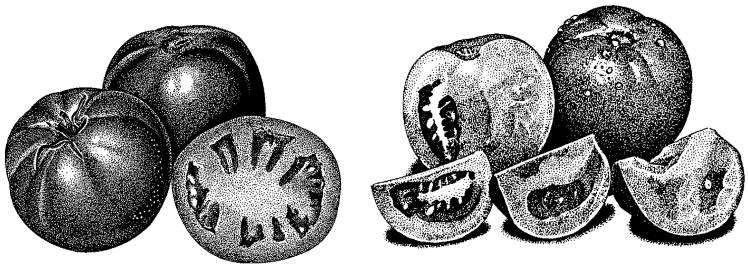
FRESH MARKET
TOMATO



1999
Variety & Disease Control Trials In San Joaquin & Stanislaus Counties

University of California
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1999

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 resistance 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 increased 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.

1999 Variety Trials

In 1999, 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 Tone Ranch Farms (Paul Polk and Walt Geer), and Triple "E" Produce (Tom Guido and Nate and Joe Esformes) near Lodi, California. Additional support for conducting the trials was provided by the California Tomato Commission and its President, Ed Beckman. 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 14 replicated lines with an additional 15 cultivars in single replication observation plots. The "Roma-type" trial contained six replicated varieties with another fourteen lines in observation. Transplants for both trials were produced by Craven Transplants (Brad Bonnett) near Crows Landing, California. The field variety at the trial site was Shady Lady.

The trials were transplanted on June 23, 1999, under very warm climatic conditions. Stand survival was good despite a period of hot days that followed trial establishment. The soil type at the trial site was a Wyman clay with a sand/gravel streak that ran through the eastern half of the trial. Vine growth in the trial and fruit set were not as good as they might have been due to the variable soil structure. Good water and fertility management by the grower resulted in a good crop, with very good fruit size, being produced overall. With the exception of some Powdery Mildew, disease pressure throughout the season was quite low.

The trials, both Round and "Roma-type" varieties, were hand harvested on September 20 and 21, 1999. Yields, considering some soil stress conditions, were quite good with excellent fruit size in both the Round and "Roma-type" variety trials. Complete data on yield and fruit size for the Replicated Round Varieties are shown in Table 1. The best yield of marketable red and green fruit was achieved by XPH 12179 at 24.9 tons/acre, followed by Qualit 23 (24.1 tons/acre), Affirm (23.2 tons/acre), Qualit 21 (22.5 tons/acre), DeVille (22.3 tons/acre), SunBrite (21.4 tons/acre) and STM 3104 (21.3 tons/acre).

In the single replication Observation Round Variety block, the highest yield of marketable red and green fruit occurred with XPH 12254 at 23.9 tons/acre, followed by HA-3010 (21.8 tons/acre), Sonnet (20.5 tons/acre), PX 150431 (20.5 tons/acre), RFT 7018 (20.4 tons/acre) and Fair Lady (20.0 tons/acre). Table 2 provides complete yield and fruit sizing data for varieties trialed in the observation trial.

Fruit quality characteristics such as fruit shape, fruit smoothness, presence of green shoulder on the fruit, fruit firmness, stemability of fruit, along with observations on vine size, vine cover and other comments are provided in Table 3A for the Replicated Round Lines and Table 3B for the Observation Round Varieties.

In the "Roma" type fresh market tomato Replicated Trial block, the greatest yield of marketable red and green fruit was produced by Yaqui at 22.0 tons/acre, followed by Clemente (18.3 tons/acre), Supra (18.1 tons/acre) and Firense (16.0 tons/acre). Yield, crop maturity, and fruit sizing data are provided in Table 4.

In the Observation area of the "Roma" type fresh market tomato variety trial, the best yield of marketable red and green fruit was attained by HA-3302 at 24.2 tons/acre, followed by RT-10 (23.5 tons/acre), PX 150360 (22.7 tons/acre), RT-1 (20.9 tons/acre), RT-8 (20.6 tons/acre), H-107 (19.3 tons/acre), and H-113 (18.6 tons/acre). Table 5 provides data on yield, crop maturity and fruit size for all of the lines evaluated in the observation block of "Roma" type varieties.

Observations on fruit shape, fruit smoothness, green shoulder, fruit firmness, stemability of fruit, along with notes on vine size and vine cover for both the replicated and observation "Roma" type lines are presented in Table 6A and Table 6B.

