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

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Evaluation of fungicides for control of downy mildew on cucumber, Kinston II 2016.

The experiment was conducted at the Cunningham Research Station in Kinston, NC (N35°18.186'; W077°34.328'). Plots were single beds on 5-ft centers covered with white plastic mulch; 14-ft long with 5-ft fallow borders on each end and non-treated guard rows on each side. The previous year the field was planted with sweetpotato. Cucumber was direct seeded on 10 Aug (2-ft in-row spacing, 2 seed/hill) in raised beds 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 7, 14, 21 and 27 Sep and 5 Oct. Treatments were randomized into four complete blocks. Fungicide treatments were applied using a CO_2-pressurized backpack sprayer equipped with hollow cone nozzles (TXVS-26) delivering 40 gal/A at 45 psi. The first three spray applications were made with a single-nozzle boom and the last three with a 2-nozzle boom (19-in. spacing). Applications were made on 31 Aug, 9, 16, 23 and 29 Sep and 7 Oct. Disease severity was assessed on 20 and 29 Sep and 7 Oct as percent leaf area with necrosis per plot. Fruit were harvested on 20 and 27 Sep and 4 Oct. Data were analyzed in the software ARM (Gylling Data Management, Brookings, SD) using analysis of variance (AOV) and the Waller-Duncan test to separate means.

Downy mildew was first detected on 31 Aug at approximately 1% disease severity in the field and progressed throughout the course of the trial. Hurricane Matthew impacted Eastern North Carolina on 8 and 9 Oct and prematurely ended the trial due to wind and rain damage. Combination treatments with Bravo Weather Stik, Orondis Opti, Zampro, Previcur Flex, Ranman and Omega controlled downy mildew well and produced the greatest weight of total marketable fruit. No other treatments provided commercially acceptable levels of disease control. No phytotoxicity was observed. In the table, treatments are sorted by disease severity on 7 Oct.

Treatment and rate of product per acre	Application no.[y]	Disease severity[z] (%) 20 Sep	29 Sep	7 Oct	Mkt yield (lb/plot)
Bravo Weather Stik 6SC 24 fl oz	1, 4				
Orondis Opti 406SC 34.2 fl oz	2, 5				
Zampro 4.33SC 14 fl oz	3, 6				
Silwet 100L 0.125% V/V	3, 6	6.3 d[x]	11.5 e	17.3 e	18.40 a
Bravo Weather Stik 6SC 24 fl oz	1, 4				
Orondis Opti 406SC 34.2 oz	2, 5				
Previcur Flex 6F 19.2 fl oz	3, 6	5.8 d	12.5 e	20.8 e	17.54 a
Bravo Weather Stik 6SC 24 fl oz	1, 4				
Orondis Opti 406SC 34.2 fl oz	2, 5				
Ranman 3.33SC 2.75 fl oz	3, 6				
Silwet 100L 0.125% V/V	3, 6	6.5 d	15.8 e	22.8 e	18.92 a
Bravo Weather Stik 6SC 24 fl oz	1, 4				
Orondis Opti 406SC 34.2 oz	2, 5				
Omega 500 F 16 fl oz	3, 6	8.0 d	15.0 e	24.8 e	13.58 a
Ranman 3.33SC 2.75 fl oz	1, 4				
Previcur Flex 6F 34.2 fl oz	2, 5				
Bravo Weather Stik 6SC 24 fl oz	3, 6	20.0 bc	38.3 d	53.0 d	7.21 b
Experimental Low Rate	1-6	17.5 c	43.3 cd	64.5 c	4.53 b
OSO 5SC 6.5 fl oz	1, 3, 5				
Induce 100L 0.125% V/V	1, 3, 5				
Bravo Weather Stik 6SC 24 fl oz	2, 6				
Previcur Flex 6F 19.2 fl oz	4	23.5 b	48.8 bc	70.3 bc	5.19 b
Experimental High Rate	1-6	21.8 b	50.5 b	71.5 bc	4.19 b
Sil-Matrix 29SC 4 qt/100 gal	1-6	21.3 bc	51.3 b	73.5 b	3.22 b
Non-treated	N/A	29.3 a	58.5 a	82.0 a	2.39 b

[z] Disease rating scale based on percent necrotic foliage caused by *P. cubensis*.
[y] Application dates: 1=31 Aug, 2=9 Sep, 3=16 Sep, 4=23 Sep, 5=29 Sep and 6=7 Oct.
[x] Treatments followed by the same letter(s) within a column are not statistically different (P=0.05, Waller-Duncan k=100).