Date Out:

Chemical Code:129099
DP Barcode:D201200 4-18-93

ENVIRONMENTAL FATE AND GROUND WATER BRANCH

Review Action

To: Rebecca Cool, PM #41
Special Review and Reregistration Division (H7508W)

From: Akiva Abramovitch, Section Head
Chemistry Review Section 3
Environmental Fate & Ground Water Branch/EFED (H7507C)

Thru: Henry Jacoby, Chief
Environmental Fate & Ground Water Branch/EFED (H7507C) Henry Jacoby 4/18/93

Attached, please find the EFGWB review of...

Common Name:	Imidacloprid	**Trade name:**	ADMIMRE 2 Flowable
Company Name:	Miles, Inc.		
ID #:	94CA0020		
Purpose:	To review an EMERGENCY EXEMPTION (Section 18) on imidacloprid use on tomaotes in California.		

Type Product:	**Action Code:**	**EFGWB #(s):**	**Review Time:**
Insecticide	500		1.0 day

STATUS OF STUDIES IN THIS PACKAGE:

Guideline #	MRID	Status[1]

STATUS OF DATAREQUIREMENTS ADDRESSED IN THIS PACKAGE:

Guideline #	Status[2]

[1]Study Status Codes: A=Acceptable U=Upgradeable C=Ancillary I=Invalid.
[2]Data Requirement Status Codes: S=Satisfied P=Partially satisfied N=Not satisfied R=Reserved W=Waived.

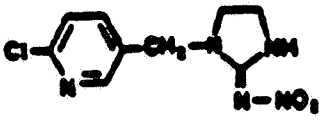
1. CHEMICAL:
Common Name: Imidacloprid

Chemical Name:
Exists as tautomer.

1-((6-Chloro-3-pyridinyl)methyl)-4,5-dihydro-N-nitro-1H-imidazol-2-amine.
1-[(6-chloro-3-pyridinl)methyl]-N-nitro-2-imidazolidinimine.
Preferred tautomer.

Type of product: Insecticide

Chemical Structure:



Physical/Chemical Properties

Molecular formula:	$C_9H_{10}N_5O_2Cl$.
Molecular weight:	255.67.
Physical state:	Light yellow powder.
Density:	1.542 g/cm^3.
Vapor pressure (20 C):	6.0 x 10^{-9} Torr.
Solubility (20 C):	0.58 g/L water; miscible in n-hexane, methylene chloride, 2-propanol, and toluene.
K_{ow} :	3.7 @ 21°C

2. TEST MATERIAL:

N/A

3. STUDY/ACTION TYPE:

The State of California, Environmental Protection Agency, Department of Pesticide Regulation requests an EMERGENCY EXEMPTION (Section 18) to use ADMIRE 2 Flowable (21.4% ai) to control the Silverleaf Whitefly (Bemisia tabaci) and Greenhouse Whitefly (Trialeurodes vaporariorum) in tomatoes.

Contact Persons:

Nicholas Toscano
University of California
Riverside, California 92521
(909) 787-5826

Mr. Ed Beckman
California Tomato Board
Fresno, California
(209) 251-0628

Dr. John Trumble
Entomologist
University of California
Riverside, California 92521

Ms. Rachel C. Neal
Sun World/ Treasure Farms
13042 Old Myford Road
Irvine, California 92720

(909)787-5624 (714) 731-7552

4. STUDY IDENTIFICATION:

1) Letter from James M. Yamauchi dated March 21, 1994; Acting Supervisor of Registration, Pesticide registration Branch: (916) 324-3530, State of California, Environmental Protection Agency, Department of Pesticide Regulation 1020 N Street Room 332 Sacramento, California 94518

5. REVIEWED BY:

Kevin L. Poff, Chemist
Environmental Chemistry Review Section #3
Environmental Fate and Groundwater Branch/EFED

Date:

6. APPROVED BY:

Akiva Abramovitch, Ph.D., Chemist
Environmental Chemistry Review Section #3
Environmental Fate and Groundwater Branch/EFED

Date: APR 15 1994

7. CONCLUSIONS:

1) Using imidacloprid in an emergency situation to control the Silverleaf Whitefly (Bemisia tabaci) and Greenhouse Whitefly (Trialeurodes vaporariorum) on tomatoes in Imperial, Orange, Riverside, and San Diego Counties of California poses a relatively low incremental risk to the environment due to the low acreage involved and since risk can be mitigated by following the specific recommendations listed below. The chemical may be applied as a: 1) narrow band drench at the base of plants followed by sprinkler irrigation, 2) shank injection, and 3) as a chemigation treatment through drip irrigation only.

