

UC Cooperative Extension/ 209-385-7403

Special Interest Articles:

- Tomato Variety Trial Results
- Nightshade and Nutsedge control trials
- Melon variety trial results from Fresno County

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Fresh Market Tomato Variety Trial

Seeded: March 17, 19, and 24 at LaBar's greenhouse
Transplant: May 5, 2004. Used 10-34-0 + zinc humate in planter water. About 2500 gpa. Drip irrigated field. 40 plants per plot (about 50 ft). Field variety Quali T-23.
Harvest: July 23, 2004. Hand harvest 12 ft from each plot. Field sorted.

Results: Yield and size results for the replicated trial are shown in Figure 1. Yields were good in 2004, and the variation within each variety was similar. Because Miroma is a roma type tomato, it was hand sorted into only the S, M, and L categories. QualiT-21 had significantly better yields and %XL fruit than the other varieties. L-312 had significantly less marketable yield than all the other lines, mainly because it had a very high cull rate of almost 47%. Many L-312 fruit were misshapen, had zippers, and "measles", or small waxy spots on the skin. Both BHN 580 and SVR 2935 had nice fruit with good uniformity. There were no significant yield differences between the other varieties.

Observational results are listed in Table 1. RFT 500 305 looked especially good in this trial, with best overall yields. Fruit were large and attractive, but did have a large blossom end. BHN 654 also looked very promising. All varieties from Seeds of Change were indeterminate and out of place in this trial. Vines were overly large and fruit load small.

Acknowledgements. Thanks to Bob Giampaoli of Live Oak Farms, Daniel Acevedo of LaBar's Greenhouse, and the participating seed companies for their support for this project.

Fresh Market Tomato: Post Harvest Results

round

20°C (68°F) and high relative humidity.

A summary of the results for **round** tomato varieties is presented in **Table 2**. The

Post harvest, continued

2004 round variety fruit generally had lower soluble solids (4.2% average for all varieties and both trials) than 2003 fruit (4.9% average), whereas % titratable acidity values were in the usual range of 0.3-0.4%. VR harvested fruit generally have the same % soluble solids but higher % titratable acidity than MG harvested fruit. Fruit in 2004 were firmer on average than fruit evaluated in 2003. Shady Lady was consistently low in firmness but had good color development, whereas L-311 or L-312 fruit were consistently firmer but had poorer red color development. **Roma** tomato variety results are summarized in **Table 3**.



Quali T-21 had significantly better yields and %XL fruit than the other varieties.

FM tomato 2004 Graph

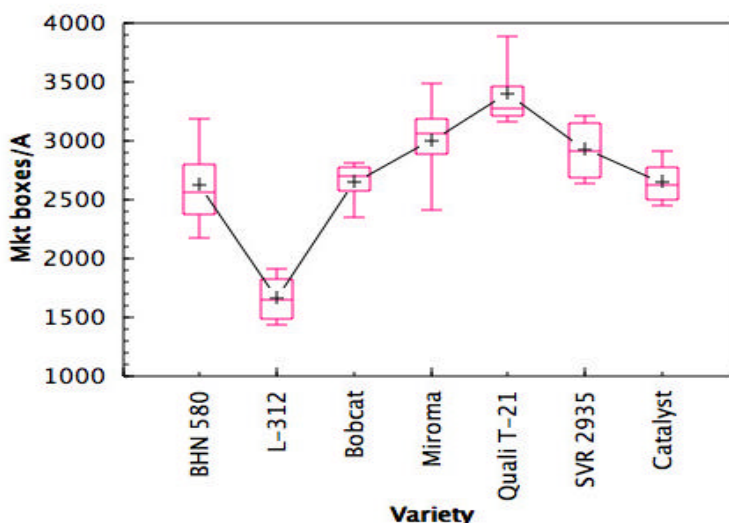


Figure 1. Total marketable yield (M, L, and XL fruit) for each replicated variety in the Merced fresh market tomato variety trial, 2004.

Table 1. Fresh market tomato variety trial yield and grade results, 2003. Observational varieties, Merced County.

