

Evaluation of fungicides to control powdery mildew on annual strawberry, 2003-04.

Bare root plants from Canada were transplanted into methyl bromide:chloropicrin (98:2) fumigated soil in plastic mulched raised beds on 21 Oct 03. The beds were 28 in wide on 4-ft centers. Each bed contained two staggered rows, 11 in apart, with plants spaced 15 in apart within rows. Transplants were irrigated by overhead sprinkler for 11 days to facilitate establishment, then irrigated and fertilized through drip tape. The experiment was conducted in four adjacent beds enclosed in a large plastic tunnel to promote disease development. Treatments were arranged in a randomized complete block design with four blocks, each in a separate bed. Each plot was 9.4 ft long and contained a total of 12 plants. Fungicide treatments were applied with a CO₂ backpack sprayer calibrated to deliver 100 gal/acre at 40 psi through a two-nozzle wand. Treatments were applied at 14-day intervals from 12 Nov to 18 Feb (8 applications). Foliar disease severity, fruit disease incidence, and yield data are reported. Foliar disease severity was evaluated on 13 Jan by selecting the most severely diseased leaf on each plant, turning it over, and estimating the area affected by characteristic necrosis, discoloration, and/or mycelial growth on a 0 to 6 rating scale (0 = completely healthy, 1 = < 1%, 2 = 1 to 10%, 3 = 11 to 25%, 4 = 26 to 50%, 6 = > 75% of the leaf surface affected). The mean rating for all 12 plants/plot was used in the analysis. Fruit were harvested twice weekly from 12 Dec to 27 Feb (23 harvests). Marketable fruit were counted and weighed. Unmarketable fruit, and fruit showing conspicuous powdery mildew growth on the achenes, were also enumerated. Fruit disease incidence was obtained by dividing the number of fruit with conspicuous powdery mildew by the total number of marketable and unmarketable fruit, expressed in percent. Each experimental variable was analyzed by a two-way analysis of variance. Treatment means were separated by Fisher's protected LSD ($P \leq 0.05$). Prior to analysis, disease incidence data were transformed by an arcsine square root function. Untransformed values are presented in the table.

The 2002-03 strawberry season was ideal for strawberry production with relatively mild weather and low rainfall. Outside the plastic tunnel, a powdery mildew epidemic developed in some areas of the farm in Nov and Dec. Several cultivars, including Camarosa, were affected. Inside the tunnel (where this experiment was carried out) powdery mildew symptoms on the foliage were light and apparently unrelated to marketable yield. However, fruit harvested from the experiment were commonly infected during the mid-Dec to mid-Feb period. All fungicide treatments reduced fruit disease incidence and increased marketable yield compared to an untreated check. Two formulations of elemental sulfur and a tank mix of Procure and thiram provided the best control of powdery mildew on the fruit. Foliar symptoms were most effectively suppressed by Procure/thiram, Quintec, and Nova.

Treatment (rate/A)	Marketable yield (lbs/A)	Foliar disease severity ^z	Fruit disease incidence (%) ^y
Microthiol Disperss 80WP (7.5 lb).....	8,700 a	1.02 b	6.6 a ^x
Sulfur 6L (8.0 pt).....	8,200 a	1.25 bc	7.4 a
Procure 50WS (8.0 oz) + Thiram 65WSB (4 lb) ^w	7,300 ab	0.52 a	8.4 a
Nova 40W (5.0 oz).....	6,900 ab	0.96 ab	18.5 b
Quintec 250SC (4.0 oz).....	6,000 b	0.94 ab	20.4 b
Procure 50WS (8.0 oz).....	7,200 b	1.19 bc	20.9 b
Procure 50WS (8.0 oz) + Captan 80WDG (1.88 lb)...	6,800 ab	0.85 b	26.5 b
Untreated check.....	2,700 c	1.58 c	64.9 c

^zDisease severity on abaxial surface of most severely diseased leaf/plant on a 0 to 6 scale with 0 = no powdery mildew symptoms and 6 = symptoms covering > 75% of leaf surface.

^yNumber of fruit with conspicuous powdery mildew growth on achenes divided by total number of marketable and unmarketable fruit, expressed as a percent.

^xIn a column, treatment means followed by the same letter are not significantly different according to Fisher's protected LSD ($P \leq 0.05$).

^wA + sign indicates a tank mix (two or more products used in combination).