TOMATO (*Lycopersicon esculentum*)
Bacterial spot; *Xanthomonas perforans*

C. -H. Huang and G. E. Vallad
Department of Plant Pathology
University of Florida, GCREC
Wimauma, FL 33598

Evaluation of Actigard for management of bacterial spot of tomato, spring 2010.

On 16 Mar 2010, plots were established at the University of Florida's Gulf Coast Research and Education Center in Balm, FL to assess the effect of Actigard 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 XP-200) were transplanted at 18-in spacing along beds skipping a 4-ft alley between plots as a buffer. Treatments were applied on 20 Apr, 27 Apr, 4 May, 11 May, 17 May, 25 May, and 1 Jun (corresponding with applications 1 to 7 below) with a CO_2 back pack sprayer calibrated to deliver 60 (apps. 1,2), 90 (apps. 3,4,5,6), and 120 gal/A (app. 7) at 40 psi. The treatments, including a non-treated control, were arranged in a completely randomized design with each treatment repeated 4 times. Plots were inoculated 1 May with a suspension (10^6 cfu/ml) of *Xanthomonas perforans* race 4 using a backpack sprayer. Plots were monitored regularly for bacterial spot, and rated on 18 May, 2 Jun, and 17 Jun after disease reached appreciable levels. Marketable yield was assessed from a single hand harvest on 3 Jun. Alternating applications of Revus Top (7.7 floz/A) and Quadris (16.4 fl oz/A) was conducted on 25 May and 1 Jun to minimize the impact of early blight, target blight, and late blight, which were critical when conducive conditions occurred in the latter half of May.

Except the weekly application of Actigard at 0.28 oz/100 gal, the other Actigard spray treatments significantly reduced the severity of bacterial spot by 16.6–49.2% compared to the non-treated control based on disease severity on 18 May. Applying Actigard significantly reduced the disease severity on 18 May and 2 Jun in comparison to the Cuprofix-Penncozeb standard (P = 0.047 and 0.0004, respectively), whereas these treatment groups were not significantly different on the final disease severity due to high disease pressure. Regarding the application frequency effect, no significant difference was detected in disease severity between weekly and biweekly applications of Actigard (P = 0.2682) on 18 May. However, weekly applications of Actigard significantly reduced disease severity on 2 Jun and 17 Jun compared to biweekly spray programs (P = 0.0186 and 0.0053, respectively). Based on area under the disease progress curves (AUDPC), Actigard treatments significantly reduced disease progress compared to the non-treated control (P = 0.0024). Of these Actigard treatments, weekly applications performed significantly better than biweekly sprays in reducing disease epidemics (P = 0.026). A higher concentration of Actigard at 0.56 oz/100 gal needs to be biweekly applied to perform as effectively as the weekly application to lower disease progress. No significant difference was detected in marketable fruit yield between treatments, suggesting that Actigard did not have a negative impact on reducing the yield in this study.

	Disease severity (%)[y]				Marketable fruit yield[w]	
Treatment, rate/A (application)[z]	18 May	2 Jun	17 Jun	AUDPC[x]	Weight (boxes/A)	Extra large (numbers/A)
Actigard 50WG, 0.56 oz/100 gal (1-7).....	43.8 d[v]	83.9 cd	91.0 b	2333 e	1089	32997
Actigard 50WG, 0.42 oz/100 gal (1-7).....	56.3 cd	81.5 d	91.0 b	2396 de	1031	30056
Actigard 50WG, 0.28 oz/100 gal (1-7) ……...	72.0 ab	83.9 cd	92.1 ab	2567 bc	936	27770
Actigard 50WG, 0.56 oz/100 gal (1,3,5,7)…...	56.3 cd	81.5 d	94.4 a	2421 cde	942	29512
Actigard 50WG, 0.42 oz/100 gal (1,3,5,7)…...	67.3 bc	91.0 ab	94.4 a	2656 b	965	31363
Actigard 50WG, 0.28 oz/100 gal (1,3,5,7)…...	62.3 bc	87.4 bc	93.2 ab	2554 bcd	991	32888
Actigard 50WG, 0.75 oz (1,2), 0.5 oz (3-6), 0.33 (7)…….	67.3 bc	91.0 ab	94.4 a	2656 b	882	27552
Cuprofix Ultra 40D, 3 lb (1-7); Penncozeb 75DF, 2 lb (1-7)……..	72.0 ab	93.3 a	93.3 ab	2721 ab	969	30383
Non-treated control……..	86.3 a	93.3 a	93.3 ab	2835 a	1062	31581
P > F	*0.0003*	*< 0.0001*	*0.0053*	*0.026*	*0.772*	*0.9384*

[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 curves (AUDPC) was calculated using the formula: $\Sigma([(x_i+x_{i-1})/2](t_i-t_{i-1}))$ where xi is the rating at each evaluation time and (t_i-t_{i-1}) is the time between evaluations.
[w] Marketable yield is based on a single harvest on 3 Jun , assumes 4356 plants/A and 20 lb/box, and includes medium, large, and extra-large fruits.
[v] Values followed by the same letter are not statistically significant (P = 0.05) according to Fisher's LSD test.