Var #	Variety	Company	Market Yield Boxes/A	XL %	L %	M %	S tons/A	Culls %
13	RFT 500 305	Syngenta	3079.7	45.8	40.5	13.7	7.6	14.0
15	RFT 500 312	Syngenta	3046.3	38.1	51.1	10.8	4.3	10.0
7	BHN 654	BHN Seed	2976.6	43.1	44.8	12.0	3.9	18.7
9	BHN 682	BHN Seed	2697.8	50.0	32.9	17.1	3.4	33.2
14	RFT 500 311	Syngenta	2642.6	36.4	49.0	14.6	5.8	15.7
12	Quali T-23	Syngenta	2346.4	53.7	35.5	10.8	4.7	15.4
10	L-310	LSL Plant Science	2160.6	45.4	38.8	15.8	3.6	38.5
11	L-311	LSL Plant Science	2160.6	45.9	42.5	11.6	2.1	29.7
8	BHN 681	BHN Seed	1727.9	36.8	43.4	19.7	3.4	40.7
19	Crimson Sprinter	Seeds of Change	1212.4	3.6	50.3	46.1	12.7	20.7
17	Martian Giant	Seeds of Change	357.2	78.0	22.0	0.0	0.0	89.2
183	sisters	Seeds of Change	119.1	0.0	0.0	100.0	10.9	40.7
Average			2043.9	39.7	37.6	22.7	5.2	30.5

Market yield = XL + L + M size fruit, from one plot. One box = 25 lbs.

XL, L, M% = weight of respective fruit sizes divided by marketable yield.

Post-harvest results

Table 2. Quality characteristics of fresh market **round** tomatoes harvested **MG** and **VR** from the 2004 Kings County and San Joaquin County replicated trials. MG fruit were treated with ethylene. F=Fresno County Trial; SJ=San Joaquin County Trial.

Cultivar & Company	Number of trials	Red Color, Hue	Firmness, Newtons	Soluble solids, %	pH	Titrateable acidity, %
MG Harvested Fruit						
BHN 580 (BHN)	2	40.5	22.2	4.28	4.82	0.32
Bobcat (Syngenta)	2	39.8	22.1	4.20	4.32	0.31
Catalyst	1 SJ	40.9	26.0	4.21	4.70	0.38
L-311 (LSL PI Sci.)	1 F	46.3	28.7	4.22	4.57	0.30
L-312 (LSL PI Sci.)	1 SJ	41.2	20.6	4.22	4.53	0.28
QualiT 21 (Syngenta)	2	41.0	23.7	4.23	4.78	0.30
QualiT 23 (Syngenta)	2	39.8	22.2	4.16	4.45	0.32
Shady Lady (Sunseeds)	2	39.2	19.1	4.20	4.53	0.32
SVR2935 (Seminis)	2	40.6	25.4	4.32	4.64	0.26
Average MG		41.1	23.3	4.23	4.59	0.31
VR Harvested Fruit						
Average VR		43.6	21.1	4.19	4.40	0.35
"LSD.05"		1.0	2.1	0.06	0.35	0.04

Color and firmness data are from 3 replicates of 15 fruits; composition data are from 3 replicates of composite samples of 15 fruit. Data were analyzed as 2-way ANOVA for each trial. The "LSD.05" value provides an estimate and is from the average LSD.05 values for the 2 maturity stages for the 2 trials. Lower hue color values indicate redder fruits, lower firmness values indicate softer fruits.

Table 3. Roma varieties.

Cultivar & Company	Number of trials	Color, Hue	Firmness, Newtons	Soluble solids, %	pH	Titrateable acidity, %
MG Harvested Fruit						
BHN 523 (BHN)	2	38.6	26.6	4.13	4.80	0.35
Mariana (Sakata)	1 SJ	40.5	29.0	4.24	5.20	0.35
Miroma (Syngenta)	2	39.5	22.9	4.18	4.44	0.33
Monica (Sakata)	1 SJ	38.8	27.8	4.21	5.50	0.38
PX 2626 (Seminis)	1 F	38.7	25.0	4.19	4.53	0.29
RFT 8109 (Syngenta)	1 SJ	39.3	25.3	4.20	5.37	0.36
SD 257 (LSL PI Sci)	2	37.8	26.1	4.18	4.70	0.34
Average MG		39.0	26.1	4.19	4.93	0.34
VR Harvested Fruit						
Average VR		41.3	20.7	4.19	5.07	0.38
"LSD.05"		0.6	2.4	0.09	0.19	0.03



Processing Tomato Variety Trial

Location: NW corner of Henry Miller and Delta Rds, near Los Banos. Dan Burns, San Juan Ranch cooperator.

