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

JUN 23 1981

OFFICE OF PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

DATE: June 18, 1981

SUBJECT: Glyphosate; EPA Reg.#524-308; PP#1F2518; Glyphosate in/on forage legumes and forage grasses CASWELL #661A

FROM: William Dykstra, Toxicologist
Toxicology Branch, HED (TS-769)

WDO for LOC 6/18/81

TO: Robert Taylor (25)
Registration Division (TS-767)
and
Residue Chemistry Branch
Hazard Evaluation Division (TS-769)

Recommendations:

1. The requested tolerances can be toxicologically supported.

2. The following studies are currently lacking and are required to be submitted within a reasonable period of time:

   a) oncogenicity - 2 species

Review:

1. Section F - Proposed Tolerances

   Request is made to establish pesticide tolerances for the combined residues of the pesticide N-phosphonomethyl glycine (Glyphosate) and its metabolite aminomethylphosphonic acid, in or on the raw agricultural commodities as follows:

Forage grasses	5.0 ppm
Forage legumes (except soybean and peanuts)	30.0 ppm

   These increased tolerances are due to the application Glyphosate as a spot treatment to no more than 10% of a field for control of weeds.

2. Formulation to be used is Roundup (EPA Reg.#524-308). Inerts are cleared under 180.1001.

3. Memo of 8/22/78 from R. Engler to R. Taylor. Toxicology Branch has reviewed the validated studies in support of Glyphosate.

   a) Data considered

   - Oral LD_{50} (rabbit): 3.8 mg/kg (valid)
   - 90-Day Rat Feeding: NOEL = 2000 ppm (valid)
   - 90-Day Dog Feeding: NOEL = 2000 ppm (valid)
   - Teratology (2 studies) Rabbit: Negative at 30 mg/kg/day (higher dose); repeat studies with a higher dose.
   - 2-Year Dog Feeding: NOEL = 300 ppm (valid)
   - 3-Generation Rat Reproduction: NOEL = 100 ppm (valid)
   - 18-Month Mouse Feeding: No carcinogenic potential at 300 ppm (highest dose). Study must be repeated since too many animals are missing.
   - 2-Year Rat Feeding: NOEL = 100 ppm (valid). Study is adequate to determine the toxic effects, but only marginal with respect to oncogenic evaluation since too few animals examined. As reported the study shows no oncogenic potential.
   - Neurotoxicity (hen): Negative at 7.5 gm/kg (cumulative for 3 days) (valid)
   - Dominant Lethal (mice): Negative at 10 mg/kg (highest dose), supplemental study, no records of positive control.
   - Host-Mediated Assay: Negative (supplemental study) no raw data available.
   - Rec-Assay: Negative (supplemental study) no raw data available.

4. Memo of 9/22/79 from M.L. Alexander to Product Manager#25. Glyphosate was not mutagenic in the following test systems:

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

   b) Reverse mutation in five histidine-requiring strains of S. typhimurium and one tryptophan-requiring strain of E. coli with or without metabolic activation.

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

5. Memo of 1/16/81 from W. Dykstra to R. Taylor.

   a) Rat Teratology: Severe maternal toxicity at 3500 mg/kg/day; negative at 3500 mg/kg/day.
   Fetotoxic NOEL = 1000 mg/kg/day

   b) Rabbit Teratology: Negative at 350 mg/kg/day
   Fetotoxicity NOEL = 175 mg/kg/day

   c) Mouse Dominant Lethal: Negative at 2000 mg/kg

6. No new toxicity data were submitted with this petition.

7. Evaluation of the ADI:

   The ADI is based on the NOEL of 100 ppm (5 mg/kg/day) in a 2-year rat feeding study. This is the most sensitive species for which chronic toxicity data are available. A 100 fold safety factor was used to calculate the ADI.

$$ADI = NOEL \times \frac{1}{100}$$

$$ADI = 5 \text{ mg/kg/day} \times \frac{1}{100} = 0.05 \text{ mg/kg/day}$$

   The MPI for a 60 kg person is 3 mg/day

8. Tolerances have been established under 40 CFR 180.364.

9. No regulatory actions are pending against the pesticide.

10. The published tolerance utilize 7.21% of the ADI. Unpublished TOX approved tolerances utilize the ADI to 19.74%.

    The current action does not utilize any of the ADI. All tolerances on Glyphosate utilize 19.74% of the ADI.

Conclusions and Recommendations:

The requested tolerance can be toxicologically supported.

The oncogenic potential of Glyphosate is not fully elucidated. The chronic rat and mouse feeding studies, however, provide assurance that Glyphosate has a relatively low oncogenic potential. A further assurance of low risk with Glyphosate is found in the fact that on a theoretical basis the exposure via the diet is about-one-fifth of the ADI at present.

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