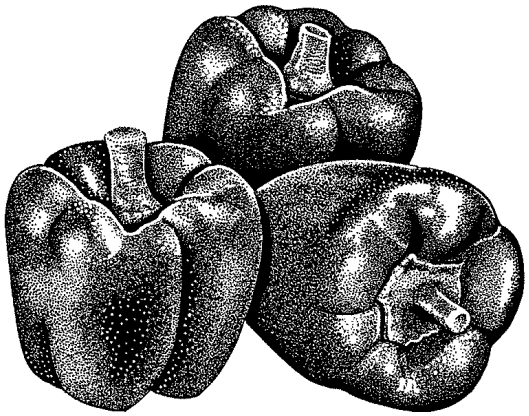
2001
BELL PEPPER
VARIETY EVALUATION
&
WEED MANAGEMENT
TRIALS



In
San Joaquin & Stanislaus Counties

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2001 BELL PEPPER VARIETY EVALUATION AND WEED MANAGEMENT TRIALS

In San Joaquin and Stanislaus Counties

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The Central Valley is a major center of bell pepper production in California. The two county areas of San Joaquin and Stanislaus had nearly 3,000 acres of all types of peppers (primarily bell peppers) in 2001 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 acreage of the crop is harvested during a period of shorter days with cool, humid nights, disease (Black mold, Botrytis, Phytophthora, etc.) and physiological disorders (Sunburn, Pepper Spot, Blossom-end rot) 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 has led some growers to reduce or completely get out of pepper production. Fortunately for this area, 2001 proved to be a limited virus problem year (except for an area near Dry Creek, California), because the aphid vector responsible for spreading many of the viruses did not appear in heavy numbers until later in the season, after most of the 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 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 coast.

There also may be a relationship of calcium nutritional imbalance in the peppers contributing to the Pepper Spot problem under the aforementioned conditions. Circular, gray/black spots develop under the skin in the fruit wall of some pepper 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

the physiological problem. This year's trial at Biglieri Farms (Steve Biglieri) in northeast San Joaquin County, at Dry Creek, sought to look at yield and fruit quality of a number of established and new bell pepper lines (including some yellow-fruited lines) from commercial seed company breeders. Incidence of Pepper Spot was also evaluated.

The variety trial at Biglieri Farms was transplanted on June 9, 2001, and the field variety was Baron. The soil type at the trial site was a Wyman silt loam, and the field was furrow irrigated throughout the season. The resulting crop stand was excellent with excellent plant growth and fruit set growing under warm to occasional hot weather conditions. The trial contained 11 replicated varieties, including the field variety, along with an additional 10 lines in a single replication observation block. The trial was hand harvested on September 19, 2001. In addition to marketable yield figures, data on crop maturity and fruit size were taken. Highest yield of red or yellow plus green marketable fruit in the replicated trial was attained by HA-535 and Encore, both at 26.68 tons/acre), followed by HA-510 (23.41 tons/acre), HA-959 (23.20 tons/acre), Wizard (22.87 tons/acre) and HA-1972 (22.83 tons/acre). HA-959, HA-831 and Shemesh are yellow-fruited varieties. Best quality fruit, including blocky shape, fruit size and good fruit wall thickness, was shown by HA-959, Shemesh, HA-535, Encore and HA-1972. Almost all of the varieties in the replicated trial were free of Pepper Spot, with only a very low level occurring in HA-831. Complete data on the replicated lines (yield, crop maturity and fruit size) are provided in Table 1. HA-1972 and HA-510 are semi-long to long-fruited lines.

In the observation trial block of the Biglieri Farms trial, the best yield of marketable red and yellow plus green fruit occurred with Double Up at 34.12 tons/acre, followed by HA-1038 (30.49 tons/acre), 8180 (29.77 tons/acre), Mar Rojo (27.30 tons/acre), and Karma and King Arthur, both at 25.41 tons/acre.

Best fruit quality among the observation lines was shown by Double Up, Mar Rojo and HA-1038, a long fruited type. Varieties showing light to moderate levels of Pepper Spot were Yellow Bell, Grande Rio and Karma. Data on yield, crop maturity and fruit size are shown in Table 2. The reader of this report is cautioned that the data for the varieties in the observation block represent only one replication of each line.

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. Thanks also to Skip Foppiano of Foppiano farms for his help and cooperation in the herbicide evaluation trials in peppers covered later in this report. Gratitude and thanks is also expressed to the California Pepper Commission for its funding support of the weed management trial work conducted this year locally. Also much appreciation is extended to the participating seed and chemical companies for providing material and monetary assistance for the trials. Many thanks also to Brad Bonnett of Craven Transplants near Crows Landing, California, for the high quality transplants provided for the variety trial. Finally, thanks to Joe Schenone of Western Farm Service for his continued coordination efforts, as Pest Control Advisor for Biglieri Farms and Foppiano Farms, in the conduct of most of the 2001 pepper trials.

