

FACT SHEET

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METHODS FOR CONTROLLING PLANT FOLIAGE DISEASES

Leon R. Smith*

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The need for chemically controlling plant diseases around the home frequently raises questions about the kind of chemical best suited for the job and how, when and how often to apply. Failure to obtain satisfactory control generally is due to using improper materials or application procedures. The following information outlines a dependable approach with emphasis on methods of applying plant protectants.

Basic Suggestions for Disease Prevention

1. Know your plants, their range of soil and climate adaptation and other specific growth requirements. Plants growing under environmental stress are disease prone, often developing diseases that otherwise would not occur.
2. Establish plants highly susceptible to foliage disease in areas where air circulates freely. Avoid wetting foliage in late evening when leaves may remain wet during night hours. High humidity and surface moisture favors development of many foliage diseases.
3. Consider using disease-resistant varieties when establishing new plantings. Local nurserymen and garden enthusiasts can suggest varieties best suited to the area that offer resistance or tolerance to common foliage diseases.
4. Identify the cause of a disease problem before applying chemicals. Some foliage diseases are difficult to control except with specific fungicides. Also, certain non-pathogenic foliage abnormalities caused by insects, root

or stem diseases and mineral deficiencies are confused easily with those caused by fungi or bacteria, even though they require different treatment methods.

Professional assistance for plant disease identification is available through all county Extension offices.

5. Anticipate the occurrence of common foliage diseases and apply recommended plant protectants before damage becomes serious. Most fungicides and bactericides function primarily to prevent further disease development, with little or no ability to eradicate disease-producing organisms already established in the host plant.

Plant Protectants and Formulations

All reputable fungicide products carry label information including safety precautions, ingredients and dosage recommendations. If the material is cleared for use on edible plants or fruit trees, the label should give the minimum time limit between application and harvest. Chemical control recommendations often are made in terms of active chemical rather than trade name. When following professional advice, check the label and insist that products contain the suggested chemical ingredients. For convenience in preparing spray mixes, choose products that give dosage information in small measures such as tablespoons or ounces required per gallon of water.

Formulations—Fungicides and bactericides are marketed in essentially four forms: (1) wettable powders, (2) emulsifiable concentrates, (3) liquids in pressurized containers and (4) dusts. Each has

*Area Extension plant pathologist, Texas A&M University, Overton.

its place for use around the home. Sprays when properly applied provide more efficient and longer lasting protection than dusts, yet dusts are easy to apply and generally require less time for coverage. Pressurized cans, usually 1 pint or larger, are convenient for spraying house plants or specimen plants that require frequent treatment. To prevent foliage burn, avoid spraying in excess or too close to plants.

Wettable powder and emulsifiable concentrate formulations offer the widest variety of fungicidal materials at the greatest economy, but spraying equipment is required for application. Types of spray equipment are almost unlimited, but all require thorough cleaning after each use to guard against corrosion of metal parts and nozzle stoppage. Wettable powder formulations may cause clogging of sprayers, particularly those with a small nozzle orifice, during the spraying operation. This generally can be overcome by premixing the powder with a small amount of water to form a thin, smooth paste before mixing in the spray tank. Adding a few drops of liquid household detergent helps reduce clogging.

