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Init. JM

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From: Carolyn K. Offutt, Chief *(Carolyn K. Offutt)*
Environmental Processes and Guidelines Section
Exposure Assessment Branch, HED (TS-769)

Attached please find the environmental fate review of:

Reg./File No.: 464-524

Chemical: Chlorpyrifos

Type Product: Insecticide

Product name: DURSBAN 4E and DURSBAN 50W

Company name: Dow Chemical

Submission Purposes: Review of a protocol to gather reentry data
for chlorpyrifos on grass/turf

Data In: 4/1/85

Action Code 177

Date Completed: 5/9/85

EAB #: 5462

TAIS (Level II) Days

60

1.5

Deferrals To:

Ecological Effects Branch

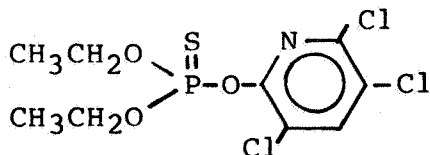
Residue Chemistry Branch

Toxicology Branch

REVIEW OF REENTRY DATA

1. CHEMICAL:

Chlorpyrifos: O,O-diethyl O-(3,5,6-trichloro-2-pyridyl)
phosphorothioate



2. TEST MATERIAL:

DURSBAN 4E or DURSBAN 50W applied to turf grass
at 1 or 4 lbs of active ingredient per acre.

3. STUDY/ACTION TYPE:

Protocol review.

4. STUDY IDENTIFICATION:

Dow Chemical Co. Protocol No. 2-85, Chlorpyrifos Dislodgeable
Residue Study in Turf for Reentry, January 29, 1985.

5. REVIEWED BY:

James D. Adams, PhD
Chemist

Environmental Processes and Guidelines Section

5/9/1985

6. APPROVED BY:

Carolyn K. Offutt, Chief

Environmental Processes and Guidelines Section

Exposure Assessment Branch, HED (TS-769)

5/9/1985

7. CONCLUSIONS:

The submitted protocol for determination of chlorpyrifos residues
in alfalfa is generally applicable for chlorpyrifos on grass, but
will have to be modified to make the results useful for assessment
of reentry exposure/hazard.

8. RECOMMENDATIONS:

The Registrant should use a surface-residue extraction procedure
such as the "Dislodgeable Residue" procedure of Iwata et al.
[Bull. Environm. Contam. Toxicol. 18:649-655] or a modification
of it.

9. BACKGROUND:

The sampling schedule and watering schedule are acceptable, but the Registrant should realize that following the proposed schedule may limit them to certain label constraints. That is, if the pesticide does not dissipate to an allowable level in the first 24-hour period, water application would be required on the label because the proposed water application will reduce the dislodgeable residue levels. Also, if the residue level 24 hours after water application (and thus 48 hours after pesticide application) is not at or below the allowable residue level, the Registrant would have to repeat the study for a longer period. I suggest that the Registrant consider changing the study or performing a duplicate study with water applied soon after pesticide application rather than 24 hours later and that the study be conducted for a longer period. This may obviate further testing.

Along with the general protocol, Dow is submitting a supporting document: "Determination of Residues of Chlorpyrifos in Alfalfa by Gas Chromatography". In the procedure of that document, the alfalfa samples are blended in acetone. That procedure would give a total residue rather than the surface "dislodgeable residues" and, if used, would tend to give high values. It is acceptable for the stated purposes of the protocol, but the pesticide residue values could give a "worse" case analysis.

Since only surface residues are important for reentry exposure, I suggest that they use a surface-residue extraction procedure such as the "Dislodgeable Residue" procedure of Iwata et al. That procedure and adaptations of it have become the standards for foliar dissipation studies.

The Registrant would have to modify the Iwata et al. procedure since it would not be possible to use the leaf-punch part of the procedure for grass. I suggest that the Registrant do a surface extraction of weighed samples of clipped grass blades/leaves. The analytical results would then be calculated in units of residue weight to grass weight, for example, parts per million (ppm).

In order to use an exposure correlation such as that of Popendorf [Am. Industr. Hygiene Assoc. J., 41:652-659(1980)], for the final estimates of human exposure, the ppm values must be converted to weight/surface-area, for example, ng/cm². That conversion factor might be determined by taking a weighed sample of grass clippings, spreading them on a surface, and estimating the surface area. The surface area measurement could be done manually or by instrumental measurement such as optical scanning of a photoreproduction of the weighed grass. Conversion factors vary with foliage type (with grass values generally about 10² cm²/g) so a conversion factor should be determined for each grass-type.

The remainder of the "Alfalfa" protocol/procedure is acceptable for the grass study. The use of flame photometric glc detector is good and the use of blank and spiked samples is mandatory.

10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

NOT APPLICABLE

11. COMPLETION OF ONE-LINER:

NOT APPLICABLE

12. CBI APPENDIX:

NOT APPLICABLE