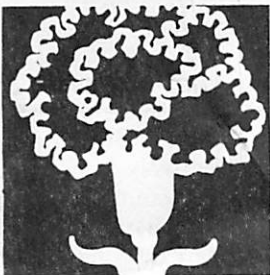


Flower & Nursery Report

for commercial growers



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SPRING and SUMMER 1983

Control of Downy Mildew and Pythium Root Rot of Snapdragon

Albert O. Paulus, Seward Besemer, and Jerry Nelson

Downy mildew of snapdragon (*Peronospora antirrhini*) and Pythium root rot (*Pythium ultimum*) caused severe economic loss to bedding and greenhouse flower growers during winter-spring 1981 season in southern California. Local and systemic infection by the downy mildew fungus produced stunted plants, shortened internodes and significantly reduced the quantity and quality of No. 1 flowers. Young leaves were dull green and a gray-to-white fungus grew on the underside of the leaves. The disease was most common during cool, wet weather. In one of the experiments on control of downy mildew the plants died and collapsed when they were about 1 foot tall. There were no symptoms of the downy mildew fungus, but the roots were dark brown in color and the water mold *Pythium ultimum* was isolated from the roots. Plants continued to collapse and die all during the harvest period. Three field plots were set up to attempt to control these diseases.

Plot No. 1, Winter 1981

A disease problem in snapdragons in a nursery in Los Angeles was diagnosed by us as downy mildew. A fungicide trial was set up to see if we could obtain control even though many of the plants were already infected. Subdue plus Manzate, Bravo 500 and Manzate fungicide sprays were applied to snapdragon plants at the six leaf stage on January 21 and February 3. Fifty plants of Floral Carpet Mixed cultivar

TABLE 1. Control of snapdragon downy mildew (*Peronospora antirrhini*) in bedding plants, Cultivar—Floral Carpet Mixed (Los Angeles County)

Treatment	Disease rating (Feb 17)	Plant height (In)
Subdue 2E, 0.75 pt + Manzate 80W, 1.5 lb	9.0 a*	3.5 a*
Bravo 500, 1 qt	2.5 b	1.7 b
Manzate 80W, 2 lb	2.0 b	1.8 b
No treatment	3.0 b	1.7 b

*Duncan's Multiple Range test (significant 1% level).
Treatments with same letter are not significantly different.

were used per replicate and the plot was replicated four times. Disease symptoms were rated on February 17 on a scale of 0 to 10, with 0 indicating severe disease with stunted plants and 10 indicating no disease. Results and rates of materials per 100 gallons of water are in table 1.

Subdue plus Manzate was the only treatment that provided effective control and gave approximately 100 percent increase in height along with excellent disease control. Bravo 500 or Manzate were ineffective.

Plot No. 2, Winter 1981

A snapdragon flower grower in San Diego county was experiencing crop and flower loss from the downy mildew fungus. Subdue plus Dithane Z-78, Subdue, and Subdue plus Manzate were applied to snapdragon plants 6 inches in height on February 9 and 18 and on March 4. Rates of materials are given per 100 gallons of water. Sprays were applied to full coverage of foliage. Seventy plants of Montana cultivar

were used in each of the four replicates. Disease symptoms were beginning to show in the plot at the start of the fungicide applications. A disease rating was made as in the previous trial and several counts were made of the No. 1 flowers obtained from each treatment. Results are in table 2.

Subdue alone or in combination with Dithane Z-78 or Manzate provided excellent disease control. Subdue alone or in combination with Dithane Z-78 produced significantly more No. 1 snapdragon flowers than Subdue plus Manzate or no treatment. We do not have any explanation for the lack of flower production in the Subdue-Manzate treatment.

Plot No. 3, Spring 1981

This trial was at the same location as trial No. 2. Spray applications of Subdue, Subdue plus Manzate or Subdue plus Dithane Z-78 were applied to snapdragon plants beginning when the plants were 4 inches tall. Sprays were applied to full coverage and applica-

TABLE 2. Control of snapdragon downy mildew on farm-grown flowers, Cultivar—Montana (San Diego County)

Treatment	Disease rating (Mar 4)	No. 1 flowers (Mar 18)
Subdue 2E, 0.75 pt + Dithane Z-78 75W, 1.5 lb	8.0 a*	49.6 a*
Subdue 2E, 0.75 pt	7.5 a	49.0 a
Subdue 2E, 0.75 pt + Manzate 80W, 1.5 lb	7.3 a	32.6 b
No treatment	3.0 b	26.6 b

Sprays applied Feb 9, 18 and Mar 4.

*Duncan's Multiple Range test (significant 5% level).

TABLE 3. Control of Pythium root rot (*Pythium ultimum*) in cut flowers, Cultivar—California (San Diego County)

Treatment	No. dead plants (Apr 21)
Subdue 2E, 0.75 pt	4.7 a*
Subdue 2E, 0.75 pt + Manzate 80W, 1.5 lb	5.5 a
Subdue 2E, 0.75 pt + Dithane Z-78 75W, 1.5 lb	11.0 a
No treatment	107.5 b

Sprays applied Feb 24, Mar 4, 18 and Apr 1.

*Duncan's Multiple Range test (significant 1% level).

tions were made on February 24, March 4 and 18, and on April 1, 1981. When plants were young some of the fungicide fell on the soil between plants. Rates of materials were per 100 gallons of water. One hundred and twenty

plants of California cultivar were used in each of four replicates. Water was applied by overhead sprinklers and results are in table 3.

Plants collapsed in some plots when the plants were about 1 foot tall

but the cause was due to infection by *Pythium ultimum* and not by the downy mildew fungus. Subdue or combinations of it with Manzate or Dithane Z-78 produced highly significant control of Pythium root rot of snapdragons.

Summary: Subdue alone or in combination with Manzate or Dithane Z-78 applied as sprays to the foliage of snapdragon plants effectively controlled downy mildew in two southern California tests. In one test Pythium root rot also was controlled by foliar sprays. It is possible that in all three tests some of the effective control could be attributed to Subdue falling on the soil where it was watered in by the irrigation system and taken up systemically in the plant.

Albert O. Paulus is Extension Plant Pathologist, and Jerry Nelson is Staff Research Associate, UC Riverside; Seward Besemer is Farm Advisor, Cooperative Extension, San Diego County.