FILE COPY

Shaughnessy No.:122010

Date Out of EAB: 17 DEC 1984

To: Robert Taylor
Product Manager 25
Registration Division (TS-767)

From: Samuel Creeger, Chief
Review Section #1
Exposure Assessment Branch
Hazard Evaluation Division (TS-769)

Attached, please find the EAB review of...

Reg./File # : 352-UGL

Chemical Name: Metsulfuron Methyl

Type Product : Herbicide

Product Name : Ally Herbicide

Company Name : E.I. du Pont

Purpose : New Chemical; registration for use on Wheat and Barley.

Action Code(s): 110

EAB #(s) : 4556

Date Received: 8/31/84

TAIS Code: 61

Date Completed: 12/17/84

Total Reviewing Time: 1.0 days

Contractor Review Time: _____

Deferrals to:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

1.0 INTRODUCTION

Dupont has submitted data in accession no. 072767 to support the proposed registration of Ally Herbicide (Methyl 2-[[[[(4-methoxy-6-methyltriazin-2-yl)-amino]carbonyl]amino]sulfonyl]benzoate) (synonyms = Metsulfuron Methyl, DPX-T6376) on Wheat and Barley. Data have previously been submitted and reviewed (5/20/83 and 7/12/84).

The current submission was forwarded to the contractor (DYNAMAC) for review. Two copies of their evaluation are appended to this review.

2.0 STRUCTURE and DIRECTIONS FOR USE

See previous reviews.

3.0 SUBMITTED DATA

The following additional studies were reviewed by DYNAMAC:

Anderson, J.J. 1984. Crop rotation study with ^{14}C metsulfuron methyl in the field. Document No. AMR-190-84.

Anderson, J.J. and J. Harvey. 1984. Field dissipation study of DPX-T6376 in Delaware, North Carolina, Florida and Mississippi. Document No. AMR-117-83.

Chrzanowski, R.L. 1984. Soil column leaching studies with [^{14}C]-DPX-T6376. Document No. AMR-82-82.

Friedman, P. 1984. Aqueous photolysis of ^{14}C-DPX-T6376. Document No. AMR-102-82.

Friedman, P. 1984. Photodegradation of ^{14}C-phenyl-DPX-T6376 on soil. Document No. AMR-77-82.

Friedman, P.L. 1984. Anaerobic aquatic metabolism of [^{14}C-phenyl]-metsulfuron methyl. Document No. AMR-134-83.

Friedman, P.L. 1984. Adsorption of ^{14}C-DPX-T6376 on soil.

Harvey, J. 1984. Crop rotation study with ^{14}C-DPX-T6376 in the greenhouse. Document No. AMR-120-83.

Rapisarda, C. 1981. Microbial degradation of ^{14}C-DPX-4189 in soil. Report No. AMR-43-81.

4.0 CONCLUSION SUMMARY

The following summary was taken from the DYNAMAC review, and is reproduced here in its entirety.

4.1 DYNAMAC'S EXECUTIVE SUMMARY

A previously reviewed study demonstrated that metsulfuron methyl was stable to hydrolysis at pH 7 and 9 at both 15°C and 25°C. Estimated half-lives of the parent at pH 5 were 3 weeks (25°C) and >30 days (15°C). The primary degradate was methyl 2-(aminosulfonyl)-benzoate. The hydrolytic stability of the triazine moiety was addressed in a study that showed 4-methoxy-6-methyl-1,3,5-triazin-2-amine was stable at pH 5, 7, and 9. No reliable quantitative data were submitted for photolysis in water or on soil.

No new aerobic metabolism studies were submitted. Previously, the estimated aerobic half-life of metsulfuron methyl in a silt loam soil was (appx.) 4 weeks. $^{14}CO_2$ was the major metabolite (36%); methyl 2-(aminosulfonyl)-benzoate, 2-(aminosulfonyl)-benzoic acid and saccharin were also identified. The fate of the triazine moiety was not addressed.

