

# Multiple Plants per Transplant Plug

Processing Tomatoes:  
Is There a Benefit?

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## Summary: # plants/plug year 2002 to 2007

- ✓ Results are mixed- few clear patterns
- ✓ Multiple plants perform better especially with thin stands
- ✓ Doubles economically advantageous on average

# *Collaborators (2002-07)*

## ➤ Growers:

JH Meek and Sons, Woodland  
Joe Rominger, D. Rominger & Sons, Winters  
Button and Turkovich Ranches, Winters  
Jim Borchard, Woodland

## ➤ Researchers and Assistants:

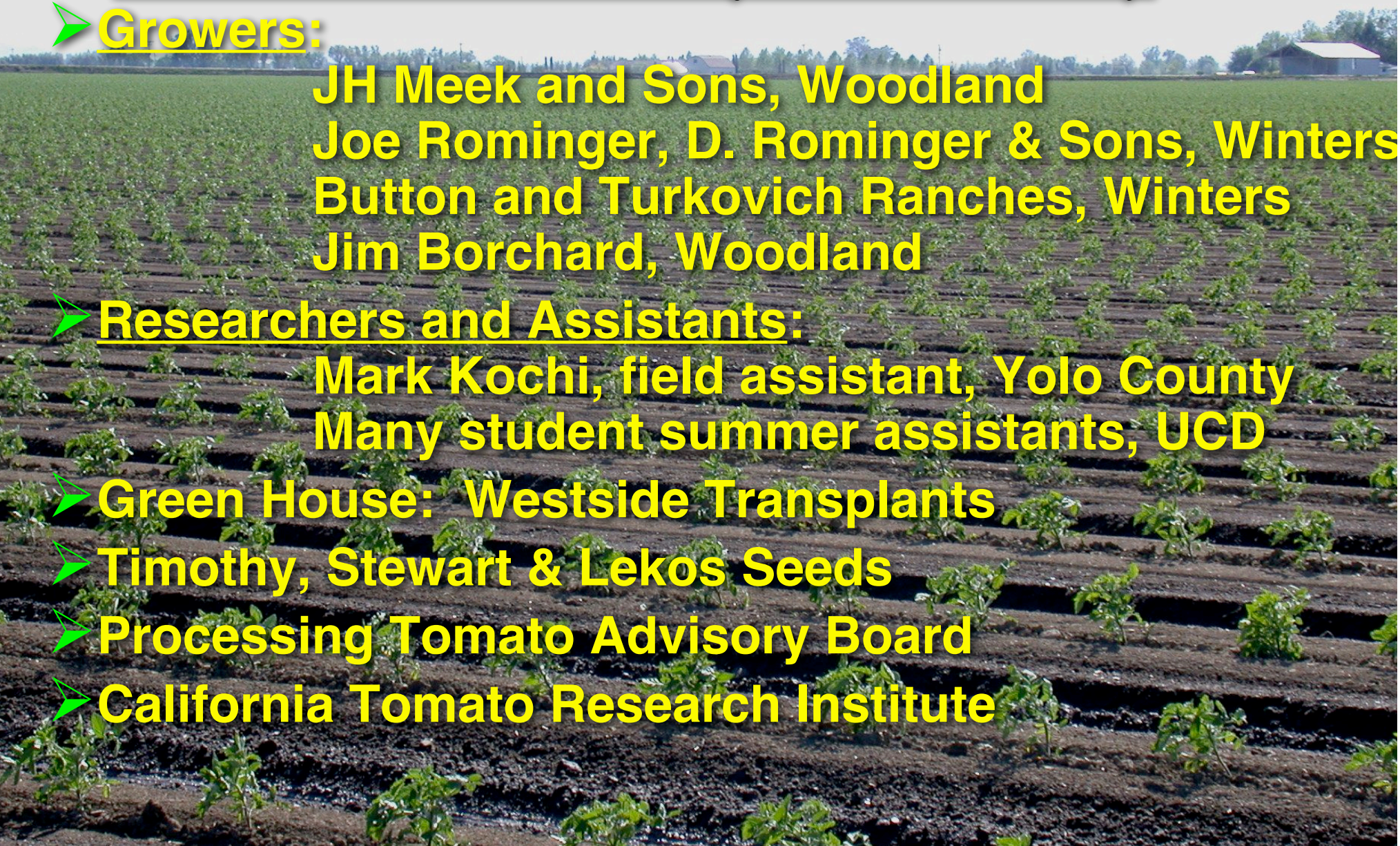
Mark Kochi, field assistant, Yolo County  
Many student summer assistants, UCD

