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, 2006.

The experiment was conducted at the Ohio Agricultural Research and Development Center's North Central Agricultural Research Station in Fremont, OH on Rimer loamy fine sand. Potassium (240 lb/A K_2O), phosphorous (92 lb/A P_2O_5) and nitrogen (105 lb/A urea) were incorporated into the test field, which was then chisel plowed on 10 Oct 05. On 18 Apr 06, the field was cultivated and raised beds on 5 ft centers were prepared. '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 11 Apr into 288-cell plug trays containing Metromix 360 seedling mix. On 23 May, seedlings were transplanted 1 ft apart into single rows 25 ft long on the beds. 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), Sencor 75DF (0.33 lb/A), and Round-Up WeatherMax (1 pt/A) were applied on 9 May. The field was cultivated on 14 and 27 Jun and hand weeded and hoed on 29 Jun. On 27 Jun, Sencor 75 DF was applied post plant at 0.33 lb/A. Insecticides Mustang Max at 3 fl oz/A and Warrior T at 3 fl oz/A were applied on 29 Jun and 31 Jul, respectively. Treatments were applied using a tractor-mounted CO_2-pressurized sprayer (55 psi, 44.9 gal/A, 3 mph) on a 7-10 day schedule beginning 26 Jun and ending 31 Aug for a total of ten applications. Severity of early blight on foliage was evaluated on 20 and 27 Jul, 3, 10, 17, 24, and 31 Aug using a modified Horsfall-Barratt rating scale. Fruit were harvested from five plants in the center of each treatment row on 6 Sep and weights of marketable fruit, green fruit, fruit with anthracnose, bacterial disease, blossom end rot and "other" rots (minor fungal and oomycete fruit rots) were determined. Average maximum temperatures for 23-31 May, Jun, Jul, Aug and 1-6 Sep were 80.8, 79.2, 84.9, 83.9, and 73.0°F; average minimum temperatures were 52.8, 52.3, 59.8, 55.7, and 49.7°F; and rainfall amounts were 1.46, 5.48, 5.07, 2.51, and 0.40 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 moderate in this trial. Based on the final (31 Aug) evaluation, all treatments significantly reduced early blight severity compared to the untreated control, although there were no differences among treatments in efficacy. Similar trends were observed in the area under the disease progress curve for early blight, but results were not statistically significant due to the exclusion of season-long data from three plots due to the occurrence of bacterial canker. There were no significant differences in total weight or percentage marketable fruit, which ranged from 52 – 69% (data not shown). The two higher rates of DPX-LEM17, Scala plus Bravo Weather Stik and Bravo Weather Stik alternated with Quadris (standard) significantly reduced anthracnose fruit rot compared to the untreated control. Bacterial fruit disease and blossom end rot incidences were low and were not affected by the treatments.

Treatment and rate/A (application time[z])	Early blight[y]		Total fruit weight (ton/A)	% anthracnose
	AUDPC[x]	% disease 31 Aug		
DPX-LEM17 SC 9.6 fl oz (1-10)	262.9 a[w]	11.0 b	41.2 a	14.0 ab
DPX-LEM17 SC 16.8 fl oz (1-10)	277.4 a	8.1 b	38.1 a	12.7 b
DPX-LEM17 SC 24.0 fl oz (1-10)	242.4 a	6.5 b	38.7 a	8.0 bc
Endura 70WDG 3 oz (1-10)	254.2 a	5.0 b	25.7 a	14.6 ab
Scala 60SC 7 fl oz + Bravo Ultrex WPG 1.8 lb (1-10)	294.9 a	4.3 b	34.5 a	7.3 bc
Bravo Weather Stik 6SC 1.7 pt (1,3,5,7,9) alt. Quadris 23F 5.6 fl oz (2,4,6,8,10)	277.4 a	3.5 b	38.3 a	4.1 c
Untreated control	528.3 a	30.4 a	31.1 a	21.4 a
P value	0.1263	0.0001	0.3889	0.0021

[z]Application timings were: 1= 26 Jun; 2= 3 Jul; 3= 11 Jul; 4= 17 Jul; 5= 24 Jul; 6= 31 Jul; 7= 7 Aug; 8= 14 Aug; 9= 21 Aug; 10= 31 Aug.
[y]Disease ratings and area under the disease progress curves (AUDPC) were based on the midpoint values of a modified Horsfall-Barratt rating scale where 1=0%, 2= 1-3%, 3= 4-6%, 4=7-12%, 5= 13-25%, 6=26-50%, 7=51-75%, 8= 76-87%, 9=88-94%, 10= 95-97%, 11=98-99% and 12= 100% early blight.
[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]Most values are the means of four replicate plots; treatments followed by the same letter within a column are not significantly different at $P \leq 0.1$. Means were separated using Fisher's protected least significant difference test.