

Vol. 98 No. 4 April 30, 1998

_ How to Use A Fogger In The Greenhouse

Dr. Richard G. Snyder, Vegetable Specialist

One very convenient way to apply chemical pesticides in the greenhouse is with the use of a fogger. However, calculating the amount of material to mix in the fogger is different from the amount you would use in a sprayer.

The amount of pesticide to use in the fogger is based on the greenhouse area which needs to be sprayed and the particular chemical being used.

It is not based on the volume of solution used. All insecticides and fungicides used with a fogger need to be mixed with a carrier solution which comes from the manufacturer.

To calculate the amount of material to use, first note the per acre rate that is on the label. For insect control, the following are examples of insecticides that can be used on greenhouse tomatoes:

<u>Chemical</u>	<u>Rate per acre (100 gal)</u>	<u>Conversions Needed</u>
Dibrom 60 EC	1 pint/100 gal water (ounces)	(1 pint = 16 fluid ounces)
Malathion 57 EC	1 quart/100 gal water (ounces)	(1 quart = 32 fluid ounces)
Malathion 25 WP	4 lbs/100 gal water	(4 lb = 64 ounces)
Thiodan 3 EC	1 quart/ 100 gal water (ounces)	(1 quart = 32 fluid ounces)
Thiodan 50 WP	1 lb/100 gal water	(1 lb = 16 ounces)

Next, calculate the portion of an acre that you need to spray. For example:

$$30 \times 96 \text{ greenhouse} = 2880 \text{ square feet; } 2880/43560 = 0.0661 \text{ acres}$$

$$24 \times 96 \text{ greenhouse} = 2304 \text{ square feet; } 2304/43560 = 0.0529 \text{ acres}$$

Add up the area of all of the greenhouses that need to be sprayed. For example, if 4 greenhouses of 30 X 96 dimension each need to be sprayed, this adds up to 0.2645 acres (4 X 0.0661), or about 1/4 acre.

Next, multiply the rate per acre times the fraction of an acre you need to spray. In this way, you will use enough chemical to cover that portion of an acre. So, for a 30 X 96 foot greenhouse (0.0661 acres), use the amounts of each chemical as follows:

<u>Chemical</u>	<u>Calculation</u>	<u>rate per 2880 square feet</u>
Dibrom 60 EC	16 ounces X 0.0661	1 fluid ounce
Malathion 57 EC	32 ounces X 0.0661	2 fluid ounces
Malathion 25 WP	64 ounces X 0.0661	4 ounces
Thiodan 3 EC	32 ounces X 0.0661	2 fluid ounces
Thiodan 50 WP	16 ounces X 0.0661	1 ounce

This is the amount of actual chemical to use in 1 gallon of carrier solution.

To make the carrier solution, the carrier is mixed with water as directed on the carrier label, typically in a ratio of 3 parts carrier to 2 parts water. A simple way to do this is to mix 3 quarts carrier with 2 quarts water (5 quarts total of carrier solution). The carrier/water solution can be stored. However, once mixed with the chemical, it should not be stored but should be used immediately.

The length of time to fog depends on the area of the greenhouse. The important thing is that the total amount of chemical is used up for the area for which it is intended. So, if enough chemical is mixed up to do 4 greenhouses (about 1/4 acre), it should be 1/4 used up after the first greenhouse, half used up after the second greenhouse, etc.

The fogger can also be used for mosquito control.

Follow all directions and precautions that come with the fogger, as well as clean up instructions.

Safety

- Fuel - Make sure machine is dry and no fuel is spilled in area.
- No smoking while operating or near machine.
- Shut down all electrical systems in the greenhouse before fogging.
- Always use safety equipment such as respirator, gloves, etc.
- Never operate machine with nozzle into the wind.
- Use dry fog.
- Don't let children play in fog.

Chemical formulation/carrier solution

- Use carrier in chemical solutions to get proper dispersal of fog particles.
- Follow chemical rates recommended to get good dispersal of chemical, a safe rate for plants, and safety for the operator.

Fogging time

- Follow the instructions above.

Greenhouse preparation

- Shut down electrical systems.
- Shut off exhaust fans.
- Close vents.
- Put up safety signs.

Engine start-up

- Use clean gasoline.
- Clean up machine or fuel spills.
- Make sure formulation is mixed well.
- Make sure tank cap is tight.

