

**Project Number 05-BL-02**

2005

Progress Report

**REGIONAL ALMOND  
VARIETY TRIALS**

Planted in 1993

University of California

# TABLE OF CONTENTS

	<u>Page</u>
Regional Almond Variety Trials: Background, Locations, Varieties Included, Details of Trials, Data Being Collected, Notes and Observations on the 2004 Season, Contributors .....	2-5
2005 Bloom Data	
CSU-Chico .....	6-7
Delta College .....	8-9
Kern .....	10-11
2005 Maturity Data	
CSU-Chico .....	12
Delta College .....	13
Kern .....	14-15
2005 Yield and Individual Kernel Weight Summary	
CSU-Chico .....	16
Delta College .....	17
Kern .....	18
Annual and Accumulative Yield Summary	
CSU-Chico .....	19
Delta College .....	20
Kern .....	21
2005 Kernel Defects .....	22-23
Alternaria Leafspot Ratings— Kern .....	24
Hull Rot Ratings— Kern .....	25

# REGIONAL ALMOND VARIETY TRIALS

## Planted in 1993

Bruce D. Lampinen, Joseph H. Connell, Paul Verdegaal, Mario Viveros, Samuel G. Metcalf, Claudia Negron, Mary Ann Thorpe, Thomas M. Gradziel and Warren C. Micke.<sup>1</sup>

### Background

Regional Almond Variety Trials (RAVTs) were designed to evaluate newer varieties in a semi-commercial (20 to 40 trees per variety) manner and to compare them to standard varieties such as Nonpareil, Mission and currently accepted pollenizers.

Previous RAVTs were established between 1974 and 1981 in Kern, Colusa, Butte, San Joaquin and Fresno Counties. These trials were planted over several years and had trees of different ages and variety combinations. Thus, the data from these earlier trials were not directly comparable and at this point data collection has ended.

### 1993 Trials

This leaflet presents data collected in 2005 from the three RAVT trials established in 1993. These trials are located in Butte County at the California State University at Chico farm (CSU-Chico), in San Joaquin County at the San Joaquin Delta College farm (Delta College) near Manteca and in Kern County at a Paramount Farming Company orchard (Kern) located south of Shafter and just off of 7th Standard road. Signs are in place at all locations to identify each variety.

To be comparable, these three new trials were all planted in the same year and with essentially the same variety composition. Thus, any differences in varietal performance among various regions should become evident. The only differences in variety composition among the trials were that Fritz was not included at the CSU-Chico trial (it was in the previous trial at this location) and Dottie Won was added to the Delta College plot. Some trees were planted/replanted after 1993. A few trees of several varieties were not available in 1993, especially for the Delta College trial. Vandalism and a tornado destroyed a few trees at CSU-Chico and normal replanting has occurred at all locations.

Varieties were planted on peach rootstock; Lovell for those at CSU-Chico and Nemaguard for trees in the Delta College and Kern plots. One exception, Kapareil, was planted on both peach and peach-almond hybrid rootstocks at all locations, but data is not always included in this publication for the trees on peach-almond hybrid.

The Kern plot is planted on a Milham sandy loam soil and is irrigated with a drip system (it was irrigated with micro-sprinklers prior to 1999). The trial at CSU-Chico is on a Vina loam soil and is irrigated with solid-set sprinklers. The Delta College trial is on a Delhi loamy sand soil and is flood irrigated. Probably as a result of the coarse textured soil and flood irrigation, the trees in the Delta trial are

---

<sup>1</sup>Bruce D. Lampinen is Extension Specialist, University of California, Davis, Warren C. Micke is Extension Pomologist, Emeritus, University of California, Davis. Joseph H. Connell, Paul Verdegaal, and Mario Viveros, are University of California Farm Advisors in Butte, San Joaquin, and Kern Counties, respectively. Samuel G. Metcalf and Mary Ann Thorpe are Staff Research Associates with the Plant Science Department, University of California, Davis. Claudia Negron is a Junior Specialist in the Plant Science Department, University of California, Davis. Thomas M. Gradziel is Associate Professor in the Plant Science Department, University of California, Davis.

generally somewhat smaller than those in the other two RAVTs. In the Delta College trial there appears to be a sandier area in the middle of the orchard where trees are more subject to periodic moisture stress. In 2004, a microsprinkler irrigation system was installed at the Delta trial.

### Varieties Included

Standard varieties are planted 1:1 with new varieties; Nonpareil for the early-mid blooming varieties and Mission for the late blooming varieties to ensure adequate pollination. In the Kern and Delta College trials, varieties are planted as a full row of 29 to 38 trees. The rows at CSU-Chico are longer so each row has three different variety sections, with 21 to 25 trees per section. In addition to Nonpareil and Mission, a plot of each of seven "new standard" varieties (other varieties commonly planted today) has been included. These new standard varieties are Butte, Carmel, Fritz (not at CSU-Chico), Monterey, Padre, Price and Sonora.

The varieties being tested in these trials are Aldrich, Chips, Donna, Dottie Won (Delta College only), Kahl, Kapareil, Jenette, Jiml, Johlyn, Livingston, Morley, Plateau, Rosetta, Ruby, Sano, Savana, Wood Colony and Yokut. While several of these varieties are not new to the almond industry, they had not been adequately tested in the uniform RAVT concept. In addition, six numbered selections from a University of California at Davis almond breeding program were included in these trials. These are 1-87, 1-102W, 2-19E, 2-43W, 13-1 (Winters) and 25-75.

Selection 1-102W and selection 2-43W were removed from the Butte trial in 2001 since their potential was deemed to be limited under the conditions in this trial. In 2001, half rows of Kochi, Durango, Avalon and Carmel (as a standard) were planted in place of the removed selections. These varieties were harvested for the first time in 2004. After the 2003 harvest season, data collection was stopped on selection 25-75, Aldrich, Monterey, Morley, Padre, Plateau, and Savana at the Butte trial since the tree loss in these rows was extensive enough to make yield data unreliable. After the 2004 harvest, data collection was stopped for Chip's, Rosetta and Jiml at the Butte trial for the same reason.

