File: 8F#355

Petition Control Branch and
Division of Toxicological Evaluation

June 2, 1965

AF 33-474

Pesticides Branch, Division of Food
Standards and Additives

PP #5F0442: Guthion on sugarcane; evaluation of analytical method and residue data.

The Chemagro Corporation proposes a 0.3 ppm tolerance for Guthion (0,0-dimethyl S-4-oxo-1,2,3-benzotriazin-3(4H)-ylmethyl phosphorodithioate) on sugarcane.

Tolerances of 0.5 to 5 ppm Guthion have been established for 33 commodities. The pesticide is also registered on a no-residue basis for use on 13 crops.

Conclusions

The analytical method is adequate for determining the Guthion residues and methods are available for enforcement of the proposed tolerance.

Residues on sugarcane which is either burned-off at harvest or washed before processing will not exceed the proposed 0.3 ppm tolerance.

There will be no residues (less than 0.1 ppm) in the processed products (sugar, syrup, molasses, and bagasse) made from burned-off or washed sugarcane containing a residue at the proposed tolerance level.

We are unable to determine the residues on raw, unwashed (green) sugarcane and in the products made from this cane. Restrictions in usage to sugarcane that is to be burned-off at harvest or washed before processing will therefore be required.

We are unable to determine the residue in sugarcane foliage including harvest trash which may be fed occasionally to livestock, and a restriction against harvest grazing or feeding treated forage and/trash to livestock will be necessary.

Recommendations

If pharmacological considerations permit, we recommend that the proposed tolerance on sugarcane be established. This recommendation is contingent upon the imposition of a label statement restricting the use only to sugarcane that will be burned-off at harvest or washed before processing and also a prohibition against grazing or feeding treated forage and harvest trash to livestock. In a conference on 5/27/65, the petitioner's representative essentially agreed to these restrictions.

Detailed Considerations

General

In the absence of a completed reproduction study, the petitioner bases his proposal on the position that no residues will be present in processed products made from treated sugarcane.

Proposed Usage

Guthion is to be used as a 7% or 10% granular formulation for ground or aeroplane broadcast application to control the sugarcane borer. Maximum dosage is to be 1.5# lbs active/A and applications are to be made no more than five times per season nor within 40 days of harvest.

Guthion is now registered for use on sugarcane on a no-residue basis. The registered usage is very similar to that now described except that the former usage includes the restrictions "Do not feed treated forage to livestock. Wash cane before processing."

Nature of the Residue

Guthion is considered to be only locally systemic. Degradation products which would be expected to occur on plants are the oxygen analog and various benzazimide derivatives.

Residue Method

A modification of the basic procedure of Maagher et al (J. Agr. Food Chem., 8, 282; 1960) was used. It has been revised by adding provisions for standards and calculation of results.

The method will detect Guthion and its oxygen analog and measure them as Guthion. It has been described and evaluated in detail by J. Wolff (memo 5/20/63; PP #394) and by G. J. Bausch (memo 11/26/62; PP #355) and found adequate for measuring residues and for enforcement purposes on commodities other than sugarcane.

Blank and recovery data presented establish the Maagher method as satisfactory also for sugarcane. Blanks for sugarcane averaged 0.02 (0.01-0.04) ppm and for its by-products (syrup, molasses, and sugar) ranged from 0.02 to 0.09 ppm. Blank values for bagasse averaged 0.1 (0.1-0.12) ppm. Recoveries of Guthion and its oxygen analog on these substrates, following addition of 0.25 to 1.00 ppm, averaged 93 (80-105)%.

A Maagher procedure (see Pesticide Analytical Manual, Volumes I and II) is currently being used in our laboratories for enforcement purposes and is being supplemented by established paper chromatographic techniques.

W. S. Cox (JAOAC, 46, 229; 1963) described the collaborative testing of the Meagher method on a number of crops. D. A. George (JAOAC, 46, 960; 1963) increased the sensitivity of the method by extracting the colored product into chloroform. J. R. W. Miles (JAOAC, 47, 882; 1965) has shortened the procedure by direct coupling of the Guthion series with N-(1-naphthyl) ethylenediamine dihydrochloride.

