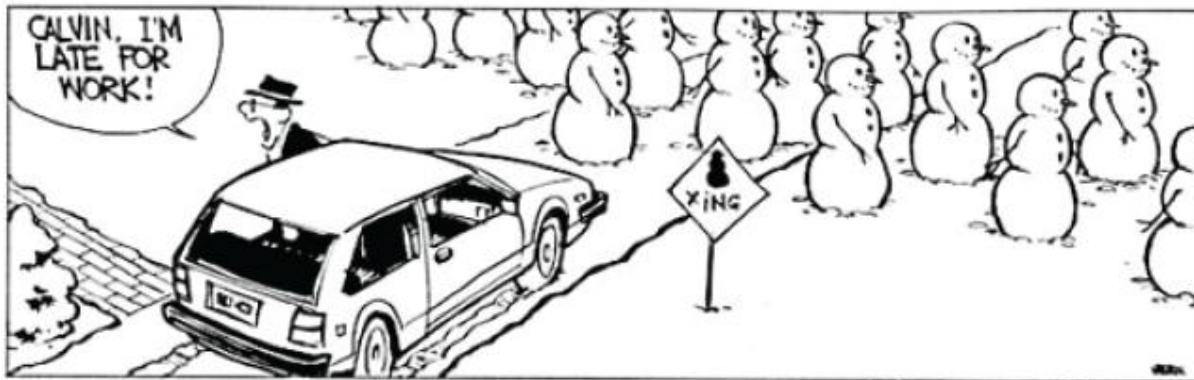


# ABCs of Greenhouse Pesticide Safety

- Gary Fish  
Maine Board of Pesticides Control  
28 State House Station  
Augusta ME 04333-0028  
(207)287-2731  
gary.fish@maine.gov



# Nobody does snowmen quite like Calvin & Hobbes



# What is a pesticide?

- Any substance or mixture of substances **intended for:**

- preventing,
- destroying,
- repelling, or
- mitigating

**any pest**



No endorsement intended or implied

- **Or, any plant regulator, defoliant or desiccant.**
- **Does not include fertilizers or nutrients**

# These are pesticides?

- Disinfectants & bleaches



- Herbicides



- Rat & mouse baits



- Fungicides



No endorsement intended or implied

# These are pesticides?

- Insecticides



- Botanicals



- Biological controls



- Slug and snail controls



No endorsement intended or implied

# Pesticide Registration





# All pesticides must be registered by both:

■ EPA

and

■ BPC





# Exempt from EPA registration but not exempt from BPC registration

## Active Ingredients Exempted Under 25(b) of the Federal Insecticide, Fungicide, & Rodenticide Act

\* indicates exempt active ingredients that are also exempt from pesticide residue tolerance requirements

Castor oil (U.S.P. or equivalent)*	Linseed oil
Cedar oil	Malic acid
Cinnamon and cinnamon oil*	Mint and mint oil
Citric acid*	Peppermint and peppermint oil*
Citronella and Citronella oil	2-Phenethyl propionate (2-phenylethyl propionate)
Cloves and clove oil*	Potassium sorbate
Corn gluten meal*	Putrescent whole egg solids
Corn oil*	Rosemary and rosemary oil*
Cottonseed oil*	Sesame (includes ground sesame plant) and sesame oil*
Dried Blood	Sodium chloride (common salt) *
Eugenol	Sodium lauryl sulfate
Garlic and garlic oil*	Soybean oil
Geraniol*	Thyme and thyme oil*
Geranium oil	White pepper
Lauryl sulfate	Zinc metal strips (consisting solely of zinc metal and impurities)
Lemongrass oil	



# Pesticide Registration - Pesticide Labeling

- Labels are legal documents that provide directions for pesticide mixing, application, storage & disposal
- Users must comply with all instructions on the pesticide label & labeling
- FIFRA 2ee





# Pesticide safety label exercise

- Just about every pesticide safety lesson can be learned by reading and following pesticide labels

# Labels we will be using

USE PRECAUTIONS ON PRODUCT LABELS TO PROTECT YOURSELF AND OTHERS. ALWAYS READ THE LABEL CAREFULLY. NEVER MIX OR BLEND PRODUCTS UNLESS THE LABELS SPECIFICALLY STATE TO DO SO. ALWAYS WEAR THE PROTECTIVE EQUIPMENT SPECIFIED ON THE LABEL.

**AiPro**  
A Special English Translation for the United States, for Commercial Use Only. This is not a translation of the original label. The original label is the only one that should be used.

**Exotherm Termil**  
A Special English Translation for the United States, for Commercial Use Only. This is not a translation of the original label. The original label is the only one that should be used.

**Net Weight: 1.00 LBS (0.45 KG)**  
**NET WT 1.00 LBS (0.45 KG)**

**KEEP OUT OF REACH OF CHILDREN**  
**KEEP OUT OF REACH OF CHILDREN**  
**KEEP OUT OF REACH OF CHILDREN**

**HAZARD STATEMENT**  
**HAZARD STATEMENT**  
**HAZARD STATEMENT**

**PRECAUTIONARY STATEMENTS**  
**PRECAUTIONARY STATEMENTS**  
**PRECAUTIONARY STATEMENTS**

**HAZARDS TO HUMANS AND DOMESTIC ANIMALS**  
**HAZARDS TO HUMANS AND DOMESTIC ANIMALS**  
**HAZARDS TO HUMANS AND DOMESTIC ANIMALS**

**PERSONAL PROTECTIVE EQUIPMENT (PPE)**  
**PERSONAL PROTECTIVE EQUIPMENT (PPE)**  
**PERSONAL PROTECTIVE EQUIPMENT (PPE)**

**KEEP OUT OF REACH OF CHILDREN**  
**KEEP OUT OF REACH OF CHILDREN**  
**KEEP OUT OF REACH OF CHILDREN**

This chemical is known to cause developmental effects in certain organisms, such as fish, birds, and aquatic invertebrates. Use of this chemical in areas where such organisms are present, particularly where the water table is shallow, may result in groundwater contamination. This chemical can contaminate surface water through runoff. After using, always clean your hands and any equipment that may come into contact with this chemical. Do not use this chemical in areas where it may be applied to crops, ornamentals, or other plants. Do not use this chemical in areas where it may be applied to crops, ornamentals, or other plants. Do not use this chemical in areas where it may be applied to crops, ornamentals, or other plants.

**ENVIRONMENTAL PRECAUTIONS**  
This chemical is known to cause developmental effects in certain organisms, such as fish, birds, and aquatic invertebrates. Use of this chemical in areas where such organisms are present, particularly where the water table is shallow, may result in groundwater contamination. This chemical can contaminate surface water through runoff. After using, always clean your hands and any equipment that may come into contact with this chemical. Do not use this chemical in areas where it may be applied to crops, ornamentals, or other plants. Do not use this chemical in areas where it may be applied to crops, ornamentals, or other plants.

**APPROXIMATE USE INSTRUCTIONS**  
Use this product only in accordance with the labeling on the label. Do not use this product in a way that will cause damage to other persons or property, or in a way that will cause damage to the environment. Do not use this product in areas where it may be applied to crops, ornamentals, or other plants. Do not use this product in areas where it may be applied to crops, ornamentals, or other plants.

