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OFFICE OF  
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: ALLETHRIN Chronic Toxicity Studies

TO: Mr. Tim Gardner (PM-17)  
Registration Division (TS-767)

FROM: Byron T. Backus *B.T. Backus*  
Toxicology Branch *08-03-84*  
HED (TS-769)

THROUGH: Robert Zendzian, Ph.D., Acting Head  
Review Section III  
and  
William Burnam, Chief  
Toxicology Branch

*8/10/84*  
*W.B. 8/17/84*

Number: 17-3

Tox. Chem. 25

Action:

This is a response to a letter of June 22, 1984 from the MGK Company as to the possibility of conducting chronic toxicity studies on one of the allethrins to satisfy data requirements for all the allethrins.

Conclusions:

1. The registrant should propose what material (or possibly what mixture) would be used in a specific chronic study. A rationale should be developed and presented as to why the results of testing this specific material or mixture would be applicable to all the allethrins for a particular type of study.
2. The rationale should be based upon what is known about the toxicity and metabolism of these compounds in mammalian species. It is not obvious that because one compound is more toxic than another when tested against arthropods that the same would be true in other organisms. Also, efficacy relates more to acute toxicity than to long-term effects.
3. It is not appropriate to state that all chronic studies for allethrin can be conducted using a single material or mixture. This should be handled on a case-by-case basis.

Discussion:

There are five compound-mixtures belonging to the allethrin series; they differ in their isomeric composition as follows:

	Allethrin 90%	Allethrin forte 92%	Bioallethrin 93%	Esbiothrin 93%	Esbiol 95%
d-trans of d	18	36.8	46.5	72	90
<u>d-trans</u> of <u>T</u>	18	36.8	46.5	21	5
T-trans of <u>d</u>	18	-	-	-	-
<u>T-trans</u> of <u>T</u>	18	-	-	-	-
<u>d-trans</u> of <u>d</u>	4.5	9.2	-	-	-
<u>d-cis</u> of <u>l</u>	4.5	9.2	-	-	-
<u>T-cis</u> of <u>d</u>	4.5	-	-	-	-
<u>T-cis</u> of <u>T</u>	4.5	-	-	-	-

It is the d allethronyl d trans chrysanthemate which is the most active against insects.

The registrant proposes to conduct chronic toxicity studies on one compound or mixture, and then use the results to satisfy data requirements for all five. However, what would actually be tested is not specified in the letter dated June 22, 1984. Additionally, there is no mention as to what types of chronic studies (feeding? inhalation?) would be involved.

Finally, the material presented in the letter of June 22, 1984 relates primarily to the manufacturing processes of these different mixtures, structural relationships to the insecticidal constituents of pyrethrum extract, and biological activity against mosquitoes. None of these arguments addresses the question of toxicity and/or metabolism of these compounds in mammalian species.

The recommendation then is for the registrant to specify what material (or mixture) is going to be tested, and to give a justification, based on toxicity and metabolism of these compounds in mammalian species, as to why a study conducted on this material could be applied to all allethrins. Further, the type of study should also be specified. It is not appropriate to state that all chronic studies can be conducted using a single material or mixture. This should be handled on a case-by-case basis.