R.F.

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

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MAR 30 1989

MEMORANDUM:

SUBJECT: PP#8F3647: Metsulfuron Methyl (Escort) in or on Grass Forage and Fodder, Grass Hay, Kidney, and Milk: Evaluation of Analytical Method and Residue Data. MRID Nos 406393-01 and 406838-01 DEB No. 4093

FROM: J. Garbus, Chemist
Tolerance Petition Section III
Dietary Exposure Branch
Health Effects Division (H7509c)

THRU: R. D. Schmitt, Acting Chief
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Health Effects Division (H7509c)

TO: R. Taylor / V. Walters PM-25
Registration Division (H7505c)

E.I. du Pont de Nemours and Company, Wilmington, DE has proposed tolerances for residues of the herbicide metsulfuron methyl (Escort), (methyl 2-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl) amino]carbonyl]amino]sulfonyl] benzoate) and its metabolite methyl 2-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]- carbonyl]-amino]sulfonyl]-4-hydroxybenzoate in or on the raw agricultural commodities:

Grass forage and fodder	15	ppm
Grass hay	30	ppm

and residues of metsulfuron methyl, (methyl 2-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl) amino]carbonyl]amino]sulfonyl] benzoate) in or on the raw agricultural commodities:

Milk	0.20	ppm
Kidney of cattle, goats, hogs, horses, and sheep	0.50	ppm

Permanent tolerances are established for metsulfuron methyl in or on the small cereal grains wheat and barley at 0.05 ppm, small

grain forage at 5.0 ppm, small grain hay at 20 ppm, in straw at 0.1 ppm, in milk at 0.05 ppm, and in meat, fat, and meat by products of cattle, goats, hogs, horses, and sheep at 0.10 ppm (40 CFR 180.428).

Temporary tolerances have been established for metsulfuron methyl and its metabolites on range and pasture grass fodder and forage at 15 ppm, on grass hay at 60 ppm, in milk at 0.2 ppm, and in kidney at 0.5 ppm as a result of PP#6G3398 (See J. Worthington memo, 7/1/1986). These temporary tolerances were due to expire on 8/27/1987.

Conclusions

1. The metabolic fate of metsulfuron methyl in plants and animals has been adequately delineated. The residue of concern consists of metsulfuron methyl and its principal metabolite in plants and metsulfuron methyl itself in animal tissues and milk.

2. Appropriate validated methodology is available for enforcement of the proposed tolerances.

3. Grass seed screenings from grasses grown for seed are used as an animal feedstuff. If metsulfuron methyl were to be used on grasses grown for seed, it will be necessary for the registrant to submit data on residues in grass seed screenings. Alternatively the registrant can submit a revised Section B with a restriction against the use of metsulfuron on grasses grown for seed.

4a. The residue data submitted with this petition supports tolerances of 15 ppm on grass forage, fodder, and hay and 0.50 ppm in kidney of cattle, goats, hogs, horses, and sheep.

4b. Sufficient data has been supplied for the tolerance request to apply to the crop grouping "Grass, forage, fodder, and hay" [180.34(xvii)]. If the registrant wishes, the tolerance can be expressed in the terms of the crop grouping. Appropriate language for the tolerance is given below.

4c. Existing tolerances for metsulfuron methyl are adequate for other animal commodities including milk. The requested milk tolerance should be withdrawn. A revised Section F should be submitted as stated below under Recommendations.

Recommendation

TOX considerations permitting, pending the revision of the label, and pending the revision of the proposed tolerances as follows:

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Metsulfuron methyl (methyl 2-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl) amino]carbonyl]amino]sulfonyl] benzoate) and its metabolite methyl 2-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)-amino]carbonyl]amino]sulfonyl]-4-hydroxybenzoate in or on the raw agricultural commodities comprising the crop grouping "Grass, forage, fodder, and hay":

Grass, forage, fodder, and hay: 15 ppm

and residues of metsulfuron methyl, (methyl 2-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl) amino]carbonyl]amino]sulfonyl] benzoate) in or on the raw agricultural commodities:

Kidney of cattle, goats, hogs, horses, and sheep: 0.50 ppm

DEB can recommend that the proposed tolerances be granted.

Detailed Considerations

Manufacturing Process and Formulation

Escort RP Herbicide is a 60% active dry flowable concentrate which according to the current petition is identical to Escort Herbicide registered as EPA # 352-439. The manufacturing process for technical metsulfuron methyl, the impurities found in the technical, and the formulation of metsulfuron methyl as Escort Herbicide have been described and reviewed in connection with PPs 4F3127 and 6G3398. DEB did not anticipate any residue problems from the impurity profile. DEB no longer determines whether inerts have been cleared under 40CFR 180.1001. This function is now within the purview of RD.