Seeded: March 8 and 9, 2004. LaBar's greenhouse.
Transplanted: May 8, 2004. 100 ft plots.
Harvest: September 13, 2004. Hand harvest 10 ft from each plot.

Results: Yield and fruit quality results for the replicated varieties are shown in Table 4. Plots were hand harvested by cutting plants from 10 feet of each plot, and was about two weeks later than it should have been. Fruit samples were taken 2 weeks prior to harvest before any significant deterioration of the plots had occurred.

Even with a delayed harvest, yields were excellent in this field, with almost every variety > 40 tons/A. Heinz dominated in yields with this trial, capturing five of the top 6 slots. H9665, H5803 EFS, H2601, and H2401 averaged more than 2.5 tons/A soluble solids, however, there was no significant separation in Brix yield for the top 13 varieties.

In the observational trial, best yield occurred with Seminis PX 345 with an outstanding 74 tons/A. This yield reflects a spot in the plot with a strong healthy canopy and may not be indicative of the whole plot, however. U 232, HMX 3859, and HMX 3863 also both yielded more than 50 tons/A with brix yields > 2.5 tons/A.

Overall state results are posted with the Tomato Research Progress Report on the website.

Acknowledgements: Many thanks to Dan Burns with San Juan Ranch for his help and cooperation with this trial, CTRI for financial assistance, and participating seed companies.

Nightshade and Nutsedge Control Trial

Summary. Certain processing tomato varieties were found to be sensitive to the new nutsedge herbicide Sandea (halosulfuron-methyl), and phytotoxicity was exasperated when Matrix (rimsulfuron, for nightshade control) was added to the tank-mix. SUN 6119 and H9780 had more than 50% phytotoxicity one week after spraying, however, there was no significant effect on yield. No significant phytotoxicity was seen with the other herbicide treatments. Results from 2003 show that the Sandea + Matrix combination gives excellent weed control in fields with nutsedge and nightshade weed problems. It is important for growers to know that while Sandea may cause some yellowing of the plants, this effect is temporary and should not impact yield.

Table 5 and Figure 2 on the following pages illustrate the main results. For more discussion on this trial, see the complete report in the 2004 Tomato Progress Report posted on our website.

Heinz dominated in yields with this trial, capturing five of the top 6 slots

"The Sandea + Matrix treatment yielded as well as the UTC in spite of the phytotoxicity symptoms earlier in the season."

Table 4. Processing tomato variety trial yield results, Merced 2004.

REPLICATED		Disease	Yield	SS	PTAB	SS Yield			
Plot	Company	Resistance	Tons/A	%	Color	pH	Tons/A		
8	Heinz	H9665	VFFNP	56.388	a	4.6	24	4.36	2.577
2	Heinz	H2401	VFFNP	54.461	a b	4.6	24	4.28	2.521
4	Heinz	H2601	VFFNP	52.141	a b c	4.9	25	4.42	2.522
3	Heinz	H2501	VFFNP	50.029	a b c d	5.0	23	4.40	2.477
6	Heinz	H5803	VFFNP	49.985	a b c d	5.1	23	4.44	2.526
17	Unilever	U941	VFFN	49.495	a b c d e	4.8	25	4.44	2.377
13	Sunseeds	SUN 6119	VFFN	48.177	b c d e	5.1	28	4.42	2.438
7	Heinz	H8892	VFFN	48.096	b c d e	4.5	24	4.42	2.169
1	CTRI/CPL	CPL 4863-N	VFFN	47.388	b c d e	4.5	24	4.42	2.109
16	Unilever	U 005 EFS	VFFNP	46.468	b c d e f	4.9	26	4.34	2.269
14	Sunseeds	SUN 6360	VFFNP	45.890	c d e f	4.8	23	4.45	2.214
18	United Genetics	UG 151	VFFN	45.814	c d e f	4.8	24	4.45	2.181
5	Heinz	H5503	VFFNP	43.957	c d e f	4.7	23	4.44	2.051
15	Sunseeds	RED SKY	VFFP	43.418	d e f	4.9	23	4.49	2.099
11	Seminis	PS296	VFFNP	42.384	d e f	5.4	26	4.37	2.300
9	Orsetti	Halley 3155	VFF	41.377	e f g	5.3	25	4.40	2.187
12	Seminis	PS607	VFFN	38.311	f g	5.3	25	4.45	2.007
10	Rogers	LaRossa	VFF	33.835	g	4.8	25	4.45	1.597
Average			46.534	4.9	24.5	4.41	2.266		
LSD 0.05			8.197	0.4	1.8	0.09	0.49		
CV, %			12.4	5	4.5	1.2	13.2		

Yield results estimated from hand harvest of 10 ft.

