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

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Evaluation of fungicides for control of downy mildew on cucumber, Kinston I 2014.

The experiment was conducted at the Cunningham Research Station in Kinston, NC (N35°18.050'; W077°34.572'). Plots were single beds on 5-ft centers covered with black plastic mulch; 14-ft long with 4-ft fallow borders on each end and non-treated guard rows on each side. The previous year the field was planted with soybean. Cucumber was direct seeded on 12 Aug (1.5-ft in-row spacing, 2 seed/hill) in raised beds and thinned to one plant per hill after emergence (9 plants/plot). Irrigation and fertilization 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 nozzles (TXVS-26) delivering 40 gal/A at 45 psi. The first two spray applications were made with a single-nozzle boom and the last four with a 2-nozzle boom (19-in. spacing). Applications were made on 4, 11, 16 and 26 Sep and 3 and 10 Oct. Disease severity was assessed on 17, 23 and 30 Sep and 7 and 17 Oct as percent leaf area with necrosis. Data was analyzed in the software ARM (Gylling Data Management, Brookings, SD) using analysis of variance (AOV) and the Waller-Duncan test to separate means. Fruit were harvested on 23 and 30 Sep and 7 and 16 Oct.

Downy mildew was first detected on 4 Sep at approximately <1% disease severity in the field and progressed throughout the course of the trial. Both the high rate and the low rate of Zorvec were highly effective in controlling downy mildew and produced the greatest weight of total marketable fruit. There was no significant difference in marketable yield between the high and low rates of Zorvec. No other treatments provided commercially acceptable levels of disease control or produced marketable fruit weights near that of Zorvec. No phytotoxicity was observed. In the table, treatments are sorted by disease severity on 17 Oct.

Treatment and rate of product per acre	Application No.	Disease Severity* (%) 17 Sep	30 Sep	17 Oct	Mkt Yield (lb/plot)
Zorvec 0.83OD 0.6 fl oz	1-6	0.3 h**	2.9 l	10.8 n	39.9 a
Zorvec 0.83 OD 0.3 fl oz	1-6	0.8 gh	11.0 k	11.5 n	36.3 a
Presidio 4SC 4 fl oz + Induce 90L 0.25% v/v + Bravo Weather Stik 6SC 2 pt Previcur Flex 6F 1.2 pt + Bravo Weather Stik 6SC 2 pt Zampro 4.33SC 14 fl oz + Induce 90L 0.25% v/v + Bravo Weather Stik 6SC 2 pt	1, 4 2, 5 3, 6	1.8 fgh	18.9 hij	60.8 m	23.8 bc
Presidio 4SC 4 fl oz + Induce 90L 0.25% v/v + Bravo Weather Stik 6SC 2 pt Previcur Flex 6F 1.2 pt + Bravo Weather Stik 6SC 2 pt Ranman 3.33SC 2.75 fl oz + Induce 90L 0.25% v/v + Bravo Weather Stik 6SC 2 pt	1, 4 2, 5 3, 6	3.8 c-f	21.6 f-j	67.0 lm	20.1 b-g
Presidio 4SC 4 fl oz + Induce 90L 0.25% v/v + Bravo Weather Stik 6SC 2 pt Gavel 75WG 2 lb Ranman 3.33SC 2.75 fl oz + Induce 90L 0.25% v/v + Bravo Weather Stik 6SC 2 pt	1, 4 2, 5 3, 6	2.5 d-h	17.1 ijk	70.5 kl	21.9 b-e
Ranman 3.33SC 2.75 fl oz + Induce 90L 0.25% v/v	1-6	1.0 fgh	15.5 jk	71.3 kl	23.1 bcd
Presidio 4SC 4 fl oz + Induce 90L 0.25% v/v + Bravo Weather Stik 6SC 2 pt Tanos 50WG 8 oz + Bravo Weather Stik 6SC 2 pt Ranman 3.33SC 2.75 fl oz + Induce 90L 0.25% v/v + Bravo Weather Stik 6SC 2 pt	1, 4 2, 5 3, 6	2.3 d-h	25.4 d-h	75.5 jk	21.0 b-f
Ranman 3.33SC 2.1 fl oz + Induce 90L 0.25% v/v	1-6	2.0 e-h	20.9 g-j	77.0 ijk	20.2 b-g
Presidio 4SC 4 fl oz + Induce 90L 0.25% v/v + Bravo Weather Stik 6SC 2 pt Tanos 50WG 8 oz Bravo Weather Stik 6SC 2 pt Gavel 75WG 2 lb	1, 4 2, 5 3, 6	1.8 fgh	34.2 bcd	79.5 hij	21.3 b-e
Zampro 4.33SC 14 fl oz + Induce 90L 0.25% v/v	1-6	3.8 c-f	25.4 d-h	80.5 g-j	21.0 b-f

