ENVIRONMENTAL CHEMISTRY EVALUATION FOR: endothall [7-oxabicyclo (2.2.1) heptane-2, 3,-dicarboxylic acid] from the dihydroxy aluminum salt of endothall.

2/10/74

Reg. No. 10250-R-
3 M Company
Ltr. 11/12/73

I. INTRODUCTION:

1. Applicant proposes the use of endothall as an aquatic herbicide. Endothall is registred for aquatic uses.

2. Product name is Mariner Brand Aquatic Herbicide System E.

3. An interim tolerance of 0.2 ppm is established for endothall in potable water (C.F.R. Sec. 121.1248), via PP#1F1105 from use in the control of aquatic weeds in canals, lakes, ponds, and other potential sources of potable water.

4. An experimental permit was granted for this use under permit #7182-EXP-8G. A request for an extension of this permit was denied, July 16, 1973.

II. DIRECTIONS FOR USE

Endothall, (Mariner aquatic herbicide System E) is intended for the control of aquatic weeds in non-flowing water in lakes, ponds, or stagnant canals and waterways. It is applied to the surface of the water. Depending on the type of vegetation, it is applied at a rate of 50-200 lbs of product (13.4% active) per acre. Treat only 1/3 to ½ of the water area in a single operation.

Treated areas should be left undisturbed for two days following treatment to obtain best results. Do not use treated water for irrigation of lawns within two days after treatment.
Do not use fish from treated areas for food or feed within three days after treatment.
If treated water is subject to complete water exchange within 7 days the water may be used for irrigation of agricultural crops at 7 days post treatment; if no exchange is possible, irrigation of agricultural crops should be delayed until fourteen days post treatment.
Do not use treated water for domestic purposes until fourteen days post treatment.

2. Biomagnification

A model ecosystem study, (pp#1F1105) using ^{14}C-endothall shows that bioaccumulation between organisms is not expected to be a problem.

3. Persistence of Endothall in Aquatic Enironment as Determined by GLC (J. Agr. Food Chem., Vol. 21 #5,1973).

The above subject was discussed in pp#3F1416, 2/27/74, by Ney and Cook. Briefly, this study involved the addition of endothall at 2 and/or 4 ppm to a farm pond and laboratory aquaria. Residues persisted for a longer period in the hydrosoil than in the water.

4. FISHERY ENVIRONMENT STUDY (Vol. III)

After the establishment of aquatic plants in ponds, three ponds received 2 ppm and three received 4 ppm of endothall acid equivalent. Water and fish were sampled at various intervals. GLC was used as the quantitative tool. Satisfactory recovery is claimed at the 0.04ppm level.

Ave. Concentration of endothall in 3 ponds (PPM)

TIME	Treated with 2 ppm	Treated with 4ppm
0	0.00	0.00
3 hrs	5.44	7.07
23 hrs	1.70	3.08
2 days	2.01	3.67
3 days	1.93	4.20
5 days	1.76	3.66
7 days	1.71	3.59
10 days	1.37	2.10
15 days	.68	0.38
21 days	.14	0.00
28 days	0	0.00

PPM Concentration of endothall in fish from ponds treeated at 4 ppm

	Bass		Catfish		Bluegill	
Time	Body	Viscera	Body	Viscera	Body	Viscera
0	0.00	0.00	0.00	0.00	0.00	0.00
1 day	0.14	0.00	0.00	0.73	0.31	*
3 days	0.02	0.00	0.14	1.27	0.42	1.84
15 days	0.00	0.01	0.00	0.00	*	*

* petitioner states that samples could not be analyzed.

The data from the Fishery Environment Study (VOL. 111) suggest several changes or additions for the above restrictions:

a. The following restriction should be added to the label: "Use only on specified waters that are under complete control of the user".

b. The three day limitation on the use of fish from treated area should be extended to fourteen (14) days after treatment. (Otherwise a tolerance maybe needed for fish.

c. The fourteen (14) day limitation on using treated water for irrigation should be extended to 28 days. (Alternatively, residue data should be submitted for crops irrigated with treated water.)

