TO:  George LaRocca  
      Product Manager #15  
      Registration Division (TS-767)  

From:  Joseph C. Reinert, Chief  
        Environmental Chemistry Review Section No. 2  
        Exposure Assessment Branch (TS-769C)  
        Hazard Evaluation Division (TS-769C)  

Attached please find the EAB fate review of...  

Reg./File No.:  50658 - EUP - R  

Chemical:  Avermectin  

Type Product:  1  

Product Name:  AVID™  

Company Name:  MERCK  

Submission Purpose:  Exposure Assessment  

ZBB Code:  3(c)(5)  

ACTION CODE:  701  

Date in:  2/28/84  

EAB #:  4214  

Date Completed:  4/20/84  

TAIS (levels II)  

Days  

63  

6  

Deferrals To:  

   ____ Ecological Effects Branch  
   ____ Residue Chemistry Branch  
   X  Toxicology Branch
ADDENDUM

As an aid to registrants and others, the following background information describes how valid monitoring studies and quantitative exposure assessments are carried out:


This review article describes state-of-the-art procedures for the actual field measurement of dermal and respiratory exposure.


This paper presents an overview of how exposure assessments are carried out in EAB, including a discussion of the use of surrogate exposure studies for assessments when no data are available for a particular pesticide.


This paper describes in greater detail what assumptions are made and how exposure assessments are performed in OPP.

Frank Prince, Ph.D.
Chemist
Review Section 2
Exposure Assessment
Branch Hazard Evaluation Division (TS-769C)
1.0 INTRODUCTION

Merck Sharp and Dohme has submitted a surrogate analysis of potential human exposure to AVID™, an Avermectin used for control of arthropod pests of ornamental plants.

2.0 MK-936: Avermectin B1: AVID

3.0 DISCUSSION

The investigators used data from a published Carbaryl exposure assessment study as a basis for estimating human exposure for an ornamental-use scenario with MK-936. They assumed that since Carbaryl was applied at a 3 lb. ai/acre level and MK-936 at a 0.025 lb. ai/acre level, that all dermal and inhalational exposure data previously collected for Carbaryl could be reduced by a factor of 120 and then be applicable to MK-936.

A. Summary of Carbaryl Study

The study which was used as a model for this surrogate analysis reported on the hourly dermal exposure (HDE) of agricultural workers to Carbaryl during both aerial and ground applications. The descending order of HDE by worker-type was found to be aerial flagger; mixer-loader; applicator; bystander. The author found that the HDE varied with the type of formulation used (powder vs. aqueous suspension; i.e. 170 vs. 40 mg. respectively) and with the method of removing dry powder from the container.

Re-entry exposure assessments were made by measuring total extractable Carbaryl residues from apple leaves as a
function of time following an application.

A. Exposure Assessment

Carbaryl exposure assessment data for the mixer/loader in an agricultural scenario was used as a basis for comparison of indoor and outdoor ornamental-type applications with AVID. MERCK SHARP and Dohme Co. did not report on published exposure studies using Carbaryl in urban-type applications. These data would have provided a more valid comparison for surrogate analysis.

B. RE-Entry Exposure

Using several assumptions, the submitter calculated a theoretical maximum Dislodgeable Foliar Residues (DFR) for AVID applications. However no estimate of the transfer of DFR'S to human skin was given.

4.0 RECOMMENDATIONS

There is a need for submission of additional supporting data namely; 1) Actual or surrogate exposure assessment data for an ornamental-use scenario. 2) Re-entry exposure assessment data.