

Evaluation of products to manage bacterial canker of processing tomatoes, 2007.

The experiment was conducted at the Ohio Agricultural Research and Development Center, Snyder Farm in Wooster, OH on Wooster silt loam. Prior to planting, 300 lb/A 19-19-19 (N-P-K) plus an additional 60 lb of nitrogen were broadcast, top dressed and incorporated into the test field on 10 Jun. 'OH 9242' tomato seeds were hot water-treated (10 min pre-soak at 100°F, then treatment for 25 min at 122°F) and sown on 24 Apr into 288-cell plug trays containing Fafard seedling mix. The herbicide Tillam 6E (4 qt/A) was applied on 6 Jun. Tomato seedlings were transplanted on 11 Jun; starter fertilizer (N-P-K 9-45-15; 1.65 lb/55 gal water) was applied to the transplants. Plots were arranged in a randomized complete block design with four replications. Each plot consisted of 20 plants spaced 1 ft apart with 5 ft between rows. Treated rows were alternated with untreated border rows. Warrior with Zeon Technology (2.8 fl oz/A) was applied on 19 Jun and 9 Jul for insect pest management. Treatments were applied using a tractor-mounted CO₂-pressurized sprayer (40 psi, 69 gal/A, 3 mph) on a 7 day schedule beginning 10 Jul and ending 5 Sep for a total of nine applications. Plants were inoculated with 10⁹ CFU/fl oz (3x10⁸ CFU/ml) of a mixture of *Clavibacter michiganensis* subsp. *michiganensis* strains C290 and A226 in the evening of 12 Jul using a CO₂-pressurized backpack sprayer (40 psi, 69 gal/A). Bravo Ultrex (1 lb/A) was applied in alternation with Quadris 23F (5 fl oz/A) on 8 and 24 Aug, 6 and 21 Sep; 15 and 30 Aug and 13 Sep, respectively to control early blight. Plants were overhead irrigated with 1.0 in. water on 12, 21, and 26 Jun, 2, 9, 12, 13, Jul, and 21 Aug. The field was cultivated, hand weeded and hoed on 10 Aug. Severity of bacterial canker on foliage was evaluated on 4, 10, 16, 24, and 31 Aug and 5 Sep using a scale of 0-100 percent foliage affected. Fruits were harvested from five plants in the center of each treatment row on 12 Sep and weight of marketable fruit, fruit with anthracnose and bacterial canker, were determined. Average maximum temperatures for 11-30 Jun, Jul, Aug and 1-12 Sep were 82.3, 83.5, 83.7, and 81.3°F; average minimum temperatures were 56.0, 58.5, 62.8, and 58.4°F; and rainfall amounts were 0.45, 2.40, 10.03, and 1.71 in., respectively. Data were analyzed by ANOVA using SAS statistical software. Means were separated using Fisher's protected least significant difference test.

All of the treatments significantly suppressed bacterial canker on foliage compared to the untreated control, although the Kasumin treatments were not as effective as the standard Kocide 2000 + Manex treatment. Addition of Kocide to the Kasumin treatment increased its effectiveness against foliar bacterial canker. Only the standard Kocide 2000 + Manex treatment significantly reduced bacterial canker incidence on fruit. Both Kasumin treatments reduced the incidence of anthracnose on ripe fruit. None of the treatments increased marketable yield compared to the untreated control.

Treatment and rate (application timing ^z)	% canker ^y (5 Sep)	AUDPC ^{yx}	Canker on ripe fruit (ton/A)	Anthracnose on ripe fruit (ton/A)	Marketable yield (ton/A)
Kasumin 1 qt/50 gal H ₂ O + Kocide 2000 2 lb/A + Activator 90 0.25% v/v (1-9)	28.1 c ^w	592.2 c	11.9 a	0.2 b	3.8 b
Kasumin 1 qt/50 gal H ₂ O + Activator 90 0.25% v/v (1-9)	47.5 b	1074.7 b	13.2 a	0.2 b	3.6 b
Kocide 2000 2 lb/A + Manex 1.6 qt/A (1-9)	11.9 d	207.9 d	5.2 b	0.6 ab	9.0 a
Untreated control.....	62.5 a	1308.8 a	11.7 a	0.8 a	6.3 ab
<i>P</i> value	0.0001	0.0001	0.0043	0.1078	0.0755

^zApplication dates were: 1= 10 Jul; 2= 17 Jul; 3= 25 Jul; 4= 1 Aug; 5= 8 Aug; 6= 16 Aug; 7= 22 Aug, 8= 29 Aug, 9= 5 Sep.

^yDisease ratings and area under the disease progress curves (AUDPC) were based on the percent foliar disease.

^xArea under the disease progress curve calculated according to the formula: $\sum[(x_i+x_{i-1})/2](t_i-t_{i-1})$ where x_i is the rating at each evaluation time and (t_i-t_{i-1}) is the time between evaluations.

^wValues are the means of four replicate plots; treatments followed by the same letter within a column are not significantly different at $P \leq 0.1078$. Means were separated using Fisher's protected least significant difference test.