

Evaluation of Procidic and Simplex alone and integrated with Actigard for the management of bacterial spot of tomato, fall 2012.

On 18 Sep 2012, plots were established at the University of Florida's Gulf Coast Research and Education Center in Balm, FL to assess the effect of foliar and drip applications of Actigard and other plant defense elicitors on the control of bacterial spot of tomato. Plots consisted of 25 ft-long bed sections within 300 ft-long, raised beds with 5 ft center-to-center bed spacing. Beds were covered with black virtually impermeable mulch and irrigated with a drip system. Tomato seedlings (cv Charger) were transplanted at 18-in spacing along beds skipping a 4-ft alley between plots as a buffer. Treatments, including a non-treated and a water-treated control, were arranged in a completely randomized design with each treatment repeated six times. The treatments were either drip- or foliar-applied on 26 Sep, 3 Oct, 10 Oct, 17 Oct, 24 Oct, 31 Oct, 8 Nov, and 16 Nov (corresponding with applications 1 to 8 below). Foliar treatments were applied with a CO₂ back pack sprayer calibrated to deliver 60 (apps. 1,2,3), 90 gal/A (apps. 4,5,6), and 120 gal/A (apps. 7,8) at 40 psi. Plots were inoculated on 5 Oct with a suspension (10⁶ cfu/ml) of *Xanthomonas perforans* race 4 using a backpack sprayer. Plots were monitored regularly for bacterial spot, and rated on 15 Oct, 12 Nov, and 4 Dec after disease reached appreciable levels. Marketable yield was assessed from two separate hand harvests on 29 Nov and 19 Dec. A preventative program that included alternating applications of Inspire Super (20 fl oz/A), Endura (12.5 oz/A), and Bravo WeatherStik (1.5 pt/A) was established across the trial to minimize the impact of early blight and target spot.

Treatment, Rate/100 gal (application)	Bacterial Spot Severity (%):			Harvested Diseased Fruit:		
	15-Oct	12-Nov	4-Dec	AUDPC	No.	Weight (lb)
Cuprofix 40D, 3 lb (1-9); Penncozeb 75DF, 1.25 lb (1-9).....	10.8	62.5 ab	81.5 ab	2726 b-e	0.8	1.1
Non-treated Control.....	15.4	42.6 c	71.4 bcd	2356 efg	1.0	1.0
Actigard, 0.5 oz (1-9).....	18.5	31.4 d	62.5 d	2003 g	1.3	1.3
Actigard, 0.5 oz (1,3,5,7,9).....	18.5	55.0 b	76.3 abc	2714 cde	0.2	0.7
Water-treated Control.....	18.5	62.5 ab	76.3 abc	2891 bc	1.1	0.8
Procidic, 25 floz (1-9).....	22.0	76.3 a	82.8 ab	3515 a	0.6	0.9
Procidic, 50 floz (1-9).....	26.3	62.5 ab	76.3 abc	3168 abc	0.7	0.7
Procidic, 75 floz (1-9).....	31.4	62.5 ab	66.8 cd	3216 ab	2.7	1.6
Procidic, 100 floz (1-9).....	26.3	62.5 ab	76.3 abc	3168 abc	1.2	0.6
Procidic (2 x), 25 floz (1-9).....	18.4	62.5 ab	76.3 abc	2946 bc	1.1	0.9
Procidic (2 x), 50 floz (1-9).....	18.5	62.5 ab	71.4 bcd	2840 bcd	1.2	1.1
Procidic (2 x), 75 floz (1-9).....	18.5	62.5 ab	76.3 abc	2891 bc	0.6	0.8
Procidic (2 x), 100 floz (1-9).....	26.3	62.5 ab	81.5 ab	3214 ab	1.5	1.3
Actigard, 0.5 oz (1-9); Procidic, 50 floz (1-9).....	18.4	37.5 cd	66.8 cd	2220 fg	1.3	0.9
Actigard, 0.5 oz (1-9); Procidic (2 x), 50 floz (1-9).....	15.5	62.5 ab	71.4 bcd	2764 b-e	0.6	0.6
Simplex, 1.5 qt (1-9).....	18.5	62.5 ab	71.4 bcd	2840 bcd	0.5	0.6
Simplex, 1.5 qt (1-9); Actigard, 0.5 oz (1-9).....	15.4	42.6 c	81.5 ab	2418 def	3.4	1.9
Simplex, 1.5 qt (1,3,5,7,9); Actigard, 0.5 oz (2,4,6,8).....	15.5	71.4 a	86.1 a	3145 abc	1.1	0.9
P =	0.1097	< 0.0001	0.0267	< 0.0001	0.7521	0.9203