From the standpoint of overall fruit quality, the leading round replicated lines were Qualit 23, Affirm, Qualit 21, SunBrite, AT-53, AT-72 and DeVille. PX 208795 also looked pretty good. Best Round Observational lines included HA-3010, PX 150431, RFT-7018, XPH 12254, Fair Lady, Early Gal, SRT 6673 (except for stemability) and LSL L-810. Of the replicated "Roma" type lines, Clemente, Supra, Hybrid 882 and Yaqui gave the best combination of yield and fruit quality. In the "Roma" type observation block, PX 150360, HA-3302, H-113 and H-107 showed the best combination of yield potential and fruit quality. RT-8, RT-1, and RT-10 showed excellent yield potential with many desirable quality features (fruit firmness, stemability and fruit smoothness) but may be handicapped in buyer acceptance by the blocky pear shape of the fruit. One element is still missing from variety evaluation trials and that is the flavor (sensory) component. It is hoped future research funding will be available for this critical consumer factor.

1999 Fresh Market Tomato Varieties
Round Lines

Seed Company	Replicated		Observation	
Asgrow Seed	SunBrite	XPH 12179	Sonnet (XPH 12217)	XPH 12254
American Takii	AT-53 AT-72	AT-100		
Hazzera Seed			HA-3010	HA-3012
LSL Plant Science	LSL R-428		LSL L-801 LSL L-809	LSL L-810
Novartis Seeds	Qualit 21	Qualit 23	RFT-7018	
Petoseed	DeVille	PX 208795	PX 150431	PX 150440
Sakata Seed America	Affirm	STM 3104		
Sunseeds	Shady Lady	SRT 6615	SRT 6669	SRT 6673
United Genetics			Fair Lady Early Gal	Simone

Table 1. 1999 FRESH MARKET TOMATO VARIETY TRIAL- YIELD & GRADES
REPLICATED VARIETIES, SAN JOAQUIN COUNTY

Variety	Market[1] Yield Tons/Acre	Fruit Sizing Data % of Market Yield				Culls[1] Tons/Acre	% [2] Reds
		Extra Large	Large	Medium	Small		
XPH 12179	24.9	59.5	33.3	7.2	0.0	3.7	5.6
Qualit 23	24.1	63.3	28.6	8.1	0.0	4.9	3.5
Affirm	23.2	58.0	30.0	12.0	0.0	2.4	4.5
Qualit 21	22.5	39.6	44.9	15.5	0.0	1.5	4.8
DeVille	22.3	25.3	54.6	20.1	0.0	5.1	2.0
SunBrite	21.4	56.5	32.6	10.9	0.0	1.8	7.2
STM 3104	21.3	44.2	48.8	7.0	0.0	4.7	4.1
Shady Lady	20.5	42.1	41.0	16.9	0.0	3.2	5.0
PX 208795	19.4	36.4	42.4	18.2	3.0	4.2	3.8
LSL R-428	18.8	51.1	42.0	6.9	0.0	4.3	3.2
AT-53	18.0	35.3	40.2	21.7	2.8	1.2	2.3
AT-100	17.3	41.2	46.7	12.1	0.0	2.5	0.9
AT-72	17.1	36.9	41.3	21.8	0.0	3.1	7.4
SRT 6615	16.5	30.7	39.1	27.0	3.2	3.1	2.2

LSD @ 5%: 6.8
CV = 23.3%

Tone Ranch, Lodi, CA

[1] Average of four replications – tons per acre of extra large, large and medium sized fruit
[2] Percent Red = percent reds by weight of the total yield including culls

Table 2. 1999 FRESH MARKET TOMATO VARIETY TRIAL-YIELD & GRADES OBSERVATION VARIETIES, SAN JOAQUIN COUNTY

Variety	Market[1] Yield Tons/Acre	Fruit Sizing Data % of Market Yield				Culls Tons/Acre	% [2] Reds
		Extra Large	Large	Medium	Small		
XPH 12254	23.9	28.4	59.7	11.4	0.5	6.1	1.2
HA-3010	21.8	48.7	46.2	5.1	0.0	6.5	10.8
Sonnet	20.5	41.7	44.4	13.9	0.0	0.8	10.2
PX 150431	20.5	30.0	42.5	27.5	0.0	1.0	12.1
RFT 7018	20.4	47.8	39.1	13.1	0.0	5.6	5.7
Fair Lady	20.0	52.8	41.7	5.5	0.0	1.3	0.0
HA-3012	18.9	42.8	32.1	18.7	6.4	2.6	6.1
PX 150440	18.5	56.4	32.0	8.7	2.9	3.9	0.0
SRT 6669	18.3	55.2	42.0	2.8	0.0	11.3	0.0
Early Gal	17.4	29.5	48.1	22.4	0.0	1.3	11.6
Simone	14.8	25.8	29.0	45.2	0.0	0.9	0.0
LSL L-801	13.1	32.0	40.0	28.0	0.0	3.0	10.8
SRT 6673	11.6	30.8	46.2	23.0	0.0	0.9	2.1
LSL L-809	11.3	17.4	56.5	17.4	8.7	1.3	0.0
LSL L-810	10.0	45.8	33.3	20.9	0.0	3.9	15.6