Kapareil on peach almond hybrid rootstock was removed from the Delta trial in 2001 due to poor productivity and the row was replanted with Avalon in the spring of 2002. Selection 25-75 and Savana were removed from the Delta trial in 2002 due to poor productivity. Kochi and Nonpareil were planted in place of Selection 25-75 in the spring of 2003 at the Delta trial. Additional new plantings at the Delta trial include Folsom (2004), Zinke (2004), Bluegum (2005) and Galaxy (2005).

### 2005 Data and Observations

This 2005 report includes information on bloom time, hullsplit/harvest time, yields, shelling percentage (percent kernel) and kernel defects. In addition previous years and accumulated yield data are given. Some information on disease susceptibility is also included.

Bloom time weather was variable this spring. At the CSU-Chico trial there were 40 good bee hours (temperatures greater than 59°F and wind less than 10 mph and no rain). At the Delta trial, the bloom period was interspersed with rainfall, particularly during Nonpareil bloom. At the Kern trial, temperatures were generally good during bloom but there were short periods of inclement weather interspersed that likely effected set in some varieties.

Overall, yields were up slightly at all three sites compared to 2004 (Fig. 1). Overall yields at the Butte and Delta trials were the highest ever while Kern was less than the 2002 maximum (Fig. 1).

In 2005, the CSU-Chico, Delta and Kern trials had 12, 16 and 11 varieties, respectively, with 6% or more kernel doubles (Fig 2; for details see Kernel Defects, page 22-23). The CSU-Chico, Delta and Kern had 3, 11 and 6 varieties, respectively, with 6% or more twin kernels. The CSU-Chico, Delta and Kern trials had 8, 15 and 5 varieties, respectively, with 6% or more blank kernels in 2004. The Kern trial had the most worm damage with 13 varieties having 6% or higher worm damage. The CSU-Chico trial had 5 and Delta only had 1 variety with 6% or higher worm damage in 2005.

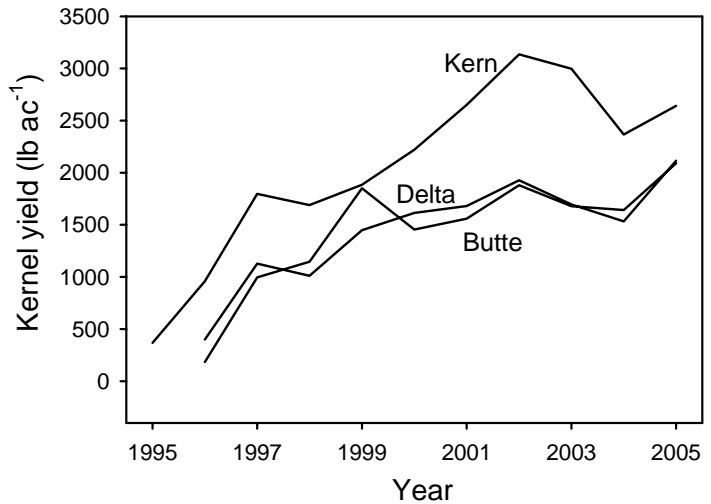


Fig. 1. Average annual yield for all varieties and selections combined at each trial.

Over the last nine years, Donna, Kahl, Sano and Plateau have had the most double kernels. Kahl and Donna have had six percent or more blank kernels in at least one of the trials each year. Kapareil has had six percent or more worm damage every year in at least one trial.

Considerable splitting (breakage) and loss of scaffold limbs, and some entire trees, has occurred in both the CSU-Chico and Delta College trials. The exact cause of this splitting is uncertain, but it may be a result of the wide tree spacing and tree damage from a 1995 tornado at the CSU-Chico trial and the prevailing wind, heavy crops and lack of sufficient tree tying at the Delta College plot. In addition, at the CSU-Chico trial, considerable shaker damage has occurred. This has resulted in enough loss of trees to make yield data questionable and hence data collection has ceased on some varieties and selections. Even without the above conditions, scaffold splitting may be a problem for the Aldrich variety with its upright growth habit and narrow crotch angles. Thus, this variety will require special care in tree training.

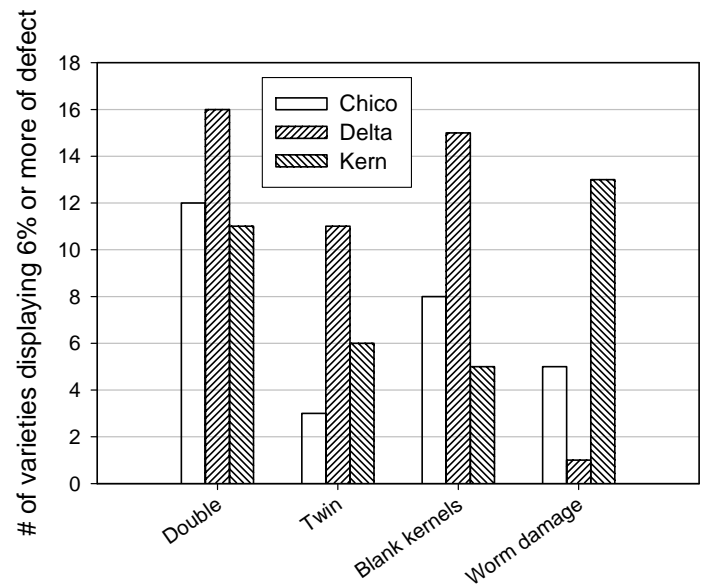


Fig. 2. Primary kernel defects observed in 2005 by site.

Until the 2002 season, only Yokut at the CSU-Chico trial had shown indications of possible noninfectious bud failure (BF) symptoms, and these symptoms might be due to a virus condition that mimics BF. However, in the spring of 2002, minor bud failure was observed on the tops of 14% of the Carmel trees in the Kern trial and 12% of the Carmel trees in the Butte trial. This followed a warm 2001 May-June period that was extremely conducive to bud failure. In 2003, bud failure was again observed at the Butte site but it was not significantly worse than in 2002. In 2004 and 2005, minor bud failure was again observed on the tops of 5% of the Carmel trees in the CSU-Chico trial. No bud failure was observed on the Carmel trees at the Kern trial in 2004 or 2005. To date, no bud failure has been observed on the Carmel trees at the Delta College trial.