**KEEP OUT OF REACH OF CHILDREN**  
**KEEP OUT OF REACH OF CHILDREN**  
**KEEP OUT OF REACH OF CHILDREN**

**HAZARD STATEMENT**  
**HAZARD STATEMENT**  
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**PRECAUTIONARY STATEMENTS**  
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**HAZARDS TO HUMANS AND DOMESTIC ANIMALS**  
**HAZARDS TO HUMANS AND DOMESTIC ANIMALS**  
**HAZARDS TO HUMANS AND DOMESTIC ANIMALS**

**PERSONAL PROTECTIVE EQUIPMENT (PPE)**  
**PERSONAL PROTECTIVE EQUIPMENT (PPE)**  
**PERSONAL PROTECTIVE EQUIPMENT (PPE)**

## MARATHON® 1% G

GREENHOUSE and NURSERY INSECTICIDE

SPECIMEN LABEL

For Systemic Insect Control on Ornamentals, Fruit and Nut Trees, and Vegetable Plants in Greenhouses, Nurseries, and Interior Plantscapes

ACTIVE INGREDIENT:	Imidacloprid, 1-[6-Chloro-3-pyridinyl]methyl-1H-imidazo[4,5-b]pyridine	1.0%
OTHER INGREDIENTS:		99.0%
TOTAL:		100.0%

EPA Reg. No. 432-1329-59807

**STOP - READ THE LABEL BEFORE USE**  
**KEEP OUT OF REACH OF CHILDREN**

### CAUTION

FIRST AID	
<b>If in eyes:</b>	<ul style="list-style-type: none"> <li>Hold eye open and rinse slowly and gently with water for 15 to 20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li> <li>Call a poison control center or doctor.</li> </ul>

EPA Est. Indicated by second and third digits of the batch number on this package.  
(79)-5905-GA-1 (77)-070989-MO-001

**Personal Protective Equipment (PPE):**  
Applicators and other handlers must wear:

- Long-sleeved shirt and long pants
- Chemical-resistant gloves made of any waterproof material such as barrier laminate, butyl rubber, nitrile rubber, neoprene rubber, natural rubber, polyethylene, polyvinylchloride (PVC) or viton.
- Shoes plus socks
- Protective eye wear

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

## AZATIN® XL

BIOLOGICAL INSECTICIDE

SPECIMEN LABEL

For Indoor and Outdoor Use on Ornamentals and Horticultural Crops  
Insect Growth Regulator

ACTIVE INGREDIENT:	Azadirachtin	3.0%
OTHER INGREDIENTS:		97.0%
TOTAL:		100.0%

\*Contains 0.265 pounds (120 grams) of azadirachtin per gallon

EPA Reg. No. 70051-27-59807

EPA Est. No.: 44616-MO-1

If you have questions or comments regarding the use of this product, please call 1-800-356-4647.

**KEEP OUT OF REACH OF CHILDREN**

### CAUTION

**PRECAUTIONARY STATEMENTS**  
**HAZARDS TO HUMANS AND DOMESTIC ANIMALS**

**CAUTION:** Harmful if swallowed or inhaled. Avoid breathing vapors or spray mist. Causes moderate eye irritation. Harmful if absorbed through skin. Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco. Remove and wash contaminated clothing before reuse.

### FIRST AID

**If swallowed:** Call a poison control center or doctor immediately for treatment advice. Have person sip a glass of water if able to swallow. Do not induce vomiting unless told to do so by a poison control center or doctor. Do not give anything to an unconscious person.

**If inhaled:** Move person to fresh air. If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth, if possible. Call a poison control center or doctor for further treatment advice.

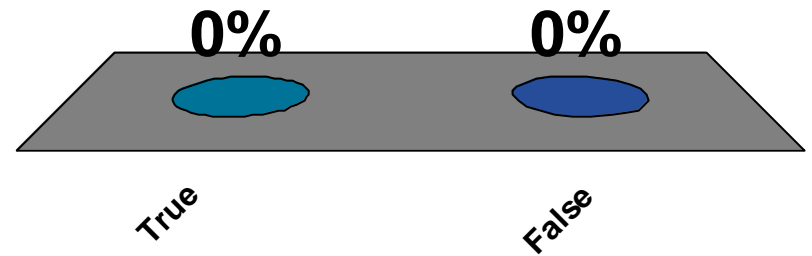
**If in eyes:** Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call a poison control center or doctor for treatment advice.

**If on skin or clothing:** Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for

No non-approval intended or implied

# Anyone can purchase or use Exotherm Termil

1. True
2. False



RESTRICTED USE PRODUCT

BASED ON POTENTIAL RISKS TO APPLICATORS AND WORKERS EXPOSED POST APPLICATION. FOR RETAIL SALE TO AND USE BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION.

**AllPro**

# Exotherm Termil

A Special Fungicide Formulated for Use on Certain Ornamentals. For Commercial Greenhouse Use Only. Use in Residential Greenhouses or Other Indoor Plant Sites is Prohibited. Treats 1000 Square Feet.

Active Ingredient	By Wt.
Chlorothalonil(Tetrachloroisophthalonitrile) .....	20%
OTHER: .....	80%
TOTAL .....	100%

EPA Reg. No. 70-223

EPA Est. No. 44616-MO-1

Net Weight: 100 GRAMS/ 3.5 OUNCES

**KEEP OUT OF REACH OF CHILDREN**

**DANGER/PELIGRO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.

(If you do not understand the label, find someone to explain it to you in detail.)



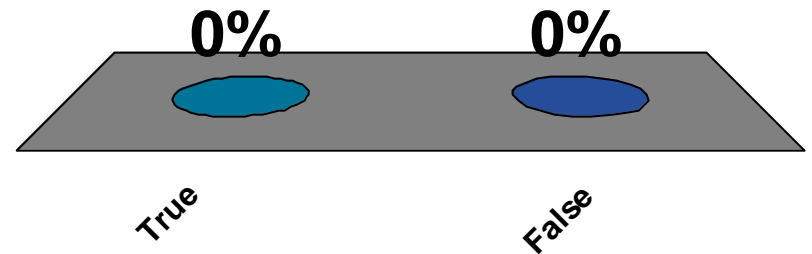
# Pesticide Classifications

- General Use – Lower risk, available over-the-counter
- Restricted Use – Higher risk, only available at licensed dealerships for purchase by licensed applicators
- Limited Use (Maine only) – Higher risk, only available by special permit



Exotherm Termil may be used in any type of greenhouse.

1. True
2. False



RESTRICTED USE PRODUCT

BASED ON POTENTIAL RISKS TO APPLICATORS AND WORKERS EXPOSED POST APPLICATION. FOR RETAIL SALE TO AND USE BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION.

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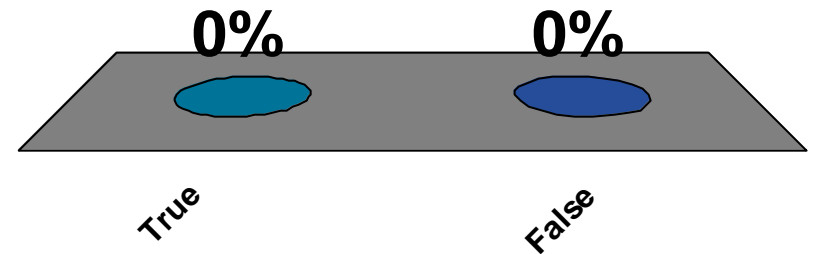
Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.

(If you do not understand the label, find someone to explain it to you in detail.)

No endorsement intended or implied

Exotherm Termil is a highly toxic pesticide.

1. True
2. False



RESTRICTED USE PRODUCT

BASED ON POTENTIAL RISKS TO APPLICATORS AND WORKERS EXPOSED POST APPLICATION. FOR RETAIL SALE TO AND USE BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION.