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

^y The severity of bacterial spot was assessed as the percentage of canopy affected. The Horsfall-Barratt scale was used for all ratings, but values were converted to mid-percentages prior to statistical analyses.

^x Area under the disease progress curve (AUDPC) values were calculated using 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.

Treatment, Rate/100 gal (application)	Harvested fruit per plot (lbs):					
	Small	Medium	Large	Extra Large	Marketable	Total
Cuprofix 40D, 3 lb (1-9); Penncozeb 75DF, 1.25 lb (1-9).....	10.9	18.3	38.8	69.1 abc	137.0 b-f	138.1 b-f
Non-treated Control.....	10.6	20.6	42.8	76.7 ab	150.7 ab	151.7 ab
Actigard, 0.5 oz (1-9).....	10.7	19.7	39.8	72.6 abc	142.8 a-e	144.1 a-e
Actigard, 0.5 oz (1,3,5,7,9).....	10.5	20.5	38.0	68.3 a-d	137.3 b-f	137.9 b-f
Water-treated Control.....	12.1	20.4	36.8	80.1 a	149.4 ab	150.2 ab
Procidic, 25 floz (1-9).....	11.3	20.1	38.9	74.7 ab	145.0 a-d	145.8 a-d
Procidic, 50 floz (1-9).....	11.2	22.1	37.8	65.9 a-d	137.0 b-f	137.7 b-f
Procidic, 75 floz (1-9).....	12.3	23.4	43.2	54.8 d	133.6 c-f	135.2 c-f
Procidic, 100 floz (1-9).....	12.5	20.0	38.2	58.4 cd	129.2 ef	129.8 ef
Procidic (2 x), 25 floz (1-9).....	11.9	17.8	39.1	72.4 abc	141.2 a-e	142.1 a-e
Procidic (2 x), 50 floz (1-9).....	11.6	22.4	38.9	72.2 abc	145.1 a-d	146.2 abc
Procidic (2 x), 75 floz (1-9).....	10.1	18.7	39.5	64.9 bcd	133.2 c-f	133.9 c-f
Procidic (2 x), 100 floz (1-9).....	10.6	19.1	37.6	58.5 cd	125.8 f	127.1 f
Actigard, 0.5 oz (1-9); Procidic, 50 floz (1-9).....	8.6	16.4	34.8	76.8 ab	136.6 b-f	137.6 b-f
Actigard, 0.5 oz (1-9); Procidic (2 x), 50 floz (1-9).....	9.8	16.9	36.6	67.5 a-d	130.8 def	131.3 def
Simplex, 1.5 qt (1-9).....	11.4	22.0	40.9	72.5 abc	146.8 abc	147.4 abc
Simplex, 1.5 qt (1-9); Actigard, 0.5 oz (1-9).....	9.8	19.3	43.4	70.8 abc	143.3 a-e	145.2 a-d
Simplex, 1.5 qt (1,3,5,7,9); Actigard, 0.5 oz (2,4,6,8).....	10.4	21.4	42.7	78.6 ab	153.1 a	154.0 a
<i>P</i> =	0.9937	0.7253	0.2599	0.0281	0.0136	0.0114