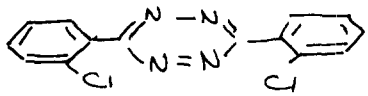
412037-01

DATA EVALUATION

1. CHEMICAL:

chemical name: 3,6-bis (2-chlorophenyl)-1,2,4,5-tetrazine
common name: clofentezine
trade name: Apollo SC
structure:



CAS #: 74115-24-5
Shaughnessy #: 125501

2. TEST MATERIAL: n.a.

3. STUDY/ACTION TYPE:

Response to request for information on soil metabolism studies (comparison of English and American soils)

4. STUDY IDENTIFICATION:

Allen, R. **Response to questions raised in EPA letter of June 19, 1989 concerning a deficiency in the aerobic and anaerobic soil metabolism data base (Second response).** Schering AG, Ltd. UK, submitted by Nor-Am Chemical Co., Wilmington, DE. dated 6/23/89, received EPA 8/16/89 under MRID# 412037-01.

5. REVIEWED BY:

Typed Name: E. Brinson Conerly
Title: Chemist, Review Section 2
Organization: EFGWB/EFED/OPP

E. B. Conerly 9/28/89

6 APPROVED BY:

Typed Name: Emil Regelman
Title: Supervisory Chemist, Review Section 2
Organization: EFGWB/EFED/OPP

SEP 29 1989

7. CONCLUSIONS:

The soils information provided in this submission completes the record for the aerobic and anaerobic soil metabolism studies by providing a specific comparison between the English experimental soils and American soils typical of the growing areas where this pesticide is used.

8. RECOMMENDATIONS:

The aerobic and anaerobic soil metabolism data requirements can be considered fulfilled.

9. BACKGROUND:

This information resolves the only remaining deficiency in the previously reviewed soil studies [EBC 1/27/87].

The data base on the parent compound is as follows:

hydrolysis -- **labile** -- $t_{1/2}$ from 248.8 hr at pH 4.95 to 34.4 hours at pH 6.98 to 4.3 hr at pH 9.18 -- the principle product is 2-chlorobenzoic (2-chlorobenzylidine) hydrazide, which further degrades to 2-chlorobenzonitrile and 2-chlorobenzamide

photolysis

aqueous -- **labile** -- $t_{1/2}$ < 7 days at pH 5

soil -- **stable** -- 85.9% parent remained after 31 days

soil metabolism -- **moderately labile** -- $t_{1/2}$ 4 -- 12 wks, products were CO_2 and a minor amount of 2-chlorobenzoic acid

leaching -- **no significant leaching of parent or degradation products**

soil dissipation -- **no leaching indicated -- $t_{1/2}$ 32.4 - 83 days**

fish bioaccumulation -- **bioaccumulation of the parent compound will not occur in the aquatic environment**, based on short hydrolytic half life and low soil mobility

Based on these data, Clofentezine is a relatively short-lived, non-mobile compound which does not pose a risk to ground water, and will not be expected to accumulate in rotational crops.

10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES: n.a.

11. COMPLETION OF ONE-LINER: attached

12. CBI APPENDIX:

The attached material may be considered confidential by the applicant and should be treated as such.

This supplement has been prepared to address U.S. Environmental Protection Agency questions posed in the letter from Mr. Dennis Edwards (OPP, Registration Division, PM12) dated June 19, 1989

Agency Question: NOR-AM's soil metabolism studies can be considered acceptable provided you submit the comparison of English test soils to those in the United States. The Agency needs a statement from you as to which areas of the United States the test soils from England are intended to represent.

NOR-AM Response:

The three soils used in the clofentezine soil metabolism study (The degradation of NC 21314 in three soil types under aerobic, sterile and anaerobic conditions by C.R. Leake and D.J. Arnold, METAB/83/31, Registration Reference NC 21314/W43) are shown to be classified according to USDA in Table 1.

Table 1 Classification of UK soils according to the United States Department of Agriculture

Soil Type	Location	UK Soil Series	USDA Order	USDA Sub-order
Clay	Little Shelford	Windrush	Entisol	Thapto-histic Fluvaquent
Loamy sand	Cottenham	Bearstead	Inceptisol	Dystric Eutrochrept
Clay loam	Bottisham	Clayhythe	Inceptisol	Histic Humaquept

Entisols

Entisols occupy up to 20% of the land area of the planet and millions of people support themselves on fertile and workable entisols developed from alluvium. In Florida the citrus groves grow on sandy entisols.

Entisols are described by soil scientists as soils which do not show fully developed horizons. This may be due to climatic reasons or because of the location e.g. a river flood plane where alluvium is constantly being deposited. Entisols formed by active cumulization of fertile soil material are highly prized for their ability to grow crops in particular rice paddies.

Inceptisols

Inseptisols are defined by soil scientists as being more developed soils than entisols. Inceptisols are widely distributed across the world and occur under a range of environmental regimes. Inceptisols are therefore used for a wide range of agricultural products, they are used extensively for cultivated field crops, cotton, grain sorghum, wheat and fruit. The inceptisols in the drier regions are used for grazing.

