

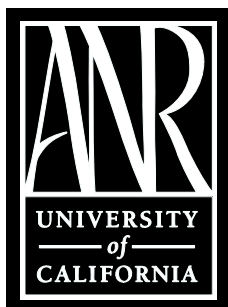
# FRESH MARKET TOMATO



**2002**

## **Variety & Disease Control Trials In San Joaquin and Stanislaus Counties**

*Including Results From*  
**THE STATEWIDE FRESH MARKET TOMATO  
COMBINED VARIETY TRIALS**



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Cooperative Extension  
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Stockton, CA 95205**

**2002**  
**SAN JOAQUIN AND STANISLAUS COUNTIES**  
**FRESH MARKET TOMATO VARIETY AND DISEASE CONTROL TRIALS**

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The need to find fresh market tomato varieties with disease and nematode resistance, as well as improved horticultural characteristics (fruit size, firmness, color, smoothness, easy stemming or jointless stems, small blossom and stem scars, less fruit cracking and better flavor), along with yield potential, continues to be of great importance to fresh market tomato growers and shippers in both San Joaquin and Stanislaus Counties.

Contributing to this increased need is the fact that all of the suitable ground for tomatoes has been cropped to either fresh market or processing tomatoes at one time or another over the years and particularly over the past few seasons. Resistance of varieties to both Races 1 and 2 *Fusarium* wilt is very common. Virtually all lines have resistance to Race 1 of *Verticillium* wilt, but there is no known resistances to *Verticillium* wilt Race 2. Presence of the disease in local fresh market tomato fields has been limited but is increasing. Potential loss of soil fumigation materials has caused seed breeders to develop nematode resistance in most of their newer lines. Many of the newer lines also possess tobacco mosaic, *Alternaria* and *Stemphyllim* resistance, and a few have bacterial speck resistance. Additional concerns by growers and shippers relate to effective management of powdery mildew and *Phytophthora* late blight, particularly with anticipated and actual losses of fungicides due to recent and proposed legislation, as well as current pathogen resistance to some existing fungicides. Possible loss of certain insecticides increased the need for varietal resistance efforts in this area. Insect resistance to insecticides is a continuing concern as well.

Another source of concern to growers is the nagging uncertainty of an adequate labor force to harvest the crop. Acreage in the San Joaquin-Stanislaus district has stabilized, after increasing dramatically over the past few years. Interest is high in developing varieties that will retain good horticultural and yield characteristics and yet lend themselves to hand picking and/or mechanical harvest. With this in mind, a number of varieties from private seed company breeding programs have been evaluated for both jointless or “arthritic” stem characteristics.

The bottom line in varietal development and acceptance revolves around having cultivars that yield and ship well enough to offset increased production costs, while providing the quality and flavor characteristics buyers and consumers demand.

## 2002 Variety Trials

During 2002, two fresh market tomato variety trials (one with standard Round lines and the other with “Roma-type” cultivars) were cooperatively conducted in the northern San Joaquin Valley with George Lagorio Farms (Don Nilsson and George Biagi) and Ace Tomato Company (Dean and Kathy Janssen, Jeff Rurup) near Colledgeville, California. Additional support for conducting the trials was provided by the California Tomato Commission and its president, Ed Beckman, and research coordinator, John Le Boeuf. Input from the field managers of a number of fresh market shippers in the San Joaquin Valley on selection of varieties evaluated in the trials was most appreciated.

The trial of Round varieties contained 11 replicated lines with an additional 28 cultivars in single replication observation plots. The “Roma-type” trial contained five replicated varieties with another twenty lines in observation. Transplants for both trials were produced by Valley Transplants (Rob Matheny) near Acampo, California. The field variety at the trial site was Bobcat.

The trials were transplanted on June 4, 2002 under nearly ideal warm conditions. Stand survival was excellent; with a timely furrow irrigation applied a few days after transplanting. The soil type at the trial site was a Landlow adobe clay. Vine growth and fruit set were excellent in both trials. Excellent grower management resulted in an outstanding trial with most varieties, Round and “Roma-types”, achieving very high yields. The trials were hand harvested on September 4<sup>th</sup> and 5<sup>th</sup>, 2002. Due to a diligent grower/packing shed pest management program, no significant insect pest or disease developed in the trial field.

Complete data on yield and fruit size for the Replicated Round varieties are given in **Table 1**. The best yield of marketable red and green fruit was achieved by SXT 6624 at 38.6 tons/acre, followed by QualiT 23 (38.0 tons/acre), Shady Lady (36.3 tons/acre), Bobcat (35.0 tons/acre) and SRT 6718 (34.5 tons/acre). Fruit size was quite large with all of the replicated lines in the trial.

In the single replication Observation Round variety block, the highest yield of marketable red and green fruit occurred with PS 150410 at 45.3 tons/acre, followed by EX 1981574 and GVS 51182, both at 43.6 tons/acre, Sunbrite (41.8 tons/acre), SRT 6728 (41.4 tons/acre), BHN 464 (41.1 tons/acre), XTM 0112 (41.0 tons/acre), and XTM 0112 and XPH 12254, both at 39.2 tons/acre. As with the replicated trial, fruit were quite large with the observation trial lines. **Table 2** provides complete yield and fruit sizing data for Round lines in the observation block.

Fruit quality characteristics such as crop maturity, fruit shape and size, fruit smoothness, fruit set and firmness, stemability of fruit, along with notes on vine cover and other observations are provided in **Table 3A** For the Replicated Round varieties and **Table 3B** for the Observation Round lines.

In the “Roma-type” fresh market tomato Replicated trial block, the greatest yield of marketable red and green fruit was produced by BHN 621 at 40.2 tons/acre, followed by BHN 523 (37.1 tons/acre), Mariana (30.3 tons/acre) and Monica (29.2 tons/acre). Yield, crop maturity and fruit sizing data are presented in **Table 4**.

