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HEALTH EFFECTS DIVISION
SCIENTIFIC DATA REVIEWS
EPA SERIES 361

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

Subject: PP4E4404. Glyphosate (Roundup® Herbicide)
in or on Mint. Use Of Surrogate Data In
Support Of Establishing Tolerances.

Chemistry Branch No.: 14419
Chemical No. : 103601
DP Barcode: D207708
MRID : None

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To: H. Jamerson, PM Team 43
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and

J. Smith, Acting Section Head
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The petitioner, Edith L. Lurvey, Associate Coordinator IR-4
Interregional Research Project No. 4 on behalf of the IR-4
Project and the Agricultural Experiment Station of Washington
requests establishment of tolerance for combined residues of
glyphosate in or on mint, at 100 ppm surrogate residue data
(forage grasses group and non-animal feed group).

The letter of authorization from Sheila A. Schuette to Hoyt L. Jamerson (dated August 2, 1994) states "The Agricultural Group of Monsanto Company authorizes the Environmental Protection Agency to review all pertinent data for glyphosate in order to complete the IR-4 request for use of glyphosate as a spot treatment in mint."

Conclusions:

1. The HED Metabolism Committee has determined that aminomethylphosphonic acid (AMPA), the metabolite of glyphosate, no longer needs to be regulated and this compound will be dropped from the tolerance regulation.

The petitioner should revise Section F to propose tolerances in terms of "...residues of glyphosate..." rather than the current proposed terms of "...combined residues of glyphosate..."

2. According to Table II, revised June 1994, the term "mint" should be restated in terms of "peppermint" and "spearmint" Section F should be revised similarly.
3. The glyphosate RED has recommended that tolerances for combined residues of glyphosate and AMPA on forage grasses at 0.2 and 200 ppm be revoked and reestablished at 100 ppm for residues of glyphosate per se.
4. The petitioner should specify the type of equipment recommended for this use.
5. A tolerance level of 200 ppm is appropriate for the proposed use on peppermint and spearmint, based upon available surrogate data.
6. Although tolerances for residues of pesticides in 'mint oil' have been established for certain other pesticide chemicals, in the present instance, we believe it is not necessary to establish tolerances for glyphosate in peppermint oil or spearmint oil since glyphosate is water soluble rather than oil soluble, and the glyphosate treated peppermint or spearmint would provide little useful crop from which to distill oil. The conclusion that glyphosate tolerances in oils are not necessary are buttressed by the fact that we have not established tolerances for soybean oil or cottonseed oil for uses on soybeans or cotton.

Recommendations

We recommend, TOX considerations permitting, provided the petitioner revises Section F as described in Conclusions 1 and 2 above, provided the petitioner specifies the type of equipment recommended for this use as described in Conclusion 4, and further, provided the petitioner proposes a tolerance level of 200 ppm as described in Conclusion 5, for the establishment of tolerance for residues of glyphosate per se in or on peppermint and spearmint at 200 ppm. A DRES run using the latter residue level may be initiated.

Detailed Considerations

Directions for Use

(Roundup®) EPA Reg. No. 524-445:

For applications made on a spray-to-wet basis, spray coverage should be uniform and complete. Do not spray to the point of runoff.

For control of annual weeds less than 6 inches in height or runner length, apply 0.5% solution of this product plus nonionic surfactant.

For control of most perennial weeds and annual weeds over 6 inches in height or runner length, apply a 1.0% solution of this product. For best results, use a 2% solution on perennials such as bermudagrass, dock, field bindweed, hemp dogbane, common milkweed and Canada thistle.

Allow at least 7 days between application and harvest.

Further applications may be made in the same area at 30 day intervals.

No more than one-tenth of any acre should be treated at one time.

The crop receiving spray in the treated area will be killed. Take care to avoid drift or spray outside the target area for this reason.

We note that the use directions on the supplementary labeling do not specify the nature of the application equipment to be used to make the treatment, although the Roundup™ Herbicide label discusses 'aerial equipment', 'broadcast equipment', 'controlled droplet application', 'hand-held and high-volume equipment' and

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'selective equipment (shielded applicators and wiper applicators)'. The petitioner should specify the type of equipment recommended for this use.

