Glyphosate/Tox

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

RELEASABLE

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM JUN 8 1983

DATE:

TO: Robert Taylor
Product Manager #25
Registration Division, TS-767

THUR: Christine F. Chaisson, Ph.D.
Head, Review Section IV
Toxicology Branch
Hazard Evaluation Division, TS-769C

Roger Gardner for CFC 6-7-83.

SUBJECT: 524-EUP-AE; Crop Destruct EUP for Gylphosate on Wheat

Caswell # 661A.

Recommendations:

1. The EUP program can be toxicologically supported.

Review:

1. No new toxicity data were submitted.

2. EUP Program Summary

   a. Thirty states in program.
   b. Trials in two to five locations per state.
   c. EUP to extend two years.
   d. Average plot size of five acres.
   e. Rates from 0.19 to 0.75 lbs. ai/A.

3. The formulation to be used in Roundup® (EPA Registration No. 524-308-AA; Inerts are cleared under section 180.1001).

4. Toxicological data considered for the EUP:

- o Teratology - rat - negative at 3500 mg/kg/day; fetotoxic NOEL was 1000 mg/kg/day

- o Teratology - rabbit - negative at 350 mg/kg/day; fetotoxic NEOL was 175 mg/kg/day.

- o Mutagenicity - negative in the following studies:

  a. Rec-assay in two strains of B. subtilis up to 2000 ug/test.

  b. Reverse mutation in 5 histidine-requiring strains of S. typhimurium and 1 tryptophan-requiring strain of E. coli, with and without metabolic activation.

  c. Ames test in four strains of Salmonella, with and without metabolic activation.

  d. Dominant lethal study in the mouse at 2000 mg/kg.

- o Three-generation reproduction - rat - NOEL of 10 mg/kg/day based on pathological findings of renal focal tubular dilation in high dose male F_{3b} weanlings.

- o Chronic/oncogenic - rat - NOEL was 31 mg/kg/day; oncogenic potential was negative.

Recently (memo dated 2/10/83 from Dykstra to Taylor), a question has arisen concerning the significance of the incidence of C-cell carcinomas of the thyroid in female rats in the life-time feeding study in this species with Glyphosate, and the thyroid slides will be reevaluated; the tentative conclusion reached is that Glyphosate was not oncogenic in that study. A final conclusion that Glyphosate is not oncogenic in that study has been presented in PP#3E2845, memo of 4/5/83 by Dr. L. Kasza.

- o Data considered desirable but lacking are a mouse oncogenicity study and a chronic oral dog study.

Tolerances are established under 40 CFR 180.364. No regulatory actions are pending against the pesticide and no RPAR criteria have been exceeded.

- o The following considerations are relevant:

A two-year oral dog study (No. 651-00565) done at IBT has recently (7-27-82) been evaluated and declared invalid. The following additional studies have been validated by the Canadian government and determined to be valid; they, therefore, remain as part of the data base for Glyphosate. However, evaluations have not been performed on these studies and hence their utility in supporting the proposed use has not been ascertained at the present time.

IBT No. B-1020 - 90-Day Oral - Rat

IBT No. C-1021 - 90-Day Oral - Dog

IBT No. 8580-09117 - 42-Day Neurotoxicity - Chicken

IBT No. B-566 - 3-Generation Reproduction - Rat
(This study, although listed as valid in a Canadian Validation Summary dated March 1, 1982, was classified invalid in their validation report dated April 8, 1981; this discrepancy should be resolved.)

Furthermore, concentrations of 0.1 - 0.13 ppm of N-nitrosoglyphosate (NNC) are present in the technical product (isopropylamine salt of gylphosate) and 0.2 - 0.4 ppm in the formulated product (Roundup®) (Memo of 12/2/77 from RCB, PP#7F1971/FAP#7H5168). It has been EPA's interim policy to routinely register (except in special cases) pesticides whose N-nitroso compound content is less that 1 ppm (FR Vol. 5, No. 124, 6/25/80). No detectable residues of NNF were found in soybean grain, forage and hay or in cottonseed using an analytical method sensitive to 0.02 ppm. Additional data based on activity measurements for tracer studies with 14C-Glyphosate indicate maximum hypothetical residues of <1-7 ppb NNG (Memo of 12/2/77 from RCB, PP#7F1971/FAP#7H5168). Such levels are not of serious toxicological concern. Additionally, no detectable exposure to NNG by applicators or during re-entry was found for other crops (Toxicology Branch memo of 9/26/78; Accession No. 233914). However there are three unvalidated IBT studies with NNG which need to be validated and, if necessary evaluated. These studies are:

IBT No. 8560-8924 - 2-year oral - rat

IBT No. 8580-8922 - 2-year oral - dog

IBT No. 8533-08923 - 3-generation reproduction - rat

Also, during a phone conversation 8-9-82 with Dr. Duncan of Monsanto, he reported the existence of an oncogenic study in mice in which the sodium salt of NNG was administered by gavage; the in-life phase has been completed and the study will be reported in the first quarter of 1983.

William Dykstra

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