The soils have also been classified according to their particle size distribution and based on the analysis conducted by UK Ministry of Agriculture they may be converted to the USDA scheme by allocating 3/4 of the material in the 20-63pm range (the coarse silt fraction) to the USDA silt fraction and 1/4 to the sand fraction. The three soils used for the clofentezine studies in fact have the same textural classification nomenclature in both the UK and USDA schemes.

The soils used in this study cover a variety of soil types. Thus the loamy sand (Cottenham) is similar to the fine sandy loam of NOR-AM's field site in Florida (Tifton fine sandy loam) 53% sand, 41% silt, 6% clay (Shelford) and clay loam (Bottisham) soils are commonly found in South Dakota/Nebraska, region of the USA.

The soils used for the clofentezine soil metabolism studies are therefore very similar to those present within the United States of America.

CD1029/dm

ENVIRONMENTAL FATE AND GROUND WATER BRANCH
PESTICIDE ENVIRONMENTAL FATE ONE-LINER

File No.: 125501 CAS No.: 74115-24-5
Type Pesticide: miticide/ovicide
Chemical Name: 3,6-bis (2-chlorophenyl)-1,2,4,5-tetrazine, Clofentezine, Apollo

Empirical Form: $C_{14}H_8N_4Cl_2$
Uses: apple and pear orchards
Form. Type: soluble concentrate

Mole Wt.	Sol. @20 C (ppm)	Vap. Pres.(torr)	Log K_{OW}	Henry
303.15	1 mg/kg			

Hydrolysis (161-1)

pH 5: **$t_{\frac{1}{2}}$ 248.8 hr (pH 4.95)
pH 7: **$t_{\frac{1}{2}}$ 34.4 hrs (pH 6.98)
pH 9: **$t_{\frac{1}{2}}$ 4.3 hrs (pH 9.18)

Photolysis (161-2, -3, -4)

Air:
Water: **$t_{\frac{1}{2}}$ < 7 days at pH 5
Soil: **stable -- 85.9% parent remained after 31 days

Mobility Studies (163-1)

Soil Partition (K_d)

1
2
3

Rf factors -- leaching

1 **loamy sand -- ≤0.15
2 **sandy loam 1 -- ≤0.15
3 **sandy loam 2 -- ≤0.15

Soil Metabolism Studies - Terrestrial

Aerobic (162-1)

1 ** clay - $t_{\frac{1}{2}}$ = 4 wks
2 ** loamy sand - $t_{\frac{1}{2}}$ = 6 wks
3 ** clay loam - $t_{\frac{1}{2}}$ = 8 wks

Anaerobic (162-2)

Field Dissipation Studies

Terrestrial (164-1)

1 # bare ground, TX -- $t_{\frac{1}{2}}$ = 34-83 days (4.9-11.9 wks)
2 # bare ground, U.K. -- $t_{\frac{1}{2}}$ = 52 days (7.4 wks)
3 ** apple orchard, NY, foliar application -- most soil residues below detection level

Aquatic (164-2)

** EPA Acceptable Study
# Supplemental (Scientifically Sound) Information

Field Dissipation Studies

Forest (164-3)	Other
1	

Ground Water Findings

1

Rotational Crop Restrictions (165-1, -2)

1

Fish Accumulation Studies (165-4)

1 ** does not accumulate

Degradation Products

1 hydrolysis -- 2-chlorobenzoic (2-chlorobenzylidine) hydrazide (further degrades to 2-chlorobenzonitrile and 2-chlorobenzamide)

2 aerobic soil metabolism -- CO_2 and a minor amount of 2-chlorobenzoic acid

Notes

leaching -- this leaching study, accepted in Jan. 1986, was done with foreign (English) soils which were not referenced to American soils

References: EBC 1/7/86, EBC 6/28/88, EBC 8/10/88

Writer: EBC 9/21/89

Shaughnessy Number: 125501

Date out of EFGWB: SEP 29 1989

To: Dennis Edwards/Portia Jenkins
Product Manager 12
Registration Division (H7505C)

From: Emil Regelman, Supervisory Chemist
Environmental Fate Review Section #2
Environmental Fate and Ground Water Branch
Environmental Fate and Effects Division (H7507C)

Thru: Hank Jacoby, Acting Chief
Environmental Fate and Ground Water Branch
Environmental Fate and Effects Division (H7507C)

Attached, please find the EAB review of...

Reg./File #: 45639-RGL

Chemical Name: Clofentezine

Type Product: miticide/ovicide

Product Name: Apollo SC

Company Name: Nor-Am Chemical Company

Purpose: response to request for information on soil metabolism studies (comparison of English with American soils)

Date Received: 8/21/89

Action Code: 300

EFGWB#(s): 90725

Total Reviewing Time (decimal days): 0.5

Deferrals to: ___Ecological Effects Branch, EFED

___Science Integration and Policy Staff, EFED

___Non-Dietary Exposure Branch, HED

___Dietary Exposure Branch, HED

___Toxicology Branch, HED