

US EPA ARCHIVE DOCUMENT

AWL

240667  
RECORD NUMBER

105001  
Shaughnessey Code

REVIEW NUMBER

ECOLOGICAL EFFECTS BRANCH REVIEW

DATE: IN 2-27-89 OUT 7-7-89

FILE OR REG. NO. 105001

PETITION OR EXP NO. \_\_\_\_\_

DATE OF SUBMISSION 12-21-89

DATE RECEIVED BY EFED 2-24-89

RD REQUESTED COMPLETION DATE 7-31-89

EEB ESTIMATED COMPLETION DATE 7-31-89

RD ACTION CODE/TYPE OF REVIEW 400

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

DATA ACCESSION NO(S). \_\_\_\_\_

PRODUCT MANAGER NO. R. Rubis (50)

PRODUCT NAME(S) Terbufos

COMPANY NAME American Cyanamid Company

SUBMISSION PURPOSE Registrant response to FRSTR

Shaughnessey Code	Chemical and Formulation	% A.I.
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## ECOLOGICAL EFFECTS BRANCH REVIEW

Chemical: COUNTER (Terbufos)

### 100 Submission Purpose and Label Information

#### 100.1 Submission Purpose and Pesticide Use

American Cyanamid Company indicated in their cover letter the purposes of this submission were:

- 1) To provide additional data which will satisfy some of the Agency's requirements;
- 2) To propose specifics for fulfillment of various data requirements;
- 3) To provide our rationale for not performing some of the studies requested, and;
- 4) To provide the Agency the timelines within which Cyanamid can reasonably comply with the data requests.

The submission also sets forth some label amendments. It appears only the label amendments and number four above relate to EEB, since no additional Fish and Wildlife data were submitted and they agreed to complete all Fish and Wildlife data requirements.

#### 100.3 Application Methods, Directions, Rates

The proposed amendments to the COUNTER label are:

- 1) For corn (field, sweet, and pop) they wish to limit the application to one treatment per season rather than the combination of at planting and postplanting treatments which the label now allows. Eliminating the option for combinations of treatments, they believe, will limit the maximum amount of product applied per acre per season and will eliminate the stated requirement for residue trials for combinations of at planting and post-planting treatments.
- 2) For corn (field, sweet, and pop) they wish to lower the maximum use rate from 2.5 lbs ai/acre to 1.3 lbs ai/acre. The decrease in use rate will not affect the efficacy of this product against the pest for which it is labelled, they indicate.
- 3) For grain sorghum they wish to decrease the maximum use rate of the at planting banded treatment from 3.9 lbs ai/acre to 1.9 lb ai/acre.

## 101.1 Discussion

These proposed label modifications will have a significant effect on the Fish and Wildlife Data Requirements which were specified in the Terbufos (FRSTR) Registration Standard. While the general requirements remain the same, the proposed decrease in use rate for corn changes the emphasis of the approach. For corn, a "definitive" field study was requested based on the results of a screening study which evaluated Terbufos's use in corn at 2.6 lbs ai/A. At the proposed lower use rate of 1.3 lbs ai/A, exposure estimates are substantially reduced; however they are still in the range which suggests effects may occur. Therefore, screening studies evaluating the use of Terbufos at the lower use rates are needed to determine if effects are not occurring.

At 2.6 lbs ai/A, band application, a square foot of treated area would have approximately 11,728 granules (based on an average granule weighing .066mg, Hill and Camardese 1984). Using the technical grade LD<sub>50</sub> reported by Hill and Camardese (1984) of 15 mg/kg for the Bobwhite Quail, 43 LD<sub>50</sub>'s are present per square foot of treated band. At the proposed decreased use rate of 1.3 lbs ai/A, using the same LD<sub>50</sub> and granular weight, 21.5 LD<sub>50</sub>'s are present on a square foot of treated area. While a substantial reduction, this still represents a relatively high number of toxic doses per square foot. Further potential for impacting non-targets at the reduced use rate is indicated when maximum potential residues of Terbufos on wildlife food sources within the treated band are estimated. If we assume, residues within the band will approximate a flowable application, Kenaga's nomograph can be used to estimate maximum residues within the band. At a use rate of 1.3 lbs ai/A maximum expected residues within a seven inch band range from 65 to 340 ppm on seeds and insects, which is within the lethal range for avian species (Bobwhite LC<sub>50</sub> = 157 (124-201) ppm). Toxicity test with songbirds suggest that some may be several times more sensitive to Terbufos than bobwhites (Blackbird LD<sub>50</sub> > 1.1 and < 2.1 mg ai/kg), raising the concern that the potential for effects may be greater than indicated from the above calculations.

While, corn is by far the principal use of Terbufos, with ten to twelve percent of the U.S. field corn acreage being treated with approximately 10 to 12 million pounds a.i. of this chemical annually, the other uses, sugar beets and sorghum, are also of concern. Both these crops have higher use rates than corn and use of this chemical in these crops has continued to increase over the past several years (Preliminary Quantitative Usage Analysis 1987). As indicated above, the grain sorghum use rate is being decreased from 3.9 to 1.9 lbs ai/A; however, this decreased rate is for the banded treatment only, still leaving the knifed-in application at 3.9 lbs ai/A. For sugar beets, use rates as high as 4.35 lbs ai/A are allowed by the current label with no proposed modifications. Hence, potential impacts based on the above hazard indexes would

be greater for these two crops than corn, thus requiring at least field studies which are designed to evaluate if effects are occurring at rates below levels of concern, ie. screening studies. For these uses, however, given the results of the screening study in corn at 2.6 lbs ai/A, studies designed to quantify the magnitude of effects may be more appropriate. In this case, given the limited information available on Terbufos's impacts to non-targets when used in sorghum or sugar beets, it may be appropriate for the study to begin with the general approach of a screening study, followed by a quantitative phase that focuses on the species affected in the screening phase.

Also, it should be noted that American Cyanamid has proposed a definitive study to support the corn use and has completed at least two years of preliminary work. EEB has raised substantial questions with this study design, one of which has been the proposed use rate, 1.3 lbs ai/A. The above proposed label modification, obviously takes care of this concern. However, as suggested above the question which needs to be addressed is what effect the lower rate has on potential impacts. The other concerns we have raised with the definitive study proposed for corn in Iowa, including replication, species selection, and area selection remain. These concerns are significant enough that we highly question whether the proposed study will be sufficient to meet the data requirement for a screening study.

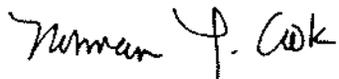
### 103.0 Conclusions

EEB has reviewed American Cyanamid's response to the Terbufos Registration Standard. They have agreed to submit all the data requested to support their registration of Terbufos. However, the proposed label modification does alter the emphasis of the field test requirement specified in the standard, as outlined above.

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 7/18/89

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 7/20/89