

Date Out:

Chemical Code: 129099  
DP Barcode: D200228

4-4-95

## ENVIRONMENTAL FATE AND GROUND WATER BRANCH

### Review Action

To: Andrea Beard, PM # 41  
Registration Division (7505W)

From: Betsy Behl, Section Head  
Ground Water Technology Section  
Environmental Fate & Ground Water Branch/EFED (7507C)

Thru: Henry Jacoby, Chief  
Environmental Fate & Ground Water Branch/EFED (7507C)

Attached, please find the EFGWB review of...

Common Name:	Imidacloprid	Trade name:	NTN 33893, Bay NTN 33893
Company Name:	Miles, Inc.		
ID #:			
Purpose:	Section 18 request for use of imidacloprid on pears in WA.		

Type Product:	Action Code:	EFGWB #(s):	Review Time:
Insecticide	001		days

### STATUS OF STUDIES IN THIS PACKAGE: REQUIREMENTS

Guideline #	MRID	Status <sup>1</sup>
None		C

### STATUS OF DATA

### ADDRESSED IN THIS PACKAGE:

Guideline #	Status <sup>2</sup>
-	-

<sup>1</sup>Study Status Codes:

A=Acceptable U=Upgradeable C=Ancillary I=Invalid.

<sup>2</sup>Data Requirement Status Codes: S=Satisfied P=Partially satisfied N=Not satisfied R=Reserved W=Waived.

1. CHEMICAL:

Chemical name: 1-((6-Chloro-3-pyridinyl)methyl)-4,5-dihydro-N-nitro-1H-imidazol-2-amine  
Common name: Imidacloprid  
Trade name(s): NTN 33893, Bay NTN 33893  
Structure:

2. TEST MATERIAL:

Not Applicable.

3. STUDY/ACTION TYPE:

Review Submission Related Data Package

4. STUDY IDENTIFICATION:

Title: Degradation and Translocation of Imidacloprid (NTN 33893) Under Field Conditions on a Lysimeter

Author: E. Hellpointner

Identifying No.: 129099  
DP Barcode: D200228  
Date Sent to EFED: 3/9/94

5. REVIEWED BY:

Kevin J. Costello  
Signature: Kevin J. Costello  
Hydrologist  
OPP/EFED/EFGWB/Ground-Water Section  
Date: 4/4/95

6. APPROVED BY:

Betsy Behl  
Signature: Betsy Behl 4/4/95  
Section Head  
OPP/EFED/EFGWB/Ground-Water Section

## 7. CONCLUSIONS

Laboratory persistence and mobility data suggest that use of NTN might lead to ground-water contamination, especially when applied to vulnerable soils overlying shallow water tables. Modeling of NTN applications suggest that the insecticide might leach more than alternatives, but NTN has a health advisory level lower than most alternatives. Miles, Inc., the registrant of NTN, is preparing to commence two field-scale ground-water monitoring studies to better clarify the chemical's leaching potential. Miles is working toward registering the use of NTN on a variety of crops, including pears.

EFGWB recommended that an emergency exemption be granted in 1994 for the use of NTN on apples in Washington, provided that applications were not made to "vulnerable areas". The application to 16,000 acres was described as posing a relatively low incremental risk to the environment. The applications described in this exemption request should pose a lesser risk, as the request is for the same geographical area. The 0.10 lb. a.i./acre for pears is less than the 0.3 lb. a.i./acre rate for apples. In addition, this request covers only 5000 acres.

## 8. RECOMMENDATIONS

Screening model runs suggested that NTN might be more likely to leach to ground water than its alternatives; however, NTN has a much higher health advisory level than these alternatives, and thus poses less of a risk.

## 9. BACKGROUND

### Environmental Fate Studies

While the results of environmental fate studies in the NTN registration package indicate that the chemical is persistent and mobile enough to leach to ground water, the results are not conclusive. Aerobic soil metabolism studies indicate that NTN is highly persistent, with a half-life greater than a year. Partition coefficients for NTN range from below 1.0 for a sand soil, to 4.7 in a silt loam, indicating NTN should be as mobile as other pesticides previously shown to leach. However, NTN was not seen to leach below 12 inches in field dissipation studies in California, Georgia, and Minnesota.

### Reason for Exemption Request

The State of Washington prepared an estimate of the yields that might be expected for a pear crop treated with NTN, and with alternative insecticides. Based on previous annual yields, the NTN-treated crop would be expected to provide a profit of \$412.86 per acre. The estimate for a pear crop without NTN-treatment was derived through a weighted average of the application costs of chlorpyrifos, azinphos-methyl, and encapsulated methyl parathion, with a downward correction of 6% for an expected downgrade in the quality of the crop. By these calculations, each acre of pears would exact a loss to the grower of \$298.49.

## 10. DISCUSSION

### PATRIOT Modeling

The pesticide leaching screening model PATRIOT was used to compare estimated relative leaching potential between NTN and possible alternatives for use on vegetables. A simulation was compiled to model the leaching of NTN and 7 alternatives when applied to tomatoes on the Delhi soil series in California. The 10-year simulation was run using historical weather data provided in the database from the Sacramento weather station.

The results of these simulated applications predicted far greater leaching of NTN than any of the alternatives considered. PATRIOT

3

predicted an annual average leaching of 19.3% of NTN applied to the simulated 177 cm water table. Of the remaining chemicals, only methomyl was predicted to leach at all, at an annual average rate of 2.1%. No leaching was predicted for dimethoate, methamidophos, disulfoton, endosulfan, oxamyl, or permethrin.

Similarly, NTN was predicted to leach at a greater rate than 9 alternatives simulated for potatoes in Wisconsin, including aldicarb and carbofuran. PATRIOT predicted an annual average leaching of 6.1% of NTN applied to the simulated 128 cm water table. Of the remaining chemicals, only carbofuran, aldicarb and oxamyl were predicted to leach, at rates of 2.2, 1.9% and 0.6%, respectively.

Although NTN was predicted in the screening model to be most likely to leach, it poses a lesser chronic risk than the other chemicals predicted to leach. The lifetime Health Advisory Level for NTN has been estimated to be 525 ppb. The Office of Water has set Maximum Contaminant Levels of 10 ppb and 40 ppb, respectively, for aldicarb and carbofuran. The Lifetime Health Advisory Level for both methomyl and oxamyl is 200 ppb.

4