SQUASH (Cucurbita pepo 'Goldbar' and 'PSX 2287')
Powdery Mildew; Sphaerotheca fuliginea

(133)

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FUNGICIDES AND INTEGRATED USE OF GENETIC AND CHEMICAL CONTROL FOR MANAGING POWDERY MILDEW OF SUMMER SQUASH, 1991: A field experiment was conducted on Riverhead sandy loam soil at the Long Island Horticultural Research Laboratory in Riverhead, N.Y. Three-week-old seedlings were transplanted into aluminum mulch on 23 Jul at 30-in plant spacing and 68-in row spacing. Plots consisted of 4 rows of 7 plants. Fertilizer was broadcast and incorporated at a rate of 1000 lb/A of 10-20-20 on 21 May. Weeds were controlled by applying Dual 2S at 1.5 pt/treated A between the mulch strips on 18 Jul, mechanically cultivating, and hand-weeding. The following insecticide applications were made: Javelin WG (1-2 lb/A) on 3 and 13 Aug; Lannate L (1-2 pt/A) on 3, 13, 29 Aug and 10 Sep; and Phosdrin 4EC (0.5-1 pt/A) on 3, 13, 29 Aug. The field was irrigated (0.5 in.) on 1 Aug. Average monthly high and low temperatures (F) and total rainfall (in.) were 85, 66, 2.1 in Jul; 84, 67, 9.4 in Aug; and 75, 58, 4.9 in Sep, respectively. Hurricane Bob delivered 5.5 in. of rain on 19 Aug. The objectives of this experiment were: 1) to evaluate the efficacy of fungicides applied to susceptible (Goldbar) and resistant (PSX 2287) varieties, 2) to determine if powdery mildew can be controlled successfully in summer squash with an IPM spray program developed for pumpkin, and 3) to evaluate an abbreviated IPM spray program terminated 2-3 weeks before the end of the harvest period. These varieties are from PetoSeed. Upper and lower leaf surfaces in each plot were examined weekly for powdery mildew. Initially, 45 of the oldest leaves were examined in each plot. Powdery mildew was first observed on 12 Aug, which was 4 days before the first harvest. Young and mid-aged leaves were also examined beginning on 10 Sep. Colonies were counted or severity (percent leaf area covered by mildew) was assessed. The action threshold for initiating the IPM spray program was 1 leaf out of 45 leaves with powdery mildew. Bravo + Bayleton were 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. For the preventative spray program fungicides were applied 8 times (31 Jul; 8, 16, 23, 30 Aug; and 7, 16, 22 Sept). The IPM spray program was initiated on 23 Aug and terminated after 3 or 5 sprays on 7 or 22 Sep, respectively. Fruit were harvested, counted, and weighed every 2-5 days from 16 Aug to 24 Sep. A randomized complete block design with 4 replications was used. 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 12 Aug through 19 Sep. Planned comparisons were made between treatment combinations of interest.

The preventative spray program suppressed powdery mildew development on upper and lower leaf surfaces of both varieties. The level of powdery mildew management on upper and on lower leaf surfaces achieved with the IPM schedule (5 sprays) was not statistically different from that achieved when a preventative schedule was used (8 sprays) for both varieties. There were no significant differences in the level of control achieved with the two IPM spray programs (3 or 5 sprays). No phytotoxicity was observed. There were no significant differences in total weight of fruit harvested between 16 and 29 Aug and between 29 Aug and 16 Sep. However, between 16 and 30 Sep, powdery mildew reduced yield by 42% and 43% for the nontreated plants of PSX 2287 and Goldbar, respectively, as compared with the average for the fungicide-treated plants.

Variety	No. fungicide applications*	% of upper leaf surface with mildew**				% of lower leaf surface with mildew**			
		11 Sep	p-value	AUDPC	p-value	11 Sep	p-value	AUDPC	p-value
Evaluation of a Preventative Spray Program									
Goldbar	0	22.2		370		9.4		270	
Goldbar	8	0.0	.0001	0	.0001	0.0	.0001	2	.0001
PSX 2287	0	3.2		66		0.4		7	
PSX 2287	8	0.0	.0001	0	.0001	0.0	.0001	0	.0001
Comparison of IPM and Preventative Spray Programs									
Goldbar	5	0.1		5		0.8		20	
Goldbar	8	0.0	.0092	0	.0001	0.0	.0001	2	.0140
PSX 2287	5	0.0		1		0.0		0	
PSX 2287	8	0.0	.5781	0	.1800	0.0	.4709	0	.2085
Comparison of 2 IPM Spray Programs									
Goldbar	3	0.2		2		0.6		12	
Goldbar	5	0.1	.7276	5	.4400	0.8	.1001	20	.6914
PSX 2287	3	0.0		0		0.0		0	
PSX 2287	5	0.0	.7679	1	.2533	0.0	.7172	0	.3420

* Fungicides, Bravo 720 3 pt/A (7-day) + Bayleton 50DF 4 oz/A (14-day) + Benlate 50DF 8 oz/A (14-day), were applied 7, 5, or 3 times in a preventative spray program, in an IPM spray program initiated after powdery mildew was detected and continued through the harvest period, and in an IPM spray program terminated 2-3 weeks before the end of the harvest period, respectively.

** Exact lesion counts were made when there were less than about 50 lesions per leaf. Thereafter, severity was estimated using a conversion factor of 1% = 30 lesions/leaf.