# Exotherm Termil

A Special Fungicide Formulated for Use on Certain Ornamentals. For Commercial Greenhouse Use Only. Use in Residential Greenhouses or Other Indoor Plant Sites is Prohibited. Treats 1000 Square Feet.

Active Ingredient	By Wt.
Chlorothalonil(Tetrachloroisophthalonitrile) .....	20%
OTHER: .....	80%
TOTAL .....	100%

EPA Reg. No. 70-223

EPA Est. No. 44616-MO-1

Net Weight: 100 GRAMS/ 3.5 OUNCES

KEEP OUT OF REACH OF CHILDREN

**DANGER/PELIGRO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.  
(If you do not understand the label, find someone to explain it to you in detail.)

### PRECAUTIONARY STATEMENTS

#### HAZARDS TO HUMANS AND DOMESTIC ANIMALS

**DANGER: Corrosive.** Causes irreversible eye damage. May be fatal if inhaled. Do not get in eyes, on skin, or on clothing. Do not breathe dust.

No endorsement intended or implied

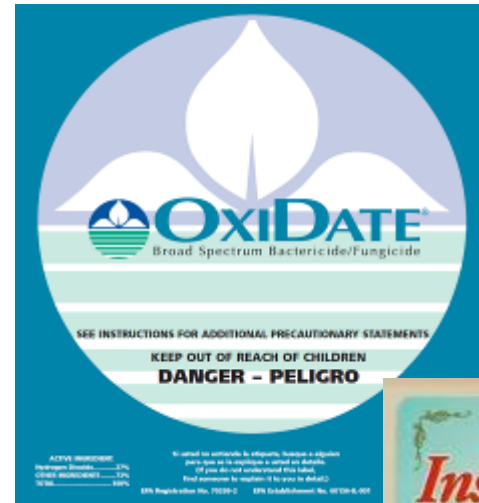
# One way to quickly assess the acute risk?

## Signal Words

Danger

Warning

Caution



**ACTIVE INGREDIENT:**  
Bacillus thuringiensis, subsp. kurstaki, strain ABTS-351, fermentation solids, spores, and insecticidal toxins ..... 54%  
**OTHER INGREDIENTS** ..... 46%  
**TOTAL** ..... 100%  
Potency: 32,050 Cabbage Looper Units (CLU) per mg (14.5 billion CLU per pound).  
The percent active ingredient does not indicate product performance and potency measurements are not federally standardized.  
EPA Reg. No. 73345-39  
EPA Est. No. 33752-14-001  
List No. 12046

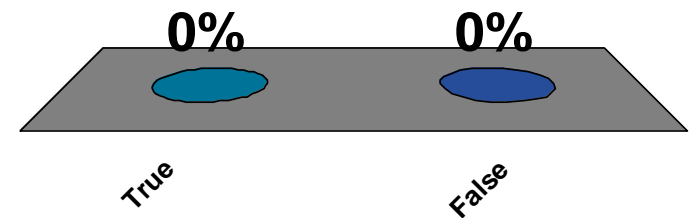


KEEP OUT OF REACH OF CHILDREN  
CAUTION

No endorsement intended or implied

If you experience red eyes, skin rash and/or lung irritation after entering an area treated with Exotherm Termil, you should see a doctor.

1. True
2. False





# Some exposures may cause chronic or allergic conditions

**KEEP OUT OF REACH OF CHILDREN**  
**DANGER/PELIGRO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.  
(If you do not understand the label, find someone to explain it to you in detail.)

FIRST AID	
<b>IF IN EYES:</b>	<ul style="list-style-type: none"><li>• Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li><li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li><li>• Call a poison control center or doctor for treatment advice.</li></ul>
<b>IF SWALLOWED:</b>	<ul style="list-style-type: none"><li>• Call a poison control center or doctor immediately for treatment advice.</li><li>• Have person sip a glass of water if able to swallow.</li><li>• Do not induce vomiting unless told to do so by a poison control center or doctor.</li><li>• Do not give anything by mouth to an unconscious person.</li></ul>
<b>IF ON SKIN OR CLOTHING:</b>	<ul style="list-style-type: none"><li>• Take off contaminated clothing.</li><li>• Rinse skin immediately with plenty of water for 15-20 minutes.</li><li>• Call a poison control center or doctor for treatment advice.</li></ul>
<b>IF INHALED:</b>	<ul style="list-style-type: none"><li>• Move person to fresh air.</li><li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth if possible.</li><li>• Call a poison control center or doctor for further treatment advice.</li></ul>
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For information on this pesticide product (including health concerns, medical emergencies, or pesticide incidents), call the National Pesticide Information Center at 1-800-858-7378.	
<b>NOTE TO USER:</b> This product may produce temporary allergic side effects characterized by redness of the eyes, mild bronchial irritation and redness or rash on exposed skin areas. Person having allergic reaction should contact a physician.	
<b>NOTE TO PHYSICIAN:</b> Persons having an allergic reaction respond to treatment with antihistamines or steroid creams and/or systemic steroids.	

No endorsement intended or implied

**RESTRICTED USE PESTICIDE**

**ACUTE TOXICITY and GROUND WATER CONTAMINATION**

For retail sale to and use only by Certified Applicators or persons under the direct supervision of a Certified Applicator and only for those uses covered by the Certified Applicator's certificate.



**TEMIK® brand 15G ALDICARB PESTICIDE**

For Control of Certain Insects, Mites, and Nematodes.

ACTIVE INGREDIENT (aldicarb [granular formulation], insecticide) ..... 15%  
INERT INGREDIENTS ..... 85%

EPA Reg. No. 264-333

EPA Est. No. 254-GA-01



KEEP OUT OF REACH OF CHILDREN

**DANGER POISON**

**PELIGRO**



=

**Toxicity**  
**X**  
**Exposure**



# All pesticides have risks!!!

■ Organic ≠ Safe



Introducing...  
**ALL-NATURAL ORGANIC  
Earth Friendly™**  
Preemergence weed control  
and fertilizer  
for lawns and gardens

■ Synthetic ≠ Highly toxic



■ Natural ≠ Safe



No endorsement intended or implied

# Even organic products are toxic!

Fig. 24 — Moser Organic Farmer & Gardener — March — May 1996

## Pesticide Issues

### Botanical Pesticides Are Not Always Safe



BY JEAN ENGLISH

A decade or two ago, the term "organic" had a different and less menacing meaning than it does now. If you substituted a naturally-derived chemical for a synthetic one, you were gardening organically. Thus, organic gardeners used the plant-derived insecticides rotenone and pyrethrin rather than the synthetically formulated insecticides Sevin and Malathion, for example. The rationale for their use was that they broke down readily — within hours or days — into harmless chemicals when exposed to sunlight.

Organic has changed over the years. The International Federation of Organic Agriculture Movements (IFOAM) now lists 12 Principal Areas of Organic Agriculture in its basic standards, and two or three of these are:

- To interact in a constructive and life-enhancing way with all natural systems and cycles;
- To encourage and enhance biological cycles within the farming systems, involving microorganisms, soil flora and fauna, plants and animals;
- Merely substituting an organic insecticide, fungicide or herbicide for a synthetic one does not automatically enhance the systems and cycles in a garden and crop, in fact, many natural systems

Some botanical insecticides are permitted for certified organic crops — but only "when used in a fast retreat and the farmer has demonstrated that other pest management practices have been tried and failed." Even then, the Certification Standards state that the "specific formulation and rate of application must be approved and recorded by the Certification Committee."

