PEPPER, BELL (*Capsicum annuum*)
Bacterial spot; *Xanthomonas campestris* pv. *vesicatoria*

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COMPARISON OF RESISTANT VARIETIES AND CHEMICAL CONTROL FOR MANAGING BACTERIAL LEAF SPOT OF PEPPER, 1997: 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 15 May. Seven-wk-old seedlings were transplanted on 9 Jun into raised beds with black plastic mulch and drip irrigation. Weeds were controlled by applying Devrinol 50DF (2 lb/treated A) on 30 May to bare ground between rows of mulch, mechanically cultivating with a rototiller and hand-weeding. Insects were controlled by applying Ambush 25W (12.8 oz/A) once, Orthene 75S (1.3 lb/A) six times, Sevin 80S (1.5 lb/A) once; and Provado 1.6F (3.75 oz/A) twice. Plants were watered as needed based on irrometer readings using drip irrigation. 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 7 and 11 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. Leaves were moistened by running overhead irrigation for 1 hr before and after inoculation. In addition, this experiment was next to a fungicide/bactericide evaluation with an inoculated spreader row. 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 8, 14, 21, and 29 Jul; 5, 14, 20, and 30 Aug; and 5, 13, 19, and 26 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 weekly from 8 Aug to 15 Oct as percent green leaf tissue with symptoms. Fruit were harvested, counted, and weighed every 6-8 days over a 74-day period (4 Aug-17 Oct). Fruit with sunscald, blossom-end rot, insect damage, or BS symptoms were considered unmarketable. Yield data were summed over three harvest periods: early (4-19 Aug), middle (25 Aug-9 Sep), late (16 Sep-17 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 21 Jul and on Camelot in the plots on 8 Aug. Weather was generally dry and not favorable for BS (only 11 days with >0.1 in. from 22 Jul to 28 Sep, total rainfall of 6.7 in.). Kocide + Maneb applied weekly on a preventive schedule was not effective. Treated Camelot was not significantly less severely infected and did not yield significantly more than nontreated Camelot. The whole plot treatment effect was significant for total yield and for fruit weight; however, treatment mean was lower for Kocide + Maneb-treated plots. Chemical control may have been compromised because applications made on 14 and 30 Aug were 2-3 days late because of rain or equipment failure. Host plant resistance was a more effective way to manage BS than chemical control. Nontreated X3R Camelot was significantly less severely infected and produced significantly more fruit than treated Camelot. Since fungicide/bactericide treatment did not affect BS severity or yield, data from treated and nontreated subplots was pooled for the variety comparisons. Enterprise was the highest yielding variety. Camelot produced significantly more fruit than X3R Camelot early (4-19 Aug), thereby confirming previous criticisms of this variety, however, X3R Camelot produced significantly more fruit than Camelot during the other harvests. Yield may have been much lower during the middle and late harvests than during the early harvest because of insufficent fertilization.

Treatment	BS severity (%)[1]		Mean	Yield (# fruit/plant and fruit weight/plant)							
				4 Aug - 19 Aug		25 Aug - 9 Sep		16 Sep - 17 Oct		4 Aug - 17 Oct	
Variety (source[2])	28 Aug	AUDPC	lb/fruit	#	lb	#	lb	#	lb	#	lb
Kocide + Maneb											
Camelot (S).....	10.5	70.8	.47	3.3	1.6	0.8	0.4	0.9	0.3	5.0	2.4
No fungicide/bactericide											
Camelot (S).....	16.8	107.8	.48	3.3	1.6	0.8	0.4	1.1	0.5	5.2	2.4
Both treatments combined[4]											
Camelot (S).....	13.6 a[3]	89.2 a	.47 bc	3.3 b	1.6 b	0.8 c	0.4 c	1.0 c	0.4 c	5.1 d	2.4 c
Commandant (R).....	0.7 b	6.4 b	.47 cd	2.6 de	1.3 cd	1.0 c	0.5 bc	2.0 ab	0.8 ab	5.6 cd	2.6 bc
X3R Aladdin (S).....	0.4 b	4.6 b	.46 cd	2.3 e	1.1 d	0.9 c	0.4 bc	2.0 ab	0.8 ab	5.1 d	2.4 c
X3R Camelot (S)....	0.4 b	3.4 b	.48 bc	2.6 de	1.3 cd	1.5 a	0.8 a	2.1 ab	0.9 ab	5.8 bcd	2.9 b
X3R Wizard (S).....	0.6 b	5.9 b	.50 a	2.8 cd	1.5 bc	0.9 c	0.5 bc	2.1 ab	0.9 ab	6.2 bc	3.0 b
XPH12205 (A).....	0.6 b	7.6 b	.48 bc	3.2 bc	1.6 b	1.2 bc	0.6 ab	1.8 b	0.8 b	6.2 bc	3.0 b
Boynton Bell (HM)...	0.4 b	5.6 b	.46 d	3.2 bc	1.5 bc	1.4 ab	0.7 a	2.0 ab	0.8 ab	6.6 b	3.0 b
Enterprise (A).....	0.5 b	4.0 b	.49 ab	3.8 a	2.0 a	1.5 ab	0.8 a	2.5 a	1.0 a	7.7 a	3.8 a
ANOVA analyses (p-values)											
Kocide + Maneb	0.65	0.58	0.04	0.20	0.10	0.14	0.10	0.90	0.80	0.06	0.046
Variety	0.0003	0.0001	0.0002	0.0001	0.0001	0.0001	0.0002	0.0016	0.002	0.0001	0.0001
F Camelot vs [5]											
NF Camelot [5]	0.14	0.12	0.56	0.95	0.92	0.83	0.87	0.64	0.55	0.79	0.73
NF X3R Camelot [5]	0.02	0.006	0.11	0.20	0.48	0.0003	0.0002	0.011	0.01	0.0096	0.007

[1] Percent of leaf tissue in a plot with bacterial spot symptoms.
[2] A= Asgrow, HM=Harris Moran, R=Rogers, and S=Seminis.
[3] Numbers in a column with a letter in common are not significantly different according to Fisher's Protected LSD (P=0.05).
[4] Data from fungicide-treated and non-treated subplots were combined since fungicide main effect was rarely significant.
[5] Planned comparison of fungicide-treated (F) Camelot and non-treated (NF) Camelot and non-treated (NF) X3R Camelot.