INCOMPLETE COPY

DATA EVALUATION RECORD

CHEM 080808 Propazine §164-1

FORMULATION–00–ACTIVE INGREDIENT

DRAFT

STUDY ID 441848-08

Lightle, S. and P. N. Coody. 1996. The Mobility and Degradation of ^{14}C-Propazine Utilizing Field Installed Lysimeters in a North Carolina Loamy Sand Soil. Unpublished study performed by PTRL East, Inc., Richmond, KY and submitted by Griffin Corporation, Valdosta, Ga.

REVIEWED BY:

Rodolfo A. Pisigan, Jr., Ph.D.
Chemist
OPPTS/OPP/EFED
ERB-IV

Signature:_____

Date:_____

APPROVED BY:

Mah T. Shamim, Ph.D.
Branch Chief
OPPTS/OPP/EFED
ERB-IV

Signature:_____

Date:_____

A. CONCLUSIONS / SUMMARY

(1) The study was submitted to support registration of an end use products and to partially satisfy the requirements of FIFRA Subdivision N Guidelines (164-1: Field Dissipation for Terrestial Use) and substitute for a Small Scale Prospective Ground Water Study. The study was found supplemental due to the following deficiencies discussed in the Reviewer's Discussion and Comments section: (a) mass balance of the applied radioactivity was poor towards the end of the study; and (b) experimental conditions with respect to rainfall and irrigation for the first 30-60 days after pesticide application are not favorable to leaching.

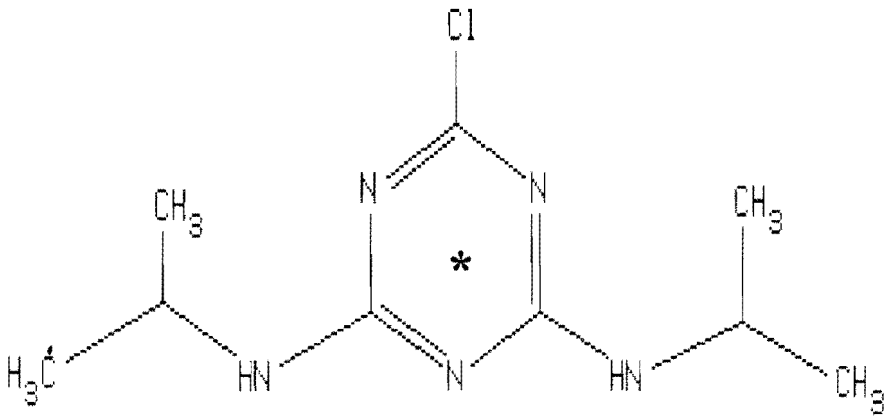
(2) Radiolabeled propazine and bromide tracer were applied to cylindrical lysimeters (length=36 in ; diameter=8 in) containing undisturbed Norfolk loamy sand in Clayton, NC. The application rate corresponded to 2.4 lb ai/acre based on lysimeter surface area. The soil is generally sandy and acidic with an organic carbon content of < 0.7%. The lysimeters received rainfall and supplemental irrigation water corresponding to 110% of 10-year average for the test location. Samples of soil, leachate, and overflow water were analyzed periodically for propazine and its metabolites during the 367-day study. Breakthrough of

bromide tracer below the lysimeters was observed after around 170 - 200 days after treatment (DAT). The dissipation kinetic analysis based on total radiocarbon residues in the upper 12 inches indicated a first-order half-life of 332 days and a rate constant of -0.0021/day. Propazine and its four metabolites (propazine-2-hydroxy, atrazine-desethyl, atrazine-desethyl-2-hydroxy, and atrazine-desethyl-deisopropyl) were detected in the soil layers and leachate samples. The maximum concentration of ^{14}C-propazine in all leachate samples was 32 ug/L, representing 0.04% of the applied radioactive carbon. The average recovery of applied radioactivity from all sources at all sampling times decreased from 82.1% at 1 DAT to 46.0% by 367 DAT.