Here are some characteristics of some botanical (plant-derived) pesticides:

#### Nicotine

Nicotine, derived from Nicotiana (tobacco) and sold as Black Leaf 40, Dethal and Dethal Spray, Malathion and many other trade names, is readily absorbed through the skin and stimulates and eventually depresses the nervous system. It can cause headaches, vomiting, dizziness, confusion, weakness, a slowed reaction, rapid breathing, high blood pressure, throbbing joints, convulsed pupils, laryngeal heartburn, tremors, convulsions, depression leading to dilated pupils, slowed reflexes, rapid pulse, diarrhea, prostration, and death due to respiratory failure. In the long term, its transdermal use produces a withdrawal effect in cats and dogs. Its oral LD50 (the concentration required to kill 50% of the target organism in tests) in rats is high: 50 to 60 mg/kg body weight, and its dermal LD50 is similar in high, also 50 mg/kg. Because nicotine is water soluble and highly volatile, it can move throughout the environment and can harm organisms other than the target pest. It is of medium to moderate toxicity to birds, for example, and, long-term, is teratogenic to fish. Because of its extreme toxicity, certified organic growers are not permitted to use nicotine.

used in a garden dust or wettable powder, it can cause weakness of the mouth and tongue, nausea, vomiting, gastric pain, muscle tremors, uncoordination, irritation of the skin and respiratory tract, and/or respiratory stimulation followed by depression and death. In the long term, nicotine is a suspected carcinogen, teratogen and fetotoxic, and it can cause liver and kidney damage. Its oral LD50 in rats is 132 to 1,500 mg/kg body weight (medium to high toxicity), in the environment, rotenone has low to medium toxicity to birds, medium toxicity to mammals, and medium to high toxicity to aquatic insects.

IFOAM's certification standards do allow rotenone use, unless other methods of control will not work. The contact and residual ability of rotenone is up to the grower; its EPA registration may be lost if its producer decides that the economics of paying for new tests required by toxicologists are not viable.

#### Ryania

Ryania, from Ryania speciosa, can cause the eyes to retract into the sockets, weakness, weakness, shallow slow deep breathing, inhibition, central nervous system depression, convulsions and death due to respiratory failure. Its oral LD50 in rats is 750 to 1,000 mg/kg body weight (medium toxicity). Okawa et al. say that rotenone, the active ingredient in ryania, in 20 times more toxic to mammals than its natural insecticide, Ryania has medium toxicity to fish. Ryania is not a currently used insecticide in fish, although it is permitted by IFOAM certification standards.

#### Sabadilla

Sabadilla, from Schoenocaulon officinale, can irritate the upper respiratory tract and skin and can cause

TABLE 2-12 Original chart from Pests of the Garden and Small Farm by Mary Louise Flint Amended by Gary Fish September 1997

## Oral LD<sub>50</sub> Values for Some Pesticides Used in Small Farms and Gardens.

CHEMICAL	COMMON TRADE NAMES	ORAL LD <sub>50</sub> <sup>a</sup>	EIQ <sup>b</sup>	TYPE OF PESTICIDE
Nicotine	Black Leaf 40	55	45 <sup>1</sup>	insecticide
Rotenone*		132	33	insecticide
Bordeaux*		300	68	fungicide
Diazinon		300	43	insecticide
2,4-D		375	17	herbicide
Carbaryl	Sevin	500	21	insecticide
Acephate	Orthene	866	23	insecticide
Copper hydroxide*	Kocide	1000	33	fungicide
Copper oxychloride sulfate*	C-O-C-S	1000	33 <sup>1</sup>	fungicide
Ryania*		1200	55	insecticide
Malathion		1375	24	insecticide
Pyrethrum*		1500	18	insecticide
Propargite	Omite	2200	43	acaricide
Sabadilla*		4000	36	insecticide
Glyphosate	Round-up	4300	15	herbicide
Cryolite*	Kryocide	10,000	21	insecticide
Benomyl	Benlate	>10,000	53	fungicide
<i>Bacillus thuringiensis</i> *	Dipel	15,000	8	insecticide

NOTE: Some materials on this list may not be currently registered as pesticides or their use may be restricted.

\*asterisk indicates chemical was acceptable for organically grown produce.

<sup>a</sup>LD<sub>50</sub> indicates the amount of pesticide that will kill half of a group of test animals. These values are for milligrams of pesticide per kilogram of body weight. These figures do not provide an indication of the chronic health risk or persistence in the environment.

<sup>b</sup>EIQ or Environmental Impact Quotient is a method to calculate the environmental impact of most common fruit and vegetable pesticides (insecticides, acaricides, fungicides and herbicides) used in commercial agriculture. The values obtained from these calculations can be used to compare different pesticides and pest management programs to ultimately determine which program or pesticide is likely to have the lower environmental impact.

<sup>1</sup>Estimated EIQ.



“All substances are poisons; there is none which is not a poison. The right DOSE differentiates a poison from a remedy.”

—Paracelsus (1493-1541)

Even too much water can kill  
Over 1.5 liters/hour is deadly



Woman dies after water-drinking contest  
Water intoxication eyed in 'Hold Your Wee for a Wii' contest death

AP Associated Press  
Updated: 10:24 p.m. ET Jan 13, 2007

SACRAMENTO, Calif. - A woman who competed in a radio station's contest to see how much water she could drink without going to the bathroom died of water intoxication, the coroner's office said Saturday.

Jennifer Strange, 28, was found dead Friday in her suburban Rancho Cordova home hours after taking part in the "Hold Your Wee for a Wii" contest in which KDND 107.9 promised a Nintendo Wii video game system for the winner.

"She said to one of our supervisors that she was on her way home and her head was hurting her real bad," said Laura Rios, one of Strange's co-workers at Radiological Associates of Sacramento. "She was crying and that was the last that anyone had heard from her."

NBC VIDEO



Launch

Woman in water drinking contest dies  
Jan. 15: Sacramento Bee reporter Christina Jewett talks to MSNBC-TV's Contessa Brewer about the death of a woman who had competed in a radio station contest.

MSNBC

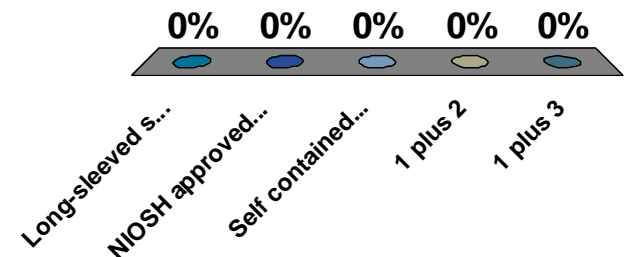
# How is risk reduced?- PPE





# What PPE is required when treating a 5,000 sq ft greenhouse with Exotherm Termil?

1. Long-sleeved shirt, shoes plus socks and chemical resistant gloves
2. NIOSH approved respirator with organic vapor cartridge
3. Self contained breathing apparatus
4. 1 plus 2
5. 1 plus 3



# How many cans are needed?

**Dosage and Method of Application:** The number and placement of the ready-to-use cans of AllPro Exotherm Termil will vary with the size of greenhouse to be treated. Each can will treat a greenhouse area of 1,000 square feet. Use the appropriate number of cans evenly spaced, down the center aisle where possible, to treat the entire greenhouse area. DO NOT place cans more than 50 feet from each other. Place can(s) just above crop foliage in center of 1,000 square feet area, or in such a manner to obtain uniform distribution of the fungicide.

