TOMATO (*Solanum lycopersicum* 'Peto 696')
Early blight; *Alternaria solani*
Anthracnose; *Colletotrichum coccodes*

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Evaluation of fungicides for the control of foliar and fruit diseases of processing tomatoes - 2, 2007.

The experiment was conducted at the Ohio Agricultural Research and Development Center's North Central Agricultural Research Station in Fremont, OH on Colwood fine sandy loam. Potassium (240 lb/A K_2O), phosphorous (78 lb/A P_2O_5), nitrogen (108.5 lb/A urea), and borate (7.5 lb/A) were incorporated into the test field on 8 May. The test field was cultivated and raised beds on 5 ft centers were prepared on 10 May. 'Peto 696' tomato seeds were hot water-treated (10 min pre-soak at 100° F, treatment for 25 min at 122° F) and sown on 19 Apr into 288-cell plug trays containing Metromix 360 seedling mix. On 21 May, seedlings were transplanted 1 ft apart into 25 ft long single rows. Starter fertilizer (N-P-K 10-34-0; 0.7 qt/50 gal water) was applied in the transplant water. Treatments were arranged in a randomized complete block design with four replications. Treatment rows were alternated with untreated guard rows. The herbicides Dual II Magnum (1 pt/A) and Sencor 75DF (0.33 lb/A) were applied on 15 May. The field was cultivated on 18 Jun and hand weeded and hoed on 18 Jun and 17 Jul. Insecticide Asana XL at 2.4, 3.0 and 6.0 fl oz/A was applied on 20 and 29 Jun, and 16 Jul, respectively. Pounce 3EC at 6.0 and 4.0 fl oz/A was applied on 24 Jul and 15 Aug, respectively. Treatments were applied using a tractor-mounted CO_2-pressurized sprayer (55 psi, 38.4 gal/A, 3 mph) on a 7 days schedule beginning 25 Jun and ending 31 Aug for a total of ten applications. To control bacterial disease Kocide 3000 was applied at 1.33 lb/A on 20 and 29 Jun, 9 and 24 Jul, and 15 Aug. Plants were overhead irrigated with 0.75 and 0.90 and 0.90 in. water on 13 and 27 Jun, and 10 Jul, respectively. Severity of early blight on foliage was evaluated on 11, 19, and 25 Jul and 2, 8, 15, 22, and 31 Aug using a scale of 0-100 percent foliage affected. Fruit were harvested from three plants in the center of each treatment row on 4 Sep and weights of marketable fruit, fruit with anthracnose, bacterial disease, blossom end rot, fruit with Phytophthora (buckeye rot), "other" rots (minor fungal and oomycete fruit rots), and fruit damage by insects were determined. Average maximum temperatures for 21-31 May, Jun, Jul, Aug and 1-4 Sep were 83.1, 82.8, 82.2, 82.7, and 83.1°F; average minimum temperatures were 58.9, 59.0, 59.7, 63.9, and 54.8°F; and rainfall amounts were 0.62, 0.81, 4.62, 9.33, and 0.00 in., respectively. Data were analyzed by ANOVA using SAS statistical software. Means were separated using Fisher's protected least significant difference test.

Early blight disease pressure was low early in the season due to dry conditions through the end of July. However, two significant rain events (3.3 in. on 27 Jul and 3.9 in. on 20 Aug) flooded plots and resulted in increased disease pressure and abiotic stress later in the season, potentially masking treatment effects. All of the treatments significantly reduced early blight severity compared to the untreated control. The most effective treatment against early blight was Revus Opti 3.67SC + Activator 90 alternated with Bravo Weather Stik treatment. Anthracnose incidence on fruit was high, but none of the treatments reduced anthracnose incidence compared to the untreated control. The incidence of bacterial diseases, buckeye rot, blossom end rot, minor rots and insect damage in harvested fruit was low and there were no differences among treated or untreated control plots. Total marketable yield and percent marketable fruit were increased by treatment with LEM 17SC (24 fl oz), Cabrio 20EG alt. Bravo Weather Stik, Revus Opti 3.67SC + Activator 90 alternated with Bravo Weather Stik, Revus Top 4.17SC (5.5 fl oz) + Activator 90 alternated with Bravo Weather Stick, and A13703G + Activator 90 alternated with Bravo Weather Stik.

Treatment and rate/A (application timing[z])	% early blight[y] (31 Aug)	AUDPC early blight[yx]	% anthracnose	Marketable yield (ton/A)	% marketable
LEM 17EC 9.6 fl oz (1-10)	28.1 b[w]	408.8 bc	37.4 a	11.0 cd	30.6 de
LEM 17EC 16.8 fl oz (1-10)	25.0 bc	400.9 bc	30.0 a	13.4 cd	33.7 b-e
LEM 17EC 24 fl oz (1-10)	28.1 b	450.4 b	35.8 a	16.9 a-d	38.6 b-e
LEM 17SC 9.6 fl oz (1-10)	26.9 b	427.4 bc	33.1 a	12.4 cd	32.6 cde
LEM 17SC 16.8 fl oz (1-10)	28.1 b	450.1 b	29.9 a	14.4 bcd	35.2 b-e
LEM 17SC 24 fl oz (1-10)	27.5 b	462.5 b	32.6 a	18.0 abc	44.5 a-d
Cabrio 20EG 10 oz (1,3,5,7,9) alt Bravo Weather Stik 2 pt (2,4,6,8,10)	26.3 b	430.9 bc	22.7 a	20.1 abc	44.0 a-d
Revus Opti 3.67SC 2.5 pt + Activator 90 0.125% V/V (1,3,5,7,9) alt Bravo Weather Stik 1.5 pt (2,4,6,8,10)	20.6 c	360.7 c	17.5 a	24.8 a	55.5 a
Revus Top 4.17SC 5.5 fl oz + Activator 90 0.125% V/V (1,3,5,7,9) alt Bravo Weather Stik 1.5 pt (2,4,6,8,10)	25.0 bc	422.0 bc	22.7 a	22.6 ab	48.6 ab
Revus Top 4.17SC 7 fl oz + Activator 90 0.125% V/V (1,3,5,7,9) alt Bravo Weather Stik 1.5 pt (2,4,6,8,10)	24.4 bc	424.0 bc	28.6 a	12.7 cd	35.5 b-e
A13703G 8 fl oz + Activator 90 0.125% V/V (1,3,5,7,9) alt Bravo Weather Stik 1.5 pt (2,4,6,8,10)	23.8 bc	413.6 bc	21.1 a	19.8 abc	46.7 abc
Untreated control	34.4 a	584.5 a	34.9 a	8.4 d	23.7 e
P value	0.0027	0.0035	0.1946	0.0243	0.0077

[z]Application dates were: 1= 25 Jun; 2= 2 Jul; 3= 9 Jul; 4= 16 Jul; 5= 23 Jul; 6= 30 Jul; 7= 6 Aug; 8= 14 Aug; 9= 23 Aug; 10= 31 Aug.
[y]Disease ratings and area under the disease progress curves (AUDPC) were based on the percent foliar disease.
[x]Area 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.

[w]Values are the means of four replicate plots; treatments followed by the same letter within a column are not significantly different at $P \leq 0.05$. Means were separated using Fisher's protected least significant difference test.