SS = soluble solids

Color = lower values indicate redder fruit.

SS yield = soluble solids yield, in tons/A

Disease resistance: V = Verticillium, FF = Fusarium race 1 and 2, N = nematodes, P = bacterial speck.

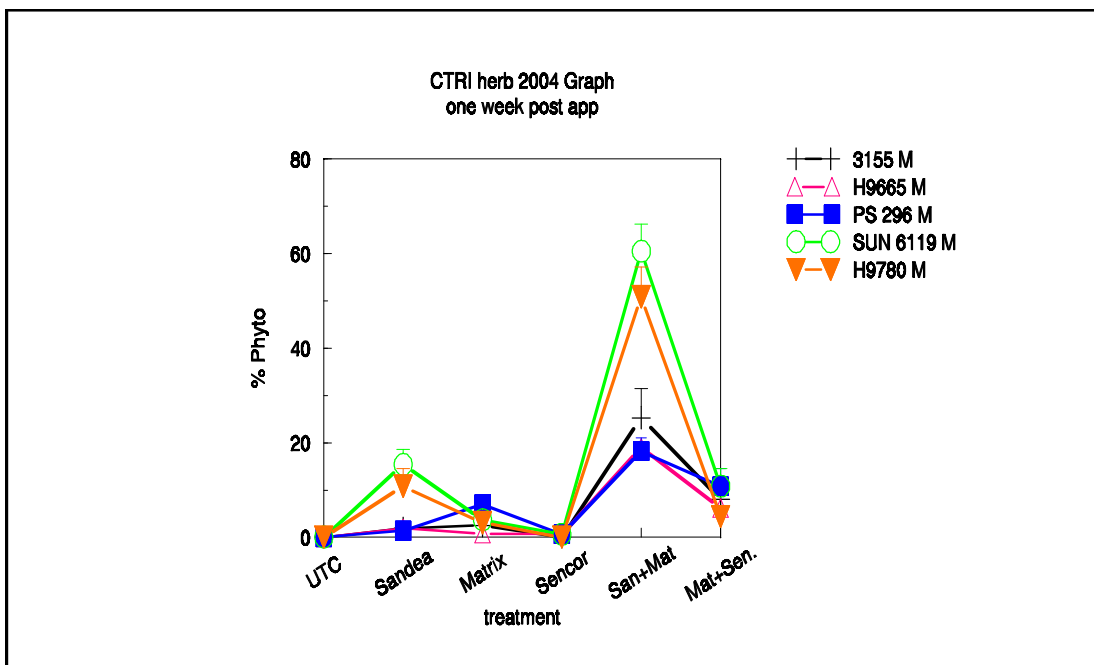


Figure 2. Phytotoxicity showing the variety by herbicide treatment interaction one week after application. SUN6119 and H9780 were more sensitive to the herbicides than the others.

Nightshade and Nutsedge Control (continued)

Table 5. Crop phyto and weed control ratings as affected by herbicide treatment, Merced 2004.



Treatment	Variety	1 week post		2 weeks post		19-Aug Weeds	yield				
		Phyto, %	Weeds	Phyto, %	Weeds		lbs/5 ft	tons/A	Color	SS, %	pH
1. UTC		0	0	0	7.3	40.9					
2. Sandea		6.27		0	0.1	14.7					
3. Matrix		3.40		0.4	0	5.3	67.00	58.37	25.8	5.07	4.39
4. Sencor		0.38		0	0	3.7					
5. Sandea + Matrix		34.76		3.4	0	8.8					
6. Matrix + Sencor		8.00		0	0	5.9					
	3155	7.5	0	0.1	---	---	63.76	55.55	25.8	5.28	4.39
	H9665	5.7		0.1	---	---	78.83	68.68	24.8	4.57	4.34
	PS 296	7.6		0.1	---	---	59.18	51.56	25.3	5.60	4.35
	SUN 6119	18.2		2.0	---	---	71.93	62.67	26.8	5.07	4.46
	H9780	13.8		1.4	---	---	66.32	57.78	26.3	4.82	4.42
Herb treatment LSD		5.94	---	1.5	1.5	5.8	NS		NS	NS	NS
Variety LSD		3.5	---	1.3	---	---	5.40	4.70	1.12	0.21	0.06
Treatment x Variety		***	---	**	---	---	NS		---	----	---
CV, %		52.6	---	269.0	194.0	70.0	14.0		3.6	3.5	1.05

Herbicide application made June 16.