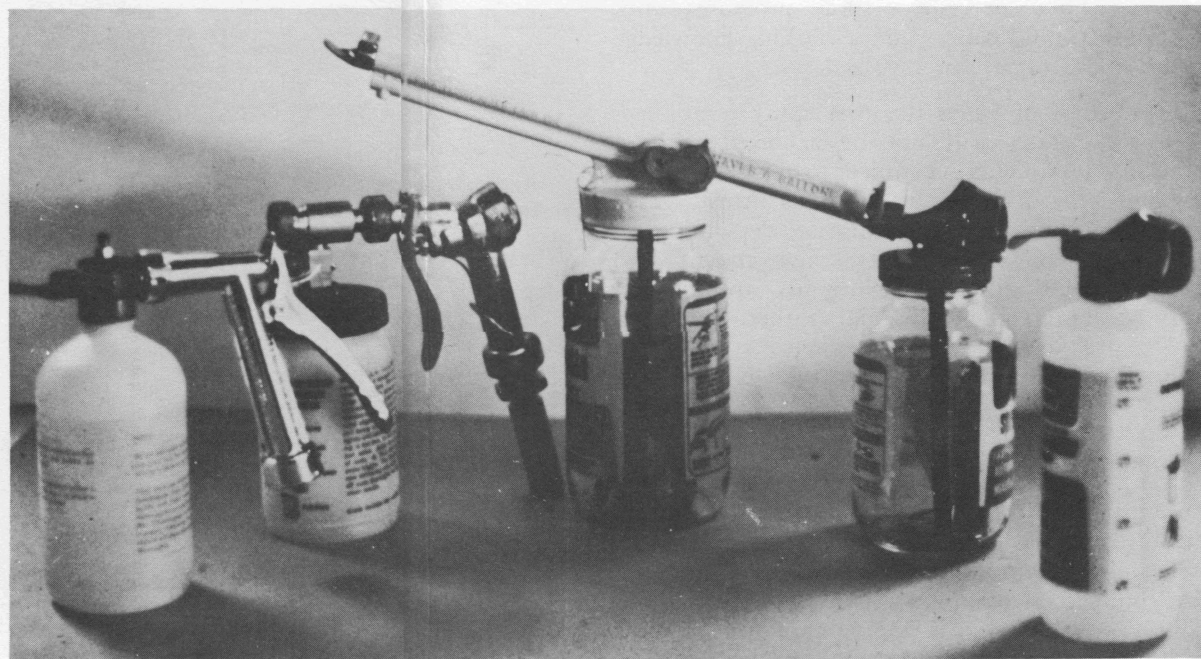
Equipment

Dusters—Dusting equipment is available in all practical sizes ranging from 1/2 to 25 pounds or more in dust capacity. Small piston or plunger-type dusters are convenient when only a few plants are involved, but for the most efficient application on a large area, continuous flow models of the bellows-operated or hand-crank, rotary type are preferred. Regardless of type, extension tubes and dust-deflecting accessories are essential for coverage of hard-to-reach places and undersurfaces of low growing plants.

For best results and maximum personal safety, dust when air is calm and plant surfaces are damp, but not wet. Dusting wet surfaces causes unsightly deposits on leaves. After dusting, remove excess dust from the hopper to prevent caking in storage and possible corrosion of metal parts.

Hose-on sprayers—Of the many different types of spray equipment on the market, the hose proportioner or hose-on sprayer probably is the most widely used around the home. Its popularity is due mostly to low cost, simplicity and versatility in applying all kinds of spray materials. This sprayer attaches to the end of a garden hose and meters the pesticide out through a siphon to mix with water from the hose. The chief difference between models of hose-on sprayers is the metering system used to regulate dosage. The simplest models have a non-adjustable nozzle and siphon system calibrated so that a set volume of water is

Selection of garden hose sprayers. Non-breakable pesticide dispensers are preferred.



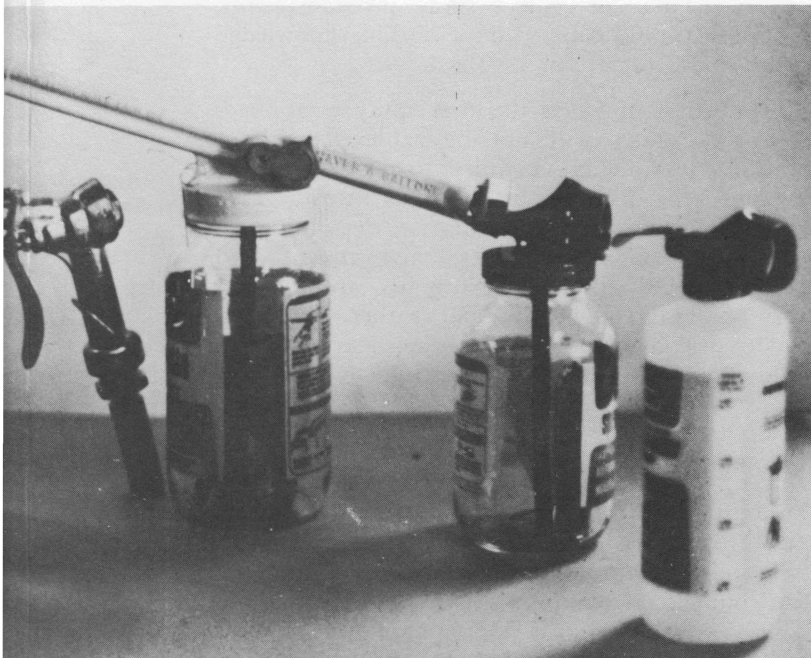
required to empty the pesticide container. These are available in sizes calibrated to deliver 3 to 15 gallons of spray for each jar of chemical used. Sprayers with the lower delivery rates are best suited for spraying plant foliage; the 15-gallon size is best for lawns. Instructions for measuring pesticide amounts generally are provided with the sprayer, but correct dosage also can be calculated by multiplying the gallon size of the sprayer by the recommended amount per gallon of water.

For example: Product label information recommends 3 tablespoons (tbsp.) of the product per gallon of water; the sprayer to be used has a 3-gallon capacity.

Therefore: 3 tbsp. \times 3 gal. = 9 tbsp. (the correct amount to place in the pesticide jar).