## PERSONAL PROTECTION EQUIPMENT (PPE)

Some materials that are chemical resistant to this product are made of waterproof material. If you want more options, follow the instructions for category A on an EPA chemical-resistant category selection chart.

**Applicators and Other Handlers Must Wear:**

- Long-sleeved shirt and long pants,
- Shoes plus socks, and
- Chemical-resistant gloves.

In addition to the PPE listed above, handlers lighting 3 canisters or less per application and for handlers who remain in the treated area before full ventilation has taken place for 10 minutes must wear:

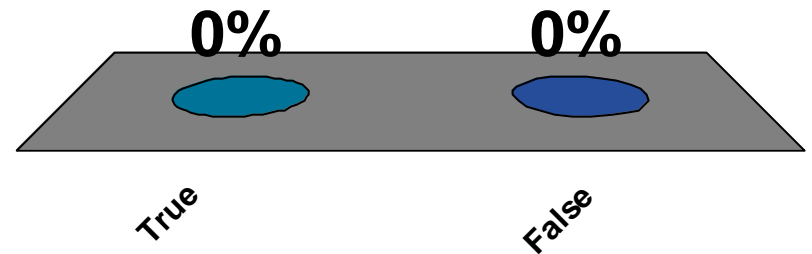
-a full face NIOSH approved respirator with an organic vapor cartridge or canister with any R,P, or HE filter.

In addition to the PPE required for applicators and other handlers, handlers lighting more than 3 canisters per application or any handler (i.e. persons entering to operate ventilation equipment) remaining in the treated area before full ventilation has taken place for longer than 10 minutes at a time must wear:

-a self-contained breathing apparatus

Exotherm Termil is okay to use in greenhouses that have permeable floors over gravel soils.

1. True
2. False





# The environmental hazards section is very important

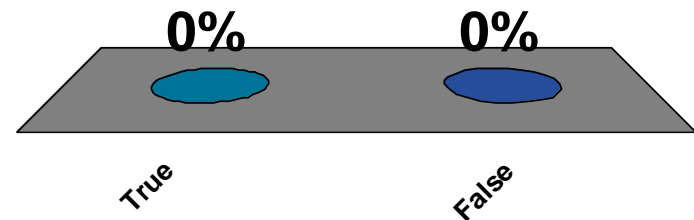
## ENVIRONMENTAL HAZARDS

This pesticide is toxic to aquatic invertebrates and wildlife. Do not apply directly to water or to areas where surface water is present or to intertidal areas below the mean high-water mark. Drift and runoff may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water when disposing of equipment washwater or rinsate.

This chemical is known to leach through soil into groundwater under certain conditions as a result of label use. Use of this chemical in areas where soils are permeable, particularly where the water table is shallow, may result in groundwater contamination. This chemical can contaminate surface water through spray drift. Under some conditions it may also have a high potential for runoff into surface water for several days to weeks after application. These include poorly draining or wet soils with readily visible slopes toward adjacent surface waters, frequently flooded areas, areas overlaying extremely shallow ground water, areas with infield canals or ditches that drain to surface water, areas not separated from adjacent surface waters with vegetated filter strips, and areas over-laying tile drainage systems that drain to surface water.

It is acceptable to re-enter a greenhouse that has been treated with Exotherm Termil **without wearing any PPE** after 24 hours.

1. True
2. False



# Agricultural use requirements

## AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE), notification to workers, and restricted-entry intervals. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

**Entry Restrictions:** Entry (including early entry that would otherwise be permitted under the WPS) by any person other than a correctly trained and equipped handler who is performing a handling task permitted by the WPS is PROHIBITED in the entire greenhouse (entire enclosed structure/building) from the start of application until one of the WPS ventilation criteria has been met. The WPS ventilation criteria include (1) ten air exchanges are completed; (2) two hours of mechanical ventilation; (3) four hours of passive ventilation; (4) eleven hours with no ventilation followed by 1 hour of mechanical ventilation; (5) eleven hours with no ventilation followed by 2 hours of passive ventilation; (6) twenty-four hours with no ventilation. After ventilation is completed, do not enter or allow worker entry into the entire enclosed area during the remainder of the 12-hour restricted interval (REI), except as allowed by the WPS. The WPS ventilation criteria and REI do not begin until application is complete. Application is complete when smoke is no longer being produced.

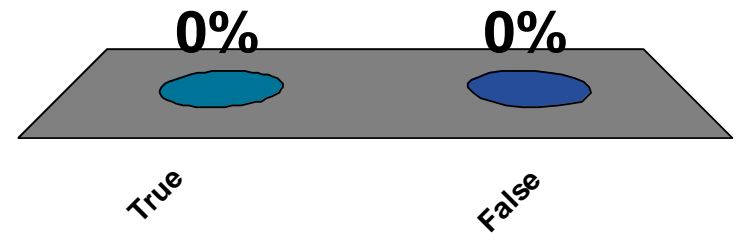
**PPE for Entry During the Restricted Entry Interval:** PPE for entry by handlers into smoke-treated greenhouses before WPS ventilation criteria have been met is listed in the "Hazards to Humans and Domestic Animals" section of this labeling. PPE for early entry into smoke-treated greenhouses after ventilation is complete, that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water is: Coveralls; Chemical-resistant gloves with laminate barrier or vitron; shoes plus socks, and protective eyewear.

No endorsement intended or implied



Greenhouse workers who enter a greenhouse which was treated with Exotherm Termil need only be notified about the application with a WPS approved warning sign posted at each entry point.

1. True
2. False





# Employee notification

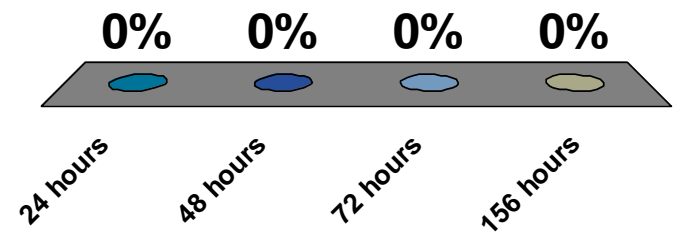
## AGRICULTURAL USE REQUIREMENTS

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**Notification:** Notify workers of the application by warning them orally and by posting warning signs outside all entrances to the greenhouse.


How long must eye flush water be available to workers who enter a greenhouse that was treated with Exotherm Termil?

1. 24 hours
2. 48 hours
3. 72 hours
4. 156 hours





# Decontamination supplies



**Special Eye Irritation Provisions:** This product is a severe eye irritant. Although the restricted-entry interval expires after 12 hours, for the next 6 1/2 days entry is permitted only when the following safety measures are provided: (1) at least one container designed specifically for flushing eyes must be available in operating condition at the WPS-required decontamination site intended for workers entering the treated area. (2) Workers must be informed, in a manner they can understand, that residues in the treated area may be highly irritating to their eyes; that they should take precautions, such as refraining from rubbing their eyes, to keep the residues out of their eyes, that if they do get residues in their eyes, they should immediately flush their eyes using the eyeflush container that is located at the decontamination site or using other readily available clean water and how to operate the eyeflush container.