Tone Ranch, Lodi, CA

[1] Average of only 1 replication – tons per acre of extra large, large and medium sized fruit
[2] Percent Red = percent reds by weight of the total yield including culls

Table 3A.

1999 FRESH MARKET TOMATO VARIETY TRIALS
TONE RANCH – LODI, CALIFORNIA
REPLICATED TRIAL – "ROUND LINES"

Variety	Maturity[1]	Fruit[2] Shape	Fruit[3] Smoothness	Green Shoulder	Fruit[4] Firmness	Stemming[5]	Vine[6] Size	Vine Cover	Other Notes
Qualit 21	M	FR	4.0	No	3	2	M	Semi open	Large fruit, floppy vine
Qualit 23	ML	FR-G	3.5	No	4	2	M	Semi open	Large fruit
Affirm	ML	FR-G	3.5	No	3.5	4	M	Fair to Good	Large fruit
STM 3104	M	FR-G	3.0	Yes	4	4	M	Semi open	Med-large fruit
Shady Lady	ML	FR	2.5	No	4	4	ML	Fair to Good	Med-large fruit
SRT 6615	M	FR	2.5	No	4	2	M	Semi open	Some sunburn, medium size fruit
LSL R-428	ML	FR	2.5	No	4	2	M	Good	Ribby, med-large fruit
AT 53	M	FR-G	3.0	No	4	4	M	Fair to Good	Ribby, medium size fruit
AT 72	ML	FR-G	3.0	No	4	4	M	Fair	Med-large, slightly pointed fruit
AT 100	M	FR	3.0	No	3	2.5	M	Fair to Good	Some ribbed fruit
Sunbrite	M	FR-G	3.5	No	4	3	M	Open	Large fruit, some slightly pointed
XPH 12179	M	FR-G	3.0	No	3	2.5	M	Open	Large fruit, some ribby
De Ville	M	FR-G	3.0	No	4	3	M	Semi open	Med-large fruit, some ribby
PX 208795	ML	FR-G	3.5	No	3	3	ML	Fair to Good	Med-large fruit, some ribby

[1] M = Midseason Maturity E = Early Maturity L = Late Maturity VL = Very Late Maturity ML = Mid Late Maturity EM = Early to Midseason Maturity
[2] Fruit Shape: FR = Flat Round; G = Globe
[3] Fruit Smoothness: 1 = Bad; 5 = Excellent
[4] Fruit Firmness: 1 = Soft; 5 = Very firm
[5] Stemability: 1 = Hard Stemming (Many stems attached to fruit); 5 = Stems Easily
[6] Vine Size M = Medium ML = Medium Large L = Large S = Small

Table 3B.

