



Infected cauliflower plant shows wilted leaves and reddish purple discoloration of leaves and lower stem. Diseased plants can be easily pulled from the soil.



toms. Arapaho was very late in maturity, and White Contessa very early.

The most susceptible group, listed in descending order of root rot severity, included Torina, Snowflower, Monarch 73M, Self Blanche 343, and Snow Crown 345. The cultivar Type 165 was somewhat intermediate in susceptibility. Cultivars less severely affected were two selections of Snowball Y Improved, Snowball 123, and Strong Osenia.

Cultivars showing the best horticultural features for this growth period were Monarch 73M, Type 165, and Snow Crown 345, but these were in the intermediate to most susceptible ranking. Yield data were not taken.

1982 field test

In 1982, four cultivars were tested in plots 20 feet long, with one plant row per bed, hand-seeded on August 6. Cultural practices were the same as in the 1981 field test. The plots were randomized and replicated four times. In evaluations 102 days after seeding, Snow Pack, Ryan, and Antone all showed a high level of tolerance to phytophthora root rot: only 2 to 6 percent of the plants died. Snowball Y was significantly more susceptible: 33 percent of the plants died.

Metalaxyl study

Snowball Y was hand-seeded on August 6 in 20-foot-long plots, with one plant row per bed, for the study with metalaxyl. Immediately after planting, the seed was slightly covered with soil, and Ridomil 2E, at the rate of either 0.5 or 5 pounds active ingredient per acre in 100 gallons of water, was sprayed on top of the bed (seed line) in a 6-inch-wide spray zone. Similar untreated plots served as controls. The plots were randomized and replicated four times. They were sprinkler irrigated on August 7, and seedlings started emerging on August 12. None of the plants appeared to be injured by the treatments.

Fifty-seven days after seeding, phytophthora root rot was present in the untreated plots and in those treated at the 0.5 pound rate. In plots receiving the 5-pound rate, the first signs of root rot were seen on the 72nd day after seeding. The table summarizes test results.

In conclusion, these studies show that several cauliflower cultivars are tolerant of phytophthora root rot and that the fungicide metalaxyl, as applied in this test, can significantly suppress the disease.

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Managing phytophthora root rot in cauliflower

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Phytophthora root rot has been a problem for several decades in cauliflower grown in the San Francisco Bay Area. About 2,000 acres are planted to this crop annually in Alameda County, where the disease is common and often destructive, particularly in the Fremont production area.

Soils in the Fremont district are fine textured and do not drain well. The usual practice of furrow irrigation, coupled with occasionally excessive winter rainfall, frequently produces a waterlogged soil conducive to disease development.

Symptoms of the disease, caused by the fungus *Phytophthora megasperma*, in cauliflower, *Brassica oleracea* var. *botrytis* L., include a reddish purple discoloration of the main stem and older leaves, followed by wilting of the entire plant. Sometimes the stem has a purplish canker near the soil line, and discoloration of the vascular tissue and rotting of the pith are occasionally observed. Roots are rotted, and diseased plants can be easily pulled from the soil.

In December 1980 field observations, the senior author noticed considerably different reactions to phytophthora root rot among cauliflower cultivars: Ryan and Antone (selections by a local grower, which are not commercially available) appeared to be resistant; Snowball Y, Snowball B, and Elgon were very susceptible. Isolation of the causal agent was not attempted at that time.

Field tests were conducted in Alame-

da County in 1981 and 1982 to evaluate responses of cultivars to root rot and, in 1982, to test disease management with the fungicide metalaxyl (Ridomil).

1981 field test

In the 1981 test, 12 cultivars of the snowball type were hand-seeded on August 5 in plots 10 feet long, with one plant row per bed. Plots were sprinkler irrigated for emergence, furrow irrigated thereafter, and normal grower cultural practices were followed. The plots were randomized and replicated four times. Cultivars were evaluated for resistance to root rot in November 1981. November was very rainy, and the soil in the test plots was constantly waterlogged.

Root and stem tissue was taken from wilted plants, and fungus isolations were made in the laboratory.

The cultivars Arapaho and White Contessa were free of root rot symp-

Ridomil soil treatment and incidence of phytophthora root rot in cauliflower ('Snowball Y')

Treatment*	Plants		Percent loss†
	Healthy	Dead	
Ridomil 2E, 5 lb	81	4	4.7 a
Ridomil 2E, 0.5 lb	56	20	22.4 b
Nontreated	61	30	33.0 b

* Ridomil 2E, at 5 or 0.5 lb active ingredient per 100 gal water per acre, sprayed on top of bed immediately after seed were sown.

† Loss 102 days after planting. Entries followed by different letters are significantly different by Duncan's multiple range test at 5% level.