We conclude that the method is adequate to measure Guthion residues on sugarcane and processed products derived from sugarcane. Procedures are available for enforcement of the proposed tolerance.

Residue Data

General--The residue data for sugarcane in the petition reflect cane which had been burned-off at harvest. Additional data for raw (green), washed sugarcane are available in FBD, USDA files. The only meaningful residue data for the processed products of sugarcane reflect cane which had been burned-off at harvest.

Sugarcane--Twelve samples of burned-off treated Louisiana and Florida sugarcane showed at 36-45 days after the last of 4 or 5 treatments corrected residues, adjusted to the proposed maximum dosage, which averaged 0.14 (0.04 to 0.28) ppm. The maximum residue on treated burned-off cane then was 0.28 ppm.

Data are available in FBD, USDA files for raw, washed cane which had been given 5 to 6 treatments at double the maximum dosage. The residues 29 to 41 days following the last application showed no detectable residues by a method sensitive to 0.1 ppm.

Conclusion--We conclude that residues on sugarcane which is either burned-off at harvest or washed before processing will not exceed the proposed tolerance.

Sirup, Molasses, Sugar, and Bagasse--Sirup, molasses, and sugar, when produced from treated burned-off sugarcane containing 0.2 ppm residue, showed in a single pertinent study no residue (less than 0.1 ppm). We would expect none also in these same by-products when derived from burned-off sugarcane containing 0.3 ppm, the level of the proposed tolerance.

Sirup, molasses, and sugar, when produced from raw, unburned, unwashed sugarcane (not analyzed but estimated on the basis of the bagasse residue to contain 3.7 ppm) showed no residues (less than 0.1 ppm) in sugar and sirup but 0.6 ppm in molasses (see letter G. G. Stetson to J. Alpert, 5/6/65).

Bagasse, when produced from treated burned-off sugarcane containing 0.2 ppm residue, showed no residue (less than 0.1 ppm). We would expect none also in bagasse when derived from burned-off sugarcane containing 0.3 ppm, the level of the proposed tolerance.

Bagasse, when produced from treated raw unburned, unwashed sugarcane (not analyzed but estimated to contain 3.7 ppm), showed a corrected residue of 1.85 ppm or less (see letter of G. G. Stetson, referred to above).

<u>Conclusion</u>--On basis of data presented, there will be no residues in any processed products made from burned-off cane, and from raw (green) washed cane as well, bearing residues at the proposed tolerance level.

<u>Other Considerations</u>

We understand that the sugarcane grown on small farms and used for edible sirup production is raw unburned cane (Agr. Handbook 209, Dec. 1961). We also understand from telephone conversations with J. A. Kupfer, Jr., ASCS, USDA, and D. Smith, Sugar Producers' Association of Puerto Rico, that about 40% of the crop used for sugar and molasses production in Puerto Rico and any crop harvested in the future with the new type USDA machines will be raw, unburned cane.

Forage and harvest trash from sugarcane harvesting may be fed occasionally to cattle (see above conversations with D. Smith and J. A. Kupfer, Jr.). In the absence of data, the label need contain a no-feeding restriction as was the case with the no-residue registration and PP #T343 (Fenac in sugarcane). The petitioner's representative in conference on 3/27/65 indicated a willingness to add the restriction "Do not graze or feed treated forage to livestock," and to the inclusion (if needed) of "harvest trash."

<u>Summary</u>

On the basis of the available data, we find that we can recommend in favor of the proposed tolerance only if the usage is restricted to sugarcane which is to be burned-off at harvest or washed before processing. We find also that the processed products made from such cane will bear no residues (less than 0.1 ppm).

The available data give us no reliable basis for estimating the residues which may be present on raw, unwashed sugarcane. We are unable, therefore, to determine whether or not residues will be present on the processed products made from this cane.

There are no data for residues on sugarcane foliage, and in the absence of these data, we can recommend in favor of the proposed tolerance only if there is a label restriction against the grazing or feeding of treated forage and harvest trash to livestock.

A. E. H. Houk

cc
BSSE(2) TE BF(Jones) FB/CO
FDA/FB--PPs #3F0442, #304, #355, #T343
AEHHouk:jrf 6/2/65
RD/I - GJBeusch; JAlpert