CUCUMBER (*Cucumis sativus* 'Vlasstar')
Downy mildew; *Pseudoperonospora cubensis*

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Evaluation of fungicides for control of downy mildew on cucumber, Kinston, NC II 2019.

The experiment was conducted at the Cunningham Research Station in Kinston, 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 sweetpotato. Cucumber was direct seeded on 24 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 a handheld boom with a hollow cone nozzle (TXVS-26). Applications were made on 15, 21 and 28 Aug and 4, 13 and 20 Sep. Disease severity was assessed on 30 Aug and 3, 10, 17 and 24 Sep as percent leaf area with necrosis per plot. Fruit were harvested on 30 Aug and 4, 11, 18 and 26 Sep. 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 21 Aug at approximately 3% disease severity in the field and progressed throughout the course of the trial. The combination treatments with Orondis Opti, Ranman and Previcur Flex provided the highest level of downy mildew control. All other treatments had significantly less disease than the non-treated plots. No phytotoxicity was observed.

		Disease severity[z] (%)		
Treatment and rate of product per acre	Application no.[y]	30-Aug	10-Sep	24-Sep
Orondis Opti 3.37SC 32 fl oz/a	1, 3, 5			
Ranman 3.33SC 2.75 fl oz/a	2, 4, 6	6.5bc[x]	23.0bc	39.0d
Orondis Opti 3.37SC 32 fl oz/a	1, 4			
Previcur Flex 6F 1.2 pt/a	2, 5			
Ranman 3.33SC 2.75 fl oz/a	3, 6	8.8b	24.8b	39.5d
V-10365 0.83SC 12.1 fl oz/a	1, 3, 6			
Induce SL 0.125% v/v	1, 3, 6			
Elumin 4SC 8 fl oz/a	2, 4			
Ranman 3.33SC 2.75 fl oz/a	5	4.5c	21.0d	47.8c
V-10365 0.83SC 12.1 fl oz/a	1, 3, 6			
Bravo Weather Stik 6SC 32 fl oz/a	1, 3, 6			
Elumin 4SC 8 fl oz/a	2, 4			
Ranman 3.33SC 2.75 fl oz/a	5	5.3c	22.0cd	49.0bc
Orondis Opti 3.37SC 32 fl oz/a	1			
V-10365 0.83SC 12.1 fl oz/a	2, 4, 6			
Bravo Weather Stik 6SC 32 fl oz/a	2, 4, 6			
Elumin 4SC 8 fl oz/a	3, 5	6.3c	24.5b	51.8b
Non-treated	N/A	19.0a	44.8a	82.8a

[z] Disease rating scale based on percent necrotic foliage caused by *P. cubensis*.
[y] Application dates: 1=15 Aug, 2=21 Aug, 3=28 Aug, 4=4 Sep, 5=13 Sep and 6=20 Sep.
[x] Treatments followed by the same letter(s) within a column are not statistically different (P=0.05, Fisher's protected LSD).