Nature of the Residue in Plants and Animals.

The glyphosate RED, dated 10-27-92, established that the nature of the residue was adequately understood in plants and animals. The residue of concern is glyphosate per se. The HED Metabolism Committee has determined that aminomethylphosphonic acid (AMPA), the metabolite of glyphosate, no longer needs to be regulated and this compound will be dropped from the tolerance regulation.

Analytical method.

The glyphosate RED, dated 10-27-92, established that adequate enforcement methods are available for analysis of residues of glyphosate and its metabolite AMPA in or on plant commodities. These methods include GLC (Method I of PAM Vol. II; limit of detection is 0.05 ppm) and HPLC with fluorometric detection. Use of the GLC method, however, is being discouraged due to lengthiness of the procedure. The HPLC method has undergone successful Agency validation (method tryout) and was recommended for inclusion in PAM Vol. II.

The FDA Pestrack data base 'Pesticide Analytical Manual (PAM) I, Appendix, dated November 6, 1990' states that recoveries are not likely for glyphosate under FDA Multiresidue Methods.

Storage Stability:

Since no new residue data have been submitted with this petition, there is no need for new storage stability data.

Magnitude Of The Residue:

Mint:

The petitioner does not submit any new glyphosate field trial residue data for mint.

We have reviewed glyphosate residue data in
MRID 00108147 "Residue and Metabolism: Roundup on Forage
Grasses, Legumes, and Pasture Crops. (Unpublished
study received 5-9-78)".

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We concluded (see K. Arne review of PP1F2518, 10-29-81) that residues of glyphosate per se were as high as 174 ppm in orchardgrass at 7 DAT and 162 ppm in alfalfa at 7 DAT. We recommended for and subsequently established tolerances on forage grasses at 200 ppm of glyphosate (and its metabolite AMPA, later removed from the tolerance expression).

We have also recently reviewed

MRID #430770-01

M.E. Oppenhuizen. November 1993. *Magnitude of Glyphosate Residues Following Preharvest Use in Alfalfa*. Study performed by Monsanto Company, St. Louis, MO (Field Management Contractor was Stewart Agricultural Research Services, Inc., Macon, MO) and submitted by Monsanto Company, St. Louis, MO. Laboratory Project ID#MSL-12953 (MRID #430770-01)

In this instance (see M. Rodríguez review of PP4F4312/4H5692, Glyphosate on Alfalfa. 1-11-95), we concluded that tolerances are appropriate for residues of glyphosate in alfalfa forage at 75 ppm and 200 ppm for alfalfa hay. We note that these are the tolerance levels requested by the petitioner (Monsanto) for alfalfa.

We conclude that a tolerance level of 200 ppm is appropriate for the proposed use on peppermint and spearmint, based upon available surrogate data for orchardgrass and alfalfa.

Mint oil:

The petitioner does not submit any glyphosate field trial residue data for mint oil.

Table II, Revised June 1994, has determined that mint oil is a processed commodity from mint (peppermint or spearmint). Food additive tolerances are required for mint oils if residues exceed those in the rac (i.e., tops [leaves and stems]). Residue data on spent hay are needed only for material balance purposes, i.e., to determine if the residue occurs in the oils or in spent hay. Although tolerances for residues of pesticides in 'mint oil' have been established in the past, in the present instance, there are several reasons why we believe it is not necessary to establish tolerances for glyphosate in peppermint oil or spearmint oil.

Available product chemistry data indicate that glyphosate is far more water soluble rather than oil soluble.

Since glyphosate will also kill the treated crop in the area of treatment, the glyphosate treated peppermint or spearmint would provide little useful crop from which to distill oil.

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Previous studies with other oil-bearing commodities, notably soybeans and cottonseed, have indicated the lack of concentration of glyphosate in plant oil.

We conclude that tolerances for residues of glyphosate in mint oil need not be established.

Meat, Milk, Poultry And Eggs:

According to Table II, Revised June 1994, there are no animal feed items associated with the production of peppermint or spearmint. Therefore, there is no concern for secondary residues in meat, milk, poultry or eggs, from the use of glyphosate on peppermint or spearmint.

cc: RF, Circ., PP4E4404, R. Cook.

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