## ➤ Green House: Westside Transplants

## ➤ Timothy, Stewart & Lekos Seeds

## ➤ Processing Tomato Advisory Board

## ➤ California Tomato Research Institute









# PLUG POPULATION TRIAL, 2002

## Mike Murray, Colusa County

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# plants/plug	pH	color	%SS	size (g)	Yield (T/A)
1	4.42	22.5	4.4	43.2	52.2
2	4.46	22.8	4.6	40.7	57.0 (+ 9%)
3	4.39	23.5	4.6	45.1	59.9 (+ 15%)
LSD <sub>.05</sub>	N.S.	N.S.	N.S.	-	3.0
Average	4.44	22.8	4.5	43.0	56.3





***1 vs 2 Plants per Transplant Plug,  
Class 2 soil, single line, ~15" between plugs,  
J.H.Meek & Sons, Woodland, 2003***

		plants	Yield	
Variety		per plug	tons/A	Brix
1	AB 2	single	55.2	4.9
2	AB 2	double	52.5	5.0
3	AB 5	single	53.4	4.8
4	AB 5	double	54.0	4.6
LSD 5%			4.1	0.2
% CV			6	3

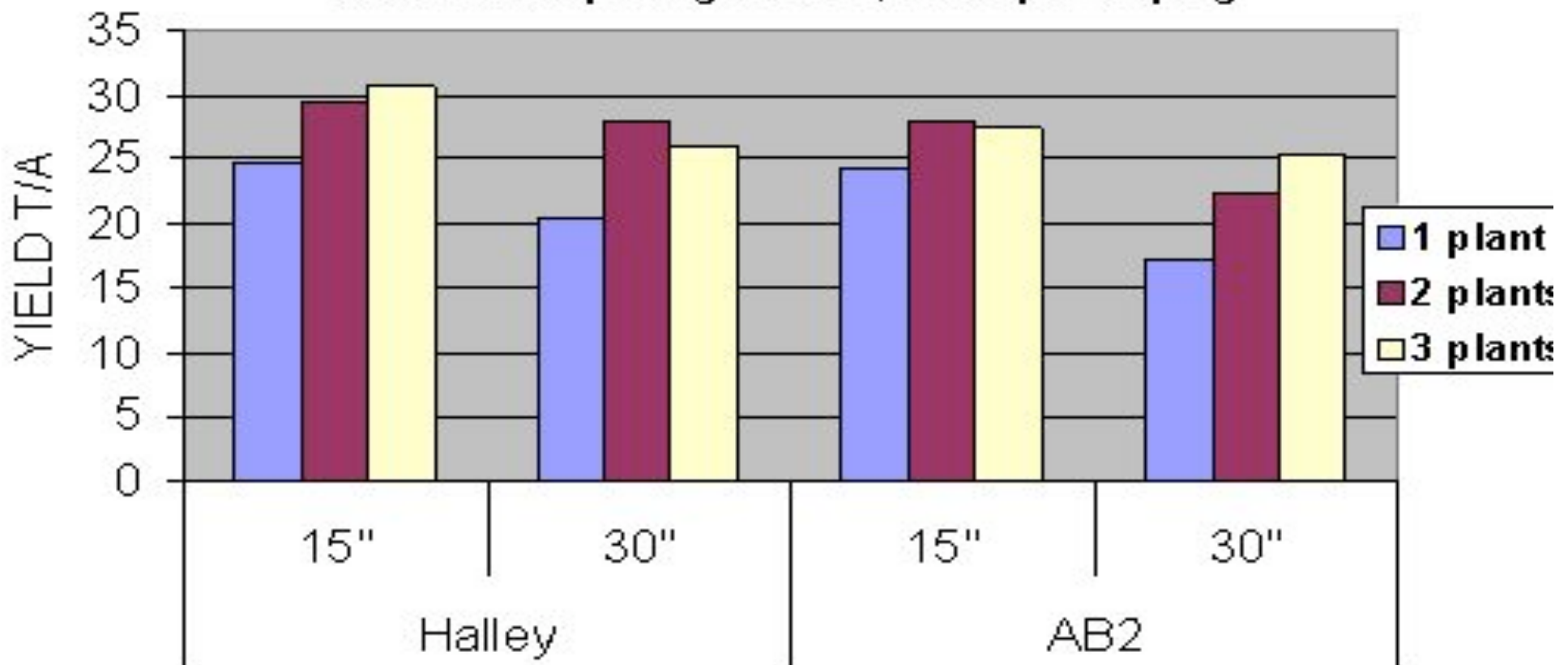
***No significant  
difference in yield  
or fruit quality***