In the Observation trial area of the “Roma-type” fresh market tomato variety trial, the best yield of marketable red and green fruit was attained by C9008 at 42.7 tons/acre, followed by C8985 (40.5 tons/acre), GVS 1029 (39.2 tons/acre), GVS 1031 (37.5 tons/acre), HA 3813 (36.6 tons/acre), and SD 257 (35.1 tons/acre). **Table 5** shows data on yield, crop maturity and fruit size for all of the lines evaluated in the observation block of the “Roma-type” varieties. While fruit smoothness was good with all of the lines in the “Roma-type” trial, both replicated and observation, fruit size tended to be somewhat variable.

Observations on maturity, fruit shape, fruit smoothness and firmness, fruit set and size and stemability of fruit along with notes on vine cover and other comments are presented in **Table 6A** and **Table 6B** for both the replicated and observation “Roma-type” cultivars in the trial.

From the standpoint of overall fruit quality and yield potential, the leading Round replicated liens were QualiT 23, Bobcat, SXT 6624, SRT 6718 and Shady Lady. Best Round observational lines included BHN 500, BHN 524, Classy Lady, GVS 51182, EX 1981574 and GVS 51178. Of the replicated “Roma-type” liens, Mariana and BHN 523 gave the best combination of fruit quality and yield in this trial. In the “Roma-type” observation block, C8985, C9008, SD 256, SD 257, H 131, GVS 1029, GVS 51995 provided a good combination of yield and fruit quality. Most of the other “Roma-type” liens were square round in shape or other nontraditional shapes.

A comprehensive report by Marita Cantwell, Extension Postharvest Specialist at UC Davis, on postharvest evaluation of fruit from replicated lines in the four variety trials (three Round and one Roma) that were conducted this year by farm advisors in Tulare/Kings, Merced and San Joaquin Counties is available at our office by request. Factors such as fruit color, firmness and composition at the mature green and vine-ripe stage were evaluated.

### **MANY THANKS**

Many thanks to Don Nilsson and George Biagi (Lagorio Farms) and Dean and Kathy Janssen and Jeff Rurup (Ace Tomato Co.) for their participation and cooperation in the two variety trials. Much gratitude is also expressed to Paul Polk (Polk Farms) and Tom Guido and Nate and Joe Esformes (Triple “E” Produce) for their help and guidance in the conduct of the two fresh market tomato disease management trials in 2002. Thanks also to Ed Beckman and John Le Boeuf and the members of the California Tomato Commission Research Committees for their continued support of variety evaluation and pest management research. Thanks also to Marita Cantwell (UC Cooperative Extension Postharvest Specialist at UC Davis) for her continued and tireless help in postharvest evaluation of the fruit from many of the cultivars tested in the variety trials. Also, a special thanks to Michelle Le Strange (Farm Advisor in Tulare and Kings Counties) for the outstanding Statewide Variety Trial report she prepared. It took a lot of time to combine the data from the three Round variety trials conducted in the San Joaquin Valley and to statistically analyze the results. Finally, thanks to the participating seed industry for providing the basic materials for the trials, as well as continued financial support to the UC Farm Advisor Fresh Market Tomato Variety Evaluation project.

**2002 Fresh Market Tomato Varieties  
Round Lines**

<b>Seed Company</b>	<b>Replicated</b>		<b>Observation</b>	
American Takii			AT 48	AT 89
Asgrow			Sunbrite	XPH 12254
BHN Seed	BHN 503		BHN 464 BHN 499 BHN 500	BHN 501 BHN 524
Golden Valley Seed			GVS 51178 GVS 51182 GVS 51535	GVS 51643 GVS 51644 GVS 51993
Hazera Seeds			HA 3603 HA 3638	HA 3640
LSL Plant Science	B807		B812	
Sakata Seed			XTM 0112	XTM 7111
Seminis Seeds	PS 150440		PS 150410	EX 1981574
Southwestern Seed			SW 100102	SW 100103
Sunseeds	SXT 6624 SRT 6718 Shady Lady	SRT 6719 SRT 6722	Classy Lady	SRT 6728
Syngenta	QualiT 21 QualiT 23	Bobcat		
United Genetics			Fair Lady	

**Table 1.**

2002 Fresh Market Tomato Variety Trial  
Lagorio Farms / Ace Tomato Co. – Colleagueville, California  
Replicated Varieties

Variety	Market Yield/Acre		% Market Yield			Non Market Yield		Total Yield	% Reds
	Tons	Boxes	X-Large	Large	Medium	Small T/A	Culls T/A	T/A	
SXT 6624	38.6	3,088	30.9	37.2	31.9	1.7	4.1	44.4	8.0
QualiT 23	38.0	3,040	41.6	37.4	21.0	2.5	7.3	47.8	7.9
Shady Lady	36.3	2,904	37.0	42.7	20.3	1.9	5.0	43.2	12.1
Bobcat	35.0	2,800	40.2	32.4	27.4	2.0	5.3	42.3	4.2
SRT 6718	34.5	2,760	30.0	41.0	29.0	1.3	4.0	39.8	4.0
QualiT 21	33.8	2,704	50.8	27.3	21.9	2.0	7.8	43.6	4.5
SRT 6719	33.6	2,688	26.1	41.9	32.0	2.2	2.3	38.1	4.4
BHN 503	33.5	2,680	45.1	34.5	20.4	1.8	10.1	45.4	10.7
B-807	33.3	2,664	50.2	31.1	18.7	2.8	8.1	44.2	9.7
SRT 6722	31.5	2,520	32.1	45.2	22.7	2.3	3.6	37.4	5.6
PS 150440	31.3	2,504	34.9	42.2	22.9	1.5	8.5	41.3	10.5
Average:	34.5	2,759				2.0	6.0	42.5	7.4
LSD @ 5%:	3.1	248							
C.V. %	6.2%	6.2%							

