

Delayed fungicide application to cucumber and the effects on downy mildew severity and yield, 2006.

The experiment was conducted in a commercial cucumber field near Spivey's Corner, NC (N35°11.467' W078°26.897'). Seed was planted on 14 Aug. No irrigation was used. Treatments were randomized into four complete blocks. Plots were bare ground single rows on 30-in. centers, 20 ft long with 5-ft borders on each end. Treated rows were alternated with non-treated rows. Fungicide treatments were applied using a CO₂-pressurized sprayer equipped with a single-nozzle and a 2-nozzle (19-in. spacing) handheld boom and hollow cone nozzles (TXVS-26) set to deliver 40 gal/A at 45 psi. The objective of this experiment was to compare two different fungicide strategies, locally systemic + protectant (Tanos + Manzate Pro Stick alt. w/ Previcur Flex + Bravo Weather Stik) and protectant only (Manzate Pro Stick) in relation to the timing of the first application. The first three applications were made with one pass using the single-nozzle boom while the remaining applications were made using the 2-nozzle boom with one pass. Treatments were initiated one week after planting when plants had one true leaf. Treatments were applied on 7-day intervals with applications made on 21, 28 Aug, 5, 11, 18 and 25 Sep. Disease severity was rated on 22, 25 and 29 Sep. Fruit were harvested on 2 Oct.

Downy mildew was first detected at a very low level (<1% in 1 plot) on the day of the third fungicide application. Disease progressed quickly after the third fungicide application aided by heavy rains from Tropical Storm Ernesto. Cultivar Feisty (Harris Moran) is listed as moderately resistant to downy mildew, but this resistance was insufficient to control the disease. Our study last year showed clear evidence for early application of fungicide for the control of downy mildew (F&N 61:V104). This year's trial emphasizes the importance of early detection and early applications of fungicides for effective control of downy mildew. It also shows the importance of the right fungicide applied at the right time. Even though the first application of the combination treatment was made early, the second application, where Tanos + Manzate were present when the pathogen first appeared (incubation period 4-12 days), actually yielded significantly better and had less disease present on the last rating than the full-season treatment. Disregarding the first application of the combination treatment, if plants were not treated within 2 to 3 weeks of disease detection, treatments had little or no effect on disease control compared to the non-treated control. The combination treatment (locally systemic + protectant) was superior to the protectant-only treatment regardless of when fungicides were applied within 2 to 3 weeks of disease detection.

Treatment, rate of product per acre	Disease severity ^z		Total yield (lb/plot)	
	29 Sep	22 Sep	No. 1	% Cull
Non-treated	83.8 a ^y	76.3 a	0.1 b	94.2 a
Tanos 50DF, 8 oz + Manzate Pro Stick 75DG, 2 lb alt. w/ Previcur Flex 6F, 1.2 pt + Bravo Weather Stik 6SC, 2 pt (1,2,3,4,5,6) ^x	58.8 bc	58.8 ab	1.7 b	47.9 cd
Tanos 50DF, 8 oz + Manzate Pro Stick 75DG, 2 lb alt. w/ Previcur Flex 6F, 1.2 pt+ Bravo Weather Stik 6SC, 2 pt (2,3,4,5,6)	42.5 d	38.8 c	4.3 a	28.0 d
Tanos 50DF, 8 oz + Manzate Pro Stick 75DG, 2 lb alt. w/ Previcur Flex 6F, 1.2 pt+ Bravo Weather Stik 6SC, 2 pt (3,4,5,6)	52.5 cd	53.8 b	3.3 a	34.5 d
Tanos 50DF, 8 oz + Manzate Pro Stick 75DG, 2 lb alt. w/ Previcur Flex 6F, 1.2 pt+ Bravo Weather Stik 6SC, 2 pt (4,5,6)	51.3 cd	61.3 ab	1.4 b	59.9 bc
Tanos 50DF, 8 oz + Manzate Pro Stick 75DG, 2 lb alt. w/ Previcur Flex 6F, 1.2 pt+ Bravo Weather Stik 6SC, 2 pt (5,6)	67.5 b	67.5 ab	0.1 b	86.8 ab
Tanos 50DF, 8 oz + Manzate Pro Stick 75DG, 2 lb alt. w/ Previcur Flex 6F, 1.2 pt+ Bravo Weather Stik 6SC, 2 pt (6)	70.0 b	72.5 ab	0.01 b	96.9 a
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Manzate Pro Stick 75DG, 2lb (1,2,3,4,5,6).....	67.6b	68.8 ab	0.4 b	86.7 ab
Manzate Pro Stick 75DG, 2lb (2,3,4,5,6).....	65.0 b	61.3 ab	0.9 b	69.0 abc
Manzate Pro Stick 75DG, 2lb (3,4,5,6).....	63.8 b	63.8 ab	0.5 b	83.7 ab
Manzate Pro Stick 75DG, 2lb (4,5,6).....	71.3 b	67.5 ab	0.1 b	94.5 a
Manzate Pro Stick 75DG, 2lb (5,6)	67.5 b	67.5 ab	0.2 b	90.0 ab
Manzate Pro Stick 75DG, 2lb (6)	72.5 b	67.5 ab	0.0 b	100.0 a
LSD (P=0.05)	8.7	11.78	1.03	0.206

^zDisease rating scale based on percentage of necrotic foliage (0-100).

^yTreatments followed by the same letter(s) within a column are not significantly different (P=0.05, Student-Newman-Keuls).

^xNumbers in parentheses represent the weeks that fungicides were applied.