

Evaluation of cultivars in combination with fungicides for control of downy mildew and yield effects on cucumber, Clinton 2017.

The experiment was conducted at the Horticultural Crops Research Station in Clinton, NC (N35°01.448'; W078°17.481'). Plots were single raised beds on 5-ft centers covered with white plastic mulch; 14-ft long with 5-ft fallow borders on each end with non-treated guard rows on each side. The previous year the field was planted with sweetpotato. Cucumber was direct seeded on 20 Jul (2-ft in-row spacing, 2 seed/hill) and thinned to one plant per hill after emergence (7 plants/plot). Irrigation and fertilization (4-0-8, N-P-K) were applied via drip tape on 1, 3, 18, 21, 23 and 30 Aug and 5, 8, 11, 15 and 19 Sep. Treatments were randomized into four complete blocks. Fungicide treatments were applied using a CO₂-pressurized backpack sprayer equipped with hollow cone nozzles (TXVS-26) delivering 40 gal/A at 45 psi. Applications were made on 23 and 30 Aug and 8, 15, 20 and 27 Sep. Disease severity was assessed on 8, 15, 18 and 28 Sep as percent leaf area with necrosis per plot. Fruit were harvested on 5, 13, 19 and 26 Sep and 3 Oct. Data were analyzed in the software ARM (Gylling Data Management, Brookings, SD) using analysis of variance (AOV) and Fisher's Protected LSD test to separate means.

Downy mildew was first detected on 23 Aug at approximately 3% disease severity in the field and progressed throughout the course of the trial. All treatments presented significantly less disease and better plant vigor when compared to the non-treated Expedition. Peacemaker treated with Actigard had the highest plant vigor rating, the highest fresh weight and produced the most marketable fruit. Peacemaker treated with Aliette and Citadel treated with Actigard or Aliette had higher plant vigor rating as well as fresh weight and marketable yield compared to the non-treated controls. No phytotoxicity was observed. In the table, treatments are sorted by disease severity on 28 Sep.

Treatment and rate of product per acre	Application no. ^y	Disease severity ^z (%)	Vigor rating ^w	Fresh wt ^v (lb/plot)		Mkt yield (lb/plot)
		28-Sep	28-Sep	3-Oct		
Actinovate (Peacemaker) 10SP 12 oz	1-6	31.0 e ^x	6.3 abc	3.55 ab		13.48 bc
Actigard (Peacemaker) 50WG 1 oz	1-6	35.0 de	7.5 a	5.40 a		25.0 a
Non-treated Peacemaker	N/A	37.5 cd	5.8 bc	3.15 abc		10.83 bc
Aliette (Peacemaker) 80WDG 5 lb	1-6	38.0 cd	7.3ab	4.85 ab		17.73 ab
Actigard (Citadel) 50WG 1 oz	1-6	43.0 bc	6.8 ab	4.45 ab		16.80 ab
Non-treated Citadel	N/A	43.5 bc	6.0 abc	3.50 ab		11.03 bc
Actinovate (Citadel) 10SP 12 oz	1-6	45.0 b	5.0 c	2.75 bc		6.75 bc
Aliette (Citadel) 80WDG 5 lb	1-6	45.8 b	6.5 abc	4.70 ab		17.88 ab
Non-treated Expedition	N/A	83.8 a	1.3 d	0.98 c		2.50 c

^z Disease rating scale based on percent necrotic foliage caused by *P. cubensis*.

^y Application dates: 1=23 Aug, 2=30 Aug, 3=8 Sep, 4=15 Sep, 5=20 Sep, 6=27 Sep.

^x Treatments followed by the same letter(s) within a column are not statistically different ($P=0.05$, Fisher's Protected LSD).

^w Plant vigor rating scale (1=Poor, 10=Good)

^v Total weight of plant/vines per plot.