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Treatment and rate of product per acre	Application No.	Disease Severity* (%) 17 Sep	30 Sep	17 Oct	Mkt Yield (lb/plot)
Ranman 400SC 2.75 fl oz + Induce 90L 0.25% v/v					
+ Bravo Weather Stik 6SC 2 pt	1, 4				
Tanos 50WG 8 oz + Bravo Weather Stik 6SC 2 pt	2, 5				
Gavel 75WG 2 lb	3, 6	1.8 fgh	29.6 b-f	81.8 f-j	17.6 e-i
Previcur Flex 6F 1.2 pt	1-6	2.0 e-h	22.1 f-j	83.0 e-i	15.1 ghi
V-10208 4SC 10 fl oz	1-6	2.8 d-h	19.2 g-j	84.3 d-h	24.8 b
V-10208 4SC 8 fl oz	1-6	3.0 c-h	23.7 f-i	84.5 d-h	21.0 b-f
Zampro 4.33SC 14 fl oz + Induce 90L 0.25% v/v					
+ Bravo Weather Stik 6SC 2 pt	1, 4				
Previcur Flex 6F 1.2 pt + Bravo Weather Stik 6SC 2 pt	2, 5				
Ranman 3.33SC 2.75 fl oz + Induce 90L 0.25% v/v					
+ Bravo Weather Stik 6SC 2 pt	3, 6	4.8 b-e	25.1 d-h	84.5 d-h	19.4 c-h
Gavel 75WG 2 lb	1-6	3.5 c-g	23.7 e-i	85.8 d-h	15.0 ghi
Zampro 4.33SC 14 fl oz + Induce 90L 0.25% v/v					
+ Bravo Weather Stik 6SC 2 pt	1, 4				
Gavel 75WG 2 lb	2, 5				
Tanos 50WG 8 oz + Bravo Weather Stik 6SC 2 pt	3, 6	2.8 d-h	27.1 c-g	86.5 c-g	17.2 e-i
Presidio 4SC 4 fl oz + Induce 90L 0.25% v/v	1-6	0.3 h	20.9 g-j	87.3 c-f	15.9 f-i
Manzate Pro-Stick 75WG 3 lb	1-6	7.5 ab	33.3 bcd	87.8 b-f	12.7 ij
Presidio 4SC 3 fl oz + Induce 90L 0.25% v/v	1-6	2.0 e-h	20.4 g-j	88.8 b-e	18.0 d-i
Manzate Pro-Stick 75WG 2 lb	1-6	5.0 bcd	37.1 b	90.3 a-d	13.2 ij
Bravo Weather Stik 6SC 2 pt	1-6	3.3 c-g	32.7 b-e	90.5 a-d	14.5 hi
Bravo Weather Stik 6SC 3 pt	1-6	5.8 bc	36.4bc	92.8 abc	14.6 hi
Tanos 50WG 8 oz	1-6	3.3 c-g	39.3 b	94.0 ab	9.1 jk
Non-treated	1-6	9.3 a	70.0 a	96.8 a	4.73 k

* Disease rating scale based on percent necrotic foliage caused by *P. cubensis*.
** Treatments followed by the same letter(s) within a column are not statistically different (*P*=0.05, Waller-Duncan k=100).