Phytotoxicity values as compared to the untreated control.

Weeds primarily mallow and pigweed. Values indicate weed pressure (0 = nothing).

Ratings only made on herbicide treatments.

LSD = Least significant difference at the 95% probability level. UTC excluded from analysis.

Means separated by less than this amount are not significantly different.

NS = not significant

***, ** = interaction significant at p=0.001 and 0.01 respectively.

Melon Variety Trials from Fresno County

Shannon Mueller, Farm Advisor. For a full report regarding these trials, see the Fresno UCCE website at <http://cefresno.ucdavis.edu>

Table 6. Season total yield and quality data from watermelon variety evaluation. West Side Research And Extension Center, 2004.

Variety	Yield T/A	Avg. # Melons	Avg. Melon Weight (lbs)	Sugar °Brix	Color	Rind Thickness
SSX 8247	37.04 b	55.92 c	18.18 abc	8.85 ab	2.0	2.1
SSX 8656	40.68 ab	59.75 bc	19.06 a	8.83 ab	1.7	1.8
Jamboree	43.87 ab	66.00 ab	18.32 ab	8.29 c	1.6	2.2
Sangria	37.99 b	61.00 bc	17.20 c	8.98 a	1.7	2.0
Summer	46.91 a	72.25 a	17.84 bc	8.58 bc	1.9	2.2
Flavor						
<i>p-value</i>	0.0473	0.0222	0.0286	0.0139	0.0829	0.1111
<i>LSD (0.05)</i>	6.907	9.317	1.048	0.375	ns	ns
<i>CV (%)</i>	10.75	9.51	3.72	2.77	10.23	9.37

1Color: 1 – Pink

2 – Red

3 – Dark Red

2Rind Thickness: 1 – Thin

2 – Medium

3 – Thick

Values in columns followed by the same letter are not significantly different at the 0.05 level using Duncan's Multiple Range test.

Cantaloupes

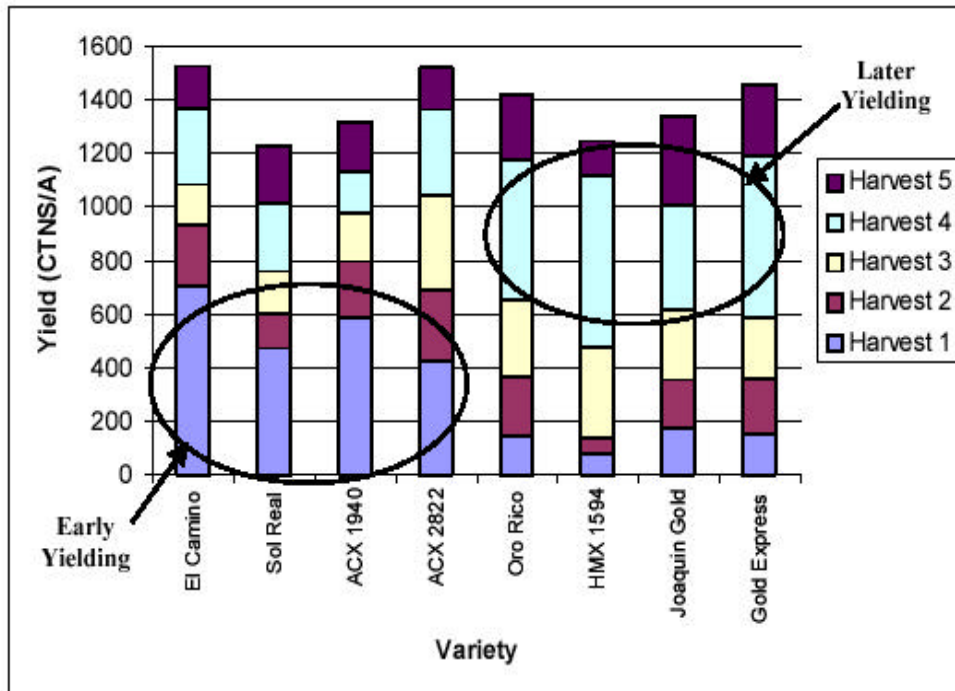


Fig 3. Mid-season **cantaloupe** variety trial, cumulative yield (cartons/A), Fresno County, 2004. Yields were not significantly different for total yield, but there were significant differences on the first and fourth harvest depending on maturity dates.

