in view of the small quantities used in seed treatment, and because of the extremely low residues in soil which could result from seed treatment, data on soil metabolism would not be useful in further defining the fate of chloroneb when soil incorporated. Consequently, this requirement is waived.

4. Rotational Crops

In view of the small potential for exposure to soil, based on the small quantities used in seed treatment, the amount of uptake by the target crops as provided by Rhodes et al (1971), and in consideration of standard crop products; the amount of material available for uptake by rotation crops is insignificant. Therefore, this requirement is waived.

5. Fish Accumulation

Based on data provided by the registrant and evaluation by the Residue Chemistry Branch, the octanol/water partition coefficient has been established to be 79. Consequently, with this low index of accumulation potential & hydrolytic stability, this requirement is waived.

6. Photolysis

In view of potentially large amounts of chloroneb being used as foliar applications on turf and the potential for persistence where the fungicide is not soil incorporated, a study on the photolysis on soil would be helpful in defining the fate of chloroneb. However, the ultimate definition of the fate of chloroneb, following foliar application, can be best determined by the field dissipation test below. Consequently, this requirement is waived.

7. Field dissipation - Turf Application

For turf uses, I recommend that a single study for the wettable powder formulation be required.

The fate and transport of chloroneb has been well defined (as per registrants restrictions) for soil incorporated chloroneb. However, the fate of this fungicide under the relatively large potential foliar applications to turf, is not well defined. A protocol should be submitted before the study is initiated;

L. A. Richardson
Chief, Section 3
Environmental Fate Branch, HED (TS-769)