2) The maximum amount of imidacloprid to be used under this EMERGENCY EXEMPTION would be 0.375 lbs ai/acre/application X 1 application X 2000 acres = 750 lbs ai. / or 24 ozs./acre/ application X 1 application X 2000 acres/128 ozs. per gallon = 375 gallons.

8. RECOMMENDATIONS:

The EMERGENCY EXEMPTION (section 18) to use imidacloprid (ADMIRE 2 flowable systemic insecticide) to control Silverleaf Whitefly (Bemisia tabaci) and Greenhouse Whitefly (Trialeurodes vaporariorum) on tomatoes in Imperial, Orange, Riverside, and San Diego Counties of California may be granted provided ground and surface water in the use sites are protected by not applying the chemical to vulnerable areas. Imidacloprid is a persistent chemical and there is potential concern for this chemical to leach to ground water and/or be transported to surface waters, therefore it should not be applied where soil organic matter is low and/or the water table is shallow.

9. BACKGROUND :

Imidacloprid [NTN 33893; 1-((6-chloro-3-pyridinyl)methyl)-4,5-dihydro-N-nitro-1H-imidazole-2-amine] is a broad spectrum, systemic insecticide currently being developed by Miles Inc. for Terrestrial Non-food, as well as Residential and Commercial Outdoor: Lawns, turfgrass, and ornamentals. Also, Greenhouse Non-food or Residential and Commercial Indoor: Ornamentals. The proposed maximum use rates are 0.5 lb ai/A/year or 500-560 g/ha, greenhouse soil applications are limited to a single application per crop cycle, or once per year on crops having a production cycle of longer than one year. The maximum use rate on turf and ornamentals is set at 0.44 lb/ai/acre. Single active ingredient formulations include wettable powder, flowable concentrate, and granular. Multiple active ingredient formulations include carbofuran (5% granular). Formulations include the 94% ai technical, 75% concentrate, and a 2.5% and 0.62% granular

ENVIRONMENTAL FATE AND GROUND WATER ASSESSMENT

In general, the EFGWB is concerned about surface water contamination with turf use and ground water contamination under terrestrial uses because imidacloprid has high water solubility and is persistent, and moderately mobile based on Kd values. In a terrestrial non-food use such as on turf vertical movement is less likely due the chemical and physical adsorption of the chemical to the high organic matter of the turf. However, in a situation where a turf is placed over soils of low organic matter content, such as sandy and sandy loam soils, leaching can occur after imidacloprid moves through the turf and penetrates these soils. Also, due to persistency alone, repeated applications could cause saturation of soils sites thereby increasing desorption rates of future applications of the chemical increasing its potential for ground water contamination. In addition, there is an increase risk of ground water contamination by the parent molecule, if, for instance, a heavy rainfall occurred following an imidacloprid application to a sandy soil with low organic matter content and the compound moved to an area below that of anaerobic microbial degradation, the resistance of imidacloprid to hydrolysis coupled with its mobility could cause ground water contamination.

The submission of data required for full registration of imidacloprid on terrestrial non-food use sites is summarized below:

Satisfied:

-**Hydrolysis** (161-1); MRID #42055337, EFGWB #92-0210,-0196. Stable at pH 5, 7, some degradation at pH 9 t1/2= 355 days.

-**Photodegradation in Water** (161-2); MRID #42256376, EFGWB #92-0847,-1039/42.
Half-life of approximately 1 hour (4.2 hours theoretical, under natural sunlight) in sterile aqueous buffer solutions (pH 7) that were continuously irradiated with an artificial light source (xenon

lamp) for up to 2 hours at 23-24.5 C.

-**Photodegradation on Soil** (161-3); MRID #42256377, EFGWB #92-0847,-1039/42.
Half-life of 39 days (171 hours, theoretical half-life under natural sunlight) on sandy loam soil that was continuously irradiated with a UV-filtered xenon light source for 15 days at 25 ± 2 C.

-**Aerobic Soil Metabolism** (162-1); MRID #42073501, EFGWB #92-0210,-0196.
Calculated half-life of > 1 year in a sandy loam soil that was incubated in the dark at 22 ± 2°C and 75% of the 0.33 bar moisture. CO_2, was the major degradate.

-**Anaerobic Aquatic Metabolism** (162-3); MRID #42256378, EFGWB #92-0847,-1039/42. Half-life of 27 days in anaerobic silt loam sediment that was incubated in the dark at 22 ± 1 C for 1 year.

