

Efficacy of fungicides for managing downy mildew in cucumber, 2013.

A field experiment was conducted at the Long Island Horticultural Research and Extension Center (LIHREC) in Riverhead, NY, on Haven loam soil. Fertilizer (N-P-K, 10-10-10) at 1000 lb/A (100 lb/A of nitrogen) was broadcast over the bed area and incorporated on 20 Jun. Beds were formed with drip tape and covered with black plastic mulch on 20 Jun. A waterwheel transplanter was used to make planting holes in the beds and apply starter fertilizer (20-20-20 Nutri-Leaf) plus insecticide on 24 Jun. Seeds were sown on 24 May in the greenhouse. Seedlings were transplanted by hand into the holes in the beds on 25 Jun. During the season, water was provided as needed via drip irrigation lines. Weeds were managed between mulched rows by applying a tank mix of Strategy (3 pt/A), Sandea (0.5 oz/A), Scythe (1%), and Roundup WeatherMAX (22 oz/A) on 24 Jun, and by hand weeding especially in the transplant holes. Cucumber beetles were managed with Admire Pro (7.5 fl oz/A) applied with the transplanter on 24 Jun. Plots were single 18-ft rows with 12 plants at 18-in. spacing. Rows were 8.5 ft apart. The plots were 9 ft apart within the row initially until plants began to vine partly filling the area. Vines were moved as needed to maintain plot separation. A randomized complete block design with four replications was used. Fungicides were applied weekly for 5 weeks beginning on 18 Jul, one day after symptoms were first observed, using a backpack CO₂-pressurized sprayer equipped with a single-nozzle boom and an 8006VS nozzle delivering 50 gal/A operated at 54 psi and 2.4 mph. It was intended that the treatments be applied on a preventive schedule. Downy mildew severity was assessed on 23 and 30 Jul and 6, 14, and 19 Aug by estimating incidence of symptomatic leaves in each plot and rating severity on nine representative affected leaves. Incidence and average severity for symptomatic leaves were used to estimate canopy severity. Fruit was removed from plants to maintain plant growth; yield was not assessed. Area Under Disease Progress Curve (AUDPC) values were calculated from 30 Jul through 19 Aug. Average monthly high and low temperatures (°F) were 78/61 in Jun, 86/71 in Jul, and 80/64 in Aug. Rainfall (inches) was 9.92, 3.07, and 2.43 for these months, respectively.

Downy mildew developed naturally in this experiment. Treatments were started 1 day after symptoms were first seen. GWN-10126 was the most effective of the three oomycete fungicides evaluated singly. It was the only treatment providing effective suppression at the last assessment on 19 Aug. Zampro and the grower standard program were also effective based on the 14 Aug assessment. Degree of control achieved with these three treatments at that time was 63% to 75%. Presidio was ineffective at all assessments.

Treatment and rate/A (application dates) ^y	Canopy severity of downy mildew (%) ^z				AUDPC ^x
	30 Jul	6 Aug	14 Aug	19 Aug	
Nontreated	0.3	16.8	38.1 a	38.3 a	438.8 a
Presidio 4SC 4 fl oz (1-4)	0.3	9.4	30.5 ab	25.9 ab	308.6 ab
Zampro 525SC ^w 14 fl oz (1-4)	0.4	10.0	13.9 b	20.0 ab	203.1 ab
Ranman 400SC ^w 2.75 fl oz (1, 4); Forum 6 fl oz (2); Presidio 4SC 4 fl oz (3) + Bravo Ultrex 1.8 lb (1-4)	0.1	3.6	9.9 b	17.5 ab	121.5 ab
GWN-10126 ^w 36 fl oz (1-4).....	3.0	5.0	9.4 b	14.9 b	109.1 b
<i>P-value (treatment)</i>	<i>0.5235</i>	<i>0.7642</i>	<i>0.0033</i>	<i>0.0418</i>	<i>0.0352</i>

^z Numbers in each column with a letter in common are not significantly different from each other (Tukey’s HSD, P=0.05).

^y Rate of formulated product/A. Foliar application dates were 1 = 24 Jul, 2 = 31 Jul, 3 = 7 Aug, 4 = 15 Aug.

^x AUDPC values were square root transformed before analysis.

^w Zampro, GWN-10126, and Ranman were applied with Induce 0.25% v/v.