2001 Bell Pepper Variety Trial
Seed List

Replicated	Observation	Seed Company
	Double Up XPP0131	Asgrow Seed
Gusto	Karma Grande Rio	Harris Moran/Ferry Morse
HA-535 HA-959 HA-831 HA-1972 HA-510 Shemesh	HA-1038	Hazzera Seed
Encore	Jupiter	Novartis
Baron Wizard	Mar Rojo King Arthur	Petoseed
Maxi Bell	Yellow Bell	United Genetics

Table 1. 2001 Bell Pepper Variety Trial
Biglieri Farms – Dry Creek, CA

Replicated Variety	Marketable Yield[1] (red/yellow + green fruit) tons/acre	Crop Maturity @ Harvest (%)[1]				Fruit Sizing Data (%)[2]				
		Red/Yellow	Green	Pepper Spot Affected Fruit	Other Culls	Jumbo	Extra Large	Large	Medium	Small
HA-535	26.68	8.9	88.9	0.0	2.2	0.0	25.7	36.8	25.7	11.8
Encore	26.68	18.2	67.0	0.0	14.8	56.9	17.9	16.3	5.7	3.2
HA-510	23.41	4.3	85.4	0.0	10.3	29.7	32.4	37.9	0.0	0.0
HA-959	23.20	4.1	77.9	0.0	18.0	0.0	29.6	33.3	27.8	9.3
Wizard	22.87	5.4	85.6	0.0	9.0	29.1	39.4	27.5	4.0	0.0
HA-1972	22.83	0.0	87.3	0.0	12.7	39.7	27.8	20.6	11.9	0.0
Shemesh	22.07	22.7	67.4	0.0	9.9	0.0	14.6	38.8	27.2	19.4
HA-831	21.78	31.0	52.8	0.5	15.7	12.6	34.4	30.3	12.6	10.1
Maxi Bell	21.60	14.9	71.5	0.0	13.6	20.4	16.3	30.6	12.3	20.4
Gusto	20.15	17.7	72.0	0.0	10.3	22.8	19.3	17.5	21.9	18.5
Baron	19.60	20.5	68.8	0.0	10.7	16.5	31.5	25.2	9.4	17.4
LSD @ 5%	4.59									
C.V. =	13.9%									

[1] Average of four replications
[2] Fruit Sizing Data: Jumbo > 240g; Extra Large 200-240g; Large 170 – 200g; Medium 150-170g; Small < 150g

Table 2. 2001 Bell Pepper Variety Trial
Biglieri Farms – Dry Creek, CA

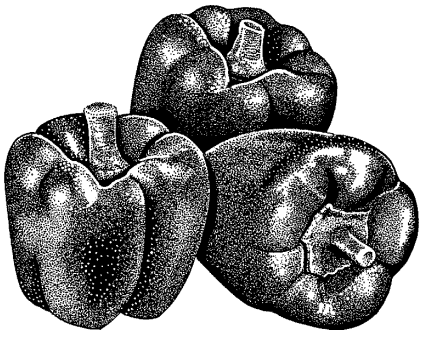
Observation Variety	Marketable Yield[1] (red/yellow + green fruit) tons/acre	Crop Maturity @ Harvest (%)[1]				Fruit Sizing Data (%)[2]				
		Red/Yellow	Green	Pepper Spot Affected Fruit	Other Culls	Jumbo	Extra Large	Large	Medium	Small
Double Up	34.12	8.3	89.6	0.0	2.1	64.3	29.3	6.4	0.0	0.0
HA-1038	30.49	2.2	89.1	0.0	8.7	38.7	21.1	17.6	15.5	7.1
8180	29.77	6.7	84.4	0.0	8.9	57.0	43.0	0.0	0.0	0.0
Mar Rojo	27.30	13.0	84.4	0.0	2.6	45.4	37.8	12.6	4.2	0.0
Karma	25.41	12.8	76.9	2.6	7.7	88.3	6.4	5.3	0.0	0.0
King Arthur	25.41	18.4	53.1	0.0	28.5	63.2	26.3	10.5	0.0	0.0
Grande Rio	24.68	12.5	72.5	2.5	12.5	27.8	38.9	24.1	5.5	3.7
Jupiter	24.68	9.5	71.4	0.0	19.1	49.5	30.1	15.5	4.9	0.0
XPP0131	19.60	10.0	80.0	0.0	10.0	33.7	31.3	21.7	7.2	6.1
Yellow Bell	18.88	2.9	71.4	11.4	14.3	38.0	39.1	0.0	12.0	10.9

[1] Average of only one replication
[2] Fruit Sizing Data: Jumbo > 240g; Extra Large 200-240g; Large 170 – 200g; Medium 150-170g; Small < 150g

BELL PEPPER

WEED MANAGEMENT

TRIALS



A Pre-Transplant Incorporated Weed Control Trial in Bell Peppers.