Sandea Herbicide Evaluation

OBJECTIVE: Evaluate different commercial processing tomato varieties in their tolerance to different rates of Sandea (halosulfuron-methyl) herbicide. A tank mix with Matrix (rimsulfuron) was also included for evaluation.

Phytotoxicity scores are presented in Table 7. Significant differences were found between the varieties regarding their sensitivity to Sandea, but there was no significant difference between the treatments that received Sandea.

The varieties appear to break out into 2 groups: almost no observed phytotoxicity from the treatments, and those which showed levels > 25% at two weeks post-application. The varieties in the "sensitive" group were SUN 6119, H9780, H9557, HM830, SUN 6117, and HYPEEL 108. 3155, UG 113, and Hypeel 303 showed moderate sensitivity around 20% two weeks post application. All other varieties would be considered not sensitive or tolerant of Sandea.

Despite the wide difference in phytotoxicity, there were no significant yield differences observed between the herbicide treatments (Table 1). Significant differences were observed between varieties. Best yields occurred with H9665, followed closely by H9780, HyPeel 347, BOS S55, and H9557.

Sandea is a herbicide for post-emergence control of nutsedge.

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Sandea Results:

Table 7. Sandea variety evaluation on processing tomatoes, Merced 2004.

Herbicide treatment	Variety	Phytotoxicity Rating, %			yield	
		2-Jun-04	8-Jun	15-Jun	lbs/5 ft	tons/A
1. UTC		13.3	0.0	0.0	48.9	
2. Sandea 0.66 oz/A		48.2	30.1	24.4	50.1	43.2
3. Sandea 1.0 oz/A		42.9	25.4	18.3	49.3	
4. Sandea 0.66 oz + Matrix 2 oz/A		50.1	24.8	20.1	49.9	
	1 Halley 3155	44.4	22.2	25.0	46.0	40.08
	2 BOS S55	29.7	6.6	11.8	53.3	46.43
	3 H9494	29.7	0.0	3.3	52.2	45.48
	4 H9665	26.4	2.2	0.9	58.8	51.23
	5 H8892	36.6	8.8	1.8	37.7	32.84
	6 SUN 6119	60.3	36.6	47.1	50.7	44.17
	7 H9780	63.3	44.0	43.2	55.5	48.35
	8 H1100	28.4	15.3	29.5	40.6	35.37
	9 H9557	43.2	25.8	47.1	52.8	46.00
	10 UG 113	21.5	18.8	24.0	50.6	44.08
	11 HM 830	51.8	28.5	13.8	48.6	42.34
	12 SUN 6117	58.9	34.4	33.3	56.6	49.31
	13 CXD 179	21.9	6.6	3.3	45.6	39.73
	14 U447	25.0	8.1	9.1	50.8	44.26
	15 APT 410	39.6	10.8	3.0	44.5	38.77
	16 Hypeel 347	28.9	7.5	7.5	54.6	47.57
	17 Hypeel 108	59.4	64.1	70.0	52.2	45.48
	18 Hypeel 303	28.4	23.1	3.3	50.7	44.17
	Herbicide LSD 0.05	6.75	NS	NS	NS	
	Variety LSD 0.05	23.24	22.9	21.6	8.8	
	Variety x herbicide CV, %	*	NS	NS	NS	
		49.6	66.5	76.8	19.0	

Phytotoxicity ratings on a scale of 0 - 5. Ratings converted to % using arcsin method.
Yield measured by hand picking 5 ft within each plot.

LSD 0.05 = Least Significant Difference at the 95% confidence level. Means less than this amount are not significantly different. NS = not significant. UTC means for phytotoxicity ratings are not included in the statistical analysis.

* = interaction significant at p=0.1.

CV = coefficient of variation.

Upcoming Meetings

Jan 6, 2005. South Sacramento Valley Processing Tomato Production Meeting. Heidrick Ag History Center, Woodland.

Jan 19, 2005. PTAB meeting. Double Tree Hotel, Modesto.

Jan 21, 2005. South SJV Winter Vegetable Meeting. West Side Research and Education Center, Five Points.

About Our Organization...

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