Processing Tomato Transplant Studies:

- ✓ Root Orientation
- ✓ Plant Age, Plug Size, Doubles

Gene Miyao, UC Farm Advisor, Yolo/Solano/Sacramento

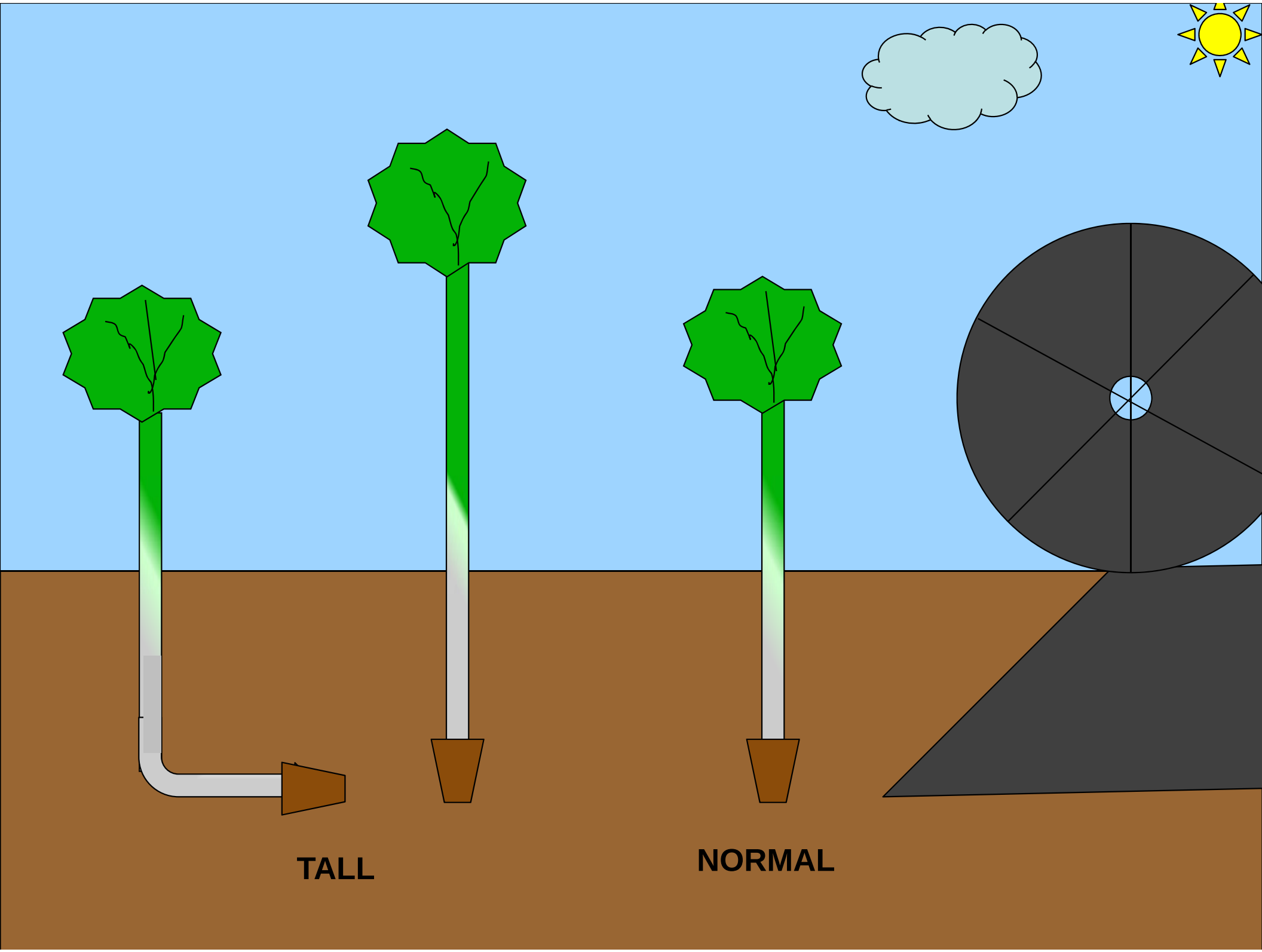
Plant Placement Primarily a Function of Planter Type:

(carousel-type)

