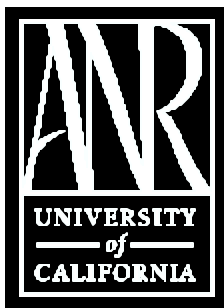


**2004
BELL PEPPER
VARIETY EVALUATION
TRIALS**



*In
San Joaquin County*



University of California
Cooperative Extension
420 South Wilson Way
Stockton, California 95205

**2004 BELL PEPPER VARIETY EVALUATION TRIAL
In San Joaquin County**

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The Central Valley is one of the larger bell pepper production areas of California. San Joaquin County had about 1,600 acres of all types of peppers (primarily bell peppers) in 2004 for both fresh market and processing. The requirement for varieties that have high yield potential and possess excellent horticultural characteristics is essential to the continued economic health of the pepper industry. Most of the production in this area occurs during midsummer into late fall.

Because a substantial portion of the county's acreage of peppers is grown during a period of shorter days with cool, humid nights, disease (Black Mold, Powdery Mildew, Phytophthora, etc.) and physiological disorders (Pepper Spot, Blossom end rot, and Sunburn) are always potential problems for producers. More recently, a complex of virus diseases (cucumber mosaic, pepper mottle, tobacco etch, potato virus Y, ring spot, and/or tobacco mosaic virus) have occurred, resulting in serious losses for some local growers in given years. Frustration with the virus problem and reduced crop prices to growers have led some growers to reduce acreage or completely get out of pepper production. Fortunately for this area, 2004 proved to be a very limited virus problem year, because the aphid vector responsible for spreading many of the viruses did not appear in heavy numbers and then only after plantings were well established.

Now that there are a number of exciting new pepper cultivars available to producers, information on yield and fruit quality, as well as disease resistance/tolerance levels, is particularly desirable for the local industry. Additionally, Pepper Spot/Black Spot (STIP) has sometimes been a problem on a number of varieties grown under short day, cool night conditions, i.e., late summer/fall in this area, and along the Central Coast. Older, open pollinated lines and certain hybrids have been particularly susceptible to the problem under the aforementioned environmental conditions.

There also may be a relationship of calcium nutritional imbalance in the peppers contributing to the Pepper Spot problem. Circular, gray/black spots develop under the skin in the fruit wall of susceptible varieties about the time the fruit attain a size diameter of three or more inches. As the fruit ripen, the spots slightly enlarge and turn green or yellow. A number of newer hybrid varieties show a good level of resistance or tolerance to this physiological disorder. This year's trial at Biglieri Farms (Steve Biglieri) on the Colosso Ranch near Dry Creek, east of Galt, California, sought to look at yield and fruit quality of a number of established and new bell pepper lines (including some yellow-fruited varieties and one orange-colored cultivar) from commercial seed company breeders.

The variety trial in 2004 at Biglieri Farms was transplanted on June 18th and the field variety was Baron. The soil type at the trial site was a Wyman silt loam and the trial field was furrow irrigated throughout the season. The resulting crop stand was excellent with vigorous plant growth and very good fruit set. Climatic conditions over the growth period were warm overall with only a limited number of very hot days. The trial contained ten replicated lines and another 26 varieties in single-replication observation plots. Due to development of *Phytophthora* root rot in areas of the field, including part of the variety trial, hand harvest of the trial was done on September 7, 2004 – this was approximately two weeks earlier than planned, so crop maturity was not as far along as would have been preferable. In addition to marketable yield figures, data on crop maturity and fruit size were taken. In the Replicated trial, highest yield of red or colored fruit plus green or immature marketable colored fruit was produced by Double Up at 13.8 tons/acre, followed by Wizard (12.6 tons/acre), Baron (11.9 tons/acre), Affinity (11.8 tons/acre), XP 1133 (11.5 tons/acre) and Encore (11.2 tons/acre). Best quality fruit, including blocky shape and good fruit color and size, was led by Double Up, Affinity, Wizard, HA 2506, and Baron. All of the replicated lines were free of Pepper Spot (STIP). One individual replication of Golden Sun and two replications of HA 744 were lost to *Phytophthora* root rot, so they were not included in the replicated statistical analysis and are listed separately at the bottom of **Table 1**, which contains complete data on eight replicated varieties which were completely harvested.

