

Evaluation of biopesticides and fungicides for management of southern blight on tomato, spring 2010.

On 26 Apr 2010, plots were established at the University of Florida’s Gulf Coast Research and Education Center in Balm, FL to assess the effect of conventional and biological pesticides on southern blight of tomato. Raised beds, 300 ft in length, were prepared on 5 ft center-to-center spacing, covered with black virtually impermeable mulch and irrigated with a drip system. Beds were fumigated with Telone II (1,3 dichloropropene) during preparation for weed and nematode management. Plots consisted of 3 adjacent, 21 ft-long bed sections (63 ft total bed length) transplanted with the TYLC resistant cultivar XP-200 at 18-in spacing along beds skipping a 3 ft section between plots as a buffer. Treatments were applied on 16 Apr (seedling drench), 27 Apr, 12 May, 19 May, 26 May, 2 Jun, 9 Jun, 16 Jun, and 22 Jun (corresponding with applications 1 to 9 below). Drench treatments were applied to seedlings by hand with a watering can; approximately 1 gal per 224 seedlings. All treatments were dripped into irrigation lines through a manifold with pressurized CO₂ (20 psi). Treatments, including a non-treated control were arranged in a completely randomized block design with each treatment repeated 4 times. Plots were monitored regularly for southern blight, and rated 18 Jun, 25 Jun, and 7 Jul for disease incidence. The final disease incidence data was utilized for statistical analysis. Due to lateness of the trial, high heat, and appreciable rains, trial was terminated prematurely preventing any assessment of yield.

Weather in spring 2010 was cooler and wetter than average, keeping soil temperatures unusually low and, hence, delayed disease development. Southern blight incidence averaged 13.8% in the non-treated control plots. Disease pressure was not uniform across the trial with the lowest level of disease in block 1 and the highest in block 2. Disease data was arcsine transformed to normalize and reduce heteroscedasticity among treatments. Several biopesticide treatments, Phostrol, K-Phite, Actinovate, Serenade ASO, Mycostop, and Soilgard 12G, did not statistically differ from the non-treated control; neither did the conventional pesticide standard Terraclor (pentachloronitrobenzene). Only Convoy (flutolanil) conferred a significant level of protection against *S. rolfsii*. Data for the biopesticide Tenet was removed from the analysis due to an unacceptable level of variance; possibly due to unequal spatial distribution of *S. rolfsii* inoculum. However, while disease incidence in Block 1 and 4 for Tenet was 0, all neighboring plots exhibited disease incidence levels greater than 5% suggesting that inoculum distribution was unlikely the sole source for the variance but perhaps due to an interaction of the biological agents, *Trichoderma asperellum* (ICC 012) and *T. gamsii* (ICC 080) with other soil factors.

Treatment, rate/A (application) ^z	Southern blight incidence (%) ^y					LSMean ^x
	Block 1	Block 2	Block 3	Block 4	Avg.	
Non-treated control.....	13.9	23.8	9.5	7.9	13.8	12.6 a
Phostrol, 5 pt (2, 3).....	5.6	7.9	17.9	22.2	13.4	12.0 a
Soilgard 12 G, 6.7 g/gal (1), 5 lb (2, 3)....	18.4	15.0	5.1	10.0	12.1	11.1 a
Actinovate, 1.68g/gal (1), 5 oz (2 - 8).....	7.7	10.0	7.9	13.9	9.9	9.4 a
K-Phite, 5 qt (3, 5, 7, 9).....	5.7	17.1	7.3	10.3	10.1	9.4 a
Terraclor, 3 lb/100gal (2).....	5.6	8.8	15.0	10.3	9.9	9.3 a
Serenade ASO, 11 ml/gal (1), 2 qt (2, 3)..	2.9	19.4	11.1	7.3	10.2	8.9 a
Mycostop, 3.8 g/gal (1), 4 oz (2, 3).....	2.8	14.7	2.7	10.5	7.7	6.6 a
Convoy, 3.2 oz/gal (1), 2 pt (5, 9).....	0	0	2.5	5.1	1.9	0.9 b
Tenet, 1.5 g/gal (1), 4 lb (2, 3).....	0	20.0	16.7	0	9.2	N.D.
Block Average	6.3	13.7	9.6	9.8		P = 0.0100

^z Listed treatment rates are on a per acre basis unless noted otherwise.

^y Percent incidence of southern blight based on 42 plants per plot. Data is shown for each replicated block in the experiment, along with the non-transformed average disease incidence.

^x Back transformed, least significant means (LSMean) followed by the same letter are not significantly different, based on transformed data [*arc-sine* (\sqrt{x}); where x = disease incidence] at P = 0.05. Data for Tenet was excluded from the final statistical analysis due to an unacceptable level of variance. N.D. = not determined.