**Table 2.**

2002 Fresh Market Tomato Variety Trial  
Lagorio Farms / Ace Tomato Co. – Colleagueville, California  
Observation Varieties

Variety	Market Yield/Acre		% Market Yield			Non Market Yield		Total Yield	% Reds
	Tons	Boxes	X-Large	Large	Medium	Small T/A	Culls T/A	T/A	
PS 150410	45.3	3,624	62.7	18.2	19.1	5.1	6.7	57.1	18.3
EX 1981574	43.6	3,488	43.6	33.5	22.9	3.7	12.8	60.1	13.0
GVS 51182	43.6	3,488	73.2	18.3	8.5	0.0	10.4	54.0	6.5
Sunbrite	41.8	3,344	25.5	47.9	26.6	3.5	9.2	54.5	6.4
SRT 6728	41.4	3,312	31.7	31.7	36.6	2.8	2.5	46.7	8.4
BHN 464	41.1	3,288	28.7	50.3	21.0	2.2	7.4	50.7	5.5
XTM 0112	41.0	3,280	41.0	36.5	22.5	2.0	7.1	50.1	7.0
XTM 7111	39.2	3,136	34.3	25.4	40.3	2.8	1.1	43.1	1.0
XPH 12254	39.2	3,136	56.0	34.9	9.1	2.2	0.4	41.8	27.1
B-812	38.8	3,104	36.3	45.6	18.1	1.0	13.8	53.6	4.9
HA 3603	37.9	3,032	36.8	53.5	9.7	1.3	6.5	45.7	15.2
BHN 501	37.9	3,032	31.0	54.2	14.8	0.0	9.1	47.0	10.2
HA 3638	37.0	2,960	42.2	39.5	18.3	1.7	4.0	42.7	15.3
Classy Lady	34.9	2,792	42.7	26.7	30.6	1.3	4.7	40.9	18.1
AT 48	34.0	2,720	31.9	33.3	34.8	1.1	1.5	36.6	4.8
SW 100103	33.5	2,680	42.8	36.2	21.0	1.8	0.9	36.2	18.1
BHN 500	33.5	2,680	67.3	28.8	3.9	1.6	9.8	44.9	10.7
GVS 51178	33.1	2,648	60.0	21.9	18.1	2.6	10.9	46.6	10.3
SW 100102	32.7	2,616	27.0	37.2	35.8	3.9	3.0	39.6	18.7
AT 89	32.2	2,576	45.7	36.2	18.1	2.2	7.0	41.4	6.3
BHN 524	32.2	2,576	41.7	33.1	25.2	0.7	11.5	44.4	5.9
GVS 51535	31.8	2,544	25.8	48.4	25.8	1.9	4.6	38.3	9.1
GVS 51993	31.8	2,544	33.6	30.7	35.7	1.1	3.7	36.6	8.3
BHN 499	31.4	2,512	43.6	34.9	21.5	2.3	5.1	38.8	7.9
Fair Lady	31.4	2,512	24.6	58.5	16.9	1.1	8.9	41.4	2.1
HA 3640	30.5	2,440	58.6	22.6	18.8	1.7	4.8	37.0	5.9
GVS 51644	25.7	2,056	31.4	28.9	39.7	3.3	2.4	31.4	6.9
GVS 51643	19.5	1,560	18.7	41.1	40.2	1.7	1.4	22.6	1.5

**Table 3A.**

2002 Fresh Market Tomato Variety Trials  
Lagorio Farms / Ace Tomato Co.; Colleeville, California  
Replicated Trial – Round Lines

Variety	Maturity <sup>1</sup>	Fruit <sup>2</sup> Shape	Fruit <sup>3</sup> Smoothness	Fruit <sup>4</sup> Firmness	Fruit Set	Stemability <sup>5</sup>	Vine Cover	Fruit <sup>6</sup> Size	Other Notes
QualiT 21	M	FR	3.0	3.5	Good	3.0	Fair - Good	L-XL	Semi-floppy, medium large vine
QualiT 23 *	M	FR-G	3.0	3.5	Good	2.5	Good	L-XL	Semi-floppy, large vine, some ribbiness in the fruit
Bobcat *	M	FR-G	3.0	3.5	Good	2.5	Fair	L-XL	Semi-open, large vine, some fruit ribbiness, good crop
PS 150440	EM	FR	3.0	3.0	Good	2.5	Fair –Good	M-L	Large vine, some exposed and ribby fruit
SXT 6624 *	M	FR-G	3.5	3.5	Good	3.0	Fair –Good	M-L	Floppy, medium large vine, nice smooth fruit
SRT 6718 *	ML	FR-G	3.5	3.0	Good	2.5	Fair –Good	M-L	Large vine, some exposed fruit, nice, smooth fruit
SRT 6719	ML	FR-G	3.5	3.5	Good	3.0	Good	M-L	Large vine, smooth fruit with nice green color
SRT 6722	M	FR	3.0	3.0	Good	3.5	Fair –Good	M	Floppy, large vine
Shady Lady *	M-ML	FR-G	3.0	3.0	Good	3.0	Fair –Good	M-L	Floppy vine with some exposed fruit, some ribby fruit, fairly smooth
B-807	M	FR-G	2.5	3.0	Good	3.0	Fair	M-L	Floppy, open vine, ribby fruit
BHN 503	M	FR-G	3.5	3.0	Good	3.5	Fair	M	Floppy, open vine with some ribbiness in fruit

<sup>1</sup> M = Midseason Maturity; E = Early Maturity; L = Late Maturity; EM = Early to Midseason Maturity; ML = Mid Late Maturity