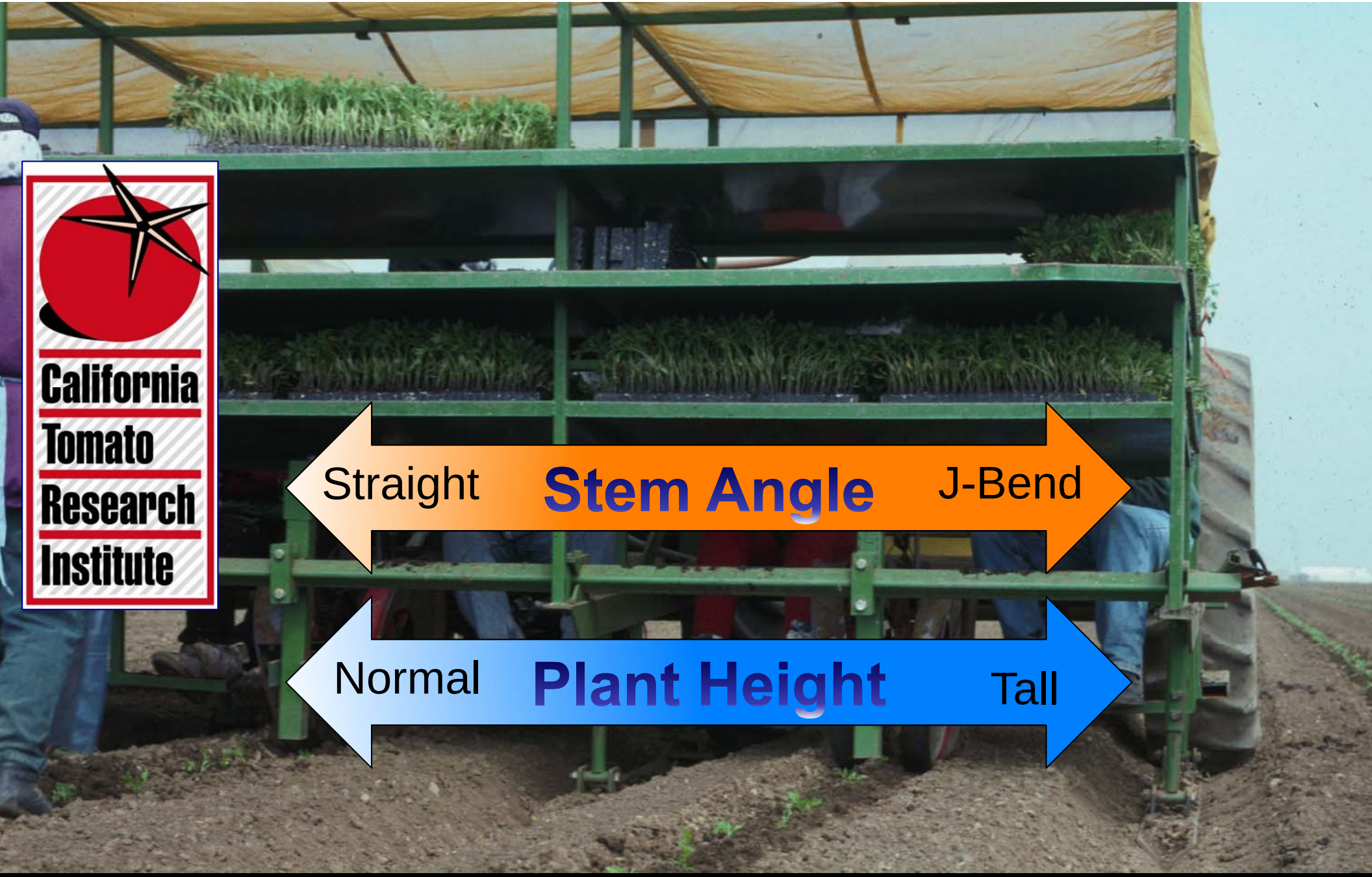
(finger-style)

Shoe Depth vs Worker controlled

Gravity- fed Human


TALL
NORMAL


'J'-Shaped Angle


California
Tomato
Research
Institute
Straight
Stem Angle
J-Bend
Normal
Plant Height
Tall

Influence of stem angle- orientation

	stem angle	plant length	total fruit biomass	calculated Market-able tons	% pink& green	% mold
1	straight	norm	75.0	48.4	31.6	3
2	straight	tall	70.2	42.9	34.8	2
3	J-bend	norm	71.6	46.4	26.5	6
4	J-bend	tall	71.5	39.5	39.1	3
	LSD 5%		NS	6.3	NS	NS
	% CV		7	14	33	80
	F Value		1.3	3.4	1.9	2.7

average of 8 reps

- ✓ High yielding
- ✓ Early machine harvest

1/3 non-ripe fruit

Influence of stem angle- orientation

	stem angle	plant length	total fruit biomass	calculated Market-able tons	% pink& green	% mold
1	straight	norm	75.0	48.4	31.6	3
2	straight	tall	70.2	42.9	34.8	2
3	J-bend	norm	71.6	46.4	26.5	6
4	J-bend	tall	71.5	39.5	39.1	3
	LSD 5%		NS	6.3	NS	NS
	% CV		7	14	33	80
	F Value		1.3	3.4	1.9	2.7
	Group Comparisons:					
	Straight vs. J-bend stem		72.6 / 71.6	45.7 / 43.0	33.2 / 32.8	2.5 / 4.6
	Probability		NS	NS	NS	0.05
	F Value		0.3	0.2	0.01	4.3
	Normal vs. tall plants		73.3 / 70.8	47.4 / 41.2	29.0 / 36.9	4.3 / 2.8
	Probability		NS	0.01	0.05	0.14
	F Value		1.8	8.4	4.3	2.4

