

Evaluation of fungicides for control of powdery mildew (*Leveillula taurica*) on tomato, 2014

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This study was conducted in a commercial fresh market tomato field (cv. Valley Cat) located SE of Stockton, CA. Closest intersection was Kaiser and Burnham Roads, GPS coordinates were 37.891, -121.157. Closest CIMIS weather station was #70 Manteca, located 5.3 miles away.

The field was transplanted on July 9th and furrow-irrigated. Each plot consisted of a single row on 60-in centered beds and plots measured 35 feet long. The experimental design was a randomized complete block design with four replications. The trial area was managed by the grower similarly to the rest of the field except that no sulfur or mildew fungicides were applied to the test area. Experimental fungicide applications were initiated prior to disease appearance; the first application was on August 22nd, the second and third applications following on a 14-day interval on September 5th and 19th. All fungicides were applied in the equivalent of 44 gallons of water per acre with a CO₂ backpack sprayer (operating at 34 psi at the boom) and a handheld boom with four hollow cone nozzles (TXVS-18), two of which were on drops. A surfactant was added to all treatments (see footnote to Table 1 for specifics). No phytotoxicity symptoms were observed on foliage, but damage was noted on some fruit at harvest (white spotting of some fruit treated with 2x label rate of Quintec). Plots were rated for the percentage of the foliage that was symptomatic (yellow spotting, sporulation, or necrotic). Powdery mildew pressure was high in this late-season trial, with mildew severity in the non-treated plots increasing from 18% on September 18th to 63% on October 6th. The registered products Quadris Top and Priaxor performed well, limiting the disease severity to 4 to 6%. Other products which kept the disease severity below 10% were the experimental products Quintec, Rhyme, Luna Sensation, Torino and Mettle. On October 7th to 8th, a 5- by 6-ft section of each plot was hand-harvested and sorted for defects (sunburn, fruit rot and other culls). Fruit yield and cull rates were similar between treatments. Our great appreciation is extended to Mike Carr and Pacific Triple E, Grant & Richard Thompson, and PCA Bill Vignolo for their cooperation on this trial.

Table 1. Fungicide programs evaluated for tomato powdery mildew: disease severity, fruit yield and cull rate.

Product name, rate and application timings	Active ingredient(s)	FRAC grouping	Application dates			Powdery mildew severity (%)			Total fruit biomass (tons/ac)	Marketable (% fruit by wt)	Sunburn (% fruit by wt)
			22-Aug	5-Sep	19-Sep	18-Sep	22-Sep	6-Oct			
			a	b	c						
non-treated control						18.3 a	21.8 a	62.8 a	36.3	49.9	43.3
Taegro Eco 5.6 oz (abc)	0.73 oz Bacillus FZB24	biological	x	x	x	10.9 b	10.9 bc	25.3 b	38.6	55.9	39.8
GWN-10250 24 oz (abc)	unknown		x	x	x	10.9 b	10.9 bc	21.8 b	38.9	60.6	34.1
Gem 3.8 oz (abc)	1.92 oz trifloxystrobin	11	x	x	x	10.0 b	12.8 ab	15.5 bc	37.9	55.3	39.5
Torino 3.4 oz (abc)	0.36 oz cyflufenamid	U6	x	x	x	8.1 bc	8.1 bcd	15.5 bc	42.2	61.3	34.5
GWN-10250 16 oz (abc)	unknown		x	x	x	4.4 cd	9.0 bcd	13.6 bcd	30.3	46.2	46.6
Mettle 5oz (abc)	0.625 oz tetraconazole	3	x	x	x	8.1 bc	8.1 bcd	13.6 bcd	34.3	54.7	42.2
Sonata 4qt (a) f.b. Gem 3.8 oz + Sonata 2 qt (bc)	1.7 oz Bacillus QST2808 f.b. 1.92 oz trifloxystrobin + 0.85 Bacillus QST2808	11 + biological	Sonata	Sonata + Gem	Sonata + Gem	10.0 b	8.1 bcd	12.8 bcd	35.8	48.9	48.1
Rhyme 3.5 oz (abc)	0.91 oz flutrifol	3	x	x	x	6.3 bcd	8.1 bcd	9.0 cde	31.2	53.4	42.8
Priaxor 8 oz (ac) alt. Vivando 15 oz (b)	1.4 oz fluxapyroxad + 2.8 oz pyraclostrobin alt. 4.7 oz metrafenone	7 + 11 alt. U8	Priaxor	Vivando	Priaxor	6.3 bcd	6.3 bcd	9.0 cde	35.2	57.3	39.0
Mettle 6oz (abc)	0.75 oz tetraconazole	3	x	x	x	4.4 cd	6.3 bcd	8.1 cde	35.0	56.5	38.4
Torino 5 oz (abc)	0.53 oz cyflufenamid	U6	x	x	x	6.3 bcd	6.3 bcd	6.3 cde	36.8	54.3	40.6
Quadris Top 8oz (abc)	1.67 oz azoxystrobin + 1.05 oz difenoconazole	11 + 3	x	x	x	6.3 bcd	6.3 bcd	6.3 cde	33.0	49.0	45.9
Quintec 4oz (abc)	1 oz quinoxyfen	13	x	x	x	4.4 cd	4.4 cd	4.4 de	37.9	52.4	39.9
Quintec 6oz (abc)	1.5 oz quinoxyfen	13	x	x	x	4.4 cd	4.4 cd	4.4 de	35.1	55.8	37.0
Rhyme 7 oz (abc)	1.82 oz flutrifol	3	x	x	x	2.5 d	4.4 cd	4.4 de	37.6	64.0	32.3
Priaxor 8 oz (abc)	1.4 oz fluxapyroxad + 2.8 oz pyraclostrobin	7 + 11	x	x	x	2.5 d	4.4 cd	4.4 de	35.4	70.9	26.9
Luna Sensation 7 oz (abc)	1.82 oz fluopyram + 1.82 oz trifloxystrobin	7 + 11	x	x	x	4.4 cd	2.5 d	4.4 de	35.2	50.2	43.3
Rhyme 5 oz (abc)	1.3 oz flutriafol	3	x	x	x	4.4 cd	4.4 cd	2.5 e	38.4	47.3	41.4
Quintec 12oz (abc)	3 oz quinoxyfen	13	x	x	x	4.4 cd	2.5 d	2.5 e	38.8	41.4	47.0
					Mean	6.8	7.5	12.3	36.2	54.3	40.1
					P value	0.0005	0.0019	< 0.0001	NS	NS	NS

Values represent the means of four observations; means in the same column followed by the same letter are not statistically different, according to Fisher's protected least significant difference test. Most treatments included 0.25% NIS Latron B-1956 (v/v). However NIS rate for Quintec and Quadris Top was 0.125%.