

POWDERY MILDEW CONTROL WITH BENOMYL FOR GREENHOUSE-GROWN SNAPDRAGONS

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Powdery mildew is a common and serious disease in home garden and commercial (greenhouse and field) plantings of ornamentals. Control of powdery mildew on greenhouse snapdragons with the systemic fungicide benomyl has been successful when the fungicide has been sprayed on the foliage, drenched into the soil at three-week intervals, or mixed in the soil prior to planting. Definite systemic action has resulted either from drench applications around growing plants or mixing the fungicide in the soil prior to planting. When mixed in the soil prior to planting, the effectiveness has lasted nine and a half months following addition and about seven and a half months following planting. Benomyl (Benlate) is not yet registered for use on snapdragons or other ornamentals.

POWDERY MILDEW is frequently a serious disease of greenhouse snapdragons grown for cut flowers. Although the disease is generally more severe during the late summer and fall months, outbreaks may occur any time throughout the year. Because of the difficulty of controlling the fungus, investigations reported here were conducted with the experimental systemic fungicide, benomyl (DuPont Benlate).

Two experiments were established at Daylight Nursery, in Half Moon Bay, San

Mateo County. The snapdragons were planted in a clay loam soil in ground beds. In the first test, benomyl was sprayed on 25 plants each, of the varieties Bright Butterfly and Pink Round. Twenty-five plants each of the same varieties were also treated by adding benomyl to the soil as a drench at the rate of 2.5 gallons per 15 sq ft. All treatments were started in December, 1968 and were applied once every three weeks until mildew became severe in October, 1969. The results are given in table 1.

All treatments

All treatments were found to give complete control of mildew on both varieties. Bright Butterfly was considered slightly more susceptible than Pink Round; however Pink Round was more severely affected by the root rot pathogen, *Thielaviopsis basicola*—only eight plants survived in the untreated checks. The remaining plants were stunted and weakened and thus had lower mildew ratings. Powdery mildew fungi tend to build up more on vigorous plants than on weak plants. Benomyl applications gave some control of *Thielaviopsis* on Pink Round—25 plants remained in all the treated plots.

In another experiment designed to control root rots resulting from infection by *Thielaviopsis basicola* and *Pythium* sp., the variety Virginia was planted in beds already treated with various fungicides. The materials were mixed in the soil in December, 1968 and the plants set out in mid-February, 1969. In this test, benomyl, wherever it was used as a soil treatment, gave excellent control of powdery mildew (see table 2). The root rot on the

checks was severe and fewer plants survived, as in the experiment reported in table 1. The remaining plants were also weakened and stunted, thus accounting for their lower rating.

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TABLE 1. POWDERY MILDEW CONTROL WITH BENOMYL ON TWO SNAPDRAGON VARIETIES

Benomyl treatment	Concentration in parts per million	Disease Rating*	
		Bright Butterfly†	Pink Round‡
Spray	100	0	0
Spray	200	0	0
Spray	300	0	0
Drench	100	0	0
Drench	150	0	0
Check (no Treatment)	—	2.04	1.38‡

* Rating based as follows: 0 = No infection; 1 = 1–20% of leaves infected; 2 = 20–40% of leaves infected; 3 = 40–60% of leaves infected; 4 = 60–80% of leaves infected; 5 = 80–100% of leaves infected.

† Based on average of 25 plants.

‡ Based on average of 8 plants.

TABLE 2. POWDERY MILDEW CONTROL IN VIRGINIA VARIETY SNAPDRAGON RESULTING FROM SOIL APPLICATION OF FUNGICIDES

Treatment	Concentration in parts per million*	Disease Rating†
Check (no treatment)		1.82‡
Terrazole	50	2.57
Dexon	25	2.26
Benomyl	100	.01
Benomyl†	100	
Dexon	25	.01
Benomyl†	100	
Terrazole	50	.07

* Based on weight of moist soil at time of planting.

† Disease rating—same as table 1.

‡ Each figure represents the average of 3 replicates, each of which included 25 plants at the start of the experiment but because of the severity of root rot, some treatments had as few as 15 plants when disease severity ratings were recorded.