Evaluation of fungicides for control of powdery mildew (*Leveillula taurica*) on tomato, 2012

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This study was conducted in a commercial fresh market Roma tomato field (cv. Galilea) located SE of Tracy, CA. The field was transplanted on July 29th and furrow-irrigated. Each plot consisted of a single row on 60-in centered beds and 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 September 12th, the second following 16 days later and the third application 14 days after the second. All fungicides were applied in the equivalent of 50 gallons of water per acre with a CO_2 backpack sprayer (operating at 34 psi at the boom) and a handheld boom with four hollow cone nozzles, two of which were on drops. A non-ionic surfactant (Latron B-1956) was added to specified treatments (Table 1). No phytotoxicity symptoms were observed on foliage, but damage was noted on some fruit at harvest. The damaged fruit exhibited white spotting on the green fruit which remained visible as the fruit began to ripen and turn color. Plots were rated for the percentage of the foliage that was necrotic using a 10-point pre-transformed rating scale. Powdery mildew pressure was low and the rating/evaluation of necrosis due to mildew was complicated by severe pressure from Verticillium wilt which caused the older leaves to become necrotic. It appeared that some of the fungicides treatments may have increased the severity of Verticillium wilt, perhaps due to plant stress. Foliar necrosis did vary between treatments, although most treatments had very similar levels. No conclusions were drawn about relative efficacy against powdery mildew. On October 31st, a 7-ft section of each plot was hand-harvested and sorted for defects (white spotting and other culls). There were a couple fruit in a non-treated plot exhibiting the white spotting, but this may have resulted from drift from an adjacent treated plot. Aside from the white fruit spotting in a few treatments, the other major cause of fruit culling was buckeye rot caused by *Phytophthora capsici*. However, the incidence of buckeye rot was too low to make any meaningful comparisons between treatments. Fruit yield was similar between treatments.

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Table 1. Fungicide programs evaluated, foliar necrosis, total fruit yield and cull rate.

Product rate and timings*	weight of active ingredient (FRAC code)	Foliar necrosis (%)** Oct 21st	Yield (T/ac)	Culls (% fruit by weight)	Fruit spotting (% fruit by weight)
Quintec 12 fl oz (ABC)*	3 oz quinoxyfen (13)	35.0 a	19.7	12.8 a	9.8
Quintec 6 fl oz (ABC)*	1.5 oz quinoxyfen (13)	24.5 a b	22.8	5.0 b c d	2.8
YT669 12 fl oz (ABC)*	3.12 oz picoxystrobin (11)	21.0 b c	23.8	2.9 b c d	0.0
Quintec 4 fl oz (ABC)*	1 oz quinoxyfen (13)	19.5 b c d	20.3	2.5 b c d	0.6
Fontelis 1.5 pt (ABC)	5 oz penthiopyrad (7)	18.3 b c d e	20.1	2.5 b c d	0.0
non-treated control		17.5 b c d e	20.3	3.5 b c d	0.1
Mettle 6 fl oz (ABC)*	0.75 oz tetraconazole (3)	15.5 b c d e	23.7	3.0 b c d	0.0
YT669 12 fl oz (ABC)	3.12 oz picoxystrobin (11)	14.4 b c d e	24.7	5.3 b c	0.0
Topguard 7 fl oz (ABC)*	0.91 oz flutriafol (3)	12.9 b c d e	23.3	3.3 b c d	0.0
YT669 6 fl oz (ABC)	1.56 oz picoxystrobin (11)	12.9 b c d e	23.5	1.5 d	0.0
Fontelis 1 pt (ABC)	3.34 oz penthiopyrad (7)	12.1 c d e	20.3	4.0 b c d	0.0
Q8Y78 18 fl oz (ABC)	1.5 oz picoxystrobin (11) + 3 oz penthiopyrad (7)	12.0 c d e	21.3	4.8 b c d	0.0
Mettle 8 fl oz (ABC)*	1 oz tetraconazole (3)	11.8 c d e	23.8	1.8 c d	0.0
Mettle 4 fl oz (ABC)*	0.5 oz tetraconazole (3)	10.1 c d e	21.0	3.5 b c d	0.0
Quadris Top 8 fl oz (ABC)*	1.67 oz azoxystrobin (11) + 1.05 oz difenoconazole (3)	9.4 c d e	17.3	6.0 b	0.0
YT669 16 fl oz 3x weekly	4.16 oz picoxystrobin (11)	8.6 d e	25.6	3.5 b c d	0.0
YT669 32 fl oz 3x weekly	8.32 oz picoxystrobin (11)	8.5 d e	24.7	3.0 b c d	0.0
Topguard 10 fl oz (ABC)*	1.3 oz flutriafol (3)	8.1 d e	20.5	3.5 b c d	0.0
Fontelis 48 fl oz 3x weekly	10 oz penthiopyrad (7)	8.1 d e	22.2	2.3 c d	0.0
Fontelis 1 pt (AC) alt. Quadris Top 8 oz (B)	3.34 oz penthiopyrad (7) alt. 1.67 oz azoxystrobin (11) + 1.05 oz difenoconazole (3)	7.4 d e	20.8	3.0 b c d	0.0
Topguard 14 fl oz (ABC)*	1.82 oz flutriafol (3)	6.6 e	21.1	2.3 c d	0.0
	Mean	*14.01*	*21.95*	*3.81*	*0.64*
	P value	*0.0032*	*NS*	*0.0002*	*NA*
	CV (%)	*61.8*	*14.74*	*68.5*	*NA*

Applications timings A = Sep 12 B = Sep 28 C = Oct 12; crop safety treatments applied weekly on Sep 28, Oct 3 & Oct 10.

*Asterisks indicate that applications of these treatments included 0.25% Latron B-1956 (v/v)

** Disease pressure from mildew was low, foliar necrosis was due primarily to Verticillium wilt, not powdery mildew.

Means in the same column followed by the same letter are not statistically different, according to Fisher's protected least significant difference test. NS = not significant