***No Trends***

# RESULTS

## Transplant Density, Fresno, 2004

Figure 1: YIELD of Halley & AB2  
at 2 in-row spacings with 1, 2 or 3 plants/plug



	Location	Year	Variety	Plants per plug			Statistical significance at 0.05
				single	double	triple	
1	Colusa	2002 T1	H 9492	52.2	57.0	59.9	yes
2	Colusa	2003 T3	H 9492	29.6	32.9	35.1	85%*
3	Colusa	2003 T3	Halley	26.6	31.7	27.9	NS
4	Fresno	2004 T1	Halley	24.8	29.4	30.7	yes @ 15" spacing
5	Fresno	2004 T1	Halley	20.3	27.9	26.0	yes @ 30" spacing
6	Fresno	2004 T1	AB 2	24.4	28.0	27.4	yes @ 15"
7	Fresno	2004 T1	AB 2	17.4	22.3	25.4	yes @ 30"
8	Fresno	2005 T2	Halley	44.2	42.9	40.0	no @ 14" spacing
9	Fresno	2005 T2	Halley	41.7	40.8	39.4	no @ 28" spacing
10	Fresno	2005 T2	AB 2	43.1	50.3	49.9	yes @ 14" spacing
11	Fresno	2005 T2	AB 2	45.0	49.4	48.3	yes @ 28" spacing
12	Fresno	2006 T3	Halley	52.2	52.5	54.2	no @ 14" spacing
13	Fresno	2006 T3	Halley	44.4	48.7	49.2	yes @ 28" spacing
14	Fresno	2006 T3	AB 2	52.1	52.3	52.4	no @ 14" spacing
15	Fresno	2006 T3	AB 2	42.8	48.7	49.2	yes @ 28" spacing
16	Fresno	2006 T4	Halley	36.7	39.8	-	yes, combined
17	Fresno	2006 T4	Halley	28.0	31.2	-	yes @ 28" spacing
18	Fresno	2006 T4	AB 2	36.3	39.9	-	yes, combined
19	Fresno	2006 T4	AB 2	28.9	33.4	-	yes @ 28" spacing
20	Yolo	2003 T1	H 9492	32.4	33.9	-	No
21	Yolo	2003 T1	Halley	30.8	31.0	-	No
22	Yolo	2003 T2	AB 2	55.2	52.5	-	No
23	Yolo	2003 T2	AB 5	53.4	54.0	-	No
24	Yolo	2005 T3	Halley	46.4	45.0	-	No
25	Yolo	2005 T3	AB 2	43.2	45.0	-	No
26	Yolo	2006 T4	APT 410	52.7	50.6	-	No
27	Yolo	2006 T4	H 9280	48.9	49.3	-	No
28	Yolo	2006 T5	HyPeel 45	41.5	43.4	-	No
29	Yolo	2006 T5	AB 2	39.7	38.3	-	No
30	Yolo	2006 T5	H 9780	36.9	34.6	-	No
31	Yolo	2007 T6	APT 410	46.6	55.9	-	yes
32	Yolo	2007 T6	H 9280	37.4	47.4	-	yes

## ***Low Populations: Yields favored with Double Plants***

	Location	Year	Variety	rows/ bed	plugs/A	Yield (tons/A)			Statistic significa at 0.0
						<u>Plants per plug</u>			
						single	double	triple	
1	Fresno	2004 T1	Halley	1	3485	20.3	27.9	26.0	yes
2	Fresno	2004 T1	AB 2	1	3485	17.4	22.3	25.4	yes
3	Fresno	2005 T2	Halley	1	3734	41.7	40.8	39.4	NS
4	Fresno	2005 T2	AB 2	1	3734	45.0	49.4	48.3	yes
5	Fresno	2006 T3	Halley	1	3734	44.4	48.7	49.2	yes
6	Fresno	2006 T3	AB 2	1	3734	42.8	48.7	49.2	yes
7	Fresno	2006 T4	Halley	1	3734	28.0	31.2	-	yes
8	Fresno	2006 T4	AB 2	1	3734	28.9	33.4	-	yes
Average						33.6	37.8	39.6	