Robert J. Mullen, Scott Whitely and Chuck Cancilla

A pre-transplant incorporated weed control trial in bell peppers, evaluating four herbicides and/or combination treatments, was established on July 2, 2001, at Foppiano Farms (Skip Foppiano) near Collegeville, California. All treatments were applied to the soil surface of the pepper beds using a handheld CO_2 backpack sprayer with 8002 nozzles at 40 psi in a spray volume of 30 gallons per acre water. All treatments were mechanically incorporated approximately 3 inches deep into the soil in two passes with the grower's rolling cultivator about an hour after spray application. There were four replications of each treatment, and the plot design was a randomized complete block. The field was transplanted five days later with the variety Capistrano, and sprinkler irrigation followed on July 8, 2001. After a second sprinkler irrigation, the field was furrow irrigated for the remainder of the season. The soil type at the trial site was a Stockton adobe clay, and the bed spacing was 60 inches (2 – 30 inch beds); individual plot row lengths were 25 feet. Weed control and crop vigor ratings were taken on July 26th and again on August 12th. Best control of the barnyardgrass and wild radish present occurred with a combination treatment of Dual Magnum (metolachlor) plus Prowl (pendimethalin), followed by Prowl alone, the combination treatment of Prefar (bensulide) plus Devrinol (napropamide) and the high rate of Dual Magnum alone. Crop vigor was excellent with all treatments. The trial was hand harvested on October 10, 2001. All treatments provided yields equal to or better than the untreated control, although fruit set and fruit size were less than a normal crop probably due to the general lateness of the planting and milder temperatures. High temperatures at transplanting reduced plant vigor and caused a general slowdown in growth as well.

2001 BELL PEPPER PREEMERGENCE WEED CONTROL
Foppiano Farms – Collegeville California

Treatment	Rate Lb/Acre a.i.	Weed Control [1] Barnyardgrass		**Wild Radish**		Crop Vigor [1]		Marketable Yield [2] (Tons/Acre)
		7/26	*8/12*	*7/26*	*8/12*	*7/26*	*8/12*	
Prefar (6E) + Devrinol (50DF)	4.00 + 2.00	9.0	9.3	9.8	9.1	9.0	9.4	11.4
Dual Magnum (7.62E)	1.27	9.8	9.4	8.3	7.1	8.9	9.4	10.7
Dual Magnum	2.54	10.0	9.5	9.5	8.9	8.3	9.1	10.0
Prowl (3.3E)	1.50	9.4	10.0	9.6	9.3	8.9	9.3	10.0
Dual Magnum + Prowl	1.27 + 1.50	9.8	10.0	9.8	9.9	8.6	9.1	9.4
Untreated Control	------	1.0	0.3	1.0	0.3	8.9	9.1	9.4

LSD @ 5%: 1.9
CV = 12.4%

[1] Average of four replications:
Weed Control – 0 = no weed control; 10 = complete weed control
Crop Vigor – 0 = crop dead; 10 = crop growing vigorously

[2] Average of four replications and marketable yield includes ripe and mature green fruit

Notes:

Treatments - Prefar + Devrinol missing a little yellow nutsedge

Dual Magnum, at the low rate, missing a little common purslane and a couple yellow nutsedge

Dual Magnum, at the higher rate, missing a couple yellow nutsedge

Prowl missing some yellow nutsedge

Prowl + Dual Magnum missing a couple yellow nutsedge and a few common lambsquarter

Untreated control has some yellow nutsedge, common lambsquarter, a few common purslane and redroot pigweed

A Postemergence Weed Control Trial in Transplanted Bell Peppers Using Directed Sprays