1999 FRESH MARKET TOMATO VARIETY TRIALS
TONE RANCH – LODI, CALIFORNIA
OBSERVATION TRIAL – "ROUND LINES"

Variety	Maturity[1]	Fruit[2] Shape	Fruit[3] Smoothness	Green Shoulder	Fruit[4] Firmness	Stemming[5]	Vine[6] Size	Vine Cover	Other Notes
LSL L-801	M	FR	2.0	No	4	3	SM	Open	Rough fruit and sunburn
LSL L-810	M	FR-G	3.0	No	4	3	SM	Semi open	Large fruit, poor fruit set
SRT 6669	M	FR-G	3.0	Yes	2.5	4	ML	Fair to Good	Large fruit
SRT 6673	ML	G	3.5	No	4	2	ML	Good	Medium size fruit and poor fruit set
Early Gal	ML	FR	3.0	No	3.5	4	M	Semi open	Medium size fruit and some ribby
Simone	M	FR	2.5	No	4	4	M	Open	Rough and ribby fruit
Fair Lady	ML	FR-G	3.0	No	4	3	ML	Good	Med-large fruit and some ribby
Sonnet	ML	FR	2.5	No	3	3	ML	Fair	Med-large fruit with some ribby
XPH 12254	M	FR-G	3.0	No	3.5	4	ML	Semi open	Med-large fruit with some ribby
PX 150431	EM	FR-G	3.5	No	3	4	M	Semi open	Floppy vine, medium size fruit, some ribby
PX 150440	ML	FR-G	2.5	No	4	4	M	Semi open	Floppy vine, some ribby fruit, good color
HA-3010	ML	FR-G	3.0	No	4	4	ML	Fair	Med-large fruit with some ribby
HA-3012	M	FR	2.5	No	4	3	ML	Open	Med-large fruit with some ribby
LSL L-809	ML	FR-G	2.5	No	4	4	ML	Semi open	Floppy vine, some ribby fruit, medium fruit
RFT-7018	M	FR	3.0	No	3	3.5	ML	Fair	Medium large fruit with some ribby

[1] M = Midseason Maturity E = Early Maturity L = Late Maturity VL = Very Late Maturity ML = Mid Late Maturity EM = Early to Midseason Maturity
[2] Fruit Shape: FR = Flat Round; G = Globe
[3] Fruit Smoothness: 1 = Bad; 5 = Excellent
[4] Fruit Firmness: 1 = Soft; 5 = Very firm
[5] Stemability: 1 = Hard Stemming (Many stems attached to fruit) 5 = Stems Easily
[6] Vine Size M = Medium ML = Medium Large L = Large S = Small SM = Small-Medium

1999 Fresh Market Tomato Varieties
"Roma" Lines

Seed Company	Replicated	Observation
Asgrow Seed	Clemente	
American Takii		RT-1 RT-10 RT-8
H.J. Heinz Seed		H-106 H-113 H-107 H-115
Novartis Seeds	Supra	
D. Palmer Seed		Matador Vaquero
Petoseed	Yaqui Hybrid 882 Firense	PX 150046 PX 150360
Sunseeds	SXT 6343	
Hazzera Seed		HA-3302
United Genetics		Tres Reyes Rio Oro 31

Table 4.

1999 FRESH MARKET TOMATO VARIETY TRAIL – YIELD & GRADES
"ROMA" TYPE, REPLICATED VARIETIES, SAN JOAQUIN COUNTY

	Market[1] Yield	Crop Maturity @ Harvest (%)[1]			Fruit Sizing Data (%)[2]			
Variety	Tons/Acre	Red	Green	Culls	Extra Large	Large	Medium	Small
Yaqui	22.0	13.5	77.0	9.5	0.0	23.7	18.4	57.9
Clemente	18.3	5.9	82.6	11.5	0.0	0.0	36.4	63.6
Supra	18.1	12.9	78.6	8.5	0.0	12.4	72.2	15.4
Firense	16.0	10.5	82.8	6.7	0.0	16.7	27.8	55.5
Hybrid 882	14.6	16.4	77.3	6.3	0.0	0.0	23.1	76.9
SXT 6343	9.9	10.3	79.5	10.2	0.0	0.0	13.3	86.7

LSD @ 5%: 3.8
CV = 15.5%

Tone Ranch, Lodi, CA

[1]Average of four replications – tons per acre of extra large, large, medium and small sized fruit
[2]Fruit Sizing criteria: Extra large>165g; Large 130-165g; Medium 90-130g; Small 50-90g

Table 5.