<sup>2</sup> Fruit Shape: FR = Flat Round; G = Globe

<sup>3</sup> Fruit Smoothness: 1 = bad; 5 = excellent

<sup>4</sup> Fruit Firmness: 1 = soft; 5 = very firm

<sup>5</sup> Stemability: 1 = hard stemming (many stems attached to fruit); 5 = stems easily

<sup>6</sup> Fruit Size: M = Medium; L = Large; XL = Extra Large

\* Varieties marked with an asterisk indicate varieties with good to excellent potential

**Table 3B.**

2002 Fresh Market Tomato Variety Trials  
Lagorio Farms / Ace Tomato Co.; Collegenille, California  
Observation Trial – Round Lines

Variety	Maturity <sup>1</sup>	Fruit <sup>2</sup> Shape	Fruit <sup>3</sup> Smoothness	Fruit <sup>4</sup> Firmness	Fruit Set	Stemability <sup>5</sup>	Vine Cover	Fruit <sup>6</sup> Size	Other Notes
PS 150410	EM	FR	2.5	3.5	Good	2.5	Fair	M-L	Floppy vine with some exposed, ribby fruit
EX 1981574*	M	FR	3.0	3.0	Good	3.0	Fair–Good	M-XL	Floppy vine with some exposed fruit
Classy Lady*	M	FR-G	3.5	3.5	Good	3.5	Fair	M-XL	Slightly pointed fruit, smooth, floppy vine
SRT 6728	M	FR-G	3.0	3.0	Good	2.5	Fair–Good	M-L	Some exposed fruit with some ribbiness and open sinus
B-812	EM	FR-G	3.0	3.0	Good	3.0	Fair–Good	M-L	Light green, large vine, some off-shape fruit
XTM 0112*	ML	FR-G	3.5	3.5	Good	3.5	Fair–Good	M-L	Floppy vine with some fruit ribbiness
XTM 7111	ML	FR	3.0	3.5	Good	3.0	Fair	M-XL	Floppy vine with some fruit ribbiness
Sunbrite	EM	FR	3.0	2.5	Good	2.5	Fair	M-XL	Floppy vine with some exposed and ribby fruit
BHN 464	M	FR	3.0	3.0	Good	2.5	Poor–Fair	M-L	Floppy vine with lot of exposed fruit, some ribby fruit
BHN 499	M	FR-G	2.5	3.0	Good	3.5	Poor–Fair	M-L	Open vine with exposed, sunburned fruit, some ribbiness and open sinus
AT 48	ML	G	3.0	2.5	Good	3.0	Fair–Good	M-L	Large floppy vine, some ribby fruit
AT 89	M	G	3.0	3.0	Good	2.5	Fair–Good	M-L	Floppy vine with some ribby fruit
HA 3603	M	FR-G	2.5	3.0	Good	3.0	Fair	M-XL	Floppy open vine with some ribby fruit
HA 3638	ML	FR	2.5	3.5	Good	3.0	Fair	M-L	Floppy open vine with some exposed fruit and ribby fruit
HA 3640	M	FR-G	3.0	3.5	Good	3.5	Fair–Good	M-L	Floppy vine, a few blotchy ripe fruit
SW 100102	EM	FR	3.0	3.0	Good	3.5	Fair	M-L	Floppy open vine with some ribby fruit
SW 100103	EM	FR	3.0	3.0	Good	3.0	Fair	M-XL	Floppy vine with some fruit having open sinus & cracking
XPH 12254	M	FR	3.0	3.0	Good	2.5	Good	M-XL	Floppy vine with some ribby fruit
BHN 500*	M	FR-G	3.5	3.5	Good	3.0	Fair–Good	M-XL	Floppy vine with slight fruit ribbiness, smooth, large fruit
GVS 51178*	M	FR-G	3.5	3.5	Good	3.5	Fair–Good	M-XL	Floppy vine with some ribby fruit and off-shapes, pretty smooth
GVS 51182*	M	G	3.5	3.5	Good	3.5	Fair	M-XL	Floppy open vine with some exposed fruit, pretty smooth
GVS 51535	ML	FR	3.0	3.0	Good	3.0	Fair–Good	M-L	Floppy vine with some ribby fruit
GVS 51643	ML	FR-G	2.5	3.0	Good	3.0	Fair–Good	M-L	Floppy vine with some ribby fruit and off-shapes
GVS 51644	M	FR-G	2.5	3.0	Good	2.5	Fair	M	Smallish ribby fruit and open, floppy vine
GVS 51993	ML	FR	2.5	3.5	Good	2.5	Fair	M	Variable fruit size with some ribbiness and a floppy vine
Fair Lady	M	FR-G	2.5	3.0	Good	3.0	Fair	M-XL	Floppy vine, fruit ribby with some blotchy and off-shape fruit
BHN 501	EM	FR-G	3.0	3.0	Good	3.0	Fair	M-XL	Floppy, semi-open vine with some ribby fruit
BHN 524*	EM	FR-G	3.5	3.0	Good	3.5	Fair	M-XL	Floppy, open vine with some exposed fruit and sunburn, smooth fruit

<sup>1</sup> M = Midseason Maturity; E = Early Maturity; L = Late Maturity; EM = Early to Midseason Maturity; ML = Mid Late Maturity

<sup>2</sup> Fruit Shape: FR = Flat Round; G = Globe

<sup>3</sup> Fruit Smoothness: 1 = bad; 5 = excellent

<sup>4</sup> Fruit Firmness: 1 = soft; 5 = very firm

<sup>5</sup> Stemability: 1 = hard stemming (many stems attached to fruit); 5 = stems easily

<sup>6</sup> Fruit Size: M = Medium; L = Large; XL = Extra Large

\* Varieties marked with an asterisk indicate varieties with good to excellent potential