-**Adsorption/Desorption** (163-1); MRID #42520801, EFGWB #93-0266,93-0071. This review. Freundlich K_{ads} constants and 1/N isotherms describing the adsorption of NTN 33893 on a sand (0.4% OM), loamy sand (0.6% OM), silt loam (2.6% OM), silt loam (with sodium azide), and loam (2.0% OM) were K_{ads}=0.956; 1/N=0.781, K_{ads}=1.02; 1/N=0.877, K_{ads}=4.18; 1/N=0.775, K_{ads}=4.76; 1/N=0.729, and K_{ads}=3.45; 1/N=0.757 respectively. The Freundlich K_{des} constants and 1/N isotherms describing the desorption of NTN 33893 on the above soils were K_{des}=0.662; 1/N=0.917, K_{des}=0.542; 1/N=1.02, K_{des}=4.68; 1/N=0.775, K_{des}=3.38; 1/N=0.877, and K_{des}=4.40; 1/N=0.793 respectively.

-**Adsorption/Desorption** (163-1); MRID #42520802, EFGWB #93-0266, 93-0071, This review. (Supplemental adsorption/desorption data was submitted on degradate NTN 33823 generated in the anaerobic aquatic metabolism 162-3 study. NTN 33823 increased to a total maximum average of 66.0% of the applied radioactivity at 249 days posttreatment and was 64.0% at 358 days). Freundlich K_{ads} constants and 1/N isotherms describing the adsorption of NTN 33823 on a sand (0.4% OM), loamy sand (0.6% OM), silt loam (2.6% OM), and loam (2.0% OM) were K_{ads}=0.761; 1/N=1.22, K_{ads}=2.91; 1/N=1.09, K_{ads}=14.2; 1/N=1.02, and K_{ads}=10.1; 1/N=0.819 respectively. The Freundlich K_{des} constants and 1/N isotherms describing the desorption of NTN 33823 on a sand, loamy sand, silt loam, and loam were K_{des}=0.456; 1/N=1.41, K_{des}=2.45; 1/N=1.13, K_{des}=16.9; 1/N=1.03, and K_{des}=12.0; 1/N=0.840 respectively.

-**Soil Column Leaching** (163-1); MRID #42055339, EFGWB #92-0210,-0196. (Aged) (>85% of the radioactivity was contained in the aged portion and the 0-5cm column layer). Imidacloprid was found at 48.5 ± 1.1%* of the applied radioactivity in the top layer (the applied sandy loam soil). 37 ± 0.0% of the applied radioactivity was found in the 0-5 cm layer. 10.8 ± 1.4% was found in the 5-10 cm layer. 4.2 ± 0.6% was found in the 10-15 cm layer. 1.8 ± 0.1% was found in the 15-20 cm layer. 0.3 ± 0.1% was found in the 20-30 cm layer. 0.14% of the applied radioactivity was found in the total

volume of leachate. About 90.4% of unchanged parent compound was found in the sandy loam soil after an aging period of 30 days.

Ancillary data (supplemental):

-Adsorption/Desorption (163-1); MRID #42055338, EFGWB #92-0210,-0196. (Unaged) This study was determined to be supplemental due to an inadequate comparison of German soils to US soil. K_{ads} values on a sandy loam soil, (greenhouse Kansas), (1.4% OM), silt soil, Hofchen (1.8% OM), low humus sandy soil, (standard soil 2.1), (0.75% OM), and a silty clay, (Ranschbach), (0.64% OM) were K_{ads}=3.59; 1/N=0.744, K_{ads}=2.38; 1/N=0.827, K_{ads}=1.17; 1/N=0.777, K_{ads}=1.36; 1/N=0.851 respectively. The Freundlich K_{des} constants and 1/N isotherms describing the desorption of NTN 33893 on the above soils were K_{des}=4.0; 1/N=0.789, K_{des}=2.75; 1/N=0.905, K_{des}=2.09; 1/N=0.921, K_{des}=2.11; 1/N=0.916 respectively.

-Terrestrial Field Dissipation (164-1); EFGWB #92-0847,-1039/42. MRID #42256379. Imidacloprid dissipated with an observed half-life of >1 year from the upper 6 inches of a bareground plot (100 x 102 feet) of loamy sand soil in Georgia following a broadcast application of imidacloprid (23.3% ai liquid suspension) at 0.5 lb ai/A on April 16, 1990.