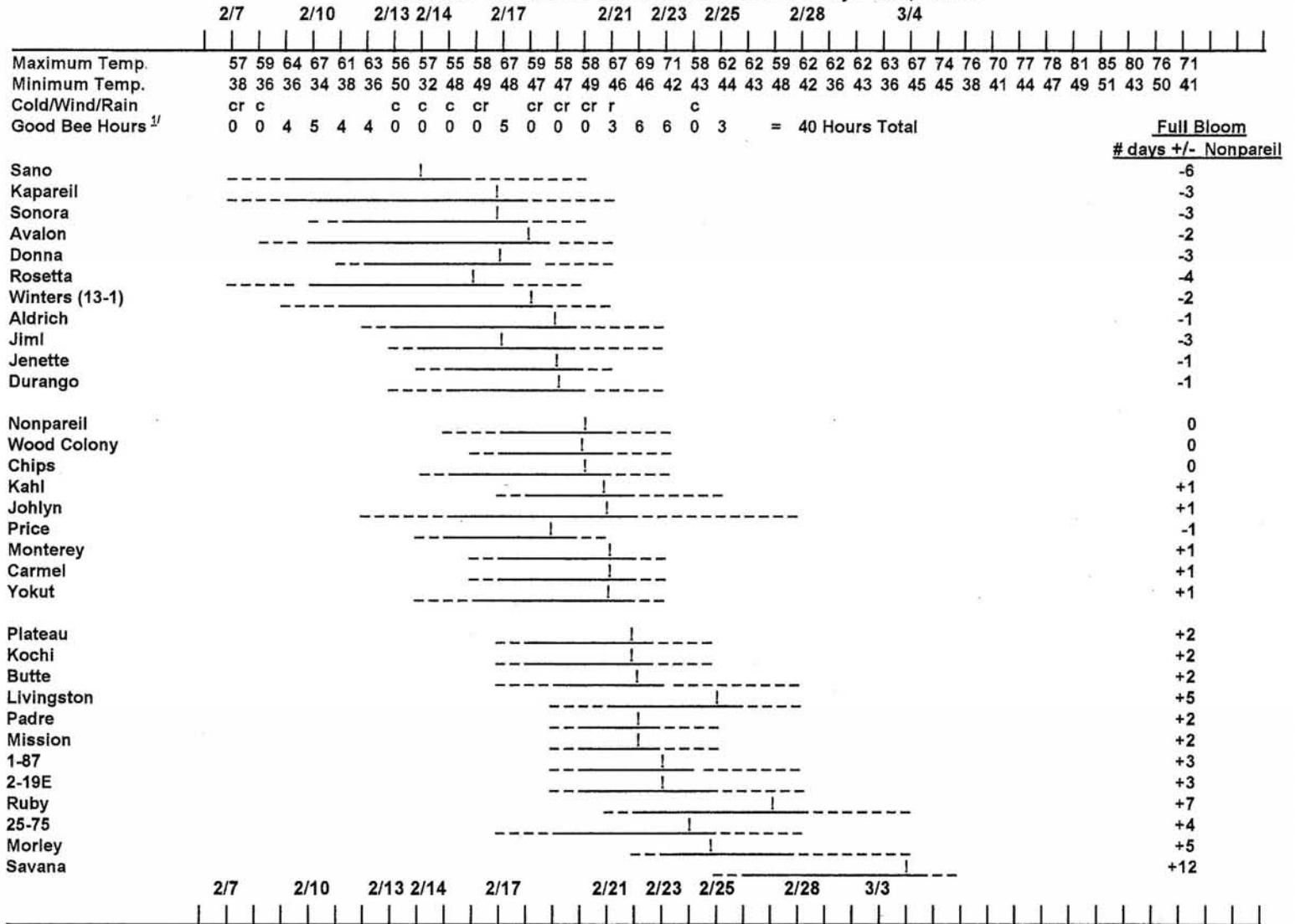
Selection 13-1 was released several years ago with the name ‘Winters’. It has shown good production (particularly at the CSU-Chico trial) and should be a good pollenizer for Nonpareil. However, the high susceptibility of Winters to diseases (especially *Alternaria* and *Anthraco*se) and worm damage continues to be a concern.

### Acknowledgements

The authors wish to thank the Almond Board of California for helping with tree purchase and for continued support of this project. The following nurseries supplied trees at reduced cost for these trials: Bright's Nursery, Burchell Nursery, Dave Wilson Nursery, Fowler Nursery, Sierra Gold Nurseries and Spoto Nursery. We particularly want to express our appreciation and thanks to the staffs of California State University at Chico, San Joaquin Delta College and Paramount Farming Company for excellent cooperation in managing and maintaining these trials. The assistance of Cooperative Extension field assistants in Kern, Butte and San Joaquin Counties and field personnel of the University of California Plant Science Department is gratefully acknowledged.

# ALMOND REGIONAL VARIETY TRIAL - 2005 BLOOM

Planted in 1993 at the California State University Farm, Chico



Dashed line encompasses 1 to 100% bloom, solid line covers 10 to 90% bloom, full bloom date marked with a ! = 80% bloom.

<sup>1/</sup> Good Bee Hours = total daylight hours between 1% bloom on Sonora and 100% bloom on Mission when temperatures are ≥ 59 F, wind ≤ 10 mph, and no rain. This is a cooperative project between The Almond Board of California, CSU-Chico, and University of California Cooperative Extension.

Prepared by: Joseph H. Connell, U.C. Farm Advisor and Megan Brown, Lab Assistant, Butte County, August 18, 2005.

