HED DOC. NO. 014309

August 31, 2000

MEMORANDUM

SUBJECT: ***CLETHODIM*** - Report of the FQPA Safety Factor Committee

FROM: Brenda Tarplee, Executive Secretary
FQPA Safety Factor Committee
Health Effects Division (7509C)

THROUGH: Ed Zager, Chairman
FQPA Safety Factor Committee
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PC Code: 121011

The FQPA Safety Factor Committee evaluated the available hazard and exposure data for clethodim on July 31, 2000 and made the recommendation for the FQPA safety factor to be used in human health risk assessments (as required by Food Quality Protection Act of August 3, 1996). The committee concluded that the FQPA safety factor could be removed (1x) in assessing the risk posed by this chemical.

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I. HAZARD ASSESSMENT

(*Memorandum:* M. Bonner to E. Zager received July 19, 2000)

A. Adequacy of the Toxicology Database

The toxicology data base for clethodim is complete. There are adequate studies for evaluating susceptibility following pre- and postnatal exposure including rat and rabbit developmental studies, and a 2-generation rat reproduction study in rats.

B. Determination of Susceptibility

There is no quantitative or qualitative evidence of increased susceptibility of fetuses to *in utero* exposure to clethodim in the developmental toxicity studies in rats and rabbits. There is also no quantitative or qualitative evidence of increased susceptibility of offspring observed in the two-generation reproduction study in rats. In the developmental toxicity study in rats, developmental effects were observed only in the presence of maternal toxicity. In the developmental toxicity study in rabbits and in the reproduction study in rats, no developmental/offspring effects occurred at the highest dose tested (evidence of maternal/parental toxicity was achieved).

C. Requirement of a Developmental Neurotoxicity Study

The HIARC concluded that a developmental neurotoxicity study with clethodim is not required (Refer to HED Doc. No. 012370 for complete report of the HIARC).

II. EXPOSURE ASSESSMENTS

A. Dietary Food Exposure Considerations

(*Memorandum:* M. Xue to E. Zager dated August 8, 2000)

Clethodim is the active ingredient in post-emergence herbicides effective against a wide range of annual and perennial grasses. These products are applied to registered crops via broadcast foliar applications at rates up to 0.25 lb. ai/A. For more difficult to control grass weeds, a second application within about 14 days is allowed. The maximum seasonal use rate is 0.5 lb. ai/A.

Clethodim is a member of the cyclohexenone class of herbicides. Tolerances are established for various plant and animal commodities for the combined residues of clethodim and its metabolites containing the 5-(2-(ethylthiopropyl)cyclohexene-3-one and 5-(2-(ethylthiopropyl)-5-hydroxycyclohexene-3-one moieties and their sulphoxides and sulphones at levels ranging from 0.05 ppm to 15 ppm (40 CFR §180.458). Time limited tolerances are also established on alfalfa, dry beans, peanuts, and tomatoes

(expiration date 4/30/2001).

Codex, Canadian, or Mexican maximum residue levels (MRLs) have been established or proposed for residues of clethodim however, some of the proposed tolerances have been recommended for withdrawal or have been recently changed. Harmonization could be an issue for Codex and/or Canadian MRLs for some commodities.

The HED Dietary Exposure Evaluation Model (DEEM) will be used to assess the risk from chronic dietary exposure to residues in food resulting from the use of clethodim (no dose and/or endpoint was selected to assess acute dietary exposure). In conducting this chronic dietary (food) risk assessment, tolerance level residues were used for alfalfa, dry beans, peanuts and tomatoes and all other commodities with published or pending, permanent or time-limited, clethodim tolerances. Percent crop-treated (%CT) data were used on some of these crops, as provided by BEAD (10/27/97). The risk assessment should be viewed as partially refined. Further refinement using anticipated residue values and additional %CT information would result in a lower estimate of chronic dietary exposure.

The Committee recognizes that further refinement to the dietary food exposure analyses may be required as the risk assessment is developed. Therefore, provided the final dietary food exposure assessment does not underestimate the potential risk for infants and children, the safety factor recommendations of this Committee stand.

B. Dietary Drinking Water Exposure Considerations
(*Correspondence:* S. Dutta to B. Tarplee dated August 8, 2000)

The environmental fate database is adequate to characterize drinking water exposure for clethodim. In summary, the data indicate that clethodim, and its sulfoxide and sulfone, may migrate into surface water bodies through run-off which occurs shortly after application (e.g. rainfall). Since they are not adsorbed readily to soil, they are likely to remain in the aqueous phase, where they are subject to rapid photolysis and biodegradation. They may remain long enough to exert acute effects on residents biota, but are unlikely to cause chronic effects. Clethodim does not show a significant potential for bio-accumulation in aquatic organisms.

No monitoring data are available for Clethodim. The drinking water Estimated Environmental Concentrations (EECs) for surface water were calculated using the Tier 1 model, Generic Estimated Environmental Concentration (GENEEC), based on a maximum application rate of 0.5 lb ai/acre. The modeling results indicate that clethodim has the potential to move into surface waters, especially during times of unusually heavy rainfall.

The SCI-GROW model was run to estimate the ground water concentrations due to possible leaching. The estimated concentration by the model may exceed in certain

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circumstances where the karst formation exist or where the local geology is marked by highly permeable sand.

C. Residential Exposure Considerations

(*Memorandum:* J. Arthur to M. Bonner dated July 20, 2000)

Clethodim is used in outdoor residential settings as a weed treatment around walkways, driveways and foundations, and on vegetables and ornamentals at an application rate of 0.25 lb ai/acre.

There are no chemical-specific monitoring data available for Clethodim. Therefore, the *Draft Standard Operating Procedures for Residential Exposure Assessments* will be used as the basis for all calculations for residential post application exposure scenarios.

III. SAFETY FACTOR RECOMMENDATION AND RATIONALE

A. Recommendation of the Factor

The Committee recommended that the FQPA safety factor be **removed (1x).**

B. Rationale for Removing the FQPA Safety Factor

The Committee concluded that the safety factor could be removed for clethodim because:

1. There is no indication of quantitative or qualitative increased susceptibility of rats or rabbits to *in utero* and/or postnatal exposure;
2. A developmental neurotoxicity study is **not** required; and
3. The dietary (food and drinking water) and non-dietary (residential) exposure assessments will not underestimate the potential exposures for infants and children