EEB FILE COPY
099101

DP Barcode : D190326
PC Code No : 099101
EEB Out : 12-14-93

To: SUSAN LEWIS PM 21
Product Manager
Registration Division (H7505C)

From: Anthony F. Maciorowski, Chief
Ecological Effects Branch/EFED (H7507C)

Attached, please find the EEB review of...

Reg./File # :
Chemical Name : BENOMYL
Type Product :
Product Name :
Company Name : DUPONT
Purpose : REVIEW 6A2 ADVERSE EFFECTS DATA ON BENOMYL

Action Code : 405 Date Due : 12-15-93
Reviewer : RICK PETRIE Date In EEB: 4-20-93

EEB Guideline/MRID Summary Table: The review in this package contains an evaluation of the following:

GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT
71-1(A)			72-2(A)			72-7(A)		
71-1(B)			72-2(B)			72-7(B)		
71-2(A)			72-3(A)			122-1(A)		
71-2(B)			72-3(B)			122-1(B)		
71-3			72-3(C)			122-2		
71-4(A)			72-3(D)			123-1(A)		
71-4(B)			72-3(E)			123-1(B)		
71-5(A)			72-3(F)			123-2		
71-5(B)			72-4(A)			124-1		
72-1(A)			72-4(B)			124-2		
72-1(B)			72-5			141-1		
72-1(C)			72-6			141-2		
72-1(D)			6A2 DATA	42706601		141-5		

Y=Acceptable (Study satisfied Guideline)/Concur
P=Partial (Study partially fulfilled Guideline but additional information is needed
S=Supplemental (Study provided useful information but Guideline was not satisfied)
N=Unacceptable (Study was rejected)/Nonconcur

DP Barcode : D190329
PC Code No : 099101
EEB Out :

DEC 14 1993

To: SUSAN LEWIS
Product Manager 21
Registration Division (H7505C)

From: Anthony F. Maciorowski, Chief
Ecological Effects Branch/EFED (H7507C)

Attached, please find the EEB review of...

Reg./File # :
Chemical Name : BENOMYL
Type Product : FUNGICIDE
Product Name : BENLATE
Company Name : E.I.DUPONT DE NEMOURS
Purpose : REVIEW AUSTRAILIA REPORT RE: BENOMYL CROP DAMAGE

Action Code : 405 Date Due : 12-15-93
Reviewer : RICK PETRIE Date In EEB: 4-20-93

EEB Guideline/MRID Summary Table: The review in this package contains an evaluation of the following:

GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT
71-1(A)			72-2(A)			72-7(A)		
71-1(B)			72-2(B)			72-7(B)		
71-2(A)			72-3(A)			122-1(A)		
71-2(B)			72-3(B)			122-1(B)		
71-3			72-3(C)			122-2		
71-4(A)			72-3(D)			123-1(A)		
71-4(B)			72-3(E)			123-1(B)		
71-5(A)			72-3(F)			123-2		
71-5(B)			72-4(A)			124-1		
72-1(A)			72-4(B)			124-2		
72-1(B)			72-5			141-1		
72-1(C)			72-6			141-2		
72-1(D)			INCIDENTS	42727501		141-5		

Y=Acceptable (Study satisfied Guideline)/Concur
P=Partial (Study partially fulfilled Guideline but additional information is needed
S=Supplemental (Study provided useful information but Guideline was not satisfied)
N=Unacceptable (Study was rejected)/Nonconcur

DP Barcode : D192551
PC Code No : 099101
EEB Out :

To: SUSAN LEWIS
Product Manager 21
Special Review and Reregistration Division (H7508W)

From: Anthony F. Maciorowski, Chief
Ecological Effects Branch/EFED (H7507C)

Attached, please find the EEB review of...

Reg./File # : 284785
Chemical Name : BENOMYL
Type Product : FUNGICIDE
Product Name : BENLATE
Company Name : E I DUPONT
Purpose : REVIEW SUBMITTED ADVERSE EFFECTS DATA TO DETERMINE IF ANY ARE RELEVANT TO THE BENOMYL PHYTOTOXICITY INCIDENTS 6a2
Action Code : 405 Date Due : 12-15-93
Reviewer : RICK PETRIE Date In EEB: 6-29-93

EEB Guideline/MRID Summary Table: The review in this package contains an evaluation of the following:

GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT
71-1(A)			72-2(A)			72-7(A)		
71-1(B)			72-2(B)			72-7(B)		
71-2(A)			72-3(A)			122-1(A)		
71-2(B)			72-3(B)			122-1(B)		
71-3			72-3(C)			122-2		
71-4(A)			72-3(D)			123-1(A)		
71-4(B)			72-3(E)			123-1(B)		
71-5(A)			72-3(F)			123-2		
71-5(B)			72-4(A)			124-1		
72-1(A)			72-4(B)			124-2		
72-1(B)			72-5			141-1		
72-1(C)			72-6			141-2		
72-1(D)			MISC	42794301		141-5		