### Bloom Density\* -- CSU Chico, Regional Variety Trial

Variety	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Sonora	4	2	2	4	5	3	4	3	4	5
Sano	4	4	4	4	3	4	4	5	4	5
Kapareil	5	5	5	5	5	5	5	5	5	5
Rosetta	3	4	4	3	2	4	3	5	4	5
Winters	5	4	4	4	3	3	4	5	4	4
Donna	3	3	3	4	3	3	4	2	3	2
Aldrich	4	5	5	4	3	4	5	5	5	5
Chips	3	4	4	5	4	3	4	4	4	3
Jenette	4	5	5	5	3	4	5	3	5	5
Jiml	2	3	2	2	3	3	4	1	5	1
Nonpareil	4	4	3	4	3	3	3	2	3	3
Price	1	1	4	2	4	3	3	3	4	2
Yokut	1	3	1	2	1	4	2	4	2	4
Carmel	3	3	3	5	3	4	3	5	3	5
Kahl	2	3	2	3	2	4	3	5	2	5
Wood Colony	4	3	3	3	3	4	4	3	4	4
Johlyn	4	4	1	4	3	3	3	2	2	3
Monterey	4	4	2	3	3	2	4	1	3	4
Plateau	2	3	3	3	4	3	3	2	4	2
Butte	4	4	3	4	4	4	4	4	4	4
2-19E	3	3	2	5	2	5	2	5	2	5
2-43W	4	3	2	3	4	---	---	---	---	---
Padre	3	3	4	5	4	5	5	5	5	5
1-102W	4	4	4	4	4	---	4	---	---	---
1-87	3	3	3	3	3	4	3	3	3	4
Livingston	3	4	3	4	4	4	4	3	3	4
Mission	3	3	3	3	4	4	---	4	3	5
Ruby	3	3	3	3	4	3	4	4	3	3
25-75	2	3	3	3	4	3	3	3	3	4
Morley	4	3	3	3	4	4	4	4	4	5
Savana	3	3	3	3	2	3	2	3	2	4
Avalon									4	4
Carmel									3	5
Durango									4	4
Kochi									3	3

\* The density of bloom is rated annually for each variety on a subjective scale of 1 to 5 with a rating of 5 being the heaviest bloom. Consistency of bloom from one year to the next and tendencies toward alternate bloom/bearing may be indicated by these ratings. Consistently heavy bloom may also indicate consistently light cropping (see Kapareil).



San Joaquin Delta College Almond Regional Variety Trial

2005 Bloom Dates

Manteca

Row	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	1	2	3	4	
Nonpareil						12	13	14	15	16	17	18															
Chips						12	13	14	15	16	17																
Johlyn					11	12	13	14	15	16	17	18															
Dottie Won								14	15	16	17	18															
Jerette						12	13	14	15	16	17																
Kahl								14	15	16	17	18															
Sano	8	9	10	11	12	13	14																				
Yokut								14	15	16	17	18	19														
Plateau									15	16	17	18	19	20	21	22											
Mission													19	20	21	22	23	24	25								
Morley																	22	23	24	25	26	27	28				
Kapareil						11	12	13	14	15																	
Avalon						11	12	13	14	15	16	17	18														
Sonora	7	8	9	10	11	12	13	14																			
Rosetta	8	9	10	11	12	13	14	15																			
Winters (13-1)						11	12	13	14	15	16																
Price								14	15	16	17	18															
Aldrich						12	13	14	15	16	17																
Wood Colony									15	16	17	18	19														
Fritz						12	13	14	15	16	17																
Jiml						12	13	14	15	16	17	18															
Donna							13	14	15	16	17	18															
Carmel								14	15	16	17	18															
Monterey								14	15	16	17	18	19	20	21												
Butte									16	17	18	19	20	21	22	23											
Livingston												18	19	20	21	22	23	24									
1-87												18	19	20	21	22	23	24	25								
Padre												18	19	20	21	22	23	24									
Ruby																22	23	24	25								
Kochi								14	15	16	17	18	19	20													

= 10 TO 90%

**SAN JOAQUIN DELTA COLLEGE  
REGIONAL ALMOND VARIETY TRIAL  
2005 RAINFALL  
MANTECA**

February	Rain (inches)	Air Temperature		Wind > 5 mph
		Max	Min	
1	0.00	63.5	34.4	
2	0.00	61.7	38.1	
3	0.00	63.9	35.5	
4	0.00	63.1	37.0	
5	0.04	62.2	40.2	
6	0.00	63.5	42.0	5.6
7	0.04	58.1	44.2	
8	0.00	61.1	42.8	
9	0.00	62.9	36.9	
10	0.00	65.0	35.4	
11	0.12	59.6	46.1	
12	0.04	67.6	41.8	
13	0.00	61.5	44.8	
14	0.20	61.8	50.6	
15	0.87	55.5	50.2	
16	0.12	65.2	53.2	
17	0.08	58.4	51.7	
18	0.28	64.9	52.2	5.4
19	0.12	63.5	45.9	6.5
20	0.12	63.4	51.5	6.7
21	0.04	66.9	47.1	5.2
22	0.00	66.8	40.9	
23	0.00	65.4	40.9	
24	0.00	58.3	37.9	
25	0.00	58.2	41.0	
26	0.00	64.3	38.6	
27	0.67	65.4	47.1	5.3
28	0.04	64.5	39.4	
Rainfall subtotal for:		(inches)		
	December	3.85		
	January	3.48		
	February	2.78		
	March	4.41		
	April	1.31		
	May	<u>0.60</u>		
		16.45*		
* Average rainfall September – May = 11.5 inches				

*Shaded dates = Bloom period*

**EFFECTIVE BLOOM PERIOD**  
**Kern RVT - Paramount Farming Company**

<b>Early Blooming Varieties</b>			
	<b>Bloom Period</b>		
	<b>Beginning</b>	<b>Full</b>	<b>End</b>
Sano	02-04-05	02-14-05	02-22-05
Kapareil	02-04-05	02-17-05	02-22-05
Rosetta	02-04-05	02-14-05	02-22-05
Sonora	02-09-05	02-15-05	02-22-05
13-1 (Winters)	02-09-05	02-18-05	02-23-05

<b>Mid-Season Blooming Varieties</b>			
	<b>Bloom Period</b>		
	<b>Beginning</b>	<b>Full</b>	<b>End</b>
Nonpareil	02-09-05	02-17-05	02-28-05
Price	02-09-05	02-17-05	02-23-05
Jenette	02-10-05	02-17-05	02-25-05
Yokut	02-09-05	02-18-05	02-28-05
Johlyn	02-11-05	02-17-05	02-28-05
Plateau	02-12-05	02-18-05	02-26-05
Chips	02-09-05	02-17-05	02-28-05
Kahl	02-09-05	02-19-05	02-26-05
Fritz	02-11-05	02-17-05	02-25-05
Monterey	02-15-05	02-20-05	02-27-05
Aldrich	02-10-05	02-17-05	02-24-05
Wood Colony	02-11-05	02-19-05	03-02-05
1-102W	02-15-05	02-25-05	03-03-05
Jim1	02-09-05	02-19-05	02-24-05
Donna	02-10-05	02-17-05	02-25-05
Carmel	02-11-05	02-20-05	02-27-05
2-19E	02-15-05	02-22-05	03-01-05
2-43W	02-14-05	02-22-05	03-02-05