(3) Under the experimental conditions used the study, propazine showed limited mobility in the Norfolk loamy sand.

B. TEST MATERIAL

The chemical structure of radiolabeled propazine used in the study is shown below:



* Denotes site of radiolabel

It has a radiochemical purity of 97.8% and a specific activity of 104.4 μCi/mg. The solubility of propazine was reported to be 8.6 mg/L at 20 ^{o}C.

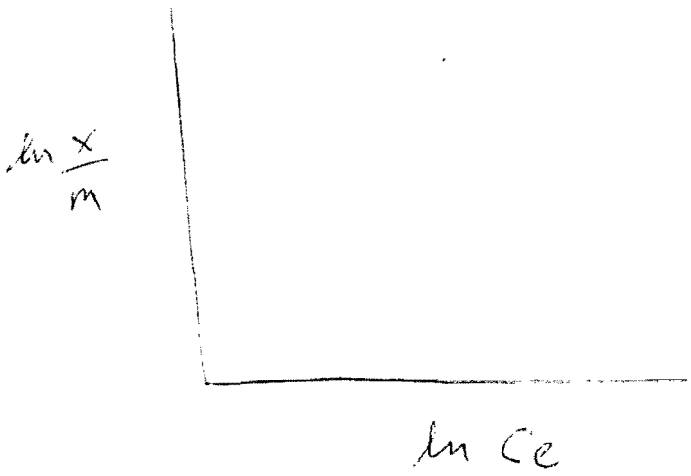
C. SOIL DESCRIPTION

The soil used in the study is Norfolk loamy sand from Clayton, NC. The soil has the following average physicochemical characteristics as summarized in Table 1: pH 4.9, 0.17% organic carbon, bulk density 1.28 g/cc, Cation Exchange Capacity 6.92 meq/100g, water holding capacity (at 0.33 Bar) 15.91%, particle size percentage: 62.8% sand, 8.0% silt, and 29.2% clay. In the different lysimeters, the soil properties tend to vary with depth. For instance, the organic carbon content and pH generally decreased with increase in soil layers depth from 0 to 36 inches. The bulk density and % sand were generally lower in the

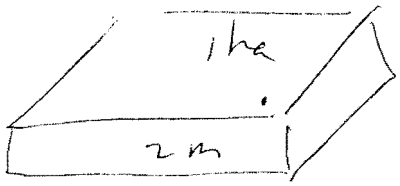
24 - 30" and 30 - 36" soil layers than those in the upper layers.

D. TEST METHODOLOGY

(1) Lysimeter Experiments:



$$\underbrace{\ln \frac{x}{m}}_{y} = \underbrace{K_F}_{\text{y-intercept}} + \underbrace{n}_{\text{slope}} \underbrace{\ln C_e}_{x}$$



$A = 10 \times 10^8$

$V = 2 \times 10^8$

$A : V = 0.5 \times 10^8$

$1\,ha \times 2.47 = 1\,acre$

$2.47\,ha = 1\,acre$

$1\,m^2 \times 2.47 \times 10^{-4} = 1\,acre$

$2.47 \times 10^{-4}\,m^2 = 1\,acre$

$1\,ha \times \frac{1\,acre}{2.47\,ha} \times \frac{1\,m^2}{4.05 \times 10^{-3}}$

$1\,ha \times 2.47 = acre$

$247\,km^2$ acre

$247 \times 10^6\,m^2 = 1\,acre$

$1\,ha \times 2.47 = 247 \times 10^6\,m^2$

$1\,ha = \frac{247 \times 10^6\,m^2}{2.47} = \boxed{10^8\,m^2}$

$(10^3)^2\,m = (1\,km)$

$10^6\,m^2 = 1\,km^2$

_____

Page _____ is not included in this copy.

Pages 5 through 6 are not included in this copy.