In the observation block of the Biglieri Farms trial, the best yield of red or colored fruit plus green or immature colored marketable fruit occurred with HMX 4673 at 24.10 tons/acre, followed by HMX 2646 (18.88 tons/acre), GV 4002 (17.13 tons/acre), HMX 2649 (17.00 tons/acre), GV 4005 (16.84 tons/acre), Paso Real (16.55 tons/acre), GV 3002 (16.26 tons/acre), GV 4011 (14.81 tons/acre) and El Charro (13.65 tons/acre). In terms of fruit quality, the best lines were HMX 4673, HMX 2646, Shemesh, HMX 2649, Paso Real, GV 4005, GV 3002, and El Charro. The presence of *Phytophthora* root rot in the trial area did not allow a thorough evaluation of the yield and quality potential of a number of lines. Data on yield, crop maturity at harvest and fruit size are presented in **Table 2** for the observation cultivars. The reader of this report is cautioned that the data from the varieties in the observation block represent only one replication of each line.

MISCELLANEOUS NOTES

Among the replicated pepper lines there was a little bit of worm damage in the fruit of HA 744, Golden Sun and Affinity. In the observation lines, two nice yellow-fruited lines were Shemesh and GV 3002. Semi-long to long fruited types showing good fruit quality were El Charro, GV 4002 and GV 4007; GV 4006 was a long fruited line with a lot of misshapen fruit and GV 3000 also had a lot of misshapen fruit.

ACKNOWLEDGEMENTS

Many thanks and a great deal of appreciation are expressed to Steve Biglieri (Biglieri Farms) for all his cooperation, help and management in the conduct and maintenance of the variety trial. Also, much appreciation is extended to Todd and Grant Craven of Craven Transplants near Crows Landing, California, for the excellent quality transplants of all varieties provided for the variety trial. Thanks also to the participating seed companies for providing the raw materials and monetary assistance to support the bell pepper variety evaluation program in San Joaquin County.

2004 BELL PEPPER VARIETY TRIAL
SEED LIST

Replicated	Observation	Seed Company
Affinity Encore	RPP 12731 RPP 9650	Jupiter RPP 9661 <u>Syngenta Seed (Rogers Brand)</u>
Double Up XPP 1133	XPP 1103	<u>Sakata Seed America, Inc.</u>
Wizard Baron		<u>Seminis Seeds</u>
Sunrise Orange	Purple Beauty	<u>Seeds of Change</u>
	HMX 2646 HMX 2649 HMX 4673	<u>Harris Moran Seed</u>
HA 2506 Golden Sun (HA 959) HA 744	HA 1038 (El Charro) HA 1195 (Paso Real) HA 490 (Shemesh)	<u>Hazera Genetics, Ltd</u>
	P 0047	<u>BHN Seed</u>
	GV 3000 GV 3001 GV 3002 GV 4000 GV 4001 GV 4002 GV 4003	GV 4004 GV 4005 GV 4006 GV 4007 GV 4008 GV 4011 <u>Golden Valley Seed</u>

**Table 1. 2004 Bell Pepper Variety Trial
Biglieri Farms, - Dry Creek, California
Replicated Varieties**

Variety	Marketable Yield/Acre ¹ (red/colored + green/colored)		Crop Maturity @ Harvest (%) ¹			Fruit Sizing Data (%) ¹				
	Tons	Boxes	Red/ colored	Green/ colored	Culls	Jumbo	Extra Large	Large	Medium	Small
Double Up	13.8	1,104	3.1	67.3	29.6	17.8	39.8	23.9	12.7	5.8
Wizard	12.6	1,008	3.1	71.3	25.6	38.9	34.1	11.2	2.3	13.5
Baron	11.9	952	3.0	65.9	31.1	13.9	30.7	27.3	18.1	10.0
Affinity	11.8	944	2.8	63.1	34.1	30.2	23.2	10.1	17.6	18.9
XP 1133	11.5	920	1.3	60.6	38.1	20.1	35.8	18.6	17.2	8.3
Encore	11.2	896	4.2	63.4	32.4	37.9	22.2	21.5	11.1	7.3
HA 2506	10.5	840	3.8	57.0	39.2	15.9	59.3	12.7	7.9	4.2
Sunrise Orange	9.7	776	12.7	54.3	33.0	0.0	4.4	13.1	30.7	51.8
Average:	11.6	930								
LSD @ 0.05:	2.8	224								
C.V. =	16.4%	16.4%								

¹ Average of four replications

Other Replicated Varieties:

Golden Sun ²	10.0	800	0.0	60.2	39.8	0.0	17.6	35.2	25.1	22.1
HA 744 ³	9.6	768	0.0	70.0	30.0	9.6	26.9	23.1	23.0	17.4

² Average of three replications

³ Average of two replications

Pepper Fruit Sizing Data:

Jumbo > 240g; Extra Large 200-240g; Large 170 – 200g; Medium 150-170g; Small < 150g

**Table 2. 2004 Bell Pepper Variety Trial
Biglieri Farms, - Dry Creek, California
Observation Varieties**

Variety	Marketable Yield/Acre ¹ (red/colored + green/colored)		Crop Maturity @ Harvest (%) ¹			Fruit Sizing Data (%) ¹				
	Tons	Boxes	Red/ colored	Green/ colored	Culls	Jumbo	Extra Large	Large	Medium	Small
HMX 4673	24.10	1,928	15.3	69.4	15.3	19.0	25.9	17.2	24.1	13.8
HMX 2646	18.88	1,510	0.0	76.5	23.5	16.1	37.1	21.0	19.3	6.5
GV 4002	17.13	1,370	4.5	62.5	33.0	33.8	30.8	7.7	9.2	18.5
HMX 2649	17.00	1,360	11.9	61.6	26.5	0.0	41.8	36.4	14.5	7.3
GV 4005	16.84	1,347	3.1	56.7	40.2	29.8	17.5	31.6	15.8	5.3
Paso Real (HA 1195)	16.55	1,324	0.0	68.7	31.3	18.2	25.5	16.4	25.4	14.5
GV 3002	16.26	1,301	6.3	52.1	41.6	56.4	25.8	9.7	8.1	0.0
GV 4011	14.81	1,185	15.4	40.6	44.0	20.4	32.6	20.4	10.2	16.4
El Charro (HA 1038)	13.65	1,092	0.0	64.4	35.6	37.0	21.7	21.7	19.6	0.0
GV 3000	13.36	1,069	0.0	64.8	35.2	24.4	26.7	28.9	0.0	20.0
Shemesh (HA 490)	12.92	1,034	4.0	67.7	28.3	0.0	12.5	50.0	25.0	12.5
GV 4000	12.63	1,010	0.0	53.4	46.6	40.4	12.8	27.7	10.6	8.5
GV 4008	11.76	941	2.8	42.0	55.2	0.0	50.0	20.8	12.5	16.7
GV 4007	11.62	930	0.0	46.0	54.0	42.6	24.6	0.0	21.3	11.5
Jupiter	11.62	930	0.0	58.8	41.2	0.0	37.1	28.6	14.3	20.0
RPP 9661	10.89	871	0.0	54.3	45.7	48.8	37.2	14.0	0.0	0.0
RPP 12731	10.45	836	0.0	58.1	41.9	0.0	27.0	45.9	8.1	19.0
GV 4003	10.45	836	0.0	53.7	46.3	25.0	22.7	13.6	38.7	0.0
P 0047	10.16	813	6.4	68.1	25.5	0.0	42.2	40.0	8.9	8.9
GV 4006	10.16	813	0.0	41.2	58.8	25.6	34.9	30.2	0.0	9.3
RPP 9650	9.87	790	0.0	55.7	44.3	0.0	14.3	66.7	19.0	0.0
GV 3001	9.87	790	0.0	51.5	48.5	22.2	27.8	18.5	9.3	22.2
GV 4001	9.87	790	0.0	56.7	43.3	64.9	26.3	0.0	0.0	8.8
Purple Beauty	9.58	766	0.0	68.8	31.2	0.0	27.8	38.9	0.0	33.3
GV 4004	8.71	697	0.0	42.9	57.1	47.8	39.1	13.1	0.0	0.0
XPP 1103	7.84	627	0.0	55.1	44.9	26.2	23.8	40.5	9.5	0.0

¹ Average of only one replication

Pepper Fruit Sizing Data:

Jumbo > 240g; Extra Large 200-240g; Large 170 – 200g; Medium 150-170g; Small < 150g

2004 BELL PEPPER VARIETY TRIAL
Biglieri Farms – Calosso Ranch; east of Galt, California

Replicated Lines

- | | | |
|--------------|-----------|------------------------|
| 1. Affinity | 5. Wizard | 7. Sunrise Orange |
| 2. Encore | 6. Baron | 8. HA-2506 |
| 3. Double Up | | 9. Golden Sun (HA-959) |
| 4. XPP 1133 | | 10. HA-744 |