Robert J. Mullen, Scott Whitely and Chuck Cancilla

A postemergence weed control trial, evaluating directed sprays of different rates of Sandea (halosulfuron) with and without crop oil concentrate (COC) added, for control of yellow nutsedge in transplanted bell peppers, was established at Foppiano Farms (Skip Foppiano) near Collegeville, California, on July 27, 2001. A second sequential treatment of the low rate of Sandea plus COC was made on August 14, 2001. All treatments were made as directed sprays to the base of the 6 to 10 inch tall bell pepper transplants but over the 4 to 7 true leaf yellow nutsedge. A CO_2 backpack sprayer, equipped with 8002 nozzles at 40 psi in a spray volume of 30 gallons per acre water, was used for all applications. There were four replications of each treatment and the plot design was a randomized complete block. The field had been transplanted to the variety Capistrano on July 10, 2001. Sprinkler irrigation followed on July 12, 2001. An additional sprinkler irrigation was applied later and then furrow irrigation was used for the remainder of the season. The soil type at the trial site was a Stockton adobe clay and the bed spacing was 30 inches; individual row length of each plot was 25 feet. Weed control and crop vigor ratings were taken on August 15th and again on August 28th. Best control/suppression of yellow nutsedge occurred with 2 applications of the low rate of Sandea plus COC, followed by a single high rate of Sandea plus COC. Crop vigor was excellent with all treatments. The trial was hand harvested on October 10, 2001. All treatments, most of them significantly, provided higher yields than the untreated control. Fruit set and fruit size were less than a normal crop probably due to the general lateness of the planting and milder temperatures. High temperatures at transplanting reduced plant vigor and caused a general slowdown in growth as well.

2001 Bell Pepper Postemergence Yellow Nutsedge Weed Control
Foppiano Farms – Collegeville California

Treatment	Rate Lb/Acre a.i.	# of applications	Weed Control[1] **Yellow Nutsedge** *8/15*	*8/28*	Crop Vigor [1] *8/15*	*8/28*	Marketable Yield [2] (Tons/Acre)
Sandea (75WG)	0.032	1	6.9	6.4	8.9	9.0	10.6
Sandea	0.047	1	7.8	7.6	8.6	9.0	10.3
Sandea + COC	0.032 + ½%	1	8.0	8.1	8.6	9.0	11.3
Sandea + COC	0.047 + ½%	1	8.6	8.5	8.6	8.8	9.3
Sandea + COC	0.032 + ½%	2	8.3	9.1	8.8	8.8	10.9
Untreated Control	------	-----	0.0	0.0	8.9	8.9	7.9

LSD @ 5%: 2.2
CV = 14.7%

[1] Average of four replications:
Weed Control – 0 = no weed control; 10 = complete weed control or suppression
Crop Vigor – 0 = crop dead; 10 = crop growing vigorously

[2] Average of four replications and marketable yield includes ripe and mature green fruit

Notes:

Treatments – Sandea at the low rate and without crop oil concentrate (COC) missed some redroot pigweed, barnyardgrass and a little common purslane

Sandea at the higher rate and without COC missed some redroot pigweed and barnyardgrass

The untreated control had a limited population of redroot pigweed, barnyardgrass, common purslane and a few wild radish and prostrate spurge

C A U T I O N

The report presents results of pepper weed control studies conducted in San Joaquin County. It should not, in any way, be interpreted as a recommendation of the University of California. Chemical or common names of herbicides are used in this report instead of the more common trade names of herbicides. No endorsement of products mentioned or criticism of similar products is intended. The rates of herbicides in this report are always expressed as active ingredient (a.i.) of the material per treated acre, unless otherwise indicated.

Trade Name	Common or Chemical Name	Manufacturer
Prefar (6E)	bensulide	Gowan Chemical Company
Devrinol (50DF)	napropamide	United Phosphorus Ltd.
Dual Magnum (7.62E)	metolachlor	Syngenta Crop Protection
Sandea (75WG)	halosulfuron	Gowan Chemical Company
Prowl (3.3E)	pendimethalin	BASF Corporation

This is a report of work in progress only. The chemicals and uses contained in this publication are experimental data and should not be considered as recommendations for use.

Until the products and their uses given in this report appear on a registered pesticide label or other legal, supplementary direction for use, it is illegal to use the chemicals as described.

WARNING ON THE USE OF CHEMICALS

Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in their original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Recommendations are based on the best information currently available, and treatments based on them should not leave residues exceeding the tolerance established for any particular chemical. Confine chemicals to the area being treated. **THE GROWER IS LEGALLY RESPONSIBLE** for residues on his crops as well as for problems caused by drift from his property to other properties or crops.

Consult your County Agricultural Commissioner for correct methods of disposing of leftover spray material and empty containers. Never burn pesticide containers.

PHYTOTOXICITY

Certain chemicals may cause plant injury if used at the wrong stage of plant development or when temperatures are too high or when overcast conditions occur. Injury may also result from excessive amounts or the wrong formulation or mixing incompatible materials. Inert ingredients such as wetters, spreaders, emulsifiers, diluents, and solvents, can cause plant injury. Since manufacturers often change formulations, it is possible that plant injury may occur, even though no injury was noted in previous seasons.

No endorsement of named products is intended, nor is criticism implied of similar products that are not mentioned.

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