MRID #42256380. Imidacloprid did not dissipate from the upper 6 inches of a plot (60 x 150 feet) of sandy loam soil planted to corn in Minnesota during the 12 months following a preemergence application of imidacloprid [Bay NTN 33893 240 FS; 1-((6-chloro-3-pyridinyl)methyl)-4,5-dihydro-N-nitro-1H-imidazol-2-amine; 22.8% liquid suspension] at 0.5 lb ai/A on June 6, 1990.

MRID #42256381. Imidacloprid dissipated with a calculated half-life of 146 days (Day 0 -Day 364) from a plot of sandy loam soil planted to tomatoes in California after a preemergence application of imidacloprid (23.3% ai liquid suspension) at 0.5 lb ai/A.

MRID #42256382. Imidacloprid dissipated from turf with a calculated half-life of 107 days (data points 0 - 126 days).

MRID #42256383. Imidacloprid did not appear to dissipate from the 0- to 3- inch depth of loam soil of a bluegrass turf plot (70 x 110 feet) in Minnesota during the 4 months following a broadcast application of imidacloprid (22.8% liquid suspension] at 0.5 lb ai/A to the turf on June 19, 1990.

Not Satisfied:

-Long Term Terrestrial Field Dissipation (164-5). Two studies are required.
Option 1: One study with the granular and one study with the liquid concentrate.
Option 2: Two studies with the liquid concentrate. One of which needs to be incorporated. In addition to the two studies with the liquid concentrate, bridging data between the liquid concentrate and granular formulation are required. **All studies are to be completed on a Type A or B soil with low organic matter content.**

Waived:

-**Laboratory studies of pesticide accumulation in fish** (165-4). No data were reviewed, although data provided by the registrant indicates a very low octanol/water (Kow) partition coefficient (Kow for imidacloprid = 3.7 @ 21°C).

Reserved:

-**Ground Water Monitoring:**
  -**Small Prospect.** (166-1)
  -**Small Retrosp.** (166-2)

10. DISCUSSION:
N/A

11. COMPLETION OF ONE-LINER:
N/A

12. CBI INDEX:
N/A

DP BARCODE: D201200

CASE: 285552
SUBMISSION: S461248

DATA PACKAGE RECORD
BEAN SHEET

DATE: 03/30/94
Page 1 of 1

Poff III

* * * CASE/SUBMISSION INFORMATION * * *

CASE TYPE: EMERGENCY EXEMP ACTION: 500 SECT18 SPC EXE NC F/F USE
RANKING : 75 POINTS (A)
CHEMICALS: 129099 Imidacloprid

ID#: 94CA0020
COMPANY:
PRODUCT MANAGER: 41 REBECCA COOL 703-308-8417 ROOM: CS1
PM TEAM REVIEWER: ANDREA BEARD 703-308-8791 ROOM: CS1
RECEIVED DATE: 03/24/94 DUE OUT DATE: 05/13/94

* * * DATA PACKAGE INFORMATION * * *

DP BARCODE: 201200 EXPEDITE: N DATE SENT: 03/30/94 DATE RET.: / /
CHEMICAL: 129099 Imidacloprid
DP TYPE: 001 Submission Related Data Package
CSF: N LABEL: Y

ASSIGNED TO	DATE IN	DATE OUT
DIV : EFED	04/01/94	/ /
BRAN: EFGB	/ /	/ /
SECT:	/ /	/ /
REVR :	/ /	/ /
CONTR:	/ /	/ /

ADMIN DUE DATE: 04/19/94
NEGOT DATE: / /
PROJ DATE: / /

* * * DATA REVIEW INSTRUCTIONS * * *

Please provide a review of the attached specific exemption request from CA for use of imidacloprid on tomatoes. This is the first time that CA has requested this use. EFGB reviewed a similar request from FL recently (review dated 1/24/94); however, the use pattern which CA is proposing is slightly different, and included application through irrigation systems (FL's did not).

Thank you

Andrea Beard
308-8791

* * * DATA PACKAGE EVALUATION * * *

No evaluation is written for this data package

* * * ADDITIONAL DATA PACKAGES FOR THIS SUBMISSION * * *

DP BC	BRANCH/SECTION	DATE OUT	DUE BACK	INS	CSF	LABEL
201195	BAB	03/30/94	04/19/94	Y	N	N
201197	EAB	03/30/94	04/19/94	Y	N	N
201198	EEB	03/30/94	04/19/94	Y	N	N
201201	TSCB	03/30/94	04/19/94	Y	N	Y

DEPARTMENT OF PESTICIDE REGULATION
1020 N Street, Room 332
Sacramento, California 94518