Observation Lines

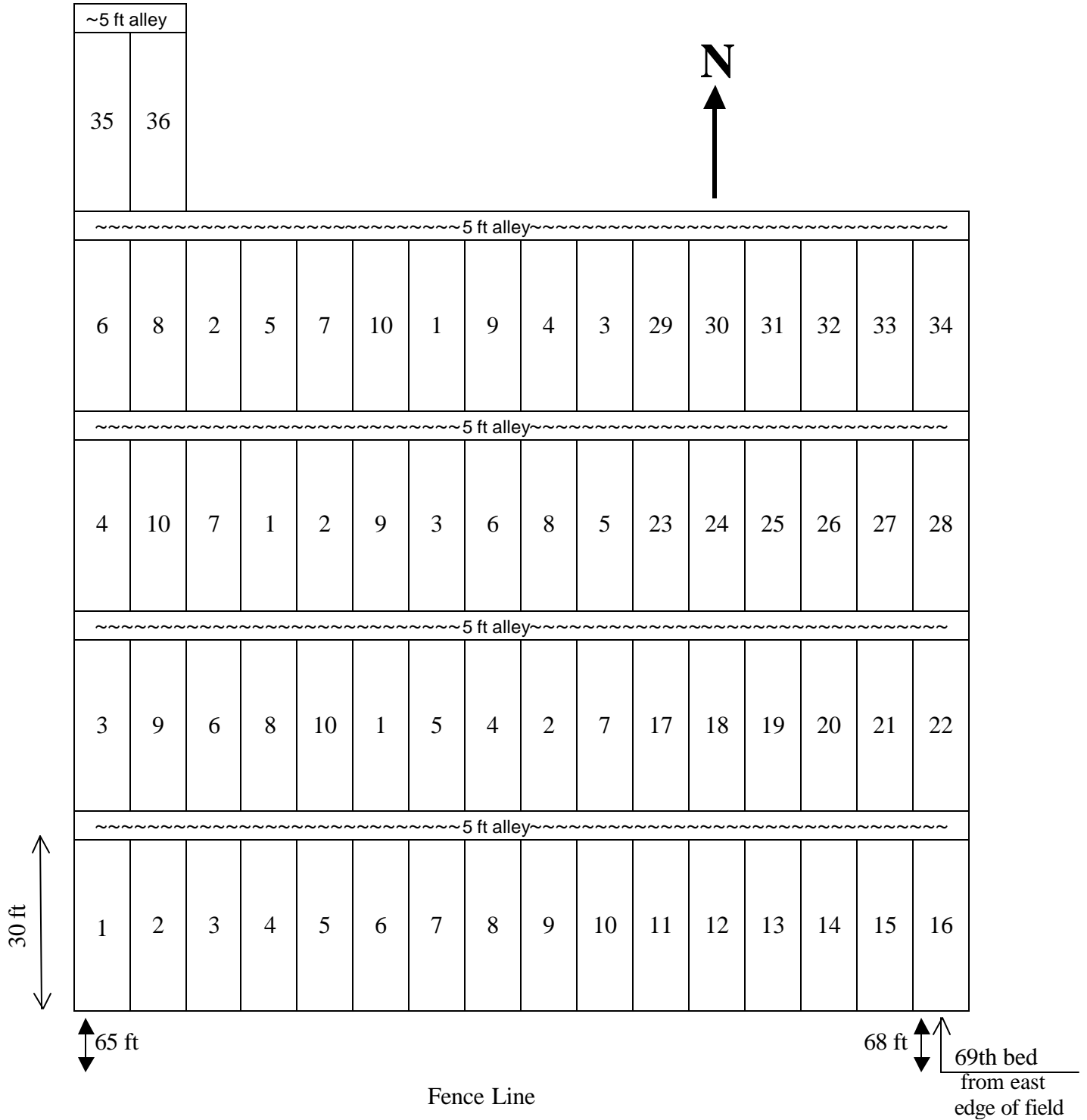
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|-------------------------|-------------|--------------|
| 11. RPP 12731 | 20. P0047 | 28. GV 4004 |
| 12. RPP 9650 | 21. GV 3000 | 29. GV 4005 |
| 13. RPP 9661 | 22. GV 3001 | 30. GV 4006 |
| 14. Jupiter | 23. GV 3002 | 31. GV 4007 |
| 15. XPP 1103 | 24. GV 4000 | 32. GV 4008 |
| 16. Purple Beauty | 25. GV 4001 | 33. GV 4011 |
| 17. HA-1038 (El Charro) | 26. GV 4002 | 34. HMX 2649 |
| 18. HA-1195 (Paso Real) | 27. GV 4003 | 35. HMX 2646 |
| 19. HA-490 (Shemesh) | | 36. HMX 4673 |

Date Transplanted: 6/18/04

Field Variety: Baron

2004 BELL PEPPER VARIETY TRIAL
Biglieri Farms – Calosso Ranch; east of Galt, California

PLOT PLAN:



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