TOMATO (*Lycopersicon esculentum* 'Mountain Spring')
Botrytis gray mold; *Botrytis cinerea*
Early blight; *Alternaria solani*
Septoria leaf spot; *Septoria lycopersici*

S. A. Miller, J. R. Mera and F. Baysal
The Ohio State University, OARDC
1680 Madison Ave.
Wooster, OH 44691

Evaluation of fungicides and application methods for disease control in high tunnel fresh market tomatoes, 2007.

The experiment was conducted under high tunnel at the Ohio Agricultural Research and Development Center, Snyder Farm in Wooster, OH on Wooster silt loam soil. On 3 Apr, the test field under high tunnel was plowed, cultivated, and beds were prepared. 'Mountain Spring' tomato seeds were hot water-treated (10 min pre-soak at 100ºF, then treatment for 25 min at 122ºF) and sown on 30 Apr into 50-cell plug trays containing Fafard seedling mix. A 30 ft by 80 ft high tunnel was positioned over the beds and anchored on 14 May. On 18 May, black plastic mulch was laid over the beds and black nursery shade cloth was laid between the beds for weed control. On 13 Jun, tomato seedlings were transplanted 1.5 ft apart into single 15 ft long rows and fertilizer (N-P-K 5-3-3; 1.6 lb/10 gal water) was applied. Treatments were arranged in a randomized complete block design with four replications. M-Trak (3qt /A) and Diatect V (6 lb/A) were applied on 20 Aug and 3 Sep; and 27 Aug and 10 Sep, respectively to control insect pests. Treatments were applied on a 7-10 day schedule beginning on 9 Jul and ending 5 Sep. Treatments were applied as drip applications through the irrigation lines using single drip irrigation tape (flow 0.5 GPM/100 ft at 12 PSI, drip emitters spaced every 12 in. (Chapin Watermatics Inc.)) with a MixRite Medicator injector (Gillis Agricultural Systems, Inc.); and as foliar applications using a CO_2-pressurized backpack sprayer (40 psi, 92.4 gal/A, 0.5 mph). Tomato plants were inoculated with (3×10^6 conidia/fl oz (3×10^5 conidia/ml) *Botrytis cinerea* strains EDG10-05 and EDG12-05 on 13 Jul and 16 Aug using a CO_2-pressurized backpack sprayer (40 psi, 92.4 gal/A). Plants were drip irrigated for one hour (108 gal water) three times per week beginning on 13 Jun and ending 19 Sep. Severity of Botrytis grey mold, early blight, and Septoria leaf spot on foliage were evaluated on 21 and 29 Aug and 5, 12, and 20 Sep; 29 Aug and 5, 12, and 20 Sep; and 5, 12, and 20 Sep, respectively using a scale of 0-100 percent foliage affected. Fruits were harvested from all plants of each treatment row on 20 Sep and weights of marketable fruit and fruit with anthracnose, Botrytis and blossom end rot were determined. Average maximum temperatures for 28-30 Jun, Jul, Aug and 1-20 Sep were 86.3, 89.8, 89.7 and 85.5ºF and average minimum temperatures were 57.3, 58.2, 63.5, and 53.9ºF. Data were analyzed by ANOVA using SAS statistical software. Means were separated using Fisher's protected least significant difference test.

Botrytis grey mold disease pressure was moderate in this trial, and only treatment with Switch 62.5WG (foliar) significantly suppressed the disease on tomato foliage. Early blight and Septoria leaf spot incidence was very low and there were no significant differences among treatments and the untreated control (data not shown). The incidence of fruit symptoms of Botrytis and anthracnose was low and there were no significant differences among treatments and the untreated control. All of the treatments except V10135 50WG (foliar) reduced the incidence of blossom end rot. Plants treated with Switch 62.5WG had higher marketable yield than the untreated control.

Treatment, rate/A and application method (timing[z])	Botrytis			Blossom end rot (ton/A)	Anthracnose (ton/A)	Marketable (ton/A)
	% disease[y] (20 Sep)	AUDPC[yx]	Diseased fruit yield (ton/A)			
V10135 400SC 12 fl oz drip (1-9).....	20.6 a[w]	458.4 a	0.32 a	0.08 b	1.5 a	41.0 abc
V10135 400SC 12 fl oz foliar (1-9).....	13.8 ab	362.2 ab	0.24 a	0.08 b	1.3 a	40.6 abc
V10135 50WG 0.75 lb foliar (1-9).....	13.1 ab	317.8 ab	0.24 a	0.16 ab	1.4 a	44.9 ab
V10135 50WG 0.75 lb drip (1-9).....	19.4 a	458.4 a	0.48 a	0.16 b	1.4 a	35.1 c
Switch 62.5WG 0.88 lb foliar (1-9).....	8.8 b	206.3 b	0.32 a	0.08 b	1.2 a	47.9 a
Untreated control.....	21.9 a	497.2 a	0.56 a	0.40 a	1.3 a	38.3 bc
P value	0.0371	0.1382	0.5545	0.0625	0.9972	0.1080

[z]Application dates were: 1= 9 Jul; 2= 16 Jul; 3= 23 Jul; 4= 30 Jul; 5= 6 Aug; 6= 13 Aug; 7= 20 Aug, 8= 29 Aug, 9= 5 Sep.
[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 $P \leq 0.1382$. Means were separated using Fisher's protected least significant difference test.