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MEMORANDUM

SUBJECT: Peer Review of Terbufos Field Study

FROM: Peer Review Panel: Armitage, Fite, Lee, Reider

TO: Michael Slimak, Chief
Ecological Effects Branch

The peer review panel has completed its evaluation of the Terbufos Avian Field Study reviewed by John Bascietto. The stated objectives of the field study were: 1) To monitor avian populations inhabiting areas in and around test fields before and after two separate applications of Counter 15G, (Terbufos) 2) To perform intensive carcass searches to determine whether acute mortality of mammals and birds can be caused by ground and aerial applications of Counter 15G to corn 3) To collect dead and moribund birds and other animals for whole body residue analysis in order to document levels of exposure to Terbufos.

On the basis of available study data, the peer review panel concurs with the following conclusions drawn by the reviewer:

1) The study partially fulfills the requirement for testing of the acute mortality potential of Counter 15G as specified by the June, 1983, E.P.A. publication of re-registration guidance.

2) The study fulfills a requirement to determine the incremental acute risk to birds and mammals posed by an amendment to the re-registration standard to add aerial and ground broadcast applications of Counter 15G on corn.

3) The study demonstrates that when Counter 15G is applied with ground equipment at 16 oz. per 1000 ft. of row, acute mortality of birds and reptiles results.

4) The study demonstrates that when Counter 15G is applied aerially at 6.7 lbs. per acre, mammal, bird and reptile mortalities result.

5) Fish are killed by aerial applications of Counter 15G.

6) Exposure of wildlife to Terbufos was clearly demonstrated by analysis of whole body residues.

7) The avian census data derived from the study were useful in determining the species and relative numbers of individuals within each species that were present during the study. However, the census techniques used

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in the study do not enable the reviewer to draw conclusions about the effect of Terbufos upon bird populations.

8) Currently registered ground-applied, soil-incorporated uses of Terbufos must be classified as restricted.

The reviewer has used data presented in the study to derive expected mortality of fish and wildlife resulting from the use of Terbufos on 9.3 million acres of corn.

It is the consensus of the peer review panel that the study data should be interpreted with caution when estimating expected avian, mammalian, and reptilian mortality.

The following weaknesses in study design raise questions regarding the use of study data to develop quantitative estimates of expected mortality:

1) No control data are available to establish baseline values for natural mortality.

2) Estimates of carcass search efficiency (50%) may be unrealistic because carcasses were not randomly distributed, and were instead placed "within a reasonable distance of a search transect".

3) Because of the small sizes of fields used in this study, experimental results cannot be extrapolated to draw conclusions with respect to large use areas.

It is, therefore, the recommendation of the peer review panel that reference to specific estimates of expected pesticide induced mortality be modified in the data evaluation record and the review of Terbufos. Members of the peer review panel suggest that the reviewer may want to indicate that the results of the study raise great concern over the use of Terbufos, which is applied to more than 9.3 million acres of corn annually. Based on the results of this study, the reviewer would be justified in stating that the resultant mortality of birds, mammals, and reptiles could be on an order of magnitude reaching millions of these organisms.

It is, furthermore, the consensus of the peer review panel that additional field studies be required to better quantify the effects of this pesticide upon aquatic and terrestrial species. Additional terrestrial field studies should be conducted within a larger study area and over a longer period of time, using more sophisticated techniques to estimate population effects upon avian, mammalian, and reptilian species. Mark and recapture techniques, radio telemetry, measurement of year class strength and recruitment success, and or other appropriate techniques should be used to derive quantitative estimates of the impact of pesticide use upon populations of

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exposed organisms. Control studies should also be undertaken to provide baseline data. Protocol for these studies should be approved by EEB's field study committee prior to study initiation.

Submitted by Peer Review Panel,

Thomas Armitage Thomas Armitage 6-27-85

Ed Fite Ed Fite 6/24/85

Richard Lee Richard M. Lee 6/24/85

Daniel Reider Daniel Reider 6/24/85

cc: John Bascietto