Y=Acceptable (Study satisfied Guideline)/Concur
P=Partial (Study partially fulfilled Guideline but additional information is needed
S=Supplemental (Study provided useful information but Guideline was not satisfied)
N=Unacceptable (Study was rejected)/Nonconcur

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DEC 14 1993

D190326, D190329, D192551,

MEMORANDUM

SUBJECT: Benomyl 6(a)(2) Data Reviews

FROM: Anthony F. Maciorowski, Chief
Ecological Effects Branch
Environmental Fate and Effects Division (7507C)

TO: Susan Lewis, PM-21
Fungicide/Herbicide Branch
Registration Division (7505C)

The Ecological Effects Branch (EEB) has completed review of three separate packages of information regarding alleged benomyl phytotoxicity to crops. Each information package is addressed separately.

D190326

This package contained 1.) MRID-42706601, a summary listing of benomyl incidents reported to DuPont Chemical Co. The summary table includes the location of the alleged incident, inspection date, crop(s) affected, list of plant effects (symptoms), the growing season in question, and the number of acres affected; 2.) a DuPont internal interoffice memorandum from Michael J. Duffy to "Distribution List"; and 3.) trial transcript for Michael J. Duffy of DuPont Chemical Co. relating to no 2.) above.

The summary table is not new information to EEB. The other two items do not significantly increase our scientific understanding of the cause(s) of alleged benomyl fungicide phytotoxicity to plants. The Michael J. Duffy statement "The potential for crop injury exists from use of Benlate DF when used according to the label - since we now know that some allowed treatments are very near the injury threshold inherent in benomyl applied in this formulation." may warrant further investigation. Perhaps DuPont can submit the studies (or information) on which this statement is based.

CONCURRENCES								
SYMBOL	7507C	H 7507C						
SURNAME	PETRIE	[illegible]						
DATE	12/13/93	12-14-93						

EPA Form 1320-1A (1/80)

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D190329

This package contained MRID-427275-01, a report from the Australia Department of Agriculture (ADA) regarding benomyl crop damage. In this report, it was determined by the ADA that Benomyl DF drench treatments (as used by the affected growers) were not registered for use on cucumbers. Symptoms of plant injury included poor vigor, dark green crinkled leaves, weak taproot system. The plants looked like they had been treated with a phenoxy herbicide. However, no herbicides had been used. Analysis of benomyl samples resulted in no detections of the phenoxy herbicides 2,4-D, 2,4,5-T, MCPA, MCPP, or Dicamba down to 10 ppm. ALS inhibiting compounds (sulfonylureas, imidazolinones), triazines, or other herbicides were not analyzed for. A 2 replicate comparative greenhouse study was conducted by a grower (with Mr. McQuinn of DuPont plus an independent consultant, Dr. Robinson) using two grower batches of benlate plus two DuPont supplied batches, compared to an untreated control. It is unclear whether the grower formulations were WP or DF. Of these comparisons, one grower's sample of benomyl caused significant adverse effects to the cucumber seedlings in both replicates. No adverse effects were observed in the other plots. No plant diseases or viruses were found in the soil or plants. Photographs were taken of the results and all parties agreed that something in the benomyl caused phytotoxicity to the cucumbers, primarily reduced tap root growth. The DuPont response to these findings was that two replicates are not sufficient to draw any definitive conclusions.

The EEB suggests that DuPont be consulted regarding follow-on testing of this growers product. This report does not of itself significantly increase our understanding of the cause(s) of alleged benomyl phytotoxicity to plants.

D192551

This package of information was transmitted from DuPont Chemical Co. to Registration Division on 12/03/92. This rather large package (150+ pages) contains: BIC greenhouse air monitoring data, copies of phytotoxicity research presentation slides from a 11/24/92 meeting with Dupont at EPA, field phytotoxicity research summary information, summary of claims for benomyl damages by state, and summary of claims for benomyl damages by crop.

While this report provides summary slide information from plant studies, no raw data were submitted. These raw data were transmitted to the Florida Department of Agriculture (FDA) for their use. The EEB does not intend to review the 23 boxes of raw data. The FDA has submitted a summary report of their findings to EPA. This report is currently in review. While DuPont has concluded that some of the occurrences of poor plant health in greenhouses may have resulted from phenotype reversion in tissue cultured cuttings, viruses such as Dasheen Mosaic Virus not

previously identified in Florida, various diseases not controlled by benomyl, misapplication of herbicides to control weeds in the greenhouse or nursery, the presence of root nematodes, and other factors, this summary information does not significantly increase our scientific understanding of the cause(s) of alleged benomyl phytotoxicity to so many plant species at numerous field and greenhouse locations.