**EFFECTIVE BLOOM PERIOD**  
**Kern RVT - Paramount Farming Company**  
 (continued)

<b>Late Season Blooming Varieties</b>			
	<b>Bloom Period</b>		
	<b>Beginning</b>	<b>Full</b>	<b>End</b>
Butte	02-14-05	02-22-05	03-02-05
Livingston	02-16-05	02-22-05	03-02-05
Padre	02-18-05	02-22-05	03-01-05
1-87	02-16-05	02-22-05	03-02-05
25-75	02-14-05	02-22-05	03-04-05
Mission	02-16-05	02-22-05	03-01-05
Ruby	02-18-05	02-25-05	03-04-05
Morley	02-22-05	02-27-05	03-08-05
Savana	02-25-05	03-02-05	03-10-05

Bloom Observations:

Good Blooming Varieties:

Sano, Kapareil, Aldrich, Wood Colony, Fritz, Carmel, Monterey, Butte, 1-87, Mission, Padre, 2-19E, Ruby

Average Blooming Varieties:

Morley, Yokut, Plateau, Sonora, Winters, Price, Jiml, Donna, Johlyn, Jenette, Kahl, 25-75

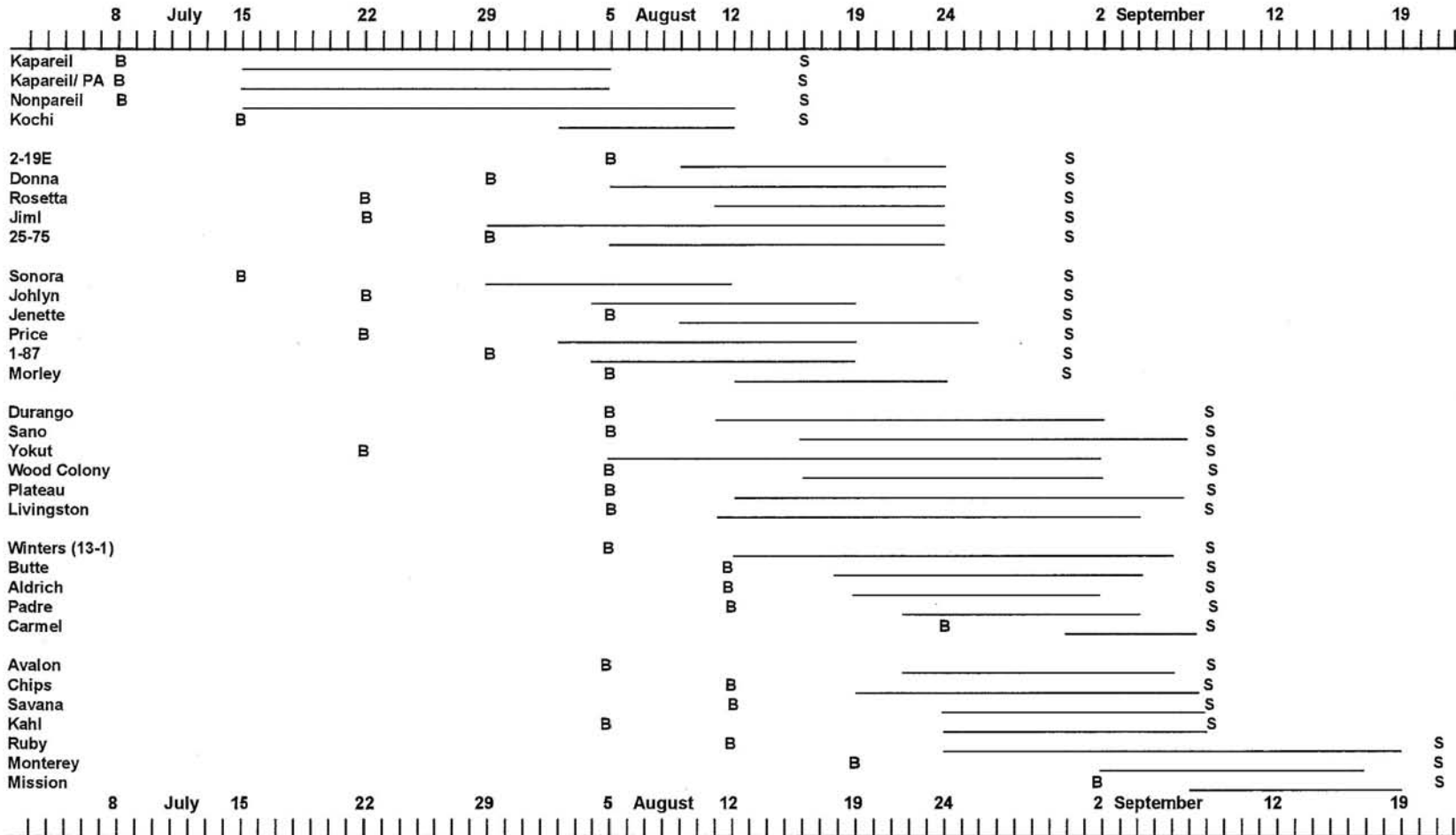
Poor Blooming Varieties:

Nonpareil, Chips, 2-43W, Rosetta

Chilling Hours: 634 (November 15 to January 15)

## ALMOND REGIONAL VARIETY TRIAL - 2005 HARVEST MATURITY

Planted in 1993 at the California State University Farm, Chico



Solid line=1 to 100% hullsplit. B--denotes blank nuts beginning to split. S--indicates when the variety was shaken to the ground, 4 harvests this year. Kochi, Durango and Avalon are young trees in their 5<sup>th</sup> growing season. This is a cooperative project between the Almond Board of California, CSU-Chico, and University of California Cooperative Extension. Prepared by: Joseph H. Connell, U.C. Farm Advisor and Megan Brown, Butte Co. Lab Assistant. 9/26/05.