# EPA Worker Protection Standard

- Information at a “central location”
- Pesticide safety training
- Personal protective equipment (PPE)
- Decontamination supplies
- Employee notification
- Emergency assistance
- Information exchange between commercial applicators and agricultural employers



**WORKER  
PROTECTION  
STANDARD**  
*Brochure #1*  
**DUTIES OF  
EMPLOYERS**



**WORKER  
PROTECTION  
STANDARD**  
*Brochure#3*  
**NURSERIES  
and  
GREENHOUSES**

<http://www.maine.gov/agriculture/pesticides/WPS/index.htm>



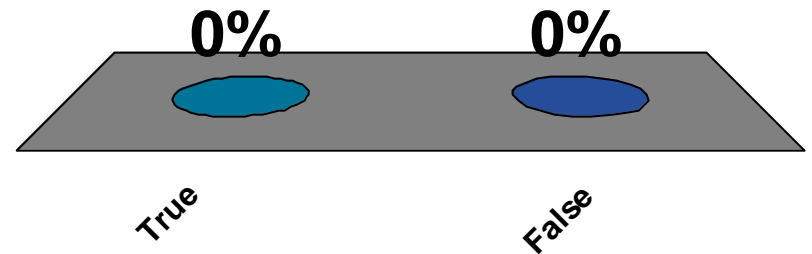
# Who can provide WPS pesticide safety training for Agricultural Workers?

- BPC or UMCE
- Licensed applicators
- Growers that have attended a “WPS Train-the Trainer” session
- Employees trained as Pesticide Handlers



Exotherm Termil residues are invisible on the plant leaves.

1. True
2. False

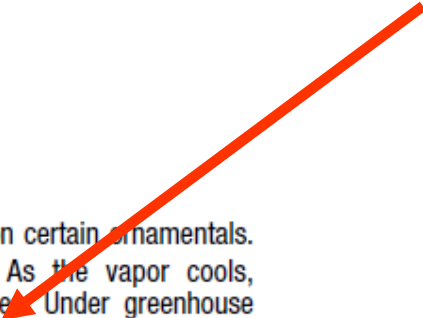




# Another reason why workers must be notified

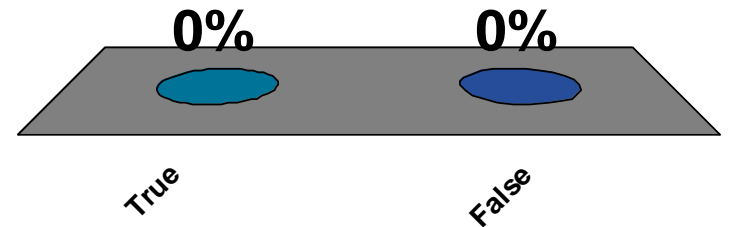
## GENERAL INFORMATION

AllPro Exotherm Termil is a protectant fungicide formulation for use on certain ornamentals. The product readily ignites to vaporize without decomposition. As the vapor cools, condensation occurs resulting in the formation of fine dust particles. Under greenhouse conditions these particles distribute to provide a thorough, but invisible covering of the plants. AllPro Exotherm Termil is recommended for use in control of blossom blight, leaf spot and stem rot caused by the fungus, *Botrytis cinerea*, on the following ornamentals:



Workers can attend to plants in a greenhouse that is attached to one being treated with Exotherm Termil as long as the adjoining doors and vents are closed.

1. True
2. False





# Reading the entire label is crucial

## GENERAL PRECAUTIONS AND RESTRICTIONS

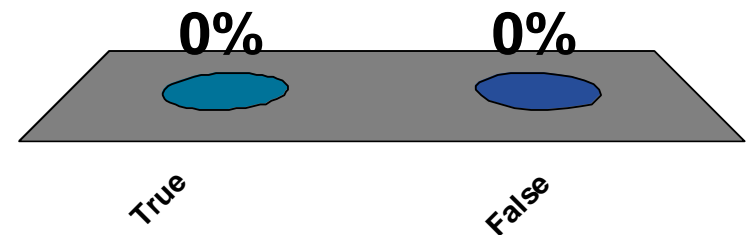
Do not apply this product to a greenhouse that is attached to another structure including another greenhouse, unless the greenhouse to be treated is entirely sealed off from the other structure.

**For use in commercial greenhouses only. Use in residential greenhouses or other indoor plant sites is prohibited.**

AllPro Exotherm Termil is recommended for the control of fungal diseases referred to by the numbers in parentheses following each type of ornamental plant.

Exotherm Termil is a good choice for control of botrytis gray mold on Poinsettia **after bract formation.**

1. True
2. False



# Greenhouse pesticides may cause phytotoxicity to certain species

AllPro Exotherm Termil is recommended for the control of fungal diseases referred to by the numbers in parentheses following each type of ornamental plant.

## FLOWERING PLANTS AND BULBS\*

African Violet(2)	Agertum(1,2)	Aphelandra(1,2)	Arabian Violet(2)
Aster (foliage only) (1)	Azalea(1,2,3)	Begonia(1)	Calceolaria(1,2)
Carnation(1,2)	Celosia(1,2)	Chrysanthemum(1,2)	Cineraria(1,2)
Crocus(1)	Cyclamen(1,2)	Daffodil(1)	Daisy(1)
Dianthus(1,2)	Delphinium (foliage only)(1)	Easter Lily(1,2)	Fuchsia(1,2)
Geranium(1,5)	Gladiolus(1,2)	Gloxinia(1,2)	Hollyhock(5)
Hydrangea (foliage only) (1,5)	Impatiens (foliage only) (1)	Iris(1,2)	Lily(1)
Lobelia (foliage only) (1)	Marigold(1)	Narcissus(1)	Nasturtium(1,2)
Pansy(1)	Petunia(1,3)	Phlox(1)	Poinsetta(A)
Primrose(1,2)	Rose(1)	Salvia(1,2)	Schizanthus(1,2)
Snapdragon(1,2)	Statice(1)	Tulip(1)	Verbena (1)
Zinnia (1,4)			

Avoid application during bloom period on plants where flower injury is unacceptable.

\*Discoloration of blooms has been noted, at least on certain varieties.

(A) Discontinue applications prior to bract formation; Phytotoxicity is possible on the bracts.

## DISEASES CONTROLLED WITH ALLPRO EXOTHERM TERMIL

### (1) Leafspots and Foliar Blights

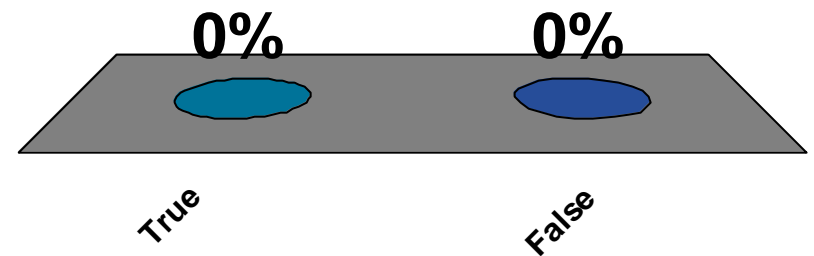
Actinopelte leafspot	Fusarium (gibberella) leafspot
Alternaria leafspot or leaf blight	Gloeosporium black leafspot
Anthraxnose (gnomonina, Glomerella)	Marssonina leafspot
Colletotrichum, Discula) blights	Monilinia blossom blight, twig blight
Black Spot (Diplocarpon)	Mycosphaerella ray blight
Botrytis blight	Mycrothecium leafspot, brown rot
Cephalosporium leafspot	Phyllosticta leafspot
Cercospora leafspot	Ramularia leafspot
Cercosporidium leafspot	Rhizoctonia web blight
Shothole (stigmata)	Scab (venturia)
Corynespora stem & Leafspot	Septoria leafspot
Curvularia leafspot	Sphaeropsis leafspot
Dactylaria leafspot	Stagonospora leaf scorch
Didymellina leafspot	Tan leafspot (Curvularia)
Drechslera (Bipolaris) leafspot, inkspot	Volutella leaf blight
Fabraea (entomosporium) leafspot	

No endorsement intended or implied



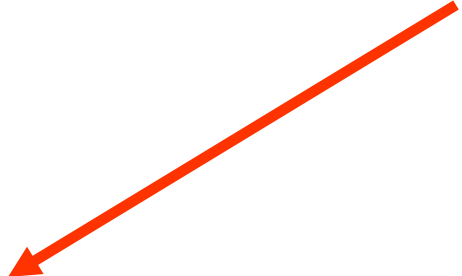
Exotherm Termil is a curative fungicide.

