

**P**OWDERY MILDEW (*Sphaerotheca pannosa* var. *rosae*) occurs wherever roses are grown, and is the most widespread disease of roses in California. The fungus appears as a white or gray, powdery or mealy coating on the leaves, tender stems and flower buds. It causes a distortion and discoloration as well as defoliation and reduced vigor.

The fungus produces large quantities of spores which are disseminated by the wind. Moisture is not necessary for the germination of these spores as is true with the spores of other fungi which attack roses, such as the rust and black spot organisms. With the exception of food absorbing structures (haustoria) which penetrate the epidermal cells, the fungus grows entirely on the surface of the plant where it is vulnerable to fungicides. Many chemicals will give varying degrees of mildew control but to efficiently control the disease, fungicides used must also be non-injurious to the plant.

Powdery mildew fungicides act in two ways. When applied to prevent infection, they are termed protectants. When applied to kill the fungus after infection, they are considered eradicants. In these trials some of the chemicals such as cycloheximide and dinocap, were known to act as eradicants while others, including sulfur, were known to act as protectants. Some of the chemicals probably act in both ways and no differentiation in action was recorded.

The results of two years of testing for control of this disease indicate that most of the fungicides tested give some degree

# Rose Powdery Mildew

## FUNGICIDE CONTROL TRIALS

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Outstanding fungicides for control of rose powdery mildew during two years of testing at Berkeley included sulfur, dinocap and cycloheximide.

of control. The trials were conducted at the University of California Gill Tract in Albany, an area particularly favorable for the development of this disease.

In 1961 the rose variety Night was sprayed with each of the fungicides every 10 days. In 1962 the variety Mandarin was sprayed every 14 days. Each treatment was replicated five times. Each plant was rated on three dates for mildew severity and general vigor as shown on the graphs. The mildew severity was rated from 0 (no mildew) to 10 (severe mildew). The vigor of the plants was rated

from 0 to 15, the highest vigor rating.

The outstanding fungicides in both tests were sulfur, dinocap and cycloheximide. Wepsyn, an experimental material, also performed well in 1962 tests. Folpet, reported elsewhere as effective, did not perform well in 1961 or 1962. Maneb, which is a good rust and black spot fungicide, gave fair mildew control. When combined with sulfur, maneb gave good mildew control. Sulfur was also compatible with dinocap and cycloheximide. There was a slight benefit in mildew control from the dinocap-sulfur combination.

Cycloheximide caused some slight yellowing and distortion of the foliage of Night and a noticeable yellowing of the foliage, but no distortion of the foliage of Mandarin. However, plant vigor in both varieties was not adversely affected by cycloheximide. In these tests a rigid time schedule (10 or 14-day intervals) was followed. Less yellowing would be expected where the fungicides are used less frequently (i.e. only as needed). Stendomycin salicylate also caused a slight yellowing of the foliage of Mandarin. Polybutene caused considerable leaf yellowing and defoliation of Night.

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Ingredients per 100 Gal Water as Indicated on Graphs

- C = cycloheximide (Acti-dione PM) 3 lb 2 oz (.027%)
- S = sulfur 5 lb (90%) + 8 fl oz wetting agent
- C + S = cycloheximide 3 lb 2 oz (.027%) + sulfur 3 lb (90%)
- D = dinocap (Karathane) 4 fl oz (48%) + 8 fl oz wetting agent
- D + S = dinocap (Karathane) 4 fl oz (48%) + sulfur 3 lb (90%) + 8 fl oz wetting agent
- Dwp = dinocap (Karathane) 8 oz (25%) + 8 fl oz wetting agent
- CO = copper oleate 21 fl oz (50%) + wetting agent
- M = maneb (Dithane M-22, Manzate) 1 1/2 lb (80%) + 4 fl oz wetting agent
- M + S = maneb (Dithane M-22, Manzate) 1 1/2 lb (80%) + sulfur 3 lb (90%) + 4 fl oz wetting agent
- F = folpet (Phaltan) 1 1/4 lb (75%)
- Po = polybutene (Polytrap) 1 gal (75%) + 6 fl oz wetting agent
- B = wetting agent (Triton B-1956) = phthalic glycerol alkyl resin 8 fl oz (77%)
- W = 5-amino-1-bis (dimethylamino) phosphoryl-3-phenyltriazol-1,2,4 (Wepsyn) 32 fl oz (10%)
- E = stendomycin salicylate (E-275) 1.5 liters (= 50 ppm in spray solution)
- N = sodium salt of 2-hydroxydiphenyl (Natriphene) 4 oz (100%) + 8 fl oz wetting agent
- I = lauryl isoquinolinium bromide (Isothan Q-15) 16 fl oz (20%)
- Cu = copper dianiline sulfate (Cudanso) 2 gal (1.6%)
- MM = methyl mercury dicyandiamide (Morton Soil Drench) 3.4 fl oz (2.2%) + 8 fl oz wetting agent