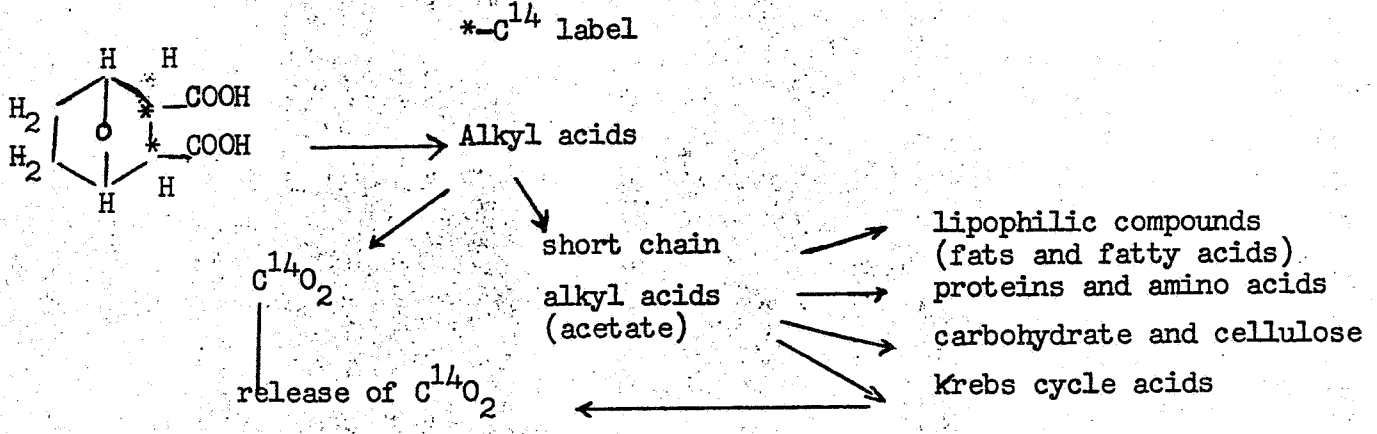
III. DISCUSSION OF DATA

1. Metabolism

Data are available in PP#1F1105 and published literature to show that endothall is fairly degraded in an aquatic environment, in plants, animals, and fish to carbon dioxide and natural components. Also, see previous reviews; particularly, PP#3F1416 of 2/27/74. page 2.

Fate of $C^{14}O_2$ of Labeled Endothall

as Indicated by Metabolism Studies by M.L. Montgomery & V. H. Freed (1964)



The petitioner states that the apparent high value at 3 days after treatment for the blue gill cannot be explained. Also, that interference in the methodology made it difficult to analyze several bluegill samples.

Conclusions:

a. The application rate to pond water is reported in ppm; however, we need to know the equivalent rate in pounds per acre of active ingredient.

b. At the treated rate of 2 and 4 ppm, endothall residues disappear from water about four weeks after treatment.

c. Residues do not concentrate in fish.

d. The maximum amount of residues that do accumulate in fish occur in the viscera; however, at, about 15 days after treatment residue have dissipated from the from flesh and viscera of fish.

IV. RECOMMENDATIONS

A. Object to registration for the following reasons.

1. The (3) day limitation on the use of fish from treated areas should be amended to fourteen (14) days treatment.

2. The fourteen (14) days limitation on using treated waters for irrigation should be amended to 28 days; alternatively, residue data should be submitted for crops irrigated with treated water.

RENey 7/10/74

Ronald E. Ney, Jr. 7/3/74
Franklin D.R. Gee 6/20/74
Environmental Chemistry Section
Efficacy and Ecological Effects Branch

EEB/J.T. 7/9/74

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DJ. Delete the claims "The carrier system is ~~innocuous~~ innocuous and becomes incorporated into the bottom sediment" and "Endothall is rapidly degraded by micro-organisms of the water." (5)

RENey
7/12/74