

FUNGICIDES AND INTEGRATED USE OF GENETIC AND CHEMICAL CONTROL FOR MANAGING POWDERY MILDEW OF CROOKNECK SUMMER SQUASH, 1993: A field experiment was conducted on Haven loam soil at the Long Island Horticultural Research Laboratory in Riverhead, NY. Fertilizer (10-10-10) was broadcast at a rate of 1000 lb/A on 24 May, then incorporated. Four-week-old seedlings were transplanted into plastic mulch on 4 Aug at 30-in plant spacing and 68-in row spacing. Plots consisted of 4 rows of 7 plants each. Weeds were controlled by applying Dual 8E (1 pt/A) on 3 Aug and by hand-weeding. The following insecticide applications were made to manage cucumber beetles, aphids, or whiteflies: Lannate L (1 qt/A) on 1 Sep, Metasystox-R 2SC (1 qt/A) on 6 Aug, Sevin 4F (1 qt/A) on 27 Aug, and Thiodan 3EC (2 pt/A) on 20 Aug. Average monthly high and low temperatures (F) and total rainfall (in.) were 80, 62, and 6.92 in Aug; and 76, 57, and 7.61 in Sep, respectively. The field was irrigated (0.5-1.0 in.) on 4, 24, 30 Aug and 4 Sep. The objectives of this experiment included evaluating the efficacy of fungicides applied after disease detection within an IPM context to susceptible (Superset) and resistant (HMX 1707) varieties. Bravo + Bayleton was applied in alternation with Bravo + Benlate on a 7-day schedule with a tractor-mounted boom sprayer equipped with no. 3 hollow cone nozzles that delivered 40 gal/A at 68 psi. Fungicides were applied 5 times (22, 28 Aug; and 2, 9, and 20 Sep). Fruit were harvested, counted, and weighed every 3-4 days. A randomized complete block design with 4 replications was used. Ten young, mid-aged, and old leaves in each plot were examined routinely for powdery mildew. Colonies were counted or severity (percent leaf area covered by mildew) was assessed on upper and lower leaf surfaces. Severity data were transformed by natural log transformation where necessary to obtain constant variance before subjection to analysis of variance. AUDPC was calculated for severity from 23 Sep through 5 Oct. Planned comparisons were made between treatment combinations of interest.

Powdery mildew development was suppressed in both varieties with fungicides applied after disease detection. Symptoms were observed earlier in plant development than in previous years, perhaps because the delay in transplanting stressed the plants. Fruit was just starting to form on 20 Aug when powdery mildew was first observed. Symptoms were found on most plants examined of both varieties, but Superset was more severely infected. Plants of the susceptible variety Superset receiving the IPM spray program had significantly less powdery mildew and produced significantly more yield than non-fungicide-treated control plants. Fungicide-treated plants of the resistant variety HMX 1707 had significantly less powdery mildew but did not produce significantly more yield than non-fungicide-treated control plants.

Variety	No. fungicide applications	% of upper leaf surface with mildew*				% of lower leaf surface with mildew*			
		30 Sep	p-value	AUDPC	p-value	30 Sep	p-value	AUDPC	p-value
<u>Evaluation of an IPM Spray Program</u>									
Supersett	0.....	25.6		219.1		52.0		567.5	
Supersett	5.....	0.0	.0001	0.0	.0001	49.3	.5273	410.9	.0017
HMX 1707	0.....	3.3		22.5		14.4		98.1	
HMX 1707	5.....	0.0	.1567	0.0	.0419	0.0	.0080	1.5	.0235

* Exact colony counts were made when possible and severity was estimated using the conversion factor of 10 colonies/leaf = 1%.

Variety	No. fungicide applications	Yield (lbs fruit/plant)*					
		Early-season (8/30-9/10)	p-value	Mid-season (9/13-9/24)	p-value	Late-season (9/27-10/8)	p-value
<u>Evaluation of an IPM Spray Program</u>							
Supersett	0.....	2.30		0.83		0.09	
Supersett	5.....	2.79	.0142	1.74	.0154	0.62	.0001
HMX 1707	0.....	2.24		1.13		0.28	
HMX 1707	5.....	2.34	.5884	1.34	.5137	0.37	.2177