March 21, 1994

Ms. Rebecca Cool (H7505W)
Emergency Response and Minor Use Section
Registration Support Branch
Registration Division/OPP
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D. C. 20460

Dear Ms. Cool:

Section 18 Emergency Exemption Request - Admire 2 Flowable (EPA Reg. No. 3125-XX)/ Tomatoes (fresh)/ Silverleaf Whitefly (Bemisia tabaci) & Greenhouse Whitefly (Trialeurodes vaporariorum)

The Department of Pesticide Regulation requests a specific exemption to use imidacloprid on tomatoes (fresh) to control the Silverleaf Whitefly (Bemisia tabaci) and Greenhouse Whitefly (Trialeurodes vaporatiorum). In addition, the Department requests an action level for tomatoes (fresh) treated with this product. This emergency exemption is not intented to circumvent the Section 3 registration requirements, but to alleviate a critical pest problem where registered alternatives are not effective. The justification for this emergency exemption request follows:

The Pest Problem

Whiteflies have been a problem in the Imperial Valley of California since 1980. In the summer and fall of 1981 whitefly populations exploded on numerous crops, including melons, cotton, and lettuce. Suction traps were collecting over 60,000 whiteflies per 100 sweeps of their traps. The problem was so severe that the Imperial County Whitefly Management Committee was formed to develop strategies to control the pest. By 1989 to 1990 scientists and growers were discovering ways to deal with the whitefly problem. They discovered that whiteflies were building up on cotton plants and when the plants were defoliated the whiteflys would move to other crops. By defoliating early it was found the whitefly did not have time to develop large populations which could move to other crops.

By 1990, when the sweetpotato whitefly seemed to be under control a second disastrous phenomenon occurred. Whiteflies were found infesting commercial citrus groves near Tucson, Arizona. This whitefly was assayed using electrophoretic techniques and was found to be strain-B (originally called the poinsettia strain). Strain-B was originally found in greenhouses in 1986 where they occurred in large numbers and were found to be resistant to chemical control. By early spring 1991 strain-B of the sweetpotato whitefly was found on a large number of crops in the Yuma and Imperial Valleys, The presence of sweetpotato whitefly on cole crops had never been experienced before. By July 1991 it was clear that a catastrophic change had taken place in the whitefly population. In 1993 the sweetpotato whitefly strain-B name was changed to the silverleaf whitefly (SLW).
(Not true - only for California!)

The Crop

Tomatoes are grown for both processing and fresh market in the Imperial, Palo Verde, and Coachella Valleys where the silverleaf whitefly is a problem. Currently, only the tomatoes (fresh) are being affected by the SLW.

Also, Orange county had approximately 500 acres planted in tomatoes which experienced a severe outbreak of the greenhouse whitefly in 1993. 100 acres of the 500 acres had already been destroyed. The growers were not able to harvest any of the crop. Photographs were submitted in our Danitol request last year showing the severe crop damage.

The total acreages that will be affected by the greenhouse whitefly and silverleaf whitefly is estimated to be around 2,000 acres.

These areas of the state are important for tomato producers because they produce the earliest crop in the state. Processors rely on these areas to supply their early markets.

Livestock will not be allowed to graze the crop.

Alternative Control Measures

Chemical Control - Thiodan is registered, but it's use is not allowed in Orange County because of environmental concerns. Guthion is ineffective at the 1 1/2 lb. treatment rate. The 14 day PHI would not be usable in this crop, where tomatoes are harvested several times over a period of weeks. Monitor and Asana have been used without success on the affected acreage. Growers are concerned about the use of non-selective materials that could increase leafminer or result in other secondary pest infestations.

Integrated Pest Management (IPM) - There have been a number of committees formed to help coordinate research against SLW. It is clear from early work with SLW that traditional chemicals will be of limited use. Some form of IPM will have to be used to control SLW. The Imperial Valley has a much more severe SLW problem than other areas. This is thought to be due to the cropping systems used in the Valley which provide host plants year round. The complexity and severity of the situation combined with the need for long term coordinated research has resulted in the formation of many committees. Following is a list of the committees and their goals:

1. Federal Steering Committee - A cooperative group effort involving USDA agencies (ARS, APHIS, CSRS, and CES) formulating cooperative programs, identifying priority research areas, avoiding duplication and maximizing efforts. This committee has formulated a 5 year national research and action plan.

