

COMPARISON OF RESISTANT VARIETIES AND CHEMICAL CONTROL FOR MANAGING BACTERIAL LEAF SPOT OF PEPPER, 1998: A field experiment was conducted at the Long Island Horticultural Research Laboratory on Riverhead sandy loam soil. Fertilizer (1000 lb/A of 10-10-10) was broadcast and incorporated on 18 May. On 8 Jun, 46-day-old seedlings were transplanted into raised beds with black plastic mulch and drip irrigation. Weeds were controlled by applying Devrinol 50DF (2 lb/treated A) between rows, mechanically cultivating with a rototiller and hand-weeding. Insects were controlled by applying Spintor 25C (5 fl oz/A) four times, Orthene 75S (1.3 lb/A) thrice, and Sevin 50WP (1 lb/A) once. Plants were watered as needed, based on irrometer readings, using drip irrigation. Calcium nitrate (200 lb/A of 15.5-0-0) was applied through the drip on 27 Aug. A split-plot design with four replications was used. The whole plot treatment was fungicide/bactericide treatment. The subplot treatment was variety. Camelot is susceptible to BS; other varieties are resistant to races 1, 2, and 3 of *X. c.* pv. *vesicatoria*. Subplots consisted of two staggered rows each with 10 plants spaced 15 in. apart within and between the two rows. Fungicide/bactericide treatment was included in this experiment to be able to compare chemical control to genetic control (treated Camelot vs nontreated X3R Camelot) and to be able to determine if there is a benefit to applying fungicide/bactericide to varieties with resistance to bacterial leaf spot (BS). To provide a source of BS, Camelot was planted between plots and inoculated on 16, 17 and 20 Jul with a suspension of races 1, 2, and 3 of *X. c.* pv. *vesicatoria* (from S. A. Miller, OH) by using a pressurized garden sprayer. The first two inoculations were done on rainy days. On 20 Jul, leaves were moistened by running sprinklers for 1.5 hr before inoculating. In addition, this experiment was next to a fungicide/bactericide evaluation with an inoculated spreader row. To provide conditions favorable for disease development, a sprinkler irrigation system that delivers 0.08 in/hr was run for 1-3 hr during early evening on 20, 30 Jul; 3, 7, 8, 9, 29, 30 Aug; and 16 Sep. Kocide 2000 (2 lb/A) was tank mixed with Maneb 75DF (1.5 lb/A) and agitated for 90 min which reportedly increases the amount of copper in solution. This solution was applied on 14, 21, and 28 Jul; 4, 12, 20, and 26 Aug; and 2, 11, 19, and 25 Sep with a tractor-mounted boom sprayer equipped with D3-45 hollow cone nozzles spaced 11 in. apart that delivered 100 gpa at 250 psi. BS severity was recorded on 4 and 17 Sep as percent green leaf tissue with symptoms. Fruit were harvested, counted, and weighed every 6-24 days over a 73-day period (6 Aug-18 Oct). Fruit with sunscald, blossom-end rot, insect damage, or BS symptoms were considered unmarketable. Yield data were summed over three harvest periods: early (6-18 Aug), middle (25 Aug-3 Sep), late (9 Sep-18 Oct). In addition to conducting a standard analysis of variance, planned comparisons were conducted to evaluate chemical control (treated Camelot vs nontreated Camelot) and to compare chemical control to genetic control (treated Camelot vs nontreated X3R Camelot).

Symptoms of BS were first observed on inoculated BS-susceptible Camelot on 23 Jul. BS was at a low level throughout this experiment, and caused little defoliation. Host plant resistance was a more effective way to manage BS than chemical control. Nontreated X3R Camelot produced significantly fewer fruit with BS and had significantly less severely infected foliage than Camelot treated 11 times with Kocide + Maneb; however, there were no significant differences in yield, possibly due to low disease pressure. In contrast with a previous experiment (B&C Tests 13:168), X3R Camelot did not produce significantly fewer fruit than Camelot during the early harvest period. Chemical control was effective. Camelot produced significantly fewer fruit with BS and had significantly less severely infected foliage than nontreated Camelot. There was no benefit to treating resistant varieties. Data from treated and nontreated subplots were pooled for the variety comparisons. Only X3R Camelot and Yorktown (aka XPH12205) did not produce significantly more fruit than Camelot during late harvest. X3R Wizard was the highest yielding variety.

Yield (# fruit/plant and fruit weight/plant)

Treatment	Bacterial spot <sup>1</sup>		Mean lb/fruit	6 Aug - 18 Aug		25 Aug - 3 Sep		9 Sep - 18 Oct		6 Aug - 18 Oct	
	Foliage	Fruit		#	lb	#	lb	#	lb	#	lb
Kocide + Maneb Camelot (S).....	8.5	2.2	0.36	4.5	1.6	3.1	1.1	3.9	1.5	11.6	4.2
No fungicide/bactericide Camelot (S).....	16.8	5.7	0.37	3.8	1.4	3.4	1.3	3.2	1.2	10.4	3.8
Both treatments combined <sup>4</sup>											
Camelot (S).....	12.6 a <sup>3</sup>	3.9 a	0.36	4.2	1.5	3.3	1.2	3.6 d	1.3 c	11.0	4.0
Commandant (R).....	4.6 b	0.1 b	0.36	4.5	1.6	2.8	1.0	5.4 a-c	1.9 ab	12.7	4.6
X3R Aladdin (S).....	1.9 b	0.1 b	0.36	4.6	1.5	2.6	0.9	4.7 bc	1.8 b	11.9	4.2
X3R Camelot (S).....	1.6 b	0.1 b	0.34	4.7	1.5	2.5	0.9	4.3 cd	1.6 bc	11.5	4.0
X3R Wizard (S).....	3.2 b	0.3 b	0.36	4.5	1.6	2.6	0.9	6.0 a	2.3 a	13.1	4.8
Yorktown (A).....	3.5 b	0.1 b	0.34	5.3	1.8	1.9	0.7	4.4 cd	1.6 bc	11.7	4.0
Boynton Bell (HM)...	3.5 b	0.3 b	0.32	4.5	1.4	2.9	1.0	5.7 ab	1.9 ab	13.1	4.3
Enterprise (A).....	2.5 b	0.0 b	0.35	4.9	2.0	2.2	0.8	5.3 a-c	2.0 ab	12.4	4.5
ANOVA analyses (p-values)											
Kocide + Maneb	0.0027	0.18	0.06	0.41	0.24	0.95	0.29	0.03	0.09	0.52	0.14
Variety	0.0001	0.0001	0.08	0.31	0.63	0.07	0.08	0.001	0.0009	0.06	0.21
F Camelot vs <sup>5</sup>											
NF Camelot <sup>5</sup>	0.002	0.0001	0.77	0.23	0.45	0.60	0.57	0.32	0.31	0.25	0.46
NF X3R Camelot <sup>5</sup>	0.022	0.008	0.85	0.84	0.90	0.47	0.54	0.78	0.86	0.94	0.85

<sup>1</sup> For foliage, rating is percent of leaf tissue in a plot with bacterial spot symptoms on 17 Sep. For fruit, rating is incidence of fruit with symptoms.

<sup>2</sup> A=Asgrow, HM=Harris Moran, R=Rogers, and S=Seminis.

<sup>3</sup> Numbers in a column with a letter in common are not significantly different according to Fisher's Protected LSD (P=0.05).

<sup>4</sup> Data from fungicide-treated and non-treated subplots were combined since fungicide main effect was rarely significant.

<sup>5</sup> Planned comparison of fungicide-treated (F) Camelot and non-treated (NF) Camelot and non-treated (NF) X3R Camelot.