Suggested Maintenance/log (follow manufacturer's recommendations)

- Keep a log on the machine to keep up with run time.
- Always clean machine after every use by burning about 2 minutes of kerosene or diesel.
- Follow proper maintenance program.
- 4 hours - clean discharge tube.
- 8 hours - clean formulation filter and engine neck.
- 12 hours - clean injection nozzle and check fuel filter.

Surface Black Cutworm Control

Dr. J. Pat Harris, Extension Entomologist

Surface black cutworms are generally found attacking our sweet corn and other vegetable crops. Infestations are more common in low-lying, damp fields with higher organic matter. Larvae exhibit three different feeding habits depending on the stage of growth. Young larvae (first and second instars) feed on the leaf surface giving it a scuffed appearance. The late second and early third instars eat holes in the leaves. Larvae then move from the leaf area into the soil and begin feeding by cutting plants at the soil surface. Sometimes black cutworm damage is spotty in fields, and replanting these areas may be more economical than applying chemical controls.



For cutworm control on sweet corn, use soil surface applications of Lorsban 4 EC, or Sevin XLR, 80 WP, or 50 WP. For control on cabbage, english peas, irish potatoes, and spinach, use applications of Sevin

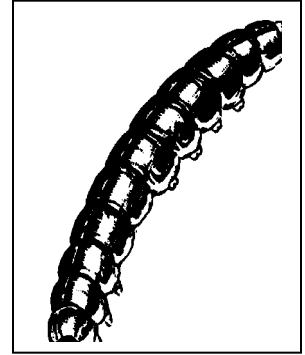
insecticide.

Cutworm activity occurs mostly in late afternoon. Therefore, time your application to coincide with their activity. Timing insecticide applications are important in your total insect program.

Aphid Control

Dr. J. Pat Harris, Extension Entomologist

Aphids (plant lice) are small, soft-bodied insects that vary in color from pink, yellow, or orange, to black. They suck plant juices causing leaves to curl and turn yellow. They may also inject poisonous saliva or disease-causing organisms during feeding. They may cause a failure of

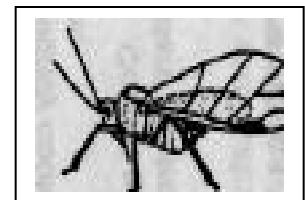


bloom set in some vegetable crops. They attack most vegetables, but tend to prefer peas, okra, mustard, turnip greens, cabbage, and tomatoes. They tend to be worse on late planted crops.

These insects secrete "honeydew" that harbors sooty mold fungus, which can further spoil vegetables. Control aphids by using spray applications of malathion, diazinon, thiodan, cygon, pyrenone, or pyrellin. Refer to individual product labels for crop registration, rates, usages, and precautions.

Update on Powdery Mildew of Greenhouse Tomatoes

Dr. Frank Killebrew, Extension Plant Pathologist



Reports from growers indicate that baking soda (1.3 lbs) + Sun Ultrafine Oil (1.3 pints) mixed with 100 gallons of water is providing acceptable powdery mildew control.

NOTE: any amount of spray mixture can be prepared provided this ratio of ingredients is used. To prepare one gallon of spray mixture, mix 1 tablespoon of baking soda and 1 tablespoon of oil with 1 gallon of water.



IMPORTANT: Do not mix insecticides, or fertilizer additives to the mixture, since this could cause plant burn.

Also, remember that if you are using a municipal water supply, it's likely that the pH of your water is already in the 8.0 range, and the addition of baking soda will boost the pH even higher. High pH leads to alkaline hydrolysis of insecticides or other fungicides added to the spray tank. So, the bottom line is, don't do it!

How can you tell if the baking soda + oil mixture is providing powdery mildew control? Within 3 or 4 days following application, the whitish patches of mildew growth on tops of leaflets should change in color to light or dark brown, indicating death of the mildew hyphae. Several applications may be needed to completely bring your mildew problem under control, but don't over-spray. Two to three applications, spaced at weekly intervals, should be sufficient.

It's also important to note that coverage of all leaflet surface area is critical to control. Use sufficient pressure to produce small

droplets, but excessive pressure will produce a "wall effect", and prevent spray penetration to foliage toward the interior of plants.

Greenhouse and Field Vegetable Disease Analysis Services Available

Dr. Frank Killebrew, Extension Plant Pathologist

Are you aware that you may have your plant disease specimens diagnosed FREE-OF-CHARGE through the Extension Plant Pathology Laboratory at Mississippi State University?

But there's a catch: While we will be pleased to assist you with plant disease diagnosis, there are a few rules which need to be followed as you prepare to send in specimens.