Estimate without proposed material (30% yield reduction):

2,800	$7.00	$19,600	$20,953	$-1,353

Production Costs

The cost of production for the past five years was:

Fresh Market

YEAR	TOTAL PRODUCTION COST/ACRE
1993	$21,057
1992	27,598
1991	25,842
1990	26,228

Orange County
(Cost of Production)
(Estimated)

Standard Production Cost = $7,000 per acre
3,500 20/lb. cartons to the acre

Harvest/Marketing Cost = $3.50 per carton ($14,000/acre)

Total Production/Marketing Cost:	$ 7,000	Production
	14,000	Harvest
	$21,000	Total cost/acre

Without the use of imidacloprid (Admire) to control the whitefly, the Orange County agricultural commissioner estimates that the growers could expect up to 30% to 40% crop loss from this pest (attachment C). Taking into account the erratic net profit margin that the growers can expect, a 30% loss of net profit would make it economically unfeasible for the growers.

Orange County already experienced a 100% loss on 120 acres of tomatoes in 1993. Therefore, without this Section 18, the 1994 tomato acreage could experience the same pest damage. This would be a very severe financial burden to the tomato growers and the local economy.

Enforcement Authority

Authority to enforce provisions of this Section 18 are provided in the

Thank you for your help with this exemption. If you should have any further questions, please contact John Inouye at (916) 324-3538.

Sincerely,

James M. Yamauchi

James M. Yamauchi
Acting Supervisor of Registration
Pesticide Registration Branch
(916) 324-3530

Enclosures

cc: Glenda Dugan, USEPA
Region IX

ji/sec/admire.030894

DEPARTMENT OF PESTICIDE REGULATION
1220 N Street, P. O. Box 942871
Sacramento, California 94271-0001

March 29, 1994

PROPOSED

CALIFORNIA AUTHORIZATION FOR PESTICIDE USE UNDER USEPA SECTION 18
SPECIFIC EXEMPTION FOR DISTRIBUTION AND USE ONLY WITHIN CALIFORNIA

Pursuant to authority granted under Section 18 of the Federal Insecticide, Fungicide and Rodenticide Act and 40 CFR, Part 166, approval is granted to use the pesticide shown below to control specified emergency.

Product: Admire 2 Flowable EPA Reg. No.: 3125-XX

Firm Name: Miles, Inc.

ACTIVE INGREDIENT	BY WEIGHT
Imidacloprid	21.4%
INERT INGREDIENTS.....	78.6%
TOTAL	100.0%

Contains 2 pounds of imidacloprid per gallon

KEEP OUT OF REACH OF CHILDREN

CAUTION

SHAKE WELL BEFORE USING

AVISO

PRECAUCION AL USUARIO: Si usted no puede leer o entender ingles, no use este producto hasta que la etiqueta le haya sido explicada ampliamente. (TO THE USER: If you cannot read or understand English, do not use this product until the label has been fully explained to you.)

STATEMENT OF PRACTICAL TREATMENT

IF SWALLOWED: Call a Physician or Poison Control Center. Drink one or two glasses of water and induce vomiting by touching back of throat with finger, or, if available, by administering syrup of ipecac. If syrup of ipecac is available, administer 1 tablespoonful (15 ml.) of syrup of ipecac followed by 1 to 2 glasses of water. If vomiting does not occur within 20 minutes, repeat the dose once. Do not induce vomiting or give anything by mouth to an unconscious person.

Handle and open container in a manner as to prevent spillag. If the container is leaking, invert to prevent leakage. If container is leaking or material spilled for any reason or cause, carefully dam up spilled material to prevent runoff. Refer to Precautionary Statements on label for hazards associated with the handling of this material. Do not walk through spilled material. Absorb spilled material with absorbing type compounds and dispose of as directed for pesticides above. In spill or leak incidents, keep unauthorized people away. You may contact the Miles Emergency Response Team for decontamination procedures or any other assistance that may be necessary. The Miles Kansas City Emergency Response telephone number is 816-242-2582, or contact Chemtrec at 800-424-9300.

Chemigation Requirements

Type of Irrigation Systems: Apply Admire 2F only through low-pressure irrigation systems. Do not apply Admire 2F through any other type of irrigation system.

GENERAL DIRECTIONS FOR ALL RECOMMENDED TYPES OF IRRIGATION SYSTEMS

Uniform Water Distribution and System Calibration: The irrigation system must provide uniform distribution of treated water. Crop injury, lack of effectiveness, or illegal pesticide residues in the crop can result from non-uniform distribution of treated water.

The system must be calibrated to uniformly apply the rates specified. If you have questions about calibration, you should contact State Extension Service specialists, equipment manufacturers or other experts.