average of 8 reps

- ✓ High yielding
- ✓ Early harvest
  1/3 non-ripe fruit

'J-bending of stem' did not influence yield

'normal' length plants produced higher yields than tall-old plants

Evaluation of Transplant Seedlings (Age, Doubles, Small Plugs) at Joe Yeung and Sons, Elkhorn, 2010

	transplant stage	Greenheart Greenhouse	seeded	projected ship date	tray count plugs	Plant height (inch)
1	normal	Yuma	5-Feb	7-Apr	231	6
2	old	Arroyo Grande	20-Dec	5-Mar	231	10.5
3	doubles	Arroyo Grande	6-Jan	8-Mar	231	9.5
4	small plugs	Arroyo Grande	21-Jan	27-Mar	338	7

Previous crop: wheat 2009
Transplant date: 8-Apr-2010
Harvest: 8-Sep
Trial Design: randomized complete block with 6 reps

Evaluation of Transplant Seedlings (Age, Doubles, Small Plugs), Joe Yeung and Sons, Elkhorn, 2010

	transplant treatment	yield tons/acre	Fruit (PTAB lab) Brix	pH	color	% pink
1	normal age	40.1	5.65	4.34	22	3
2	old	41.0	5.62	4.35	21	2
3	doubles	41.9	5.77	4.33	22	2
4	small plugs	40.5	5.58	4.34	22	2
	LSD 5%	NS	NS	NS	NS	NS
	CV	8	4	1	3	106
	Average	40.9	5.7	4.3	21.5	2.4
	F value	0.4	0.8	0.3	1.8	0.1

Summary:

- ✓ Tomato transplants fairly resilient
- ✓ Stem angle/root ball orientation not so important
- ✓ Target: Hardy, healthy plants for good stand establishment followed with robust growth

	Location	Year	Variety	Plants per plug			significance
				single	double	triple	at 0.05
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

	Location	Year	Variety	Plants per plug				significance
				single	double	triple		at 0.05
20	Yolo	2003 T1	H 9492	32.4	33.9	-	1.5	No
21	Yolo	2003 T1	Halley	30.8	31.0	-	0.2	No
22	Yolo	2003 T2	AB 2	55.2	52.5	-	(2.7)	No
23	Yolo	2003 T2	AB 5	53.4	54.0	-	0.6	No
24	Yolo	2005 T3	Halley	46.4	45.0	-	(1.4)	No
25	Yolo	2005 T3	AB 2	43.2	45.0	-	1.8	No
26	Yolo	2006 T4	APT 410	52.7	50.6	-	(2.1)	No
27	Yolo	2006 T4	H 9280	48.9	49.3	-	0.4	No
28	Yolo	2006 T5	HyPeel 45	41.5	43.4	-	1.9	No
29	Yolo	2006 T5	AB 2	39.7	38.3	-	(1.4)	No
30	Yolo	2006 T5	H 9780	36.9	34.6	-	(2.3)	No
31	Yolo	2007 T6	APT 410	46.6	55.9	-	9.3	yes
32	Yolo	2007 T6	H 9280	37.4	47.4	-	10.0	yes
33	Yolo	2007 T7	AB 2	64.0	65.9	-	1.9	No
34	Yolo	2007 T7	H 9780	60.5	60.6	-	0.1	No
35	Yolo	2007 T7	H 2601	53.8	59.9	-	6.1	yes
36	Yolo	2008 T8	APT 410	47.0	45.3		(1.7)	no
37	Yolo	2008 T9	AB 2	63.6	65.5		1.9	no*
38	Yolo	2008 T9	H 9780	64.2	67.0		2.8	no*
39	Yolo	2008 T9	H 2601	52.2	56.2		4.0	no*
40	Yolo	2009 T10	AB 2	77.8	73.1		(4.7)	no
41	Yolo	2009 T10	Sun 6366	69.7	73.2		3.5	yes
42	Yolo	2010 T11	AB 2	41.0	41.9		0.9	no

Multiple Plants per Transplant Plug

UC field trials, 2002-2010

Yield (tons/A) average

	plants per plug			△	
location	1	2	Significance		
Colusa	36.1	40.5	1 of 3	4.4	
Fresno +	39.2	41.9	5 of 8	2.7	
Yolo	50.4	51.7	4 of 23	1.3	N.S.
average	46.5	48.4			
gain		1.9			Significant

+ excluded 28-30” plant spacing on single rows


Vv
Ww
Xx
Yy


The End