Anaerobic aquatic metabolism tests demonstrated that degradation rates may vary. Half-lives in three simulated pond systems varied from 7 to 37 weeks. Submitted data were considered inadequate to define metabolite distribution. The fate of the triazine moiety was not addressed.

Column leaching studies indicated that metsulfuron methyl was mobile in a range of soil types. Mobility was reduced by aerobic aging. In batch and soil TLC studies, metsulfuron methyl was less extensively sorbed and was more mobile than terbacil or diuron. Conclusions on mobility are tentative because the submitted studies contained insufficient information to meet guideline requirements.

The field dissipation data submitted did not meet data requirements. The study did, however, confirm that metsulfuron methyl may be mobile in silt loam and sandy soils.

Confined rotational crop studies indicate that residues may be taken up by sugarbeet, rape, oat, and soybeans planted in sandy loam soil 120 days after treatment at 0.22 oz ai/A.

Tentative conclusions from a previously reviewed study suggest that metsulfuron methyl does not bioaccumulate in bluegill sunfish.

In summary, metsulfuron methyl is stable to hydrolysis at pH 7 and 9 but is hydrolyzed at pH 5. Limited data suggest a soil aerobic half-life of (appx.) 4 weeks. Degradation is slower under anaerobic aquatic conditions.

Metsulfuron methyl appears to be mobile in a range of soil types. The environmental fate of the triazine moiety has not been adequately investigated.

5.0 STATUS OF DATA REQUIREMENTS

The following summary of "recommendations" was taken from the DYNAMAC review, and is reproduced here in its entirety (with minor modification for clarity). The summary includes the evaluation of previously submitted/reviewed studies.

5.1 DYNAMAC RECOMMENDATIONS

Available data are insufficient to fully assess the environmental fate of metsulfuron methyl as well as the potential for exposure of humans and nontarget organisms to metsulfuron methyl. The submission of data to fulfill registration requirements (Subparts N and K) is summarized below:

5.1.1 Hydrolysis studies: Two previously submitted and reviewed studies were cited in this submission. One study (Friedman, 1982, Document AMR-62-82, Acc. No. 071434) was scientifically valid, and partially fulfilled data requirements, but did not address the fate of the triazine moiety. The second study (Friedman, 1982, Acc. No. 252492) supplied appropriate information.

Data requirements are satisfied; no further hydrolysis data are required.

5.1.2 Photodegradation studies in water: One study (Friedman, 1984, Document No. AMR-102-82, Acc. No. 072767) was submitted and reviewed. This study does not satisfy data requirements because metsulfuron methyl is not hydrolytically stable at the pH of the test solution.

All data are required.

5.1.3 Photodegradation studies on soil: One study (Friedman, 1984, Document No. AMR-134-83, Acc. No. 072767) was submitted and reviewed. This study does not satisfy data requirements. The temperature at which the study was conducted was not reported. It was not indicated that control and irradiated samples were maintained at the same temperature.

All data are required.

5.1.4 Photodegradation studies in air: No studies were submitted.

All data may be required pending reentry considerations.

5.1.5 Aerobic soil metabolism studies: Two previously submitted and reviewed studies were cited in this submission. One study (Rapisarda, C. 1981, Acc. No. 250928) was not considered because it has been withdrawn by the registrant. The second study (Friedman, 1982 Document AMR-62-82, Acc. No. 071434) partially satisfies data requirements but does not address the fate of the triazine moiety.

5.1.6 Anaerobic soil metabolism studies: No data were provided, however, an anaerobic aquatic metabolism study was submitted.

5.1.7 Anaerobic aquatic metabolism studies: One study (Friedman, 1984, Document No. AMR-134-83) was submitted and reviewed. Residues were not sufficiently characterized by this study to meet all data requirements.

All data are required.

5.1.8 Aerobic aquatic metabolism studies: No data were submitted, but these studies are not required because metsulfuron methyl does not have an aquatic or aquatic impact use.

