Evaluation of fungicides for control of *Oidium* powdery mildew on tomato, 2015

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This study was conducted in a commercial fresh market tomato field (roma-type, cv. 'Galilea') located SE of Stockton, CA. Closest intersection is Austin and Burnham Roads, GPS coordinates are 37.902, -121.179, and soil type is a Hollenbeck silty clay. Closest CIMIS weather station is #70 Manteca, located 5.2 miles away. The field was transplanted in early July and furrow-irrigated. Each plot consisted of a single plant row per bed with 20-inch spacing within the row and 60-inch spacing between rows; plots measured 30 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 24th, the second and third applications following on an 11- to 14-day interval on September 4th and 18th. All fungicides were applied in a water volume equivalent to 35 GPA (applications A and B) or 50 GPA (application C). Applications were made with a CO_2 backpack sprayer (operating at 34 psi at the boom) and a handheld boom with one nozzle (applications A and B) to four nozzles (application C) (hollow cone TXVS-18 nozzles), 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 exposed fruit treated with Quintec). Plots were rated for the percentage of the foliage that was mildew-symptomatic (sporulation or mildew-induced necrosis). The pathogen observed in this trial was not the mildew we normally see in Central Valley tomatoes (*Leveillula taurica*), but rather an *Oidium* spp. Most products performed well, limiting the damage to below 10% of the foliage affected, while the non-treated plots averaged 45% of the foliage affected by mildew. The exceptions which did not control the disease as well were the two numbered experimental compounds. On October 6th to 7th, a 4-ft section of each plot was hand-harvested and sorted for defects (sunburn, fruit spotting and other culls). Fruit yield and cull rates were similar between treatments. Our great appreciation is extended to Mike Carr (Pacific Triple E), PCA Bill Vignolo (Simplot), and the grower for their generous cooperation.

Table 1. Impact of fungicide programs on powdery mildew severity, fruit yield and quality.

Product, rate and timings[z]	Active ingredient(s)	Disease severity (% foliage affected) 17-Sep	28-Sep	Market yield (boxes/ac)	White spotting (% of fruit by weight)
Topguard EQ 8 fl oz (ABC)	1.82 oz flutriafol + 2.47 oz azoxystrobin	1.25 a	2.50 a	2,190	0.0
Rhyme 5 fl oz (ABC)	1.3 oz flutriafol	1.88 a	2.50 a	2,055	0.0
Mettle 6.5 fl oz (ABC)	0.8125 oz tetraconazole	2.50 a	2.50 a	2,179	0.0
Rhyme 5 fl oz (w/out adjuvant) (ABC)	1.3 oz flutriafol	2.50 a	2.50 a	2,634	0.0
Quintec 4 fl oz (ABC)	1 oz quinoxyfen	2.50 a	2.50 a	2,183	1.9
Quintec 6 fl oz (ABC)	1.5 oz quinoxyfen	2.50 a	2.50 a	1,644	8.4
Quintec 12 fl oz (ABC)	3 oz quinoxyfen	2.50 a	2.50 a	2,219	8.2
Quadris Top 8 fl oz (ABC)	1.67 oz azoxystrobin + 1.05 oz difenoconazole	4.38 abc	2.50 a	2,648	0.0
Aprovia Top 13 fl oz (ABC)	1.6 oz difenoconazole + 1.1 oz benzovindiflupyr	10.00 de	2.50 a	2,302	0.0
Priaxor 8 fl oz (ABC)	1.4 oz fluxapyroxad + 2.8 oz pyraclostrobin	1.25 a	4.38 ab	2,202	0.0
Mettle 5 fl oz. (AC) alt. Torino 3.4 fl oz (B)	0.625 oz tetraconazole alt. 0.36 oz cyflufenamid	1.88 a	4.38 ab	3,041	0.0
Luna Sensation 7 fl oz (ABC)	1.82 oz fluopyram + 1.82 oz trifloxystrobin	2.50 a	4.38 ab	2,441	0.0
Fontelis 20 fl oz + Microthiol Disperss 2.5 lb (AC) alt. Quintec 6 fl oz (B)	4.2 oz penthiopyrad + 2 lb micronized sulfur alt. 1.5 oz quinoxyfen	2.50 a	4.38 ab	2,513	0.0
Torino 3.4 fl oz (ABC)	0.36 oz cyflufenamid	3.13 ab	4.38 ab	2,606	0.0
Mettle 5 fl oz (ABC)	0.625 oz tetraconazole	4.38 abc	4.38 ab	2,209	0.0
Topguard EQ 4 fl oz (ABC)	0.91 oz flutriafol + 1.235 oz azoxystrobin	4.38 abc	4.38 ab	2,083	0.0
Luna Sensation 5 fl oz (ABC)	1.3 oz fluopyram + 1.3 oz trifloxystrobin	4.38 abc	6.25 ab	2,674	0.0
Mettle 8 fl oz (ABC)	1 oz tetraconazole	6.25 abcd	6.25 ab	2,644	0.0
Fontelis 20 fl oz + Microthiol Disperss 2.5 lb (AC) alt. Quadris Top 8 fl oz (B)	4.2 oz penthiopyrad + 2 lb micronized sulfur alt. 1.67 oz azoxystrobin + 1.05 oz difenoconazole	6.25 abcd	6.25 ab	2,577	0.0
Fontelis 16 fl oz (ABC)	4 oz penthiopyrad	6.25 abcd	8.13 ab	2,696	0.0

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Fontelis 24 fl oz (ABC)	5 oz penthiopyrad	4.38	abc	9.00	ab	2,655	0.0
DPX-U7C92 4 fl oz + Fontelis 16 fl oz (ABC)	unknown + 3.3 oz penthiopyrad	6.25	abcd	9.00	ab	2,558	0.0
DPX-U7C92 4 fl oz + Fontelis 24 fl oz (ABC)	unknown + 5 oz penthiopyrad	8.13	bcde	10.88	bc	2,512	0.0
GWN-10250 16 fl oz (ABC)	unknown	8.13	bcde	18.25	cd	2,818	0.0
GWN-10250 24 fl oz (ABC)	unknown	8.13	bcde	19.00	d	2,777	0.0
DPX-U7C92 4 fl oz (ABC)	unknown	9.00	cde	24.50	d	2,048	0.0
Non-treated control 2		12.75	e	39.00	e	1,982	0.0
Non-treated control		12.75	e	50.00	f	2,163	0.0
	Mean	5.09		9.27		2,402	0.7
	LSD value	5.02		7.49		*not significant*	*not analyzed*
	P-value	*< 0.0001*		*< 0.0001*		*not significant*	*not analyzed*

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 (*P = 0.05*).

Application timings: A = August 24 B = September 4 C = September 18

Unless otherwise noted, all applications included an NIS adjuvant Latron B-1956 at a rate of 0.25% v/v (most products) or a rate of 0.125% v/v (Quintec and Quadris Top). Maintenance applications of insecticides were applied separately from the experimental fungicide applications.