**2002 Fresh Market Tomato Varieties  
"Roma" Lines**

<b>Seed Company</b>	<b>Replicated</b>	<b>Observation</b>
BHN Seed	BHN 523                  BHN 621	C8985                          C9008
California Tomato Research Institute	CTRI-1605	
Golden Valley Seed		GVS 1020                  GVS 1030 GVS 1021                  GVS 1031 GVS 1022                  GVS 51995 GVS 1029
Hazera Seeds		HA 3811                  HA 35133 HA 3813                  HA 35213 HS 33033                  HA 35233
Heinz Seed		H-131
LSL Plant Science		SD 256                          SD 257
Sakata Seed	Monica                          Mariana	
Seminis Seeds		PS 150351
United Genetics		Rio Oro 35

**Table 4.**

2002 Fresh Market Tomato “Roma” Variety Trial  
Lagorio Farms / Ace Tomato Co. – Colleeville, California  
Replicated Varieties

Variety	Market Yield/Acre		% Market Yield				Non Market Yield	Total Yield	% Reds
	Tons	Boxes	X-Large	Large	Medium	Small	Culls T/A	T/A	
BHN 621	40.2	3,216	2.9	11.2	47.2	38.7	5.1	45.3	32.2
BHN 523	37.1	2,972	1.7	9.1	36.0	53.2	6.4	43.5	27.3
Mariana	30.3	2,424	1.3	12.5	35.1	51.1	2.5	32.8	14.2
Monica	29.2	2,334	1.7	12.4	41.1	44.8	4.1	33.3	17.2
CTRI-1605	17.4	1,396	1.2	11.1	28.2	59.5	2.7	20.1	7.0

LSD @ 5%:     7.9       632  
C.V. =       16.6%    16.6%

Roma Sizing Criteria:

Extra Large > 165 grams; Large 130 to 165 grams;  
Medium 90 to 130 grams; Small 50 to 90 grams

**Table 5.**

2002 Fresh Market Tomato "Roma" Variety Trial  
Lagorio Farms / Ace Tomato Co. – Colleagueville, California  
Observation Varieties

Variety	Market Yield/Acre		% Market Yield				Non Market Yield	Total Yield	% Reds
	Tons	Boxes	X-Large	Large	Medium	Small	Culls T/A	T/A	
C9008	42.7	3,416	9.5	20.5	46.0	24.0	3.6	46.3	46.7
C8985	40.5	3,240	5.9	14.8	42.0	37.3	9.4	49.9	24.0
GVS 1029	39.2	3,136	0.0	23.2	28.2	48.6	5.6	44.8	61.0
GVS 1031	37.5	3,000	0.0	11.3	39.0	49.7	5.6	43.1	41.6
HA 3813	36.6	2,928	3.4	11.6	54.4	30.6	5.6	42.2	4.0
SD 257	35.1	2,808	5.0	26.4	32.1	36.5	4.6	39.7	14.6
HA 3811	33.1	2,648	0.0	20.7	40.8	38.5	5.8	38.9	20.7
GVS 51995	33.1	2,648	0.0	12.3	44.8	42.9	3.1	36.2	17.9
SD 256	32.7	2,616	0.0	16.9	35.8	47.3	6.9	39.6	12.6
PS 150351	32.2	2,576	2.1	22.6	34.2	41.1	5.1	37.3	13.6
H-131	31.8	2,544	0.0	10.2	36.9	52.9	2.4	34.2	15.2
HA 35233	29.6	2,368	0.0	6.0	18.1	75.9	3.8	33.4	52.6
GVS 1030	29.2	2,336	0.0	9.4	43.8	46.8	5.1	34.3	55.6
HA 35213	27.2	2,176	0.0	11.0	40.6	48.4	4.1	31.3	14.3
GVS 1020	24.0	1,920	0.0	16.7	35.6	47.7	4.9	28.9	17.4
GVS 1022	21.3	1,704	0.0	27.8	25.0	47.2	2.0	23.3	25.9
HA 33033	20.9	1,672	0.0	4.7	16.8	78.5	4.7	25.6	38.7
Rio Oro 35	19.6	1,568	0.0	10.6	21.2	68.2	1.6	21.2	6.1
HA 35133	18.7	1,496	0.0	0.0	40.0	60.0	3.2	21.9	19.2
GVS 1021	13.5	1,080	0.0	15.1	51.6	33.3	3.3	16.8	26.8
Roma Sizing Criteria: Extra Large > 165 grams; Large 130 to 165 grams; Medium 90 to 130 grams; Small 50 to 90 grams									

**Table 6A.**

2002 Fresh Market Tomato Variety Trials  
Lagorio Farms / Ace Tomato Co.; Colledgeville, California  
Replicated Trial – “Roma” Lines

Variety	Maturity <sup>1</sup>	Fruit Shape	Fruit <sup>2</sup> Smoothness	Fruit <sup>3</sup> Firmness	Fruit Set	Stemability <sup>4</sup>	Vine Cover	Fruit <sup>5</sup> Size	Other Notes
Monica	ML	Blocky long Pear	4.0	4.0	Good	4.0	Fair-Good	M-L	Medium large vine, fruit a bit smaller than normal
Mariana*	M	Blocky long pear	4.0	4.0	Good	4.0	Good	L	Good vine and crop with large, smooth fruit
CTRI –1605	ML	Square round	3.0	4.0	Good	4.0	Good	S-M	Large vine size with smallish darker green fruit
BHN 523*	EM	Blocky pear	4.0	3.5	Good	4.0	Fair-Good	M-L	Good vine and crop with large smooth fruit
BHN 621	M	Blocky pear	3.0	3.5	Good	4.0	Fair	M-L	Semi-open medium large vine, heavy crop load

<sup>1</sup> M = Midseason Maturity; E = Early Maturity; L = Late Maturity; EM = Early to Midseason Maturity; ML = Mid Late Maturity