1999 FRESH MARKET TOMATO VARIETY TRAIL – YIELD & GRADES
"ROMA" TYPE, OBSERVATION VARIETIES, SAN JOAQUIN COUNTY

	Market Yield[1]	Crop Maturity @ Harvest (%)[1]			Fruit Sizing Data (%)[2]			
Variety	Tons/Acre	Red	Green	Culls	Extra Large	Large	Medium	Small
HA-3302	24.2	2.6	89.4	8.0	0.0	0.0	74.3	25.7
RT-10	23.5	8.2	80.3	11.5	0.0	0.0	27.3	72.7
PX 150360	22.7	17.5	73.7	8.8	0.0	0.0	21.4	78.6
RT-1	20.9	7.1	78.6	14.3	3.0	3.0	27.3	66.7
RT-8	20.6	3.0	84.1	12.9	0.0	20.3	30.2	49.5
H-107	19.3	8.6	87.1	4.3	0.0	0.0	36.1	63.9
H-113	18.6	24.2	64.6	11.2	0.0	0.0	56.1	43.9
PX 150046	16.6	8.4	71.7	19.9	18.3	12.2	51.2	18.3
Rio Oro 31	16.1	14.3	73.8	11.9	0.0	22.2	36.1	41.7
H-115	14.8	32.4	59.4	8.2	21.6	5.4	45.9	27.1
Tres Reyes	11.8	13.3	76.7	10.0	0.0	0.0	56.0	44.0
H-106	10.5	5.6	78.9	15.5	0.0	0.0	16.1	83.9
Vaquero	8.3	8.7	73.9	17.4	3.5	14.1	14.1	68.3
Matador	7.4	15.0	70.0	15.0	0.0	0.0	25.0	75.0

Tone Ranch, Lodi, CA

[1]Average of only 1 replication – tons per acre of extra large, large, medium and small sized fruit
[2]Fruit sizing criteria: Extra Large > 165g; Large 130-165g; Medium 90-130g; Small 50-90g

Table 6A.

1999 FRESH MARKET TOMATO VARIETY TRIALS
TONE RANCH – LODI, CALIFORNIA
REPLICATED TRIAL – "ROMA" LINES

Variety	Maturity[1]	Fruit Shape	Fruit[2] Smoothness	Fruit[3] Firmness	Stemming[4]	Vine[5] Size	Vine Cover	Other Notes
Supra	M	Long Round Pear	4.0	3.5	4	ML	Good	Nice fruit shape, good size
SXT 6343	ML	Square Round Pear	3.5	4.5	4	ML	Fair to Good	Very small fruit
Hybrid 882	M	Long Pear	3.5	3	4	ML	Good	Smaller fruit than normal
Clemente	M	Long Pear	3.5	3.5	4	ML	Fair to Good	Smooth, medium size fruit
Yaqui	M	Blocky Pear	3.0	4	4	M	Semi open	Large fruit, non traditional shape
Firense	ML	Blocky Pear	3.0	4	3.5	ML	Semi open	Large fruit, non traditional shape

[1] M = Midseason Maturity EM = Early to Midseason Maturity; ML = Mid Late Maturity; L = Late Maturity VL = Very Late Maturity
[2] Fruit Smoothness: 1 = Bad; 5 = Excellent
[3] Fruit Firmness: 1 = Soft; 5 = Very firm
[4] Stemability: 1 = Hard Stemming (Many stems attached to fruit); 5 = Stems Easily
[5] Vine Size M = Medium ML = Medium Large L = Large VL = Very Large

Table 6B.

1999 FRESH MARKET TOMATO VARIETY TRIALS
TONE RANCH – LODI, CALIFORNIA
OBSERVATION TRIAL – "ROMA" LINES

Variety	Maturity[1]	Fruit Shape	Fruit[2] Smoothness	Fruit[3] Firmness	Stemming[4]	Vine[5] Size	Vine Cover	Other Notes
Matador	M	Square Round-Pear	3.5	3.5	4	SM	Semi open	Non-traditional shape, poor set
Vaquero	ML	Square Round-Pear	3.5	4	4	SM	Fair to Good	Uniform size, poor set, lot of aphid
Tres Reyes	ML	Pointy Square Round	3.0	3.5	4	ML	Fair to Good	Non-traditional shape, poor set
Rio Oro 31	ML	Square Round	3.0	4	4	M	Semi open	Floppy vine, some ribby fruit
RT-1	ML	Blocky Pear	3.5	3.5	4	M	Semi open	Smallish, light colored fruit, non traditional shape
RT-8	ML	Blocky Pear	3.5	4	4	M	Fair	Floppy vine, non traditional fruit shape, some ribby
RT-10	ML	Blocky Pear	3.0	4	4	ML	Semi open	Good fruit set and yield, non traditional shape, some ribby
PX 150046	ML	Long Pear	4.0	3.5	4	ML	Fair	Fair size and set, traditional fruit shape, floppy vine
PX 150360	ML	Long Pear	4.0	3.5	4	ML	Semi open	Nice looking line, smooth fruit, a little small, floppy vine
HA-3302	ML	Pointy Pear	3.5	4	4	M	Fair	Very good yield, medium size fruit, some ribby and pointed
H-106	ML	Pointy Long Pear	3.5	4	4	ML	Fair to Good	Poor set, smallish fruit, some ribby
H-107	ML	Long Pear	3.0	4	5	M	Semi open	Lot of variability in fruit size
H-113	M	Long Blocky Pear	3.5	3.5	4	ML	Good	Non traditional shape, lot of medium size fruit
H-115	ML	True Pear shape	3.0	4	4	M	Semi open	Range of fruit sizes, nice shape, only fair set, some ribby fruit

