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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
AND TOXIC SUBSTANCES

April 20, 1999

MEMORANDUM

SUBJECT: Response to: EPA Docket No. OPP 31470: *Responses to EPA's January 1999 Preliminary Risk Assessment for the Active Ingredient, Chlorethoxyfos of Fortress 5G Insecticide in the SmartBox, Fortress 2.5 G and Fortress Technical* [EPA reg. Nos. 352-552, 352-579, 352-553], PC Code # 129006, DP Barcodes D254573, D254574, and D254576

FROM: Gary Bangs and Steve Knizner
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TO: Deanna Scher
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Responses to the HED Chlorethoxyfos Preliminary Risk Assessment, which was updated last on January 8, 1999, were received from the Natural Resources Defense Council (NRDC) and DuPont Agricultural Products. The comments received were summarized in your memo dated March 25, 1999. Below please find your summation of comments and HED's response.

Comments from NRDC:

1. FQPA 10X Factor: EPA has failed to demonstrate that there are reliable data complete enough to justify dropping use of the 10X factor.

HED Response: The decision logic used by the FQPA Safety Factor Committee is explained in their memorandum of August 6, 1999. No new data have been received to alter any of the conclusions in that decision document.

2 and 3. Aggregate Risk: The risk assessment is inadequate and less than transparent in description or characterization of risk, including risks from "take-home" exposures. The risk assessment does not include an aggregate assessment, citing the fact that there are no registered uses indoors.

HED Response: The Agency currently does not have a "take-home" exposure model in the Residential Exposure Standard Operating Procedures (12/17/98). The Agency currently does not conduct aggregate risk assessments for chemicals for which there are no registered residential uses.

4. Cumulative Risk: Cumulative risk is not addressed in this document.

HED Response: On the cover page of the 1/8/99 risk assessment, HED acknowledges that cumulative risk is not addressed in this document. The Agency is currently formulating its policies and approach for cumulative risk assessment.

Comments from DuPont:

1. Drinking Water: DuPont proposes that the surface water EECs should be re-calculated using the soil half-life value, 7 days, that the Agency accepted in 1994 rather than the half-life of 20-23 days used in current calculations.

HED Response:. EFED asked DuPont to calculate the EECs using the most current PRZM model version (3.12) rather than the version used in the 1994 calculations (1.0) with a half-life of 7 days to determine if the EECs were more sensitive to the half-life or PRZM model version. DuPont declined since the risks are already acceptable.

2. Occupational Exposure: DuPont states, "We again urge the Agency to follow HED's recommended methodology of Whelan [sic] and Pettigrew... in calculation of occupational exposure for chlorethoxyfos."

HED Response: In the absence of more specific data, route-to-route extrapolation or surrogate data must be used for interpreting inhalation and/or dermal exposure risk.

In the absence of dermal or inhalation absorption data, current HED policy is to use 100% absorption for dermal or inhalation dose, when based on an oral endpoint. Route-to-route extrapolation may *underestimate* inhalation toxicity. Default occupational inhalation rates are based upon the Exposure Factors Handbook (Exposure Factors Handbook, Volume 1. EPA, August 1997). Therefore, HED has insufficient data at this time to refine the occupational exposure and risk estimates beyond those presented in the January 8, 1999, Chlorethoxyfos Preliminary Risk Assessment.

The referenced document, "Inhalation Risk Assessments and the Combining of Margins of Exposure," was written for HED and SAP consideration on February 10, 1997, by John Whalan and Hugh Pettigrew of HED[1]. The Whalan, et al., document provides a thorough review of the issues surrounding route-to-route extrapolation of chemical exposures. This document explains how route-to-route extrapolation, e.g. from oral to inhalation dose, can be both useful and potentially misleading for toxicologists and other risk assessors.

Occupational and non-occupational exposure assessments consider the available data and toxicological endpoints before performing risk assessments. Unfortunately, a lack of chemical-specific data usually leads to the same conclusions as the following (arrived at by the Health Effects Research Laboratory, U.S. Environmental Protection Agency[2] and quoted by Whalan):

1. There is currently no formal methodology for route-to-route extrapolation.
2. Models can be valuable tools for route-to-route extrapolation. In many cases, insufficient data are available to develop sophisticated models for route-to-route extrapolation.

Biological monitoring (e.g.. urine metabolites) may be the best proxy for route-route extrapolation for now because "a substance's fate is usually independent of route once it enters systemic circulation." **There is a lack of biological monitoring data for chlorethoxyfos handler exposures.**

Finally, Whalan, et al., recommend using human pharmacokinetic/-dynamic data when available. **To apply this approach, the respirable concentration and the inhalation toxicity endpoint of the chemical need to be known:**

MOE= Inhalation NOAEL (mg/L) / Human Airborne Concentration (mg/L)

Again, **these data are unavailable for chlorethoxyfos**. The studies submitted by the Registrant for chlorethoxyfos handlers included air monitoring for total airborne concentration of the active ingredient. The total concentration does not yield the respirable amount. Nor is the specific inhalation toxicity and pharmacokinetics for humans available for this chemical. Therefore, a 100% absorption factor is used with the extrapolated oral dose. Whalan and Pettigrew also point out that most chemicals are *more* toxic by inhalation than oral route. However, the best available methodology was used in recalculating inhalation exposure using registrant-supplied handler air monitoring (see Revised Chlorethoxyfos RED, 1/8/99) in response to DuPont's December 14, 1998, letter. No further revision is necessary, as the difference noted between a previous HED assessment of exposure (J. Arthur, / /) and the RED is based upon a difference in the accepted respiratory rate for workers. The HED Exposure Science Advisory Committee has reviewed their policy and recommended the use of 29 L/min as the default respiratory rate for pesticide applicators.

References:

1. Inhalation Risk Characterizations and the Aggregate Risk Index (ARI). Memo from John Whalan and Hugh Pettigrew to Margaret Stasikowski, Director, Health Effects Division, EPA. February 10, 1997.

2. Timothy R. Gerrity and Carol J. Henry, eds. Principles of Route-to-Route Extrapolation for Risk Assessment. Health Effects Research Laboratory, U.S. Environmental Protection Agency. Elsevier Science Publishing Co. Inc. New York. 1990.

3. Dietary Exposure: DuPont urges the agency to refine the dietary exposure estimate by

incorporating 25% crop treated rather than 100% crop treated. DuPont notes that his assumption would still be conservative because it significantly overstates current market share based on recent Doane data.

HED Response: HED will refine dietary exposure estimates using the latest Quantitative Usage Analysis (QUA) from BEAD (D. Herzi, 11/98). The weighted average percent crop treated (for sweet and field corn combined) is 0.2% and estimated maximum 0.7%. The weighted average will be used to refine chronic dietary exposure estimates and the estimated maximum for acute dietary exposure estimates.