1. True
2. False





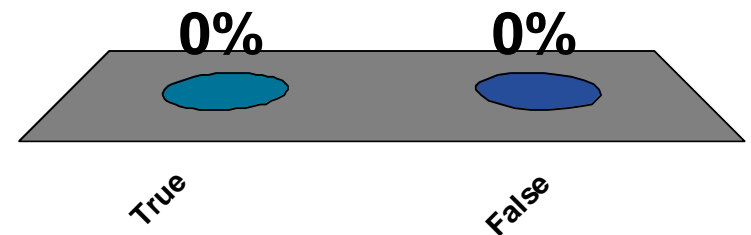
# Efficacy depends on label adherence



Application should be made prior to development of disease symptoms and continued as long as disease threatens, especially during overcast, cool and humid weather conditions. **AllPro Exotherm TermII** should be used in conjunction with good cultural practices such as; (1) proper ventilation and good air movement, (2) removal and destruction of all refuse and diseased plant parts and (3) frequent sterilization of cutting tools to avoid transmission of disease.

It is best to apply Exotherm Termil when the greenhouse temperature is below 75°F.


1. True
2. False





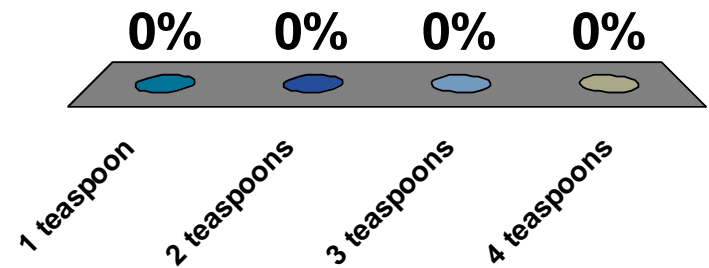
# Efficacy depends on label adherence

**REQUIRED APPLICATION PROCEDURE:** (1) All entries to the structure must be blocked/barricaded and posted with required warning signs; (2) all greenhouse vents must be closed and all circulating fans must be turned off; (3) all misting systems must be turned off, be certain all foliage and blossoms are dry before application; (4) an applicator wearing required personal protective equipment must perform the remaining tasks; (5) the applicator must remove the tops of the canisters; (6) each canister must be placed in position in the greenhouse; (7) after all canisters are set out, the canister furthest from the exit(s) to the greenhouse must be ignited first; (8) if the canisters are placed in parallel walks, rather than one central isle, an applicator must be assigned to light the canisters in each walk, so that application starts simultaneously and the applicators exit the greenhouse simultaneously; (9) each applicator ignites each canister using a hand-held propane torch (not matches or cigarette lighter) that remains lit for the entire application; (10) each applicator continues quickly to the next can until all cans are ignited, then exits greenhouse immediately; (11) entry into the greenhouse to relight cans that fail to activate the smoke generator is prohibited **If any smoke generators is activated in the greenhouse**, unless the task is performed by an applicator wearing base-line attire, chemical-resistant gloves, and an air supplying respirator equipped to supply air for the time necessary for the relighting process; (12) **DO NOT** apply when greenhouse temperature is above 75° F.



How much Azatin XL should be added to a 3 gallon hand can when treating basil plants in a greenhouse for aphids at the highest rate?

1. 1 teaspoon
2. 2 teaspoons
3. 3 teaspoons
4. 4 teaspoons



# Must never apply above the maximum labeled application rate

**Application Rates for Whitefly and Other Greenhouse (including Lath and Shade), Nursery and Interiorscape Pests**  
Apply **Azatin® XL** at the dilution rate in 100 gallons of water to assure adequate plant coverage (use 1-2 gallons of spray solution / 1,000 sq. feet).

Pests controlled by Azatin® XL	Rate of Azatin® XL per 100 gallons water	Remarks
Aphids	12 to 16 fl.oz.	Suppression and adult feeding deterrence.
Amyworms	10 to 16 fl.oz.	Foliar application to larvae.
Black Vine Weevil	21 fl. oz. / acre	Soil and foliar application to larvae.
Fungus Gnats	8 fl. oz.	Apply as soil drench for maggot control.
Leafminers	10 to 16 fl.oz.	Foliar application to larvae.
Western Flower Thrips	12 to 16 fl.oz.	Suppression of larvae and adult feeding deterrence.
Sweetpotato Whitefly	10 to 16 fl.oz.	Foliar application to larvae and nymphs.
Silverleaf Whitefly	10 to 16 fl.oz.	Foliar application to larvae and nymphs.
Greenhouse Whitefly	10 to 16 fl.oz.	Foliar application to larvae and nymphs.
Others Bagworms Cankerworms Cutworms Leafhoppers Leafrollers Sawflies Tent Caterpillars	10 to 16 fl.oz.	Foliar application to nymphs / larvae.

16 oz (1 pint)/100 gallons

No endorsement intended or implied

# Must never apply above the maximum labeled application rate

**Table 6. Equivalent quantities of liquid materials (emulsion concentrates, etc.) for various volumes of water based on pints per 100 gallons**

Water 100 gal	Recommended Rate					
	½ pt	1 pt	2 pt	3 pt	4 pt	5 pt
50 gals	4 fl oz	8 fl oz	1 pt	1½ pt	2 pt	2½ pt
25 gals	2 fl oz	4 fl oz	8 fl oz	12 fl oz	1 pt	1¼ pt
12.5 gals	1 fl oz	2 fl oz	4 fl oz	6 fl oz	8 fl oz	10 fl oz
5 gals	1 tbs	1 fl oz	2 fl oz	2½ fl oz	3 fl oz	4 fl oz
1 gal	½ tsp	1 tsp	2 tsp	3 tsp	4 tsp	5 tsp

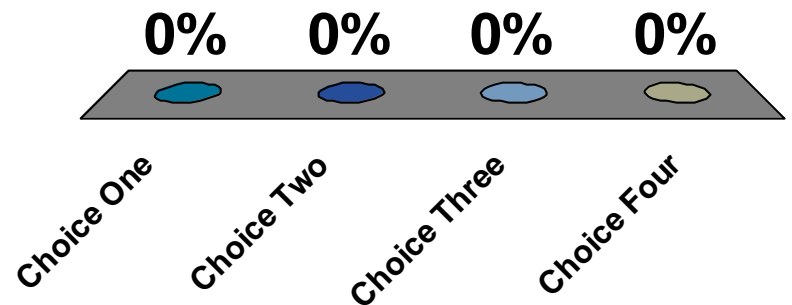
Example: Directions for use specify a rate of 1 pt per 100 gal of water. To prepare 5 gal of solution would require 3 fl oz of material.

1 teaspoon per gallon x 3 = 3 teaspoons/3 gallons



How much Marathon 1% G should you use to control aphids on one – two fennel seedlings that are in 2 inch pots at the highest rate allowed?