Chemigation Monitoring: A person knowledgeable of the chemigation system and responsible for its operation, or under the supervision of the responsible person, shall shut the system down and make necessary adjustments should the need arise.

Drift: Do not apply when wind speed favors drift beyond the area intended for treatment.

Required System Safety Devices: The system must contain a functional check valve, vacuum relief valve, and low pressure drain appropriately located on the irrigation pipeline to prevent water source contamination from backflow.

The pesticide injection pipeline must contain a functional, automatic, quick-closing check valve to prevent the flow of fluid back toward the injection pump.

The pesticide injection pipeline must also contain a functional, normally closed, solenoid-operated valve located on the intake side of the injection pump and connected to the system interlock to prevent fluid from being

Target Pest/Problem: Silverleaf Whiteflies (Bemisia tabaci) and Greenhouse Whitefly (Trialeurodes vaporariorum)

Dosage: 16-24 fluid ounces of product (.25 - .375 pounds of A.I.) per acre. (Do not apply more than 32 fluid ounces of product (.5 pound of A.I.) per acre per year)

Method of Application: Apply Admire by one of the following methods:

1. Apply a narrow band drench at base of plants followed immediately by sprinkler irrigation.
2. Apply by shank injection.
3. Apply as a chemigation treatment through drip irrigation only.

Dilution Rate: Apply in 10 to 60 gallons of water per acre.

Frequency/Timing of Application: Apply 1 application at planting time.

Worker Safety Reentry Interval: 12 hours; unless buried with untreated soil, then immediately.

Preharvest Interval: 21 days

Effective Date: February 15, 1994

Expiration Date: February 14, 1995

Other Requirements:

1. The maximum acreages to be treated is 2,000.
2. Do not apply to vegetables grown for seed.
3. Resistance: Some insects are known to develop resistance to insecticides after repeated use. As with any insecticide, the use of this product should conform to resistance management strategies established for the use area. Consult your agricultural advisor for resistance management strategies and recommended pest management practices for your area.

All applicable directions, restrictions, and precautions on the USEPA Registered label and this label must be followed.

This labeling must be in the possession of the user at the time of pesticide application.

county agricultural commissioner by the 10th day of the month following the month in which the applications are made. The county agricultural commissioner in cooperation with the Department of Pesticide Regulation, will monitor the use of the product under this exemption and will prepare a written report describing any unusual or adverse effects attributable to this use.

This exemption does not constitute a recommendation of the Department of Pesticide Regulation and will not prevent quarantine action if illegal residues are found in or on any crop. Neither the Department nor the county agricultural commissioner, manufacturer or formulator makes any warranty of merchantability, fitness of purpose, or otherwise, expressed or implied, concerning the use of a pesticide in accordance with these provisions. The user and/or grower acknowledges the preceding disclaimer and accepts liability for any possible damage or nonperformance resulting from this use.

James M. Yamauchi
Acting Supervisor of Registration
Pesticide Registration Branch
(916) 324-3530

ji/sec/admire.021494

SUN WORLD®

Sun World
Treasure Farms Division
13042 Old Myford Road
Irvine, CA 92720

Tel: 714 731 7552
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February 14, 1994

Where Produce Begins™

Mr. John Inouye
California EPA
Department of Pesticide Regulation
1020 N Street, Room 332
Sacramento, CA 95814

Dear John:

This letter is in response to your request for a summary on the effectiveness of Danitol to control greenhouse whitefly in tomatoes.

Last year, Orange County experienced severe damage to the 1993 tomato crop. This damage was caused by a new unknown virus that the greenhouse whitefly is transmitting.

Last year, we noticed the tomato crops failure to thrive and a devastating affect to the crop yields. It was then that we discovered that the greenhouse whitefly was transmitting a virus to the tomato plants. This was verified by Dr. Tom Perring, Professor of Entomology at the University of California, Riverside, and Dr. James Duffus, of U.S.D.A.

A Section 18 for Danitol on tomatoes was then petitioned for and granted by your department. Unfortunately, the Danitol was not the solution we were looking for. Danitol was recommended in combination with Monitor, another broad spectrum insecticide. This combination of Monitor and Danitol did not show any advantage over using Monitor alone, which is currently labeled for use. In order to attempt to control the Whitefly problem, we needed to use multiple (5 application) applications of the Monitor/Danitol. This resulted in a serious and devastating leafminer explosion, a secondary problem. We not only failed to control the whitefly and virus but we destroyed leafminer predators and caused a secondary problem.