[1] M = Midseason Maturity EM = Early to Midseason Maturity; ML = Mid Late Maturity; L = Late Maturity VL = Very Late Maturity
[2] Fruit Smoothness: 1 = Bad; 5 = Excellent
[3] Fruit Firmness: 1 = Soft; 5 = Very firm
[4] Stemability: 1 = Hard Stemming (Many stems attached to fruit); 5 = Stems Easily
[5] Vine Size SM = Small-Medium M = Medium ML = Medium Large L = Large VL = Very Large

Statewide Fresh Market Tomato Variety Trials

1999 STATEWIDE FRESH MARKET TOMATO VARIETY TRIALS

During the 1999 season, three fresh market tomato variety trials, evaluating selected round lines, were conducted. The early season trial was established by Michelle Le Strange, UC Cooperative Extension Farm Advisor in Tulare and Kings Counties, at Joe Maya Farms near Huron, CA, in cooperation with San Joaquin Tomato Growers. The trial contained 12 replicated varieties and another 14 lines in an observation (single replication) block. The field was transplanted on April 22, 1999 and the field variety was Shady Lady. The trial field was furrow-irrigated throughout the season and the trial was hand harvested on July 23, 1999. The second trial (midseason) was conducted by Bill Weir and Scott Stoddard, UC Cooperative Extension Farm Advisor and Research Associate in Merced County, respectively. The trial was located at Live Oak Farms (Bob Giampaoli) near La Grande, CA. The trial contained 13 replicated lines and an additional 19 varieties in an observation block. The field was transplanted on May 12, 1999, and the field variety was Qualit 23. The trial field was irrigated using subsurface drip and the trial was hand harvested starting August 4, 1999. The third trial (late season) was established at Tone Ranch Farms near Lodi, CA by Bob Mullen and Jesus Valencia, Farm Advisors in San Joaquin and Stanislaus Counties, respectively. The trial was also done cooperatively with Triple E Produce and was transplanted on June 23, 1999. The trial contained 14 replicated lines and another 15 varieties in a single replication observation block. The field variety at the trial site was Shady Lady and the field was furrow irrigated throughout the growing season. The trial was hand harvested on September 20 and 21, 1999.

Not all replicated varieties were common to all trial locations but 10 lines were. **Table A** provides market yield performance of those ten varieties for the 3 trial locations combined, as well as for each individual trial. In the combined trial data, the best yielding variety was XPH 12179 at 29.7 tons/Acre, followed by Qualit 23 (28.8 tons/Acre), Shady Lady (28.4 tons/Acre), Qualit 21 (28.2 tons/Acre), Sunbrite (27.5 tons/Acre) and DeVille (27.4 tons/Acre.

The observation varieties, common to all three trial locations, were likewise variable with only 8 lines common to all trials. **Table B** shows the market yield for these eight lines for the 3 trial locations combined, as well as for each individual trial. Highest yield of the common combined observational lines was provided by SRT 6669 at 28.3 tons/Acre, followed by RFT-7018 (26.9 tons/Acre), PX 150431 (26.8 tons/Acre), Fair Lady (26.6 tons/Acre) and Simone (25.2 tons/Acre).

Additional observational varieties (9 lines total) were common in two trial locations and market yield performance for these varieties and the trial location are provided in **Table C**. Greatest yield occurred with Hadas at 30.8 tons/Acre, followed by Vered (29.1 tons/Acre), HA-3010 (28.6 tons/Acre), HA-3012 (27.9 tons/Acre), XPH 12254 (26.5 tons/Acre) and PX 150440 (25.5 tons/Acre).

Individual trial reports from each of the participating Farm Advisors should be obtained and consulted with regard to variety performance in market yield, fruit sizing data and fruit quality observations for that particular trial location.