5.1.9 Leaching and adsorption/desorption studies: Two studies were submitted and reviewed. One study (Friedman, 1984 Acc. No. 072767, Reference G-6) providing information on the mobility of the parent compound only is judged scientifically valid. Characterization of test substances and further analytical details are required. Insufficient procedural and analytical information was provided to allow the second study (Chrzanowski, 1984, Acc. No. 072767) to fulfill data requirements on aged residues. In addition, the mobility of the triazine fragment was not investigated.

5.1.10 Laboratory and field volatility studies: No data were submitted. Requirements for these data depend upon toxicity data, product chemistry data, soil adsorption data, and methods of application.

5.1.11 Terrestrial dissipation studies: One new study (Anderson and Harvey, 1984, Acc. No. 072767) was submitted and reviewed. This study does not fulfill data requirements because treatment was not made with a typical end use product, pretreatment soil samples were not analyzed, and insufficient climatic data were reported.

All data are required.

One previously submitted and reviewed study was cited in this submission. This study (Han, 1981, Acc. No. 250928) provides data on the dissipation of the triazine moiety. Assessment of the significance of residual levels of this group has been deferred (E. Regelman Memorandum of Meeting, 10/17/84) to the Residue Chemistry and Toxicological Branches.

5.1.12 Aquatic field dissipation studies: No data were submitted; but no data are required because metsulfuron methyl does not have an aquatic or an aquatic impact use.

5.1.13 Forestry dissipation studies: No data were submitted, but no data are required because metsulfuron methyl does not have a forestry use.

5.1.14 Long-term field dissipaton studies: No data were submitted. Requirements for these data depend upon the results from the terrestrial field dissipation data.

5.1.15 Confined accumulation studies on rotational crops: Two studies were submitted and reviewed. One study (Anderson, 1984, Acc. No. 072767) does not fulfill data requirements because no soil characterization or climatic data were provided. The treatment rate in the second study (Harvey, 1984. Acc. No. 072767) was too low. Neither study addressed uptake of degradates containing the triazine moiety by rotational crops.

5.1.16 Field accumulation studies on rotational crops: No data were submitted. Data requirements are dependent upon confined accumulation studies on rotational crops.

5.1.17 Accumulation studies on irrigated crops: No data were submitted; however, data are not required because metsulfuron methyl has no aquatic food crop or aquatic noncrop use, is not used in and around holding ponds used for irrigation purposes, and has no uses involving effluents or discharges to water used for crop irrigation.

5.1.18 Laboratory studies of accumulation in fish: One previously submitted and reviewed study (Han, 1982, Acc. No. 252492) was cited in this submission. The study did not fulfill data requirements because insufficient analytical and procedural details were provided.

5.1.19 Field accumulation studies on nontarget organisms: No data were submitted; requirements for these studies depend upon the results from laboratory studies of accumulation in fish and toxicological data.

6.0 CONCLUSIONS

6.1.1 With reference to the proposed use on Wheat and Barley, only the Hydrolysis data requirement has been fully satisfied to date.

6.1.2 The following data requirements have been partially satisfied: Aerobic Soil Metabolism, Leaching, Confined Accumulation in Rotated Crops and Accumulation in Fish.

6.1.3 Limited (if any) data have yet been submitted to support the following data requirements: Photolysis in Water, Photolysis on Soil and Terrestrial Dissipation.

6.1.4 Additional data may be required in the future to satisfy the following data requirements:Photolysis in Air, Volatility, Long Term Field Dissipation and Accumulation in Non-Target Organisms.

6.2 The Anaerobic Aquatic Metabolism data requirement noted in §5.1.7 above is not required for the proposed use on Wheat and Barley.

6.3 EAB concurs with the DYNAMAC findings, except as noted in §6.2, above.

7.0 RECOMMENDATIONS

A copy of this review, as well as of the DYNAMAC evaluations, should be forwarded to the registrant for their evaluation.

If the registrant wished to discuss specific issues relating to individual studies, adequate time should be allowed to schedule participation by the DYNAMAC reviewer.

Emil Regelman
Chemist
EAB/HED
December 17, 1984