

Cucumber downy mildew management using select fungicides, Clinton, NC 2023.

The trial for management of cucumber downy mildew using select fungicides was evaluated at the Horticultural Crops Research Station in Clinton, NC. Experimental plots were 14-ft long single raised beds on 5-ft centers covered with white plastic mulch with 5-ft fallow borders on each end and non-treated guard rows on each side. Cucumber ‘Lizst’ was directly seeded on 3 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. Seven treatments and a non-treated control were evaluated in a randomized complete block design with four repetitions. Fungicide treatments were applied using a CO₂-pressurized backpack sprayer equipped with a single-nozzle, handheld boom with a hollow cone nozzle (TXVS-26) delivering 40 gal/A at 35 psi on 2, 9, 16, 23 and 30 Aug, and 6 Sep. Disease severity across each plot was assessed weekly from 2 Aug to 15 Sep on a 0 to 100% scale and was used to calculate the area under disease progress curve values. Plots were harvested every week from 9 Aug to 6 Sep and total marketable yield determined. 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 2 Aug. On 23 Aug, disease severity in all treatments, aside from Revus, was significantly lower when compared to the nontreated control. The application of Omega 500 provided the greatest reduction of disease as summarized by the Area Under the Disease Progress Curve values (AUDPC). Ranman and Previcur Flex also provided significantly better disease reduction than the nontreated control. The treatments Ranman, Zampro, Previcur Flex and Presidio had significantly greater marketable yield than the nontreated control. No phytotoxicity was observed in the experiment.

Treatments	Disease Severity ^z (%) 23 Aug	AUDPC ^y	Total Marketable Yield ^x (lb/plot)
Non-treated control	27.5 a ^w	1618.0 a	24.7 c
Ranman 2.75 fl oz	13.8 c	1324.3 bc	46.4 a
Orondis Opti 32.0 fl oz	18.8 bc	1495.9 ab	28.4 c
Previcur Flex 19.2 fl oz	15.5 c	1363.5 bc	44.8 a
Omega 500 24.0 fl oz	14.3 c	1215.6 c	30.3 bc
Zampro 14.0 fl oz	18.8 bc	1459.8 ab	37.8 ab
Presidio 4.0 fl oz	17.5 c	1461.5 ab	42.6 a
Revus 8.0 fl oz	23.8 ab	1611.5 a	27.1 c

^zDisease rating based on percent necrotic foliage per plot caused by *P. cubensis*, 7 weeks after planting.

^yArea under disease progress curve. $AUDPC = \sum_{i=1}^{n-1} \frac{y_i + y_{i+1}}{2} x(t_{i+1} - t_i)$

^xTotal marketable yields based on sum of averages of marketable yield at each harvest (lb/plot).

^wTreatments followed by the same letter(s) within a column are not statistically different ($P=0.05$, Fisher’s Protected LSD).