**Almond Regional Variety Trial**  
 2005 Hull Split Dates  
 Manteca

Variety	Date		1997 - 2005 Average Order
	10%	90%	
Kapareil	7-Jul	13-Jul	1
Nonpareil	18-Jul	29-Jul	2
Jiml	1-Aug	16-Aug	3
Sonora	8-Aug	17-Aug	4
Johlyn	1-Aug	12-Aug	5
Donna	8-Aug	22-Aug	6
Price	12-Aug	16-Aug	7
Yokut	12-Aug	23-Aug	8
Jenette	12-Aug	22-Aug	9
Rosetta	9-Aug	16-Aug	10
Morley	13-Aug	17-Aug	11
Dottie Won	24-Aug	5-Sep	12
Plateau	21-Aug	2-Sep	13
Sano	21-Aug	30-Aug	14
Kahl	16-Aug	2-Sep	15
1-87	17-Aug	30-Aug	16
Winters (13-1)	24-Aug	5-Sep	17
Aldrich	17-Aug	30-Aug	18
Chips	17-Aug	3-Sep	19
Wood Colony	17-Aug	29-Aug	20
Livingston	23-Aug	6-Sep	21
Avalon	30-Aug	7-Sep	22
Padre	23-Aug	30-Aug	23
Carmel	3-Sep	9-Sep	24
Butte	2-Sep	8-Sep	25
Ruby	30-Aug	6-Sep	26
Mission	3-Sep	12-Sep	27
Monterey	8-Sep	20-Sep	28
Fritz	9-Sep	13-Sep	29

**HULLSPLIT PERIOD**  
RAVT - Paramount Farming Company (Kern Co.)

<b>EARLY - SEASON</b>		
	<b>Hullsplit Period</b>	
	<b>Beginning*</b>	<b>End**</b>
Kapareil	07-01-05	08-01-05
Nonpareil	07-06-05	08-09-05
2-19E	07-22-05	09-04-05
Sonora	07-22-05	08-31-05
Rosetta	08-01-05	08-31-05
2-43W	07-12-05	08-31-05
1-102W	07-26-05	08-22-05
Donna	07-26-05	09-09-05
Aldrich	07-28-05	09-03-05
Jiml	07-12-05	08-09-05
Jenette	07-22-05	09-07-05
Johlyn	07-26-05	08-28-05

<b>MID - SEASON</b>		
	<b>Hullsplit Period</b>	
	<b>Beginning*</b>	<b>End**</b>
25-75	08-04-05	09-20-05
13-1 (Winters)	08-09-05	10-02-05
1-87	07-28-05	08-31-05
Price	08-01-05	09-09-05
Plateau	08-01-05	09-18-05
Chips	08-09-05	10-09-05
Savana	08-12-05	09-12-05
Morley	08-22-05	09-10-05
Wood Colony	08-15-05	09-14-05

**HULLSPLIT PERIOD**  
**RAVT - Paramount Farming Company (Kern Co.)**  
(continued)

<b>MID to LATE SEASON</b>		
	<b>Hullsplit Period</b>	
	<b>Beginning*</b>	<b>End**</b>
Sano	07-28-05	09-22-05
Yokut	08-09-05	09-12-05
Padre	08-15-05	09-12-05
Butte	08-09-05	09-12-05
Livingston	08-09-05	09-19-05
Kahl	07-26-05	09-29-05
Carmel***	-- -- --	-- -- --
Ruby	08-12-05	09-26-05

<b>LATE – SEASON</b>		
	<b>Hullsplit Period</b>	
	<b>Beginning*</b>	<b>End**</b>
Mission	08-04-05	10-02-05
Monterey	08-01-05	10-09-05
Fritz	08-18-05	10-02-05

\*Beginning means one to five percent of hullsplit.

\*\*End means 100% hullsplit.

\*\*\*No hullsplit data due to severe defoliation and nut drop due to Alternaria Leaf Spot.

Note: This year hullsplit was severely affected by Alternaria and mite infestation.



**2005 Yield Summary for the Regional Almond Variety Trial at California State University at Chico Farm, Butte County. Planted in 1993**

Variety	No. of nuts/tree	Average kernel weight (g)	Shelling percentage	Kernel pounds per	
				Tree	acre <sup>1</sup>
Butte	19552	0.99	49.8	42.7	2734
Winters (13-1)	15149	1.20	57.2	40.2	2571
Carmel	13888	1.25	56.2	38.4	2455
Yokut	11649	1.45	64.4	37.3	2388
Jenette	14071	1.20	63.0	37.2	2380
Livingston	13283	1.26	55.1	37.0	2367
Sano	11272	1.47	58.9	36.4	2333
Johlyn	13741	1.19	66.1	36.1	2313
<b>Nonpareil</b>	<b>11756</b>	<b>1.37</b>	<b>66.1</b>	<b>35.3</b>	<b>2257</b>
Kahl	12591	1.24	46.1	34.3	2197
Ruby	12544	1.23	50.1	34.1	2182
<b>Mission</b>	<b>11264</b>	<b>1.32</b>	<b>44.4</b>	<b>32.8</b>	<b>2100</b>
2-19E	13278	1.08	54.8	31.6	2025
Wood Colony	9378	1.38	55.2	28.5	1824
Sonora	7416	1.74	79.2	28.4	1819
Price	9319	1.31	63.2	26.8	1718
Kapareil	11562	0.98	71.2	25.1	1604
Donna	8331	1.26	49.6	23.2	1482
1-87	9949	1.01	54.0	22.0	1411
Aldrich	Not harvested				
Chip's	Not harvested				
Jiml	Not harvested				
Monterey	Not harvested				
Morley	Not harvested				
Padre	Not harvested				
Plateau	Not harvested				
Rosetta	Not harvested				
Savana	Not harvested				
25-75	Not harvested				
2-43W	Removed				
1-102W	Removed				

<b>High density plantings 2001- per acre yield adjusted to projected yield at 64 trees/acre</b>					
Avalon	5459	1.27	75.4	15.3	979
Carmel	4039	1.34	57.4	11.9	761
Durango	3410	1.35	56.3	10.2	650
Kochi	2920	1.43	67.0	9.2	590

<sup>1</sup>Based on a spacing that gives 64 trees per acre.