Accurate diagnosis of specific plant diseases depends on several factors. The specimen must arrive at the laboratory in fresh condition, but just as important, it must also be representative of the symptoms expressed in the field or greenhouse. Also, a complete description of the problem, cultural or chemical control practices followed, and other pertinent facts should be supplied. These facts will help us in providing an accurate identification of the problem and should be included on "Plant Disease Diagnosis and Insect Identification Form 205" which should accompany the specimen(s).

Copies of this form are available at your County Extension Office.

Observe these rules when collecting samples:

Leaf Spots

- Collect leaves showing all stages of infection.
- Wrap a *dry* paper towel around the leaves and place them in a plastic bag and close with a twist tie. Zip-locks work great.
- Do not add moisture to the bag.

Wilts

- Send the whole plant when possible. Collect several plants showing all stages of the disease.
- Gently remove plants from growing containers; don't pull them.

Fruits and Fleshy Organs

- Do not send specimens in advanced stages of decay. Select those showing early symptoms.
- Keep specimens cool until shipped. Wrap several sheets of *dry* paper towel around the fruit and place in a plastic bag.
- Do not add moisture.

Packaging and Mailing

- In mailing plant specimens for disease diagnosis, please wrap a *dry* paper towel around the specimen, place in a plastic bag, and close. The purpose of the paper towel is to absorb any moisture released from the specimen, thus helping to avoid specimen deterioration prior to arrival at the laboratory.
- Please fill out the "Plant Disease and Insect Identification Form 205" as

completely as possible. The extra 10 to 15 minutes it might take to fill out the form could save us an hour or more of "barking up the wrong tree" when examining the specimen in the laboratory.

- Make sure packages are wrapped in heavy paper.
- Mail early in the week and be sure to mark the package **FIRST CLASS**, so that we may receive the specimen without delay. Specimens mailed on Thursday or Friday are likely to spend the weekend in the post office and arrive in poor condition.
- More growers are sending specimens Express Mail or via other types of overnight delivery. This delivery system has worked well, since it gets specimens to the laboratory without delay, thus allowing us to provide a more rapid service for the grower.

Mail Specimens To

For regular mail

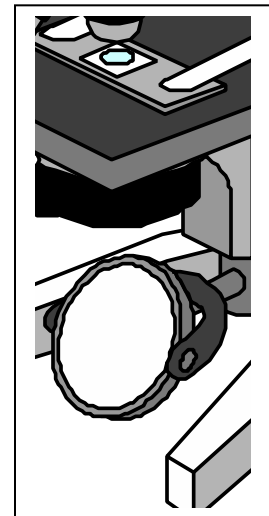
Extension Plant Pathology Lab.
Box 9655
Mississippi State, MS 39762

For Overnight Mail

Extension Plant Pathology Lab., Room 09
Bost Extension Center
Mississippi State, MS 39762

Lab Telephone No.
(601) 325-2146.

NOTE: There is no charge for analysis.



Calendar of Coming Events _

Dr. Richard G. Snyder, Vegetable Specialist

June 13 - Blueberry Jubilee; Poplarville, MS. For information, call Dr. John Braswell, Extension Fruit Specialist, at (601) 795-4525.

November 8-11 - New Crops & New Uses: Biodiversity & Agricultural Sustainability; at Hyatt Regency Hotel, Phoenix, AZ. For information, contact David Dierig, AAIC, at (602) 379-4356, ext. 265, or email to ddierig@uswcl.ars.ag.gov.

October (date to be announced) - Fall Garden Day, at Truck Crops Research Station, Crystal Springs, Mississippi. For information, call (601) 892-3731 or your local County Extension Office.

NOTE: email addresses and web pages have changed!



Dr. Richard G. Snyder, Vegetable Specialist
Truck Crops Research & Extension Center
Mississippi State University
P.O. Box 231, Crystal Springs, MS 39059
PHONE: _ (601) 892-3731
Fax: (601) 892-2056
Internet: RickS@ext.msstate.edu

Vegetable Press url:

<http://ext.msstate.edu/newsletters/vegpess/>

Greenhouse Tomato FAQ:

<http://ext.msstate.edu/anr/plantsoil/vegfruit/tomato/ghtomato/faq.html/>

Vegetable Resource Page:

<http://www2.msstate.edu/~ricks/>

Personal HomePage:

<http://www2.msstate.edu/~ricks/personal.html>

file: E:\WPFILES\VEGPRESS\NEWS0498.wpd