Table A. 1999 FRESH MARKET TOMATO VARIETY TRIALS
COMBINED AND INDIVIDUAL TRIAL YIELD DATA
REPLICATED VARIETIES
THREE LOCATIONS: TULARE, MERCED AND SAN JOAQUIN

Variety	Combined Market Yield (Tons/Acre)	Individual Trial Market Yield (Tons/Acre) Tulare	Merced	San Joaquin
XPH 12179	29.7	30.6	33.6	24.9
Qualit 23	28.8	30.1	32.1	24.1
Shady Lady	28.4	33.9	30.9	20.5
Qualit 21	28.2	29.9	32.1	22.5
Sunbrite	27.5	29.6	31.6	21.4
DeVille	27.4	30.6	29.2	22.3
LSL R-428	24.2	27.0	26.9	18.8
PX 208795	23.9	25.5	26.7	19.4
STM 3104	23.7	23.0	26.8	21.3
SRT 6615	23.4	27.4	26.2	16.5

Table B. 1999 FRESH MARKET TOMATO VARIETY TRIALS
COMBINED AND INDIVIDUAL TRIAL YIELD DATA
OBSERVATION VARIETIES
THREE LOCATIONS: TULARE, MERCED AND SAN JOAQUIN

Variety	Combined Market Yield (Tons/Acre)	Individual Trial Market Yield (Tons/Acre) Tulare	Merced	San Joaquin
SRT 6669	28.3	28.6	38.1	18.3
RFT-7018	26.9	30.3	29.9	20.4
PX 150431	26.8	36.1	23.9	20.5
Fair Lady	26.6	41.1	18.7	20.0
Simone	25.2	34.2	26.6	14.8
Early Gal	22.7	27.4	23.3	17.4
LSL L-810	21.8	31.3	24.1	10.0
LSL L-801	18.5	18.0	24.4	13.1

Table C. 1999 FRESH MARKET TOMATO VARIETY TRIALS
COMBINED AND INDIVIDUAL TRIAL YIELD DATA
OTHER OBSERVATION VARIETIES*****

Variety	Combined Market Yield (Tons/Acre)	Individual Trial Market Yield (Tons/Acre) Tulare	Merced	San Joaquin
Hadas	30.8	34.2	27.3	---
Vered	29.1	32.9	25.3	---
HA-3010	28.6	---	35.3	21.8
HA-3012	27.9	---	36.9	18.9
XPH 12254	26.5	---	29.1	23.9
PX 150440	25.5	---	32.5	18.5
SRT 6673	22.0	32.3	---	11.6
Dana	21.8	26.3	17.3	---
Sonnet	18.5	16.5	---	20.5

***** Only present in two trial locations

Disease Control Trials

An Evaluation of Fungicides for the Control of Late Blight in Fresh Market Tomatoes. Robert J. Mullen, Doug West, Don Colbert, Scott Whitely and Charles Cancilla.

Late Blight (Phytophthora infestans) has been a persistent problem in fresh market tomato growing areas of the Northern San Joaquin /Southern Sacramento Valleys, which produce for the mid-summer to mid-fall market. Last year (1998) the effects of El Ni☆o were felt over a large area of the Central Valley, with widespread outbreaks of Late Blight in both processing and fresh market tomatoes from spring until late fall. This season has proved to be just the opposite. With warm dry weather the norm for most of the season Late Blight was nearly non-existent except for a few minor spring outbreaks in the upper Sacramento Valley and a couple of fields east of Stockton, CA in early fall. The need for continued evaluation of new chemical and/or biological fungicides that might provide protective or systemic control of Late Blight remains urgent because conditions for disease development will return in the future. This year one trial, evaluating 10 chemical fungicides and/or alternating combination treatments, was established at Bava and Son Farms, northeast of Stockton, CA in a market tomato field planted to the variety Sunbrite. Treatments were begun on September 3, 1999, when the crop was at mid fruit set (1.5 to 2.5" diameter crown fruit). This was two days before a "Blight Cast" warning from a disease forecasting weather station, placed in the field near the trial site by Western Farm Service. Applications were made on a seven day spray schedule with treatments broadcast over and into the tomato crop utilizing a handheld CO_2 backpack sprayer with 8004 nozzles at 30 psi in a spray volume of 50 gallons/acre water. The soil type at the trial site was a Landlow adobe clay and the field was furrow irrigated once a week throughout the growing and fruit sizing season. Additional fungicide applications were made on September 10, 17, 24, and October 1, 1999. A very minor outbreak of the disease occurred between the applications on September 17 and 24, 1999. An erratic pattern of leaf and stem lesions was found and a disease severity rating was made on September 22, 1999. All treatments provided control of the disease over the untreated control. RH-7281 alone, RH 141457 (RH 7281 + mancozeb) alone, and the alternating combination treatment of Tattoo C (propamacarb + chlorothalonil) plus Bravo Ultrex (chlorothalonil) provided the best level of control and the combination of Flint (CGA 279202) plus Actigard (CGA 245704) had the least chemical effect on the disease. The important thing to remember is that the infection level was very light and not very much weight should be given to the control figures. Warm dry conditions returned after the rating date and the disease dried up and all but disappeared. The trial was harvested by hand on October 7, 1999. All treatments gave higher yields than the untreated control, with some of the treatments significantly higher in production. Fruit in all treatments was evaluated in the field for Late Blight infection and only a very small quantity of fruit (1.6 percent) in the untreated control showed symptoms while a few infected fruit were found in the Bravo Ultrex alone treatment (0.3 percent) and the combination of Flint plus Actigard (0.3 percent). Additional "clean" fruit were taken from each plot and incubated for 10 days at 55°F and a relative humidity of 80%. The fruit were then evaluated for fruit infection from Late Blight and none was found with any of the treatments, including the untreated control. Work on this disease, with candidate fungicides, will continue in the 2000 season.