**2005 Yield Summary for the Regional Almond Variety Trial at San Joaquin Delta College Farm, Manteca, San Joaquin County. Planted in 1993.**

Variety	No. of Nuts/Tree	Average Kernel Weight (g)	Shelling Percentage	Kernel Pounds Per	
				Tree	acre <sup>1</sup>
Livingston	19410	1.34	65.2	57.2	4290
Butte	19110	1.15	60.1	48.6	3643
Monterey	14024	1.42	75.1	43.9	3294
Plateau	11825	1.66	52.7	43.3	3251
Padre	15629	1.26	61.6	43.2	3243
Carmel	13534	1.41	65.8	42.0	3153
Dottie Won	14101	1.27	55.4	39.5	2963
Fritz	13730	1.27	61.8	38.3	2876
Ruby	9264	1.47	61.3	30.0	2247
1-87	11874	1.05	62.7	27.5	2064
Jenette	8393	1.48	73.8	27.4	2052
Wood Colony	7423	1.64	68.5	26.7	2006
Chips	7442	1.49	61.7	24.4	1829
Price	8327	1.30	67.3	23.9	1794
Donna	8230	1.30	60.8	23.6	1767
<b>Mission</b>	<b>7661</b>	<b>1.42</b>	<b>50.3</b>	<b>23.6</b>	<b>1767</b>
Morley	8436	1.25	52.8	23.2	1736
Sano	5755	1.77	69.0	22.4	1679
Sonora	5901	1.65	70.6	21.4	1607
Aldrich	8600	1.06	54.3	20.2	1512
<b>Nonpareil</b>	<b>5310</b>	<b>1.55</b>	<b>74.7</b>	<b>18.1</b>	<b>1354</b>
Johlyn	5319	1.52	74.5	17.8	1332
Yokut	4685	1.64	68.7	17.0	1272
Kahl	5645	1.36	55.6	16.9	1264
Winters (13-1)	4389	1.38	63.4	13.3	1001
Rosetta	3068	1.79	56.1	12.1	906
Jiml	2140	1.53	69.5	7.2	539
Kapareil	Not harvested				
Kapareil PA	Removed				
Savana	Removed				
1-102W	Removed				
2-19E	Removed				
2-43W	Removed				
25-75	Removed				

2002 planting					
Avalon	364	1.57	69.7	1.3	94

<sup>1</sup>Based on a spacing that gives 75 trees per acre.

**2005 Yield Summary for the Regional Almond Variety Trial at Paramount Farming Company, Shafter, Kern County. Planted in 1993.**

Variety	No. of Nuts/Tree	Average Kernel Weight (g)	Shelling Percentage	Kernel Pounds Per	
				Tree	acre <sup>1</sup>
Ruby	17517	1.16	65.2	44.6	3836
Livingston	14840	1.36	71.0	44.4	3817
Plateau	14258	1.40	64.9	43.8	3770
Fritz	17249	1.11	63.3	42.0	3614
Padre	16940	1.07	55.3	40.1	3446
Butte	15880	1.12	63.9	39.1	3363
Monterey	14286	1.24	71.4	39.0	3350
Aldrich	14980	1.15	64.4	37.8	3252
<b>Mission</b>	<b>13179</b>	<b>1.26</b>	<b>53.4</b>	<b>36.5</b>	<b>3142</b>
Chip's	14321	1.15	62.5	36.3	3120
2-19E	14449	1.13	61.4	35.8	3082
Jenette	12897	1.26	74.1	35.7	3068
Wood Colony	11689	1.26	65.0	32.5	2794
Kahl	12783	1.15	60.1	32.4	2785
Morley	13471	1.07	57.2	31.7	2725
<b>Nonpareil</b>	<b>9968</b>	<b>1.44</b>	<b>71.8</b>	<b>31.6</b>	<b>2714</b>
Sano	9920	1.43	66.8	31.3	2695
Yokut	10445	1.35	69.8	31.2	2679
Price	13152	1.05	68.7	30.5	2621
1-87	13239	1.03	61.9	30.1	2588
Donna	12727	1.03	56.6	28.9	2488
Rosetta	8358	1.54	62.7	28.3	2435
Sonora	8909	1.30	77.8	25.4	2187
1-102W	6622	1.66	72.3	24.3	2087
Johlyn	8017	1.34	68.7	23.6	2032
Savana	8075	1.22	70.0	21.7	1866
Carmel	6687	1.46	69.1	21.6	1855
Winters (13-1)	7496	1.30	65.1	21.5	1852
Jiml	7282	1.32	71.0	21.2	1821
25-75	10417	0.91	66.8	20.9	1796
2-43W	7997	1.12	55.7	19.8	1700
Kapareil	7606	0.90	74.5	15.1	1303
Kapareil/PA	6673	1.00	73.5	14.8	1269

<sup>1</sup>Based on a spacing that gives 86 trees per acre.

**Annual Yield Summary (1996-2005) and Accumulative Yield (1996-2005) for the Regional Variety Trial at California State University at Chico Farm, Butte County. Planted in 1993.**