<sup>2</sup> Fruit Smoothness: 1 = bad; 5 = excellent

<sup>3</sup> Fruit Firmness: 1 = soft; 5 = very firm

<sup>4</sup> Stemability: 1 = hard stemming (many stems attached to fruit); 5 = stems easily

<sup>5</sup> Fruit Size: M = Medium; L = Large; XL = Extra Large

\* Varieties marked with an asterisk indicate good to excellent potential

**Table 6B.**

2002 Fresh Market Tomato Variety Trials  
Lagorio Farms / Ace Tomato Co.; Colledgeville, California  
Observation Trial – “Roma” Lines

Variety	Maturity <sup>1</sup>	Fruit Shape	Fruit <sup>2</sup> Smoothness	Fruit <sup>3</sup> Firmness	Fruit Set	Stemability <sup>4</sup>	Vine Cover	Fruit <sup>5</sup> Size	Other Notes
PS 150351	M	Egg to square round	4.0	4.0	Good	4.0	Fair-Good	M-L	Nontraditional fruit shape, heavy fruits load, floppy vine
HA 3811	M	Egg to square round	4.0	3.5	Good	4.0	Fair-Good	M-L	Nontraditional fruit shape, heavy fruit load, floppy vine
HA 3813	ML	Bell shape to square round	3.5	4.0	Good	4.0	Fair	M-L	Floppy vine, some exposed fruit
HA 33033	EM	Elongated square round	4.0	4.0	Good	4.0	Fair	M	Large fruit load, open vine with some exposed fruit
HA 35133	EM	Pointy pear	3.5	3.5	Good	4.0	Fair	M	Dark green fruit with high lycopene content, med large open vine
HA 35213	M	Bell to square round	3.5	3.5	Good	4.0	Fair	M-L	Floppy vine, some blotchy ripe fruit
C8985*	M	Elongated square round	3.5	4.0	Good	4.0	Fair-Good	L	Slightly open floppy vine, large fruit and heavy fruit load
HA 35233	EM	Elongated square round	3.0	3.5	Good	4.0	Fair	M	Floppy vine, lot of smallish fruit
SD 256*	EM	Elongated square pear	4.0	4.0	Good	4.0	Fair-Good	L	Floppy vine, nice, smooth large fruit, heavy fruit load
SD 257*	M	Elongated square pear	4.0	3.0	Good	4.0	Fair	L	Floppy vine, nice, smooth large fruit, heavy fruit load
GVS 1020	M	Fat square round	4.0	3.5	Good	4.0	Fair-Good	L	Floppy vine, nontraditional fruit shape, good fruit load
GVS 1021	ML	Fat square round	4.0	4.0	Good	4.0	Good	M-L	Floppy vine, nontraditional fruit shape, late maturity
GVS 1022	M	Elongated square round	4.0	3.5	Good	4.0	Fair-Good	L	Floppy vine, pretty smooth fruit
C9008*	EM	Elongated egg to pear shape	4.0	3.5	Good	4.0	Fair	L	Lot of large, smooth fruit; high yield, open vine, some exposed fruit
GVS 1029*	E	Square round	4.0	3.0	Good	4.0	Poor-Fair	M	Floppy, open vine, good yield potential
GVS 1030	EM	Square round	4.0	3.0	Good	4.0	Fair	M	Floppy open vine
GVS 1031	EM	Square round to slight bell shape	3.5	3.5	Good	4.0	Fair	M-L	Floppy open vine, non traditional fruit shape
GVS 51995*	M	Elongated square round	4.0	4.0	Good	4.0	Fair-Good	M-L	Floppy vine, nice, long smooth fruit, good yield
Rio Oro 35	ML	Elongated square round	3.0	4.0	Good	4.0	Good	M	Fruit are some what ribby, semi-open vine
H-131*	M	Elongated pear	4.0	4.0	Good	4.0	Good	M-L	Slightly open vine, pretty nice pear, good yield potential

<sup>1</sup> M = Midseason Maturity; E = Early Maturity; L = Late Maturity; EM = Early to Midseason Maturity; ML = Mid Late Maturity

<sup>2</sup> Fruit Smoothness: 1 = bad; 5 = excellent

<sup>3</sup> Fruit Firmness: 1 = soft; 5 = very firm

<sup>4</sup> Stemability: 1 = hard stemming (many stems attached to fruit); 5 = stems easily

<sup>5</sup> Fruit Size: M = Medium; L = Large; XL = Extra Large

\* Varieties marked with an asterisk indicate good to excellent potential

**2002 Statewide Fresh Market Tomato  
Combined Variety Trials Results**

# **Disease Control Trials**

## CAUTION

This publication is a research progress report of fresh market tomato cultivar evaluation trials and pest management studies conducted in San Joaquin County during 2002. This report presents results of fresh market tomato disease management trials conducted with local grower cooperators. They should not, in any way, be interpreted as a recommendation of the University of California. Chemical or common names of pesticides are used in this report instead of the more common trade names of these products. No endorsement of products mentioned or criticism of similar products is intended. The rates of pesticides in this report are always expressed as active ingredients (a.i.) of the material per treated acre, unless otherwise indicated.

Trade Name	Common or Chemical Name	Manufacturer
Cabrio (20WDG)	pyraclostrobin	BASF Corporation
Pristine (38WDG)	pyraclostrobin + nicobifen	BASF Corporation
Previcur (6L)	propamacarb hydroxide	Aventis Crop Science
Bravo Weather Stik (SC)	chlorothalonil	Syngenta (Zeneca Ag Products)
Reason (4.17E)	fenamidone	Aventis Crop Science
KQ 667 (68.7WG)	famoxadone + mancozeb	DuPont Ag Products
Quintec (250SC)	quinoxifen	Dow Agro Sciences
Tanos (50WG)	famoxadone + cymoxanil	DuPont Ag Products
Manzate 200 (75DF)	mancozeb	DuPont Ag Products
Quadris (2.08SC)	azoxystrobin	Syngenta (Zeneca Ag Products)
Gavel (75DF)	zoxamide + mancozeb	Dow Agro Sciences
Rally (40WP)	myclobutanil	Dow Agro Sciences
Folicur (3.6F)	tebuconazole	Bayer Ag Chemicals
Serinade (10WP)	Bacillus subtilis strain QST713	Agra Quest
Rubigan (1EC)	fenarimol	Dow Agro Sciences
GWN 4350 (1AS)	GWN 4350	Gowan Chemical Co.

