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DATA EVALUATION REVIEW 9

I. Study Type: terrestrial field dissipation, field rotational crop accumulation

II. Citation:

STUDY 1
Mayasich, J.M. **Determination of the Residues of Glufosinate-Ammonium (Hoe 039866), Its Free Acid (Hoe 035956), and Its Metabolites (Hoe 061517 and Hoe 064619) in Crops Rotated After Soybeans from Geneseo, Illinois.** performed by Van Der Schaff Agricultural Research, Inc., Geneseo, IL, USA, and Dr. Specht and Partner, Hamburg, West Germany. sponsored and submitted by Hoechst Celanese, Somerville, NJ, USA. dated 5/1/89. Received EPA under MRID # 413231-27.

STUDY 2
Mayasich, J.M. **Determination of the Residues of Glufosinate-Ammonium (Hoe 039866), Its Free Acid (Hoe 035956), and Its Metabolites (Hoe 061517 and Hoe 064619) in Soil from Geneseo, Illinois.** performed by Van Der Schaff Agricultural Research, Inc., Geneseo, IL, USA, and Dr. Specht and Partner, Hamburg, West Germany. sponsored and submitted by Hoechst Celanese, Somerville, NJ, USA. dated 5/1/89. Received EPA under MRID # 413231-23.

III. Reviewer:

Typed Name: E. Brinson Conerly
Title: Chemist, Review Section 2
Organization: EFGWB/EFED/OPP

E. B. Conerly
6/18/90

IV. Conclusions:

The studies have serious deficiencies including the following:

1) The application rate supported by the analytical data is apparently much lower (ca. 1/3) than that claimed by the applicant. This discrepancy may be resolved by a satisfactory explanation by the applicant.

2) EFGWB strongly recommends **against** compositing of soil or other sample material into a single sample for analysis. The value obtained from such a composited sample is a "grand average" of the values which would have resulted from analysis of several samples. This does not provide information on application variability or other factors which are of importance to EFGWB. Further, if a single composite is somehow flawed or aberrent, it will give misleading results. Without independent samples, the investigator has no means of identifying these faulty data.

3) The analytical method may become acceptable, but additional information should be submitted to show that sensitivity is the best obtainable and to demonstrate the separation of authentic compounds, so that EFGWB may complete validation of the method. These results appear to indicate that residues of concern do not occur in the tested crops when replanted at 91 days at ca. 0.4 ppm.

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2) The residue trial represents normal climatological conditions for the area.
3) There is no potential for residues of HOE-039866 to be assimilated in crops rotated after soybeans when treated according to the label directions.
4) HOE-064619 residues are not encountered in substrates analyzed.
5) [This statement was included by the applicant.] The residue trial was conducted in full compliance with the guidelines for Rotational Crop Studies.

STUDY 2 -- soil residues

Results

1) The average HOE-039866 residues in the 0 - 10 cm core decreased rapidly from 0.37 ppm immediately after application through day 34 to non-detectable levels. No HOE-039866 residues were found at any time or depth below the 10 cm level.
2) A half-life of 9.8 days has been calculated for HOE-039866.
3) HOE-061517 occurred only at one sampling interval (0 - 10 cm depth, day 34, 0.06 ppm). No residues were found below 10 cm at any time.
4) HOE-064619 was not detected at any time.

VII. Reviewer's Comments:

The soil analyses of samples taken immediately after treatment appear to establish that the level of treatment was incorrect. It is given as 0.37 ppm in a 4 inch soil layer, but should be in the order of 1.8 ppm for a three inch soil layer or 1.4 ppm for the four inch core analyzed. Unless the applicant can demonstrate otherwise, the conclusion is inevitable that the application rate was less than stated

Analyses appear to have been based on what is essentially a single soil sample (i.e. a composite of all samples obtained for a given time and depth), although three analytical runs were done. This becomes a secondary issue, given the uncertainty about the application rate. EFGWB strongly recommends that at least three independent samples be analyzed at each time period. This prevents the possibility of a single aberrent analytical value distorting the data and its interpretation, as well as demonstrating the "natural" variability of the whole analytical system.

EFGWB recommends, but does not absolutely require, that an analytical method have a sensitivity of 0.01 ppm. The method used in this study does not meet that criterion. If the applicant can demonstrate that the method is the best available, the method may be acceptable. Further, the chromatograms presented in the submission do not show separation of a mixture of authentic compounds. This information is also essential to the final evaluation and acceptance of the method.

The residues do not appear to be significant, but the data cannot be used to support an application rate of 1.8 lb a.i./A.

VIII. CBI Information Addendum: included

V. Materials and Methods:

STUDY 1 -- plant residues
test material -- Ignite[tm] Herbicide containing glufosinate ammonium

Methods
test protocol -- test material was applied at 1.8 lb/A ai (120% expected maximum label rate for soybeans) to a bare plot which was ready to plant. During the test, irrigation was used to provide 120% of the 10-year average rainfall. The plot was immediately planted with soybeans. After 90 days some of the growing soybeans were removed, and typical rotational crops (leaf lettuce, radishes, and wheat) were planted. These rotational crops were examined at 1/4, 1/2, and full maturity:
for radishes -- planted 91 days after treatment; harvested 113, 119, and 124 days after treatment, or 22, 28, and 33 days after planting
for lettuce -- planted 91 days after treatment; harvested 124, 138, and 154 days after treatment, or 33, 47, and 63 days after planting
for wheat -- planted 91 days after treatment; harvested 335, 364, and 401 days after treatment, or 224, 273, and 310 days after planting
Remaining soybean seed and straw were harvested at maturity, 135 days after treatment and planting.

analyses -- samples were analyzed for HOE-039866, HOE-061517, and HOE-064619. Plant material was extracted with water, the extract concentrated and derivatized with trimethyl-orthoacetate. The derivatives were then analyzed by gas chromatography (phosphorus sensitive flame photometric detector). The level of detection was 50 ppb.

STUDY 2 -- soil residues
Materials
test material as described above

Methods
test protocol as described above
sampling protocol -- day 0, pre and post application; days 6, 9, 34, 65, 91, 121, and 180 days post application -- ten cores were taken at each interval, sectioned into 10 cm portions, and composited
analyses -- samples were analyzed for HOE-039866, HOE-061517, and HOE-064619

VI. Study **Author**'s Results and/or Conclusions:

STUDY 1 -- plant residues
Results

No detectable residues were measured in any rotational crop sampled. No detectable residues of parent were found in soybean grain or straw harvest 135 days after planting. An average of 0.06 ppm HOE-061517 was found in soybean seed, and 0.09 ppm in soybean straw.

Conclusions

1) The analytical method selected is capable of analyzing all residues of environmental concern.