

**Delayed fungicide application to cucumber and its effect on downy mildew severity and yield, 2005.**

The experiment was conducted in a commercial cucumber field near Spivey's Corner, NC (coordinates N35°11.603', W078°27.500'). Seed was planted on 27 Aug. The objective of this experiment was to compare two different fungicide strategies (locally systemic + protectant, and protectant only) in relation to the timing of the first application. No irrigation was used. Treatments were randomized into four complete blocks in a factorial design with factor 1 as the fungicide treatment and factor 2 as the number of applications. Plots were bareground single rows on 42-in. centers, 20 ft long with 5-ft borders on each end. Treated rows alternated with non-treated rows. Fungicide treatments were applied using a CO<sub>2</sub>-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 first application was made with one pass using the single-nozzle boom while the remaining applications were made using the 2-nozzle boom. Treatments were initiated at vine tip-over stage of plant growth. Treatments were applied on 7-day intervals with applications made on 20, 26 Sep, 4, and 11 Oct. Disease severity was rated on 28 Sep, 5, 12 and 18 Oct. Fruit were harvested on 11 and 18 Oct.

Downy mildew was first detected on the day of the first fungicide application but at a level that was difficult to detect for the experienced observer. Disease progressed quickly after the first fungicide application. Cultivar Fiesty (Harris Moran) is listed as moderately resistant to downy mildew, but this resistance was insufficient to control the disease. Treatment differences were evident 7 days following the first application. For disease severity and yield, in most cases, the combination treatment (locally systemic + protectant) was superior to the protectant-only treatment especially when applied earlier. In general, the earlier treatments were initiated, the greater the disease control, regardless of materials used. If plants were not treated within 2 to 3 weeks of disease detection, treatments had little to no effect on disease control. A 6-day delay in initiating the combination treatment resulted in a 54% reduction in yield of marketable fruit. This study emphasizes the importance of early detection and early application of fungicides for effective control of downy mildew.

Treatment, rate of product per acre	Disease Severity		Total Yield (lb/plot)	
	18 Oct <sup>z</sup>	AUDPC <sup>w</sup>	No. 1	% Cull
Non-treated .....	85.0 a <sup>y</sup>	1563.4 a	0.66 c	87.94 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) <sup>x</sup> .....	28.8 c	603.7 e	15.34 a	27.32 c
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) .....	37.5 bc	872.0 de	7.13 b	42.11 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 (3,4) .....	53.8 b	1216.0 bc	0.98 c	87.54 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 (4) .....	83.8 a	1543.2 a	0.84 c	86.38 a
Manzate Pro-Stick 75DG, 2lb (1,2,3,4) .....	50.0 b	779.6 e	8.38 b	40.60 bc
Manzate Pro-Stick 75DG, 2lb (2,3,4) .....	56.3 b	1076.6 cd	5.52 bc	54.73 b
Manzate Pro-Stick 75DG, 2lb (3,4) .....	72.5 a	1329.7 abc	1.14 c	79.93 a
Manzate Pro-Stick 75DG, 2lb (4) .....	82.5 a	1441.1 ab	1.53 c	82.15 a
LSD ( <i>P</i> =0.05)	14.2	223.3	3.77	17.60

<sup>z</sup>Disease rating scale based on percentage of necrotic foliage (0-100).

<sup>y</sup>Treatments followed by the same letter(s) within a column are not significantly different (*P*=0.05, Student-Newman-Keuls).

<sup>x</sup>Numbers in parentheses represent the weeks that fungicides were applied.

<sup>w</sup>AUDPC = Area under disease progress curve.