After placing the calculated amount of pesticide concentrate in the jar, fill the jar to capacity with water to obtain the correct spray concentration. When only a few plants are to be sprayed, smaller amounts may be prepared provided the amount of chemical and water are reduced proportionately. To prepare only one-third jar of chemical mix, measure 1/3 of 9 (3 tbsp.) into the jar and fill to one-third capacity for correct dosage. This is based on the example recommendation given above.

More versatile types of hose-on sprayers are equipped with an adjustable nozzle so that spray volume can be regulated. These work better with emulsifiable concentrates than with wettable powders. Dosage is regulated by a dial setting that meters out desired amounts of pesticide concentrate for each gallon of spray applied. Using the proper



dial setting, the amount of concentrate placed in the pesticide jar does not affect dosage; therefore, do not dilute materials in the jar with water.

Some disadvantages of hose-on sprayers are: (1) their use is limited to the area reached by hose, (2) difficulty in obtaining uniform spray coverage in large, dense shrubbery and on undersides of low-growing plants and (3) water pressure may not be sufficient to break the spray into the fine mist needed for good plant coverage.

Compressed air sprayers—These sprayers operate on air pressure (20 to 80 psi) developed by a hand-operated air pump. They will handle wettable



Medium size compressed air sprayer for general use around the home.

powders as well as liquids, provided the spray tank is agitated frequently to keep materials in suspension. Tank sizes range from 2 quarts to 5 gallons or more with the largest sizes normally mounted on wheels for handling ease. Quality features for this type of sprayer include a corrosion-resistant tank fitted with a large filler opening for cleaning ease, a pump equipped with replaceable parts and a reasonably long extension tube fitted with a rotating, adjustable nozzle.

Trombone sprayers—These also are hand-operated, but operating pressure is developed by the action of a sliding rod or piston to force liquid through the spray nozzle. Pressures up to 180 psi are possible, and liquids can be sprayed up to 30



Knapsack sprayer with hand-operated pump.

feet depending on nozzle adjustment. This sprayer most commonly is fitted with a suction hose that can be dropped into any size container of spray mix. The larger models are the best choice of all hand-operated equipment for spraying large shrubs and fruit trees.

Spraying Plant Foliage

Coverage—Disease-producing organisms, unlike other parasites, do not move around on plant surfaces. Spray depositions, therefore, must be uniform on all foliage parts including the undersides of leaves for maximum disease control. Particle size of sprays is important because materials applied in a fine mist may result in particle distribution on foliage up to 100 times greater than that obtained by coarse spray droplets. Generally, spray plants with as fine a mist as possible without sacrificing penetration ability on dense foliage. Apply enough material to reach the point of run-off.

Spray additives—Certain materials, commonly called spreaders and stickers, may be added to spray mixes to improve coverage and sticking ability of spray deposits. Spray particles when landing on glossy or waxy leaf surfaces tend to combine into large droplets and run off the plant. Rose, gardenia, holly, iris and hairy-leaved plants such as Loquat especially are hard to wet. This problem can be overcome by adding a small amount of household detergent or commercial spreader to the spray mix. Use 1/2 to 1 teaspoon per gallon. Foliage of certain plants, such as the rose, may be sensitive to detergents so use caution when adding to the spray ingredients.

Use of a sticking agent may be desirable particularly during prolonged periods of rainy weather. Several commercial stickers or spreader-sticker combinations are available, although the use of 1 tablespoon of wheat flour per gallon of spray mix may work equally as well. Before using additives, check the pesticide label to see if these materials are already in the product.

Spraying schedules—Because plant pathogens do not cause symptoms of damage until they are well established within the plant, the most effective spray program is one that starts early in the season before symptoms normally appear. This is true especially for such universal diseases as Black Spot of Rose, fire blight of pear and certain ornamentals and common leaf-spotting diseases. Each disease-producing organism, however, has some point in its life cycle when it is most susceptible to chemical

control. Thus, preventive spray programs work best when timing is based on a working knowledge of the causal organisms involved.

Regardless of when the first spray is applied, control generally will not be achieved without follow-up treatments scheduled to provide protection until the disease is no longer a threat. This period may vary with each disease, depending on stage of plant susceptibility, environment and presence of the pathogen. Normally, apply sprays every 7 to 14 days depending on weather conditions. During periods of fast growth when leaves enlarge rapidly, or during rainy periods, the 7-day schedule is most applicable.

Spraying Lawns

Control of lawn diseases requires high gallonage spray treatments for effective penetration of dense grass and thatch accumulations. Unless high pressure commercial equipment is available, the common hose-on sprayer is the best choice for this work. Dosage recommendations for lawn spraying generally are based on materials needed for each 1,000 square feet of area. Apply 15 gallons of spray mix for each 1,000 square feet. To insure proper coverage with the hose-on sprayer, stake off a 20 x 50-foot area, then practice spray with water to determine swath width and walking speed necessary to empty the pesticide container within the specified area. Use of a spreading agent or detergent in the spray mix will increase greatly spray penetration and treatment effectiveness.

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