## A Powdery Mildew Control Trial in Fresh Market Tomatoes

Robert J. Mullen, Donald Colbert, Randall Wittie and Scott Whiteley

Powdery Mildew (*Leveillula taurica*) occurs commonly in California's Central Valley, where the majority of both processing and fresh market tomatoes are grown. The disease causes a drying of the crop's leaves from the ground up, resulting in fruit being exposed to the sun. Considerable loss of yield can occur, particularly in fresh market tomatoes where even slightly sunburned fruit have to be culled. A good preventative fungicide spray program, utilizing weather station data on temperature, relative humidity and leaf wetness, is essential to disease management. This year a trial was established, evaluating ten fungicides as stand alone treatments, with one additional treatment alternating two fungicides. The trial was located near Colledgeville, California with Triple "E" Produce (Tom Guido, Nate and Joe Esformes) and initial treatments were made on August 30, 2002 with additional applications occurring September 9, 2002 and September 23, 2002. All treatments were applied over and into the crop canopy at mid fruit development (1.5 to 3.0 inch diameter) as soon as disease development was detected. There were four replications of each treatment and the plot design was a randomized complete block. Treatments were made using a handheld CO<sub>2</sub> backpack sprayer with 8004 nozzles at 30 psi in a spray volume of 50 gallons per acre water. The soil type at the trial site was a Landlow adobe clay, the field variety was Shady Lady and the field was furrow irrigated on a 7 day schedule throughout the fruit development to harvest period. Moderate disease pressure developed and disease severity ratings were made on 9/26/02, 10/4/02 and 10/10/02. Best control occurred with Folicur (tebuconazole) alone, Quintec (quinoxifen) at the higher rate and BASF 516 UGF (pyraclostrobin + nicobifen) alone. Good control was also achieved by Quadris (azoxystrobin) alone, Cabrio (pyraclostrobin) alone and Rally (myclobutanil) alone. The trial was hand harvested on October 14, 2002. All treatments outyielded the untreated control, led by Rubigan (fenarimol) at 21.4 tons of marketable fruit per acre and Cabrio (20.7 tons of marketable fruit per acre). The percentage of sunburned fruit was less with all treatments (8.0 to 17.3%), when compared to the untreated control (21.4%). Work on evaluating existing and new fungicide chemistry for Powdery Mildew control in tomatoes will continue in 2003. The need to identify effective fungicide materials, used in a rotational spray program to prevent disease resistance, is critical.

2002 Fresh Market Tomato Powdery Mildew Control Trial  
 Triple "E" Produce – Colleeville, southeast of Stockton, California

Treatment	Rate Lb/Acre a.i.	Spray Frequency	Disease Severity <sup>1</sup>			Marketable Yield <sup>2</sup> (Red + Green) Tons per Acre	Sunburn <sup>2</sup> Fruit (%)
			Rating				
			9/26	10/4	10/10		
Rally (40WP)	0.125	10-14 days	2.0	2.1	2.4	17.3	16.6
Folicur (3.6F)	0.200	10-14 days	1.5	1.8	2.0	20.1	17.3
Cabrio (20WG)	0.200	10-14 days	1.6	1.8	2.4	20.7	15.0
BAS 516 UDF (38%)	0.200	10-14 days	1.8	1.8	2.5	20.1	12.4
BAS 516 UGF (38%)	0.200	10-14 days	1.8	1.8	2.0	18.8	16.0
Rubigan (1EC)	0.031 / 0.047	*10-14 days	1.9	2.3	2.8	21.4	15.3
GWN 4350 (1AS)	0.031 / 0.047	*10-14 days	2.0	2.5	2.8	20.3	14.3
Quadris (2.08SC)	0.100	10-14 days	1.8	1.9	2.3	18.9	12.2
Quintec (250SC)	0.032	10-14 days	2.0	2.1	2.4	17.8	14.4
Quintec	0.064	10-14 days	1.8	1.8	2.0	18.4	8.0
Serinade (10WP) / Quadris	0.400 / 0.100	*10-14 days	1.9	2.6	3.0	20.0	14.1
Untreated Control	-----	-----	2.8	3.3	4.1	14.3	21.4

\* Rates or fungicide materials used as alternate sprays

LSD @ 5%: 4.2

7.4

<sup>1</sup> Average of four replications and the following disease severity rating scale:

C.V. = 15.5%

35.1%

**Disease severity rating - Barratt/Horsfall System**

Grade	% Plant Infected	% Plant Healthy	Grade	% Plant Infected	% Plant Healthy	Grade	% Plant Infected	% Plant Healthy
0	0	100	4	12 to 25	75 to 88	8	88 to 94	6 to 12
1	0 to 3	97 to 100	5	25 to 50	50 to 75	9	94 to 97	3 to 6
2	3 to 6	94 to 97	6	50 to 75	25 to 50	10	97 to 100	0 to 3
3	6 to 12	88 to 94	7	75 to 88	12 to 25	11	100	0

<sup>2</sup> Average of four replications

A Fresh Market Tomato Late Blight / Powdery Mildew Control Trial  
Robert J. Mullen, Donald Colbert, Randall Wittie and Scott Whiteley

