9-23-77

FEE EVALUATION

DATE: IN ____ OUT ____ IN 5/12/77 OUT 9/23/77 IN ____ OUT ____

FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. 39496-R and E

PETITION OR EXP. PERMIT NO. ____

DATE DIV. RECEIVED 9/21/76

DATE OF SUBMISSION ____

DATE SUBMISSION ACCEPTED 3C1D-2B

TYPE PRODUCT(S): I, D, H, F, N, R, S Growth Regulator

PRODUCT MFR. NO. Taylor

PRODUCT NAME(S) Alfol 810 Alcohol & Alfol 10 Alcohol

COMPANY NAME Continental Oil Co.

SUBMISSION PURPOSE Use on tobacco

CHEMICAL & FORMULATION Fatty Alcohols

(n-octanol 45.1%, N-decanol 54.5%, N-hexanol 0.4%)-R

(n-decanol-99.3%, n-octanol + n-dodecanol-0.7%)-E

1

1.0 Introduction

1.1 Active Ingredients: Fatty Alcohols.
(n-octanol-45.1%, N-decanol-54.5%, n-hexanol-0.4%) - R);
(n-decanol-99.3%, n-octanol + n-dodecanol-0.7%) - E.

1.2 Use: Control of sucker growth on tobacco.

2.0 Directions for use:
See E. C. Review #9538 - EUP, 3/5/76.

3.0 Discussion of data: Data submitted by reference.

3.1 Water solubility:
n-octanol-165ppm
n-decanol-8ppm

3.2 Partition Coefficients and Their Uses. Chem. Reviews, Vol. 71, pp.525-616, 1971.
This ancillary study is a compilation of partition coefficients. From this paper, the applicant calculated the partition coefficient (ratio of concentration of pesticide in octanol to that in water) as 6,060 for octanol and 125,000 for decanol.

3.3 Adsorption by soils:
A simple relationship between soil adsorption of organic chemicals and their octanol/water partition coefficients. G. G. Briggs, Proceedings 7th British Insecticide and Fungicide Conference (1973), p.83.

The adsorption of 30 unionized compounds by soils was correlated with their partition coefficients in four different soils.

$$\log P_1 = a \log P_2 + b$$

Where P_1 is the partition coefficient between soil organic matter and water and P_2 is the partition coefficient between octanol and water. By using this equation, the applicant calculated that the partition coefficient between soil and water is 400 for octanol and 2000 for decanol, indicative of very high adsorption.

3.4 Hydrolysis:
Organic chemistry textbooks were cited as indicating no hydrolysis reactions for alcohols.

3.5 Photolysis:
Photochemistry, John Wiley and Sons, Inc., N.Y., pp.441-445, 1966.

Referenced data show that alcohols are not readily subject to photolysis. Only light below 200 nm is absorbed by alcohols, and then only moderately.

3.6 Teaching studies:
Based upon the paper cited in 3.3, octanol and decanol would have low mobility in soils.

3.7 Volatilization:
Calculation of volatility from equations in the Regulations, p.26889, show that octanol and decanol have high volatility rates. We defer to toxicology for the significance of this data.

3.8 Soil metabolism:
An untranslated study in German was referenced. We cannot review this data until it is translated into English. The applicant states that degradation studies with decanol were not feasible because of its low solubility in water. This is a poor rationalization. Pesticides which are less soluble in water than decanol have been studied extensively.

Another reference, "Biological Oxidation of Hexadecanol Under Laboratory Conditions," J. AWWA, Vol. 49, 7, pp.849-859 (1957), was cited, indicating microbial degradation. The applicant has extrapolated the results from this study to octanol and decanol. Data in our files indicate that decanol and octanol are degraded to CO_2 by microorganisms (Advances in Microbial Physiology, Vol. 5, 1971, pp.1-43).

A referenced study by J. Tancogne is in French and has not been included with the submission. We cannot evaluate this study until we have a translated copy of it.

3

4.0 Recommendations:

We defer to toxicology and environmental safety to determine the significance of data submitted and to determine if additional environmental chemistry data will be needed.

Comments on octanol and decanol are as follows:

1. Decanol and octanol are natural products found in the environment. Natural waxes, such as beeswax and plant wax, contain esters of long-chain monohydric alcohols and fatty acids.

2. Plants are able to degrade decanol and octanol.

3. Microorganisms dehydrogenate these fatty alcohols to fatty acids followed by B-oxidation and respiratory metabolism to CO_2.

4. Octanol and decanol are registered by FDA for use in food and in the synthesis of food components (Federal Register, Vol. 36, No. 205, Oct. 22, 1971, p.20430) and are exempt from tolerances.

[P.M. Note: Labeling instructions recommend applying maleic hydrazide 1 - 2 weeks after application of these fatty alcohols. A synergistic effect may be produced by the combination of these pesticides. Has anyone in PSO examined this possibility?]

R. W. Cook 10-11-77 Acting Section Head

Ronald E. Ney, Jr. 9/23/7
Karen Sampson
Environmental Chemistry
EEEB

Karen Sampson 10/11/77

4