Proposed Use

Metsulfuron methyl is proposed for use as a herbicide for a wide spectrum of weeds in pasture and range grass. The rates of application depend upon the nature of the weeds to be controlled and range from 0.33 to 1.6 ounces of formulated material per acre. This is equivalent to 0.2 to 1.0 ounces active per acre. It is recommended that surfactant (80% active) be used at 0.25% of the mix. Aerial as well as ground application is permitted with the minimum volume for aerial application as 3 gallons diluted spray per acre. No restrictions on grazing are proposed after application. Restrictions are imposed on using the material on lawns, walks, driveways, and other domestic and ornamental uses of grasses. The label does not include a specific restriction against using the material on grasses grown for seed or turf.

Grass seed screenings from grasses grown for seed are used as an animal feedstuff. If metsulfuron methyl were to be used on grasses grown for seed, it will be necessary for the registrant to submit data on residues in grass seed screenings. Alternatively the registrant can submit a revised Section B which includes a restriction against the use of metsulfuron on grasses grown for seed.

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Nature of the residue

DEB's review of PP#4F3127 discusses in detail the plant metabolism of metsulfuron methyl. (See memos of P.Errico and K. Arne, 6/12/1985, 11/4/1985, and 1/27/1986) The principal metabolites are methyl 2-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]- carbonyl]amino]-sulfonyl]-4-hydroxybenzoate (A1) and its glucose conjugate methyl 2-[[[[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)amino]carbonyl]amino]-sulfonyl]-4-glucopyranosyl benzoate (A).

The enforcement analytical method involves the enzymatic hydrolysis of A to A1.

DEB considers that the plant metabolism in small cereal grains has been adequately delineated and that a similar pattern of catabolism would occur in pasture and range grasses. Therefore the residue of concern in or on grasses will be considered the same as that established for wheat and barley, the parent and metabolite A1.

DEB's review of PP#4F3127 also discusses in detail the animal metabolism of metsulfuron methyl in rats and goats. DEB considers that the parent metsulfuron methyl will be the principal residue of concern in animals.

Analytical Methods

The analytical method used for residues of metsulfuron methyl and its metabolites in grasses is identical to that employed for wheat and barley except for minor modifications, primarily the addition of a clean-up step using silica cartridges. The original method has undergone a successful method validation in conjunction with PP#4F3127 and is available in PAM II. The method for residues in meat and milk has also been validated and accepted in conjunction with that petition.

Storage stability data submitted with PP#4F3127 indicated that metsulfuron and its metabolite A were stable up to 36 mos. in or on wheat forage held in frozen storage.

Residue Data

Residue data for metsulfuron methyl and its metabolite on grasses were obtained from 25 sites including results from 11 trials previously submitted in support of the application for a temporary tolerance. The sites were in Colorado, Florida, Georgia, Illinois, Iowa, Mississippi, Montana, North Carolina, Ohio, Oklahoma, Oregon, Texas, and Virginia and represent a wide and diverse geographic distribution.

Results are given for various grasses of the Gramineae family including those representative of the crop grouping "grasses, forage, fodder, and hay [180.34(xvii)].

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The application rates were 1 ounce a.i./A (1 x the proposed maximum rate) and 2 ounces a.i./A. (2 x rate). Most applications were made by ground equipment at 10 to 15 gallons of mix per acre. At two sites the applications were made aerially at 3 gallons per acre. Except for 2 sites, all mixes contained 0.25% surfactant.

Samples were taken at the time of application (0 day) and at various interval up to four weeks. Samples of forage taken at these times were dried to hay.

All control values for forage and hay for both parent and metabolite were below the limit of detection for the respective methodologies of the respective matrices.

The greatest residue of metsulfuron methyl plus A1 at maximum label application rates (1 oz a.i./A) and at 0 day was 8.4 ppm. The greatest value found in hay was 11.8 ppm at the proposed maximum application rate. There were no significant differences between ground and aerial applications. At the 2x rate maximum residues were 15.4 ppm on forage and 26.5 ppm on hay.

Taken as a whole, the data suggest a concentration of residues of about twofold when grass is dried to hay under various field conditions.

Residue values for parent were highest at the time of application (0 day) and subsequently rapidly declined with a half-life of 3 to 7 days. Values for metabolite 1A peaked at 3 to 8 days after application with the greatest value (2.3 ppm) found at 3 days.

In view of the fact that the highest residue values were 8.4 ppm in forage and 11.8 ppm in hay at the maximum label rates, a tolerance of 15 ppm would accommodate both the residues found in forage and those found in hay.

Meat, Milk, Poultry, and Eggs

Assuming a diet consisting entirely of hay or forage bearing the suggested tolerance level, cattle could ingest 15 ppm of metsulfuron methyl and its metabolite. The feeding study submitted with PP#4F3127 shows that this level would result in less than 0.05 ppm in milk. Therefore the existing milk tolerance of 0.05 ppm remains adequate.

The same study indicates that the feeding of 20 ppm of metsulfuron methyl to cattle results in residues of 0.1 ppm in all tissues except kidney. The maximum level in kidney at this feeding level was 0.32 ppm. The proposed tolerance of 0.5 ppm for kidney would accommodate this level. The current tolerance of 0.1 ppm for meat and meat byproducts remains adequate.

cc: R.F., S.F., PP#8F3647, B. Jaeger (SAOS/HED), Reviewer, Circ., PMSD/ISB
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