IRB EFFICACY REVIEW

IN 1/12/81 OUT 3/27/81

FILE OR REG. NO. 40285-1

PETITION OR EXP. PERMIT NO.

DATE DIV. RECEIVED 11/25/80

DATE OF SUBMISSION

DATE SUBMISSION ACCEPTED

TYPE PRODUCT(S): I, D, H, (F,) N, R, S (Fumigant) Rodenticide

DATA ACCESSION NO(S). 243732

PRODUCT MGR. NO. 16

PRODUCT NAME(S) Degesch Phostoxin

COMPANY NAME Degesch America, Inc.

SUBMISSION PURPOSE Amended registration

CHEMICAL & FORMULATION Aluminum phosphide - - - - - - 55%

Efficacy Review: Degesch-Phostoxin, Reg. No. 40285
Weyers Cave, Virginia 24486

200.0 INTRODUCTION

200.1 For control of burrowing rodents - outdoor use only.

200.2 Background information

This product has been registered for use against a wide variety of stored product pests. The sites have included raw agricultural commodities, bulk animal feeds, certain processed foods, packaged animal feeds, barges, etc.

The registrant has submitted labeling which specifies the product's use in controlling a variety prairie dogs, rats, ground squirrels, moles, voles, field mice, gophers and chipmunks.

201.0 DATA SUMMARY

The applicant has submitted three studies within Accession No.243732 which includes three publications:

(1) "Contribution to the Study of the Action of Phosphine (PH_3)" by O.R. Klimmer, Dept. of Toxicology, Institute of Pharmacology, University of Bonn, Oct. 1988.

(2) "Evaluation Methods for Fumigant Control of Eastern Woodchuck" by Ross E. Byers, Ph.D., VPI, Sept. 1980.

(3) "Control of Prairie Dogs with Aluminum Phosphide" by Michael J. Bodenchuk, Wildlife Management Specialist, New Mexico Dept. of Agriculture.

I. The 25 page reprint article by Dr. Klimmer deals with pharmacological tests on captive animals: rats, guinea pigs, cats, rabbits, turkeys and hens. This publication reflects the toxicological nature of phosphine by inhalation. The data indicates the toxicity of phosphine to the animals tested under a variety of conditions. It is not the type of efficacy data which can be used to directly support the use of Degesch-Phostoxin in burrows to control rodents. These data do prove, none-the-less, that Phosphine does kill through acute inhalation.

II. Dr. Byers conducted tests using Mag-discs which are designed to release 2.5g phosphine gas into animal burrows upon contact with moisture in the air. A 50 acre peach orchard was surveyed in 1978 for the presence of woodchuck burrows. The numbers of entrances varied from 1 to 10 per den. All openings were closed in check and treated areas 10 and 3 days prior to treatment. One disc/opening was applied based on the number of holes existing 10 days before treatment. Two discs were placed in reopened burrows on 3 days and 6 days after the initial treatment.

Using detection equipment, the level of phosphine' gas in sample burrows was ascertained. As much as 3000 ppm of phosphine gas was recorded 2 hours after placement of two Mag-discs at two burrow entrances.

Of two studies, Dr. Byers determined that control was 67% and 82%, respectively.

III. Bodenchuk tested Degesch Phostoxin (aluminum phosphide) and Mag - Disc (magnesium phosphide) against the Gunnison prairie dog in North-central New Mexico.

A total of nine plots, located in and around rangeland sites, were selected. Four plots received the 2.5 gram Mag-Disc and five plots received 10 gram Degesch Mag-Disc.

Active burrows were treated with either two 3-gram phostoxin tablets or one Mag-disc. Crumbled newspaper was used to plug treated burrows. Soil was then placed to seal the openings tightly. Retreatment was made after 24 and 48 hours at two sites. Final evaluation was made after 96 hours. Roughly 50% of the burrows at one site went untreated since there was a shortage of the toxicant.

According to a citation of an Army study, the author indicates that Mag-Disc left in a burrow for four hours produced a concentration of phosphine gas equivalent to 1600 ppm. Reportedly, company representatives indicate that 200 ppm for 1 hour or 400 ppm for 30 minutes kills Rattus spp.). No such data was submitted for prairie dogs.

In these tests a total of 959 burrow openings were treated. 845 of these were relocated for final evaluation. The others were not found due to livestock of wildlife trampling marker flags. A total of 74 burrows were reopened, giving an overall kill of 91%. For the two products, a kill of 88% and 96% for Phostoxin and Mag-Discs, respectively.

202.2 Conclusions

(1) The data submitted does not include tests for all species desired to be controlled. Of the three studies submitted in support of this registration, data was included for only two of the nine species indicated on the label.

(2) Data indicates that phosphine does indeed kill animals by inhalation.

(3) A review of both prairie dog and woodchuck studies indicates efficacy in the use of Degesch Phostoxin.

There is no question as to whether or not this product kills animals. It has been shown to effectively reduce populations of prairie dogs and woodchucks.

We have no objection to the issuance of this registration. To emphasize the need to seal treated burrow entrances, it is suggested that this sentence be underlined within the use directions: "Seal tightly by shoveling soil - - - newspaper". The registrant should delineate the various rat and mouse species to be controlled and be informed that, strictly speaking, moles are not truly classed as burrowing rodents.

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