In conclusion, the Danitol did not help control whitefly population and it is my professional opinion as the Pest Control Advisor for Sun World-Treasure Farms, that earlier application would still not help to control the transmission of this virus. Early sprays will only commit us to a spray program that will result in secondary outbreaks of leafminers.

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HEAVY LEAFMINER PRESSURE ON TOMATOES

Attachment C

Los Angeles Times

p B-1 1/14/94

Tomato Crop Faces Virus Peril

■ **Agriculture:** Disease carried by pest has affected much of the county's yield and all of Irvine's. A USDA official fears it could spread to other produce.

By MATT LAIT
TIMES STAFF WRITER

IRVINE—Orange County's $17-million tomato industry is threatened by a new and "extremely serious" virus that has destroyed much of the county's recent crop, officials from the U.S. Department of Agriculture said Thursday.

According to researchers, the disease is transmitted by a nutrient-sucking insect called the greenhouse whitefly and currently has "affected 100% of the [tomato] crops in the Irvine area."

Last fall, growers in Irvine contacted the USDA after their crops started to fail.

James E. Duffus, a USDA plant pathologist, said preliminary information has shown that the new, previously unidentified virus can be devastating.

"This is one of the most destructive diseases for tomato crops occurring in the state," Duffus said.

He said the new virus is similar to a virus that has caused severe damage to desert lettuce and sugar beet crops.

Duffus presented his findings Thursday at a conference of California produce growers in San Francisco. He told them he was concerned about the disease's "potential to spread" to other tomato-farming regions throughout the state.

California is the nation's No. 1 producer of tomatoes. In Orange County, they grow on more than 1,700 acres of farmland and are the third most valuable crop, behind flowers and strawberries but ahead of oranges.

Marcia Wood, a USDA spokeswoman, said the virus has already "induced severe

Please see TOMATOES, B5

TOMATOES: Potent Virus

Continued from B1

crop losses" in Orange County. No other region seems to be affected by the new virus.

Duffus said that at least one Orange County farm has stopped growing tomatoes because of the disease.

"They're afraid to start growing again," Duffus said.

The financial toll the virus has caused in Orange County is not yet known, Duffus said. No local growers could be reached for comment Thursday night.

Duffus said the disease causes yellowing, decay and death of the plant. He said it is possible that the disease could infect other crops in the county.

"We're looking into that," he said.

Researchers also are studying ways to control the spread of the virus. Although pesticides might work, Duffus said he hopes to find an environmentally safe alternative.

If the virus is not controlled, it could "force the abandonment" of Irvine as a tomato-producing area, he said, adding that it could be several years before an "antiserum" is found to defeat the virus.

"At this point we just don't know a whole heck of a lot about this virus," Duffus said.

The most important thing right now, Duffus said, is to discover the source of the virus that the pest carries. Once the source is isolated, "than maybe we can eliminate it as a problem," he said.

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STATE OF CALIFORNIA
DEPARTMENT OF FOOD AND AGRICULTURE
DIVISION OF PLANT INDUSTRY

DETECTION ADVISORY

January 20, 1994 PD09-94

TO: County Agricultural Commissioners

FROM: Pest Detection/Emergency Projects

NEW TOMATO VIRUS

Orange County

A new virus infecting tomatoes in Orange County has been reported by Dr. James Duffus, USDA at a January 13, 1994 meeting of California produce growers in San Francisco. The virus is a closterovirus transmitted by the greenhouse whitefly, *Trialeurodes vaporariorum* The virus is apparently not transmitted by the sweet potato whitefly, *Bemisia tabaci* or any other insect, not has it been shown to be transmitted mechanically. Closteroviruses have long filamentous particles, single stranded RNA, and are restricted to phloem tissue, insect and graft transmitted, and not seed transmitted. Related viruses include sugar beet yellows, carnation necrotic fleck, citrus tristeza, among others. Symptoms of the new tomato closterovirus include severe yellowing and necrosis of leaves, stunting, and poor fruit production. According to Dr. Duffus, this virus may prove to be one of the most destructive in tomato in California. At this time little else is known about the characteristics of this virus or its original source. Research is in progress at the USDA facility in Salinas, CA.

The same or similar virus was identified by the CDFA virology lab at the same time as the find in Orange County. The sample was collected from Oceanside, and submitted by San Diego County on October 7, 1993. Dr. Mayhew reported the unidentified closterovirus on November 18, 1993. The virus was not mechanically transmitted and since the field had been plowed under, further sampling was not done.

Prepared by: Dennis Mayhew