1999 FRESH MARKET TOMATO LATE BLIGHT CONTROL TRIAL
BAVA & SON FARMS – STOCKTON, CALIFORNIA

Treatment[1]	Rate lb/Ac a.i.	Marketable Yield[2] (Red & Green) Tons/Acre	Crop Disease[3] Severity Rating 9/22/99	Crop Maturity @ Harvest (%)			
				Red	Green	Late Blight[5] Infected Fruit	Other Culls
Tattoo C (61SC)	1.00	17.9	1.3	36.7	46.2	0.0	17.1
Tattoo C + Bravo Ultrex (82.5WDG)[4]	1.80 + 1.40	19.9	1.0	23.8	59.1	0.0	17.1
Bravo Ultrex	1.40	18.4	1.4	23.4	56.2	0.3	20.1
Curzate (60WG) + Bravo Ultrex[4]	0.19 + 1.40	16.5	1.3	32.4	49.8	0.0	17.8
Tanos (20SC) + Silwet L-77 + Bravo Ultrex[4]	0.25 + ¼% + 1.40	18.2	1.5	29.0	54.0	0.0	17.0
Acrobat (50WP)	0.20	21.2	1.3	31.8	54.0	0.0	14.2
Acrobat + Bravo Ultrex[4]	0.20 + 1.40	18.1	1.1	32.1	49.9	0.0	18.0
Quadris (2.08SC) + Bravo Ultrex[4]	0.10 + 1.40	16.9	1.1	30.9	49.4	0.0	19.7
RH-7281 (2.0F)	0.20	21.3	1.0	28.4	58.0	0.0	13.6
RH-141457 (75DF)	1.69	19.4	1.0	27.4	53.1	0.0	19.5
Flint (50WG) + Actigard (50WP)	0.078 + 0.060	18.4	2.1	37.6	45.6	0.3	16.5
Untreated Control	---	15.8	2.4	31.1	45.2	1.6	22.1

LSD @ 5%: 3.4
CV = 13.0%

[1] All treatments were applied on a 7 day spray schedule – 5 application dates
[2] Average of four replications
[3] Average of four replications and the following disease severity rating scale:

Disease Severity Rating – Barrat/Horsfall System

Rating Scale	Grade	% Plant Infected	% Plant Healthy	Grade	% Planted 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

[4] Fungicides were alternated during the application schedule
[5] Late Blight infected fruit = percent of total yield including culls

C A U T I O N

The report presents results of tomato disease 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 fungicides are used in this report instead of the more common trade names of fungicides. No endorsement of products mentioned or criticism of similar products is intended. The rates of fungicides 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
Quadris (2.08 SC)	azoxystrobin	Zeneca AG Products
RH-7281 (2.0 F)	RH-7281	Rohm and Haas Co.
RH-141 457 (75 DF)	RH-7281 + mancozeb	Rohm and Haas Co.
Bravo Ultrex (82.5 WDG)	chlorothalonil	Zeneca Ag Products
Tattoo C (61 SC)	propamacarb + chlorothalonil	Agr Evo
Curzate (60 WG)	cymoxanil	DuPont Ag Products
Tanos (20 SC)	KP 481	DuPont Ag Products
Acrobat (50 WP)	dimethomorph	American Cyanamid
Flint (50 WG)	CGA-279202	Novartis
Actigard (50 WP)	CGA-245 704	Novartis

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