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PROOUCT NAME(S) TEMIK

COMPANY NAME Union Carbide Agricultural Products Company, Inc.

SU8MISSION PURPOSE Submission of terrestrial wildlife field studies protocol relative to registration standard

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OCT 20 1986

MEMORANDUM

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

SUBJECT: Review of Aldicarb Wildlife Monitoring Protocol

FROM: Richard R. Stevens
Ecological Effects Branch
Hazard Evaluation Division (TS-769-C)

THRU: Raymond Matheny
Head - Section I
Ecological Effects Branch
Hazard Evaluation Division (TS-769-C)

THRU: Michael Slimak
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TO: Larry Schnaubelt
Acting Product Manager (12)
Insecticide, Rodenticide Branch
Registration Division (TS-767-C)

The Ecological Effects Branch (EEB) has reviewed the protocol submitted under cover letter from J.S. Lovell of Union Carbide, dated July 14, 1986. Basically, the protocol includes methods based on study suggestions made by EEB in a meeting with Union Carbide February 7, 1986 and our subsequent April 25, 1986 review of Union Carbide's initial proposal.

A few of the suggestions made by EEB have not been incorporated into the protocol:

1. Residue monitoring and AChE measurements: Union Carbide maintains that because of Aldicarb's high acute oral toxicity to birds, death would be rapid (i.e., approximately 18 minutes or less) if a bird ingested aldicarb granules. "Thus, a mortality survey approach makes more sense than examining AChE depression in carcasses (if any), or from live-trapped or shot samples, as rapid death would be the probable result of any aldicarb ingestion by a bird."

EEB's original position on AChE measurements for aldicarb has changed. We believe that the relationship between cause and effect must clearly be determined to eliminate doubt and the difficulty with interpretation of results. Therefore, EEB suggests that the protocol be changed to examine whole body residues (gizzard, crop and liver) and the presence of granules in the crop and gizzard from live as well as dead birds.

2. Application methods: Most methods of application suggested by EEB have been incorporated in the protocol, with the exception of SDAP 3-8" for potatoes and BICAP 3-6" for cotton. According to Union Carbide, these methods were omitted because they are not common practices. This leaves IFAP 2" and SD 2-6" for cotton, IFAP 3-8" and BICAP/BICAE 2-4" for potatoes, and SHK and BIC 2-3" for citrus which should be representative for species diversity and density for each method of application, depth of incorporation and stage of growth.

In addition to the above, EEB suggests that the following additional changes/incorporations to the protocol be made:

3. Study plot size cannot realistically be determined without first establishing what end-point detection limits are acceptable. For example, it is not reasonable to expect that there needs to be 100% mortality just to turn up one dead bird at the study site. Also, if one dead bird is found, what does this represent; 10%, 20% or 30% mortality? We recommend that the study design for passerines be sensitive enough to detect 20% bird mortality given any bird density. Assuming a predator removal of 50% and search efficiency of 50%, then 40 birds (species that may be exposed, i.e., no swallows, warblers, etc.) per search area is sufficient to detect this limit. If density is 2 birds/acre then 20 acres should be searched; or if density is 1 bird/acre, 40 acres should be searced. The study plot size should be large enough to ensure that birds in the search area are potentially exposed to the chemical.

4. EEB would like to see a description of the equipment used to apply aldicarb throughout the study. Equipment used in all aspects of the study should be typical of what most applicators use for a given application method.

5. In our original guidance on suggested components of a field study we suggested that 5 replicates may be sufficient for each method of application. Additionally, we indicated that we wanted to see blacklight photo studies, and that these studies may be substituted for one replicate for each method of application. As a consequence, however, we are left with only four treated replicates. This may not be enough replicates to yield meaningful results using analysis of variance (ANOVA), the method of data analysis which Union Carbide says they intend to use. Five replicates would not be enough either. You may or may not find statistically significant differences with ANOVA, however, the intent of this level one study is simply to determine whether an effect is occurring and whether higher level testing is warranted to quantify such an effect.

6. The protocol does not clearly provide a contingency for inclement weather. Will sampling, carcass search strategies, surveys, transects or application methods be modified to account for inclement weather (i.e., high winds or heavy rainfall)?

If Union Carbide will incorporate the preceding comments and suggestons into their protocol for the level-one field study, I think we are close to designing a field study that will satisfy the requirement set forth in the Standard. We look forward to the final protocol when it is submitted by the registrant.