Late Blight (*Phytophthora infestans*) presents a recurring problem for the fresh market tomato industry in the late summer / early fall of the Northern San Joaquin Valley. In 1998 the effects of El Niño were felt over a large area of California's Central Valley, with widespread outbreaks of Late Blight in both processing and fresh market tomatoes from early spring to early fall. Virtually all of the reports of Late Blight infection involved metalaxyl resistant strains of the disease. Like the past two years, the 2002 season was warm and dry with no reports of Late Blight incidence in tomatoes. This does not diminish a real need for continued evaluation of new chemical and/or bio-fungicides that could provide protective and/or curative (systemic) control of Late Blight. Control of this disease remains a high priority because pathogen development, under the appropriate climatic conditions, could return quickly any time in the future. This year's trial, evaluating eleven fungicides and/or combination treatments together or as alternating spray applications, was established at Paul Polk Farms (Paul Polk) / Triple "E" Produce (Tom Guido, Nate and Joe Esformes) near Tokay Colony east of Lodi, California on September 1, 2002. The soil type at the trial site was a Wyman clay and the market tomato field variety was Sunbrite. The trial had four replications and the trial design was a randomized complete block. After the initial treatment, applications were made on a weekly basis on 9/9/02, 9/17/02 and 9/23/02. All treatments were made over and into the crop canopy with a handheld CO<sub>2</sub> backpack sprayer using 8004 nozzles at 30 psi in a spray volume of 50 gallons per acre water. Crop growth stage on the initial treatment date (9/1/02) was at early to mid fruit set, with fruit 1.5 to 2.5 inches in diameter. No Late Blight developed but a moderate level of Powdery Mildew (*Leveillula taurica*) did and so the trial was rated for this disease on September 23, 2002. In all fairness to the fungicides evaluated, many of the materials do not have strong efficacy on Powdery Mildew, their selection having been based on the expectation of Late Blight development. Interestingly, a number of materials did give good levels of Powdery Mildew control, led by Cabrio (pyraclostrobin) alone, an alternating spray treatment of Cabrio and Bravo Weather Stik (chlorothalonil), Quadris (azoxystrobin) alone, Quadris alternated with Bravo Weather Stik, Reason (fenamidone) and Bravo Weather Stik plus X-77 together, Reason plus X-77 alternated with Bravo Weather Stik, and Reason plus X-77 alternated with Previcur (propamocarb hydroxide). The trial was hand harvested on September 30, 2002. The highest marketable yield, 31.6 tons per acre, was attained by Cabrio alone and the alternating spray treatment of Previcur followed by Bravo Weather Stik. All of the treatments in the trial attained a higher yield than the untreated control. All treatments in the trial also gave lower levels of sunburned fruit, led by the combination treatment of Reason plus Bravo Weather Stik plus X-77 (5.4%), than the untreated control. Work on evaluating existing and new fungicide chemistry for Late Blight control in tomatoes will continue in 2003.

2002 Fresh Market Tomato Late Blight / Powdery Mildew Control Trial  
Paul Polk Farms / Triple "E" Produce – Off Live Oak Road, southeast of Lodi, California

Treatment*	Rate Lb/Acre a.i.	Spray Frequency	Powdery Mildew Disease Severity Rating	Marketable Yield (Red + Green) Tons per Acre	Sunburn Fruit (%)
Cabrio (20WDG)	0.20	Weekly	1.9	31.6	9.7
Cabrio / Bravo Weather Stik (6SC)	0.20 / 1.50	Alternating Weekly	2.1	26.2	9.4
Previcur (6L) / Bravo Weather Stik	1.00 / 1.50	Alternating Weekly	2.8	31.6	10.1
Reason (4.17EC) + Bravo Weather Stik + X-77	0.17 + 0.75 + ¼%	Weekly	2.6	24.7	5.4
Reason + X-77 / Bravo Weather Stik	0.51 + ¼% / 1.50	Alternating Weekly	2.6	27.5	7.3
Reason + X-77 + / Previcur	0.51 + ¼% / 1.00	Alternating Weekly	2.6	26.7	7.6
KQ667 (68.7WG)	1.38	Weekly	3.0	27.6	10.2
Tanos (50WG) / Manzate (75DF)	0.38 / 1.50	Alternating Weekly	2.8	22.9	9.5
Bravo Weather Stik	1.50	Weekly	2.9	24.2	9.2
Gavel (75DF)	1.50	Weekly	3.0	24.2	10.4
Manzate (75DF)	1.50	Weekly	3.0	26.2	12.2
Quadris (2.08SC)	0.10	Weekly	2.4	26.9	7.5
Quadris / Bravo Weather Stik	1.10 / 1.50	Alternating Weekly	2.6	25.6	8.7
Serenade (10WP) / Bravo Weather Stik	0.40 / 1.50	Alternating Weekly	2.9	23.8	10.7
Untreated Control	-----	-----	3.8	22.7	12.5

\* All treatments, including the untreated control, had Warrior (1CS) insecticide added to the spray solution at 0.03 Lb/Acre a.i. for worm control

LSD @ 5%: 7.6  
C.V. = 20.4%  
5.8  
43.5%

<sup>1</sup> Average of four replications and the following disease severity rating scale:

**Disease severity rating - Barratt/Horsfall System**

Grade	% Plant Infected	% Plant Healthy	Grade	% Plant Infected	% Plant Healthy	Grade	% Plant Infected	% Plant Healthy
0	0	100	4	12 to 25	75 to 88	8	88 to 94	6 to 12
1	0 to 3	97 to 100	5	25 to 50	50 to 75	9	94 to 97	3 to 6
2	3 to 6	94 to 97	6	50 to 75	25 to 50	10	97 to 100	0 to 3
3	6 to 12	88 to 94	7	75 to 88	12 to 25	11	100	0

<sup>2</sup> Average of four replications

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 formulations are often changed by manufacturers, it is possible that plant injury may occur, even though no injury was noted in previous seasons.

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