CUCUMBER, SUMMER (*Cucumis sativus* 'Valasstar')
Downy mildew; *Pseudoperonospora cubensis*

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Evaluation of fungicides for management of cucumber downy mildew, Clinton 2022.

The research trial was conducted at the Horticultural Crops Research Station in Clinton, NC. Experimental 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 and non-treated guard rows on each side. Cucumber was directly seeded on 21 Jun (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. Five treatments and the non-treated control were tested in a randomized complete block design with four repetitions. Fungicide treatments were applied using a CO_2-pressurized backpack sprayer equipped with a single-nozzle, handheld boom with a hollow cone nozzle (TXVS-26) delivering 40 gal/A at 35 psi. Applications were made on 20 and 29 Jul and 4, 11, and 18 Aug. Disease severity per plot was assessed on 20, 29 Jul and 3, 10, 17, 24 Aug. Data were analyzed in the software ARM (Gylling Data Management, Brookings, SD) using analysis of variance (AOV) and Fisher's protected least significant differences (LSD) test to separate means.

Downy mildew was first detected on 20 Jul at approximately 2% disease severity in the field. No phytotoxicity was observed in the experiment. At the disease severity data obtained on 10 Aug 7 weeks after planting the treatment Ranman was statistically different from the non-treated control but not different that treatment with Double Nickel alternated with Cueva. For the data collected on 24 Aug 9 weeks after planting the treatment Ranman was significantly better than all the treatments including the non-treated control. No significant differences were observed in the disease summary for the season (AUDPC). Yields were assessed as marketable and non-marketable (data not shown).

Treatments	Rate	Disease Severity[z] (%) 10 Aug - Week 7	Disease Severity[y] (%) 24 Aug - Week 9	AUDPC[x]
Non-treated control		30.0 a[w]	71.2 a	1000.63 a
Double Nickel LC 98.85% Dyne-Amic 99.0%	1 qt/a 0.25% v/v	31.3 a	68.2 a	1055.25 a
Double Nickel LC 98.85% Dyne-Amic 99.0%	2 qt/a 0.25% v/v	30.0 a	67.3 a	998.5 a
Double Nickel LC 98.85% Dyne-Amic 99.0% Cueva 10.0% Dyne-Amic 99.0%	1 qt/a 0.25% v/v 1% v/v 0.25% v/v	22.5 ab	70.0 a	923.63 a
Cueva 10.0% Dyne-Amic 99.0%	1% v/v 0.25% v/v	27.5 a	63.0 a	915.5 a
Ranman 400 SC 34.5% Dyne-Amic 99.0%	2.5 fl oz/a 0.25% v/v	12.5 b	23.1 b	417.75 b

[z] Disease rating scale based on percent necrotic foliage caused by *P. cubensis*. / 10 Aug, 7 weeks after planting.

[y] Disease rating scale based on percent necrotic foliage caused by *P. cubensis*. / 24 Aug, 9 weeks after planting.

[x] Area under disease progress curve for total of all the foliar diseases present. AUDPC = $\sum_{i=1}^{n-1} \frac{y_i + y_{i+1}}{2} x(t_{i+1} - t_i)$

[w] Treatments followed by the same letter(s) within a column are not statistically different (P=0.05, Fisher's Protected LSD).