1. 1/8 teaspoon/pot
2. 1/4 teaspoon/pot
3. 1/3 teaspoon/pot
4. None of these



# Following footnotes is essential, sometimes even that is not enough

For systemic insect control on fruit and nut trees, and vegetable plants in greenhouses, interior plantscapes, and nurseries ornamentals grown in flats, benches, beds and containers.

PEST	USE PATTERN	DOSAGE					REMARKS
		Container	Bulk Application		Topical application		
		size (inches)	Pots/cu. yd. of mix	Bulk Rate lbs/cu.yd.	Topical Rate level teaspoon	Grams/pot	
Adelgids	Herbaceous Species including vegetable plants <sup>5</sup> (one or two plants per pot)	2.0 to 3.0	4500 to 3200	7.0 to 3.5	1/8 to 1/4	0.5 to 1.0	<b>Bulk Rate Application:</b> Mix the required amount of <b>MARATHON 1% G Greenhouse and Nursery Insecticide</b> per cubic yard of medium. Mix thoroughly before filling pots and transplanting. <b>Topical Application:</b> May be made at transplanting, repotting, or on established containerized plants. Irrigate moderately after application to move the active ingredient into the root zone. Do not allow significant leaching and runoff for at least 3 irrigations or 10 days, whichever is longer.
Aphids		3.5 to 5.0	1600 to 1300	3.9 to 3.0	1/4 to 1/3	1.0 to 1.4	
Armored scale (suppression)		5.5 to 7.0	900 to 400	1.8 to 1.2	1/3 to 1/2	1.4 to 2.0	
Fungus gnats (larvae only) <sup>1</sup>		8.0 to 10.0	200 to 160	1.0 to 0.8	1/2 to 2/3	2.0 to 2.7	
Japanese beetles (adults)		11.0 to 12.0	80 to 60	0.8 to 0.5	2/3 to 1	2.7 to 4.1	
Lacebugs	Herbaceous Species including vegetable plants <sup>5</sup> (three or more plants per pot)	2.0 to 3.0	4500 to 3200	9.0 to 7.0	1/4 to 1/3	1.0 to 1.3	
Leaf beetles (including Elm and Viburnam leaf beetles)		3.5 to 5.0	1600 to 1300	6.0 to 4.0	1/3 to 1/2	1.3 to 2.0	
Leafhoppers (including glassy-winged sharpshooter)		5.5 to 7.0	900 to 400	2.5 to 2.0	1/2 to 2/3	2.0 to 2.7	
Leafminers		8.0 to 10.0	200 to 160	1.5 to 1.0	2/3 to 1	2.7 to 4.1	
Root Mealybugs <sup>2</sup>		11.0 to 12.0	80 to 60	1.0 to 0.8	1 to 1-1/2	4.1 to 6.1	
Psyllids	Woody Perennial Species						
Root Weevil Complex							

<sup>1</sup> **Fungus gnat larvae** in the soil will be controlled by incorporation. **No adult Fungus Gnat control.** Other foliar insect control is achieved by the uptake of **MARATHON 1% G** from a healthy root system translocating the active ingredient up into the plant.

<sup>2</sup> **Root Mealybug** control will require a thorough incorporation of containerized media. Coverage is essential for control while minimizing the amount of leachate. Rate: per bulk application.

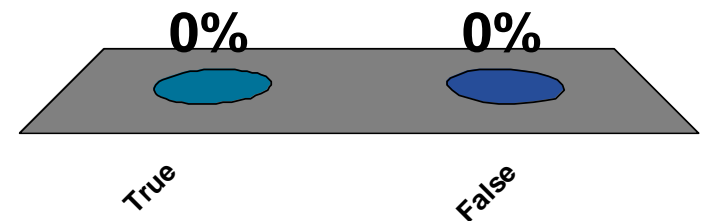
<sup>3</sup> **Citrus Root Weevil:** For use on non-bearing citrus nursery stock.

<sup>4</sup> **Thrips** suppression on foliage only. Thrips in buds and flowers will not be suppressed.

<sup>5</sup> **Note:** For use on vegetable plants intended for resale only including: Broccoli, Chinese Broccoli, Broccoli Raab, Brussels Sprouts, Cabbage, Chinese Cabbage, Cauliflower, Collards, Eggplant, Ground Cherry, Kale, Kohlrabi, Lettuce, Mustard Greens, Pepinos, Peppers, Potatoes, Rape Greens, Sorghum, Sugarbeets, Tomatillo, and Tomato.

Exotherm Termil cans should be placed on the floor no more than 50 feet apart.

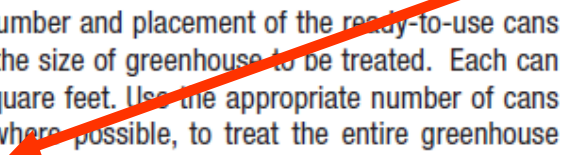
1. True
2. False





# Efficacy depends on label adherence

**Dosage and Method of Application:** The number and placement of the ready-to-use cans of AllPro Exotherm Termil will vary with the size of greenhouse to be treated. Each can will treat a greenhouse area of 1,000 square feet. Use the appropriate number of cans evenly spaced, down the center aisle where possible, to treat the entire greenhouse area. DO NOT place cans more than 50 feet from each other. Place can(s) just above crop foliage in center of 1,000 square feet area, or in such a manner to obtain uniform distribution of the fungicide.





# Pesticide Record Keeping Requirements

- *All Commercial Agricultural Producers* must keep records of *all* pesticide applications
- *Commercial Agricultural Producer* = Anyone who tries to make money producing plants, animals or animal products



# All Pesticide Applications!

- General, restricted & limited use pesticides
- Powered & non-powered applications
- Granules, liquids, foggers & aerosols
- Biological & organic pesticides
- All application sites – crops, animals & buildings
- Indoor & outdoor application sites

*If it has an EPA No. and you use it in your business, **KEEP A RECORD.***



# Why keep records

- Helps with legal disputes
- Helps prevent duplication of errors
- Helps the applicator zero in on success
- Helps with planning for pesticide purchases



# What Must be Recorded - Applicator Log Book

PESTICIDE APPLICATOR LOG							Applicator Name(s):									
Company Name:							License Number (s):									
Date	Start Time	Finish Time	Address, Town/ Field Location <sup>1</sup>	Size of Treated Area <sup>2</sup>	Sensitive Area <sup>3</sup> Yes/No	Site or Crop	Target Pest	Wind	Weather Conditions			Pesticide(s) and Diluent Applied <sup>5</sup>	Rate Description			Application Method
								Speed & Direction	Temp	Cloud Cover	Time Noted <sup>4</sup>		Undiluted	Mix	Mix Ratio	

1 - Be specific, street address, etc. Use abbreviations if needed.  
 2 - Acres or other unit of measure you normally use, eg. 1000 sq ft, tree-volume, acre-ft., linear miles, etc.  
 3 - If sensitive areas are present, a description or map is required.

4 - Note weather conditions every two hours, more often if conditions change.  
 5 - Use the pesticide key at the front of this Logbook to record pesticide brand name, active ingredient, EPA registration number and restricted entry interval or air concentration interval.  
 If you make an incorrect entry - DO NOT ERASE - cross out the error and write in the correction

NOTES:



# What must be recorded – Pesticide Key

## PESTICIDE KEY

Brand Name	Active Ingredients(s)	EPA Registration No.	Restricted Entry Interval and/or Air Concentration Level

# Other Application Record Requirements?

- Application records must be kept on file for *two years*
- Records must be available for inspection upon request
- *No reports* are required to be sent to the BPC by private growers