The material not included contains the following type of information:

_____ Identity of product inert ingredients.

_____ Identity of product impurities.

_____ Description of the product manufacturing process.

_____ Description of quality control procedures.

_____ Identity of the source of product ingredients.

_____ Sales or other commercial/financial information.

_____ A draft product label.

_____ The product confidential statement of formula.

_____ Information about a pending registration action.

_X____ FIFRA registration data.

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The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

Propazine/Lysimeter (1)

ρ_B (g cm^{-3})

0	1.75	$1.75 = \bar{\rho}_B$
3	1.74	
6	1.78	
9	1.79	
12	1.82	
18	1.83	
24	1.36	$1.32 = \bar{\rho}_B$
30	1.28	
36		

$$\text{Ave} \approx (1.75)\frac{6}{8} + (1.32)\frac{2}{8} = \boxed{1.64}$$

$$\text{Total porosity} \approx 1 - \frac{\rho_B}{\rho_d} \rightarrow 2.65\ \text{g cm}^{-3}$$

$$= 1 - \frac{1.64}{2.65}$$

$$= 0.38$$

$$\eta_T = \frac{\text{void vol}}{\text{soil vol.}}$$

$$\text{void vol.} = (\eta_T)(\text{soil vol.})$$

$$= (0.38)(29,630)$$

$$= 11,258$$

$$= \boxed{12,260\ \text{cm}^3}$$

$A \times 36\text{ in} = 324\text{cm}^2 \times (36)(2.54)$

$= 29,630\ \text{cm}^3$

$L = \frac{\text{Vol}}{A} = \frac{416\ \text{cm}^3}{324\text{cm}}$

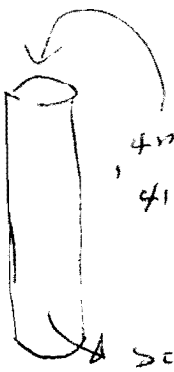
$= 1.284$ cm

$L \times A = \text{Vol}$

$L = \frac{\text{Vol}}{A}$ = 0.51 in

$= \frac{29630\ \text{cm}^3}{324\text{cm}^2}$

=



4 mL acetone w/ 8.7 mg propazine (ai)
412 mL H$_2$O w/ 9.14 mg KBr
(≈ 0.5 inch H$_2$O ~~added~~ to lysimeter)

soil – Norfolk loamy sand in Clayton, NC

Propazine/
Lysimeter (2)

Table V, p. 64.

Sampling DAT	Total Water Input (liters)
1	0.41
7	1.00
14	2.30
28	5.58
86	13.14
183	21.33
272	34.43
367	54.93

H_2O : 0.38 ≈ 12,260 cm^3 = 12.26 liters

Leachate would be expected by ≤86 days after treatment.

Note: For almost 2 years DAT, no significant leachate collected → after about a month, test chemical is in the soil as adsorbed and/or as dissolved phase → may be somewhat equivalent to "aged residues" as applied to (freshly) applied.

Page ___9___ is not included in this copy.

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Summary

application rate ~ 2.4 lb/A

lysimeter study undisturbed Norfolk loamy sand, in Clayton, NC — 2.69 a.i./ha (band on lysimeter surface area) 78 lysimeter

ai = ^{14}C-propazine

tracer — ~~KBr~~ Br from KBr

rainfall w/ supplemental ~110% of 10-yr ave. for site location

soil — generally sandy
acidic pH
< 0.7 % OC

lysimeter 38" = l; D = 8"

dissipation kinetics of applied total radioactive residues in the upper 12 inches
t 1/2 = 331.8 days
k = -0.0021 / day

Breakthrough of Br tracer below lysimeter until 170-202 DAT

Propazine + 3 metabolites
propazine-2-hydroxy,
atrazine desethyl,
& atrazine-desethyl .. ?
atrazine desethyl-desisopropyl

Max. conc of ^{14}C-propazine in all leachate sample = 3.71 ug/L

Aerobic soil metabolism
Co = 4.3 ppm
179-day period
t 1/2 = 289 d
No mineralization - negligible CO_2 production

P. 5C, 2nd paragraph

Ave. ^{14}C-prop concs following treatment = 2.64