CUCUMBER (*Cucumis sativus* 'Peacemaker', 'Citadel', 'Expedition')
Downy mildew; *Pseudoperonospora cubensis*

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Evaluation of cultivars in combination with fungicides for control of downy mildew and yield effects on cucumber, Clinton, NC 2019.

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 2018, the field was planted with cucumber. Cucumber was direct seeded on 25 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 CO_2-pressurized backpack sprayer equipped with hollow cone nozzle (TXVS-26). Applications were made on 22 and 29 Aug and 4, 12, 19 and 26 Sep. Disease severity was assessed on 29 Aug and 3, 10 and 17 Sep as percent leaf area with necrosis per plot. Fruit were harvested on 3, 10,17 and 24 Sep and 1 Oct. Data were analyzed in the software ARM (Gylling 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 22 Aug at approximately 5% 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 and Expedition treated with Bravo Weather Stik. Peacemaker treated with Actigard provided the highest level of disease control and excellent yield. Peacemaker treated with Aliette and Actinovate as well as non-treated Peacemaker managed *P. cubensis* well, had good plant vigor and yielded well. No phytotoxicity was observed.

Treatment and rate of product per acre	Application no.[y]	Disease severity[z] (%) 17-Sep	Disease severity[z] (%) 10-Oct	Vigor rating[w] 10-Oct	Mkt yield (lb/plot)
Actigard (Peacemaker) 50WG 1 oz/a	1-6	18.0g[x]	38.5g	6.5a	67.80a
Aliette (Peacemaker) 80WDG 5 oz/a	1-6	20.8fg	42.3fg	6.3ab	62.70ab
Non-treated Peacemaker	N/A	20.3fg	42.5fg	6.0ab	63.40ab
Actinovate (Peacemaker) 10SP 12 oz/a	1-6	21.0fg	45.5ef	6.3ab	67.40a
Aliette (Citadel) 80WDG 5 oz/a	1-6	24.8ef	47.3def	5.5b	49.80c
Non-treated Citadel	N/A	26.8e	49.5de	5.8ab	54.50bc
Actigard (Citadel) 50WG 1 oz/a	1-6	29.3de	51.5cde	5.8ab	45.75cd
Actinovate (Citadel) 10SP 12 oz/a	1-6	29.5de	54.0cd	5.5b	54.10bc
Ranman (Exp) 3.33SC 2.75 fl oz/a Previcur Flex (Exp) 6F 19.2 fl oz/a	1, 3, 5 2, 4, 6	34.0cd	57.0c	4.5c	36.95de
Orondis Opti (Exp) 3.37SC 32 fl oz/a Ranman (Exp) 3.33SC 2.75 fl oz/a Previcur Flex (Exp) 6F 19.2 fl oz/a	1, 4 2, 5 3, 6	37.8c	69.0b	3.5d	27.20ef
Bravo Weather Stik (Exp) 6SC 32 fl oz/a	1-6	44.0b	90.3a	1.8e	16.88fg
Non-treated Expedition	N/A	62.8a	95.5a	1.0e	9.58g

[z] Disease rating scale based on percent necrotic foliage caused by *P. cubensis*.
[y] Application dates: 1=22 Aug, 2=29 Aug, 3=4 Sep, 4=12 Sep, 5=19 Sep, and 6=26 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).