

Evaluation of cultivars in combination with fungicides for control of downy mildew and yield effects on cucumber, Clinton, NC II 2020.

The experiment was conducted at the Horticultural Crops Research Station in Clinton, NC. 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. In 2019, the field was planted with cucumber. Cucumber was direct seeded on 28 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. Treatments were randomized into four complete blocks. Fungicide treatments were applied using a CO₂-pressurized backpack sprayer equipped with hollow cone nozzle (TXVS-26) delivering 40 gal/A at 45 psi. Applications were made on 19 and 27 Aug and 3, 10, 18 and 24 Sep and 1 Oct. Disease severity was assessed on 27 Aug and 3, 10, 16 and 24 Sep and 1 and 8 Oct as percent leaf area with necrosis per plot. Fruit were harvested on 10, 17 and 24 Sep and 1 and 8 Oct. Data were analyzed in the software ARM (Gyllum Data Management, Brookings, SD) using analysis of variance (AOV) and Fisher’s protected least significant difference (LSD) test to separate the means.

Downy mildew was first detected on 19 Aug at approximately 3% disease severity in the field and progressed throughout the course of the trial. All treatments presented significantly less disease when compared to the non-treated Expedition, Expedition treated with Bravo Weather Stik and Expedition treated with Ranman alternated with Previcur Flex. Peacemaker treated with Aliette provided the highest level of disease control and excellent yield. Peacemaker treated with Actigard and Actinovate, Citadel treated with Actinovate and Aliette and non-treated Peacemaker managed *P. cubensis* and yielded well. No phytotoxicity was observed.

Treatment and rate of product per acre and variety	Application no. ^y	Disease severity ^z (%)			Mkt yield (lb/plot)
		3 Sep	16 Sep	1 Oct	
Aliette (Peacemaker) 80WDG 5 oz	1-7	9.5ef ^x	14.3f	37.3c	43.25abc
Actigard (Peacemaker) 50WG 1 oz	1-7	7.3f	13.0f	42.5bc	46.33abc
Actinovate (Peacemaker) 10SP 12 oz	1-7	9.5ef	15.8ef	46.8bc	49.35a
Aliette (Citadel) 80WDG 5 oz	1-7	14.5bc	19.5cd	49.8bc	38.43cd
Non-treated Peacemaker	N/A	8.3f	14.0f	50.5bc	48.45ab
Actinovate (Citadel) 10SP 12 oz	1-7	22.3a	26.8b	54.3b	30.13d
Orondis Opti (Expedition) 0.83OD 32 fl oz	1, 4, 7				
Ranman (Expedition) 3.33SC 2.75 fl oz	2, 5				
Previcur Flex (Expedition) 6F 19.2 fl oz	3, 6	11.0de	17.5de	57.5b	44.40abc
Non-treated Citadel	N/A	12.3cd	19.0cd	57.8b	39.40bcd
Actigard (Citadel) 50WG 1 oz	1-7	14.0c	21.0c	58.8b	33.50d
Ranman (Expedition) 3.33SC 2.75 fl oz	1, 3, 5, 7				
Previcur Flex (Expedition) 6F 19.2 fl oz	2, 4, 6	9.3ef	18.5cde	82.5a	39.68a-d
Bravo Weather Stik (Expedition) 6SC 32 fl oz	1-7	14.0c	26.8b	84.0a	31.28d
Non-treated Expedition	N/A	16.5b	33.8a	93.3a	20.43e

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

^y Application dates; 1=19 Aug, 2=27 Aug, 3=3 Sep, 4=10 Sep, 5=18 Sep, 6=24 Sep and 7=1 Oct.

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