***Spacing: 28 to 30 inches between plugs***

	Location	Year	Variety	rows/ bed	plugs/A	Plants per plug			Statistical significance at 0.05
						single	double	triple	
1	Colusa	2002 T1	H 9492	1	6970	52.2	57.0	59.9	yes ✓
2	Colusa	2003 T3	H 9492	1	6970	29.6	32.9	35.1	NS
3	Colusa	2003 T3	Halley	1	6970	26.6	31.7	27.9	NS
4	Fresno	2004 T1	Halley	1	6970	24.8	29.4	30.7	yes ✓
5	Fresno	2004 T1	AB 2	1	6970	24.4	28.0	27.4	yes ✓
6	Fresno	2005 T2	Halley	1	7467	44.2	42.9	40.0	NS
7	Fresno	2005 T2	AB 2	1	7467	43.1	50.3	49.9	yes ✓
8	Fresno	2006 T3	Halley	1	7467	52.2	52.5	54.2	NS
9	Fresno	2006 T3	AB 2	1	7467	52.1	52.3	52.4	NS
10	Fresno	2006 T4	Halley	1	7467	36.7	39.8	-	yes ✓
11	Fresno	2006 T4	AB 2	1	7467	36.3	39.9	-	yes ✓
12	Yolo	2003 T1	H 9492	1	7467	32.4	33.9	-	NS
13	Yolo	2003 T1	Halley	1	7467	30.8	31.0	-	NS
14	Yolo	2003 T2	AB 2	1	6970	55.2	52.5	-	NS
15	Yolo	2003 T2	AB 5	1	6970	53.4	54.0	-	NS
16	Yolo	2005 T3	Halley	1	6970	46.4	45.0	-	NS
17	Yolo	2005 T3	AB 2	1	6970	43.2	45.0	-	NS
18	Yolo	2006 T4	APT 410	2	10454	52.7	50.6	-	NS
19	Yolo	2006 T4	H 9280	2	10454	48.9	49.3	-	NS
20	Yolo	2006 T5	HyPeel 45	2	10454	41.5	43.4	-	NS
21	Yolo	2006 T5	AB 2	2	9091	39.7	38.3	-	NS
22	Yolo	2006 T5	H 9780	2	9091	36.9	34.6	-	NS

# Joe Rominger, D.A. Rominger & Sons, Winters, 2007

	Variety	Yield tons/A		Brix	lbs./ 50 fruit
1	APT 410 double	55.9	a	4.7	6.68
2	H 9280 double	47.4	cd	4.1	6.72
3	APT 410	46.6	cd	4.8	7.21
4	H 9280	37.4	e	4.2	7.29
LSD .05		5.0		0.6	0.67
	Single vs.	42.0	a	4.5	7.2
	2 plants/plug	51.7	b	4.4	6.7
	probability	0.000		NS	0.02

# J.H. Meek and Sons, Dixon, 2007

	Variety	Yield tons/A		PTAB °Brix	lbs per 50 fruit
1	AB 2 double	65.9	a	5.0	7.68
1	AB 2	64.0	ab	5.0	7.79
2	H 9780 double	60.6	c	4.6	7.23
2	H 9780	60.5	c	4.8	7.44
3	H 2601 double	59.9	c	4.7	6.89
3	H 2601	53.8	d	4.7	6.99
	LSD (5%)	3.2		0.3	0.7
	% C.V.	4		4	6

# Effect of # of plants on tomato yield (marketable tons/acre) years 2002-2007

location	plants per plug		
	1	2	3
Colusa	36.1	40.5	41.0
Fresno	36.4	39.8	41.0
Yolo	46.5	48.0	-
average	41.0	43.6	41.0
gain		2.6	

**Seed cost:**  
 ~ \$10 per 1 K  
 7K plants/Acre  
 = + \$70 / acre





## **Summary: # plants/plug year 2002 to 2007**

- ✓ Results are mixed- few clear patterns
- ✓ Multiple plants perform better especially with thin stands
- ✓ Doubles economically advantageous on average







***The End***