Variety	Yield (kernel pounds/acre <sup>1</sup> )										
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Accum.
Winters (13-1)	425	2076	784	2736	2446	2677	2479	3333	2425	2571	21952
Carmel	741	1240	1260	1700	1934	2070	2320	2330	2830	2455	18880
<b>Nonpareil</b>	<b>494</b>	<b>1427</b>	<b>1127</b>	<b>1952</b>	<b>1762</b>	<b>1846</b>	<b>2587</b>	<b>2000</b>	<b>1897</b>	<b>2257</b>	<b>17349</b>
Livingston	425	1449	1275	1765	1607	2283	2350	1795	2015	2367	17331
Butte	443	1169	1549	1404	1509	1705	2001	2064	1817	2734	16395
Ruby	448	1208	1315	1823	1828	1676	1859	2002	1640	2182	15980
Johlyn	537	1047	1046	1870	1595	1457	2036	1864	1494	2313	15260
Sano	372	1036	1020	1558	2128	1552	1918	1514	1780	2333	15211
<b>Mission</b>	<b>383</b>	<b>941</b>	<b>890</b>	<b>1018</b>	<b>1616</b>	<b>1483</b>	<b>2304</b>	<b>2409</b>	<b>1938</b>	<b>2100</b>	<b>15083</b>
Wood Colony	724	978	951	1464	1695	1781	2318	1387	1665	1824	14787
Jenette	279	868	672	1407	1932	1290	1939	1670	1964	2380	14401
Yokut	359	765	896	1204	1126	1964	1621	1700	1559	2388	13581
Kahl	208	672	1070	1301	1034	1491	1280	2096	1160	2197	12510
1-87	190	1295	1074	1340	1454	1711	1802	1038	1023	1411	12338
Sonora	732	494	1152	1262	1510	1165	1498	1726	952	1819	12309
2-19E	276	1299	454	1345	906	1828	964	2023	1171	2025	12292
Price	538	931	990	1230	1066	1469	1244	1602	745	1718	11532
Donna	582	913	712	1003	1255	1118	1294	957	1707	1482	11023
Kapareil	68	1129	280	941	1029	1364	1093	1237	1294	1604	10039
Chip's	344	817	1188	1030	1434	1490	3195	2063	1977	<sup>2</sup>	13538
Rosetta	248	1039	840	1422	1727	2041	1451	2015	1601	<sup>2</sup>	12384
Jiml	262	873	738	1633	1948	1484	2371	720	1682	<sup>2</sup>	11711
Plateau	360	1215	2367	2007	1943	2160	2361	1675	<sup>2</sup>	.	14089
Aldrich	275	1813	1005	1388	1494	1663	2920	1545	<sup>2</sup>	.	12104
Monterey	749	1535	1531	1410	2279	1541	2032	816	<sup>2</sup>	.	11894
Morley	219	1102	1189	1364	1846	2053	1741	1661	<sup>2</sup>	.	11176
Padre	541	1013	832	1258	1402	1833	1929	1466	<sup>2</sup>	.	10274
25-75	308	668	815	1103	1910	1433	1835	722	<sup>2</sup>	.	8794
Savana	451	1079	815	992	958	1106	1169	1717	<sup>2</sup>	.	8287
2-43W	309	1615	1081	1527	1740	<sup>3</sup>	.	.	.	.	6272
1-102W	144	1266	436	1481	1926	<sup>3</sup>	.	.	.	.	5253

High density plantings 2001 per acre yield adjusted to projected yield at 64 trees/acre											
Avalon	.	.	.	.	.	.	.	.	256	979	1235
Durango	.	.	.	.	.	.	.	.	545	650	1195
Carmel	.	.	.	.	.	.	.	.	.	761	761
Kochi	.	.	.	.	.	.	.	.	119	590	709

<sup>1</sup> Based on a spacing that gives 64 trees per acre.

<sup>2</sup> Varieties or selections were not harvested due to non-uniform tree stand remaining.

<sup>3</sup> Selections were removed from the Butte RAVT.

**Annual Yield Summary (1996-2005) and Accumulative Yield (1996-2005) for the Regional Variety Trial at San Joaquin Delta College Farm, Manteca, San Joaquin County. Planted in 1993.**

Variety	Yield (Kernel pounds per acre <sup>1</sup> )										
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Accum.
Butte	328	1631	2075	2641	2243	2311	2459	2865	1596	3643	21791
Carmel	114	2111	1893	2695	2538	2206	2697	1861	1993	3153	21259
Plateau	<sup>2</sup>	1198	2301	2511	1968	2201	2626	2106	2749	3251	20911
Livingston	73	683	1572	2779	1736	2133	2856	2214	1941	4290	20276
Padre	221	579	1502	1340	2784	2123	2995	2374	2337	3243	19498
Ruby	419	1274	1890	1985	2518	1505	2432	2494	2109	2247	18873
Monterey	153	1315	1660	2006	1718	1570	2513	2558	1594	3294	18381
Dottie Won	100	1287	1757	1667	2133	2019	2302	2291	1686	2963	18206
Fritz	134	1692	1539	2086	2024	1648	2645	1819	1519	2876	17982
Jenette	226	1313	1530	2579	1667	1927	1783	1713	2228	2052	17018
Chips	420	920	1798	2134	1828	1464	2299	2243	1613	1829	16549
Yokut	251	1288	1882	1956	2060	1674	1812	1318	2135	1272	15649
<b>Mission</b>	<b>219</b>	<b>813</b>	<b>1332</b>	<b>1780</b>	<b>2001</b>	<b>1754</b>	<b>2203</b>	<b>1887</b>	<b>1746</b>	<b>1767</b>	<b>15502</b>
Sano	<sup>2</sup>	1213	995	2299	2205	1762	1590	1506	1506	1679	14755
WoodColony	211	1131	1168	2176	1543	1677	1579	1908	1158	2006	14557
<b>Nonpareil</b>	<b>115</b>	<b>1165</b>	<b>918</b>	<b>2252</b>	<b>1333</b>	<b>1794</b>	<b>2093</b>	<b>2028</b>	<b>1403</b>	<b>1354</b>	<b>14456</b>
Kahl	<sup>2</sup>	757	1320	1836	1605	1246	1778	1462	2058	1264	13328
1-87	79	486	1207	1601	1296	1238	1787	1582	1427	2064	12767
Winters	<sup>2</sup>	1591	192	2223	392	2671	1922	1446	1274	1001	12711
Sonora	123	<sup>2</sup>	965	2407	1194	1651	1514	1234	1377	1607	12072
Morley	<sup>2</sup>	559	576	1401	842	1702	1672	1721	1740	1736	11949
Donna	169	1000	990	1394	1153	1137	1515	1539	1261	1767	11926
Aldrich	34	937	636	2169	902	1307	1724	1329	1116	1512	11665
Rosetta	<sup>2</sup>	1323	600	1745	1487	1611	1083	1105	1699	906	11558
Johlyn	<sup>2</sup>	634	997	1510	1246	1188	1822	1356	1297	1332	11381
Price	<sup>2</sup>	947	573	1731	932	1075	1422	1327	1354	1794	11155
Jiml	<sup>2</sup>	534	744	2509	1098	1179	2313	927	1264	539	11107
Kapareil	<sup>2</sup>	361	183	1200	485	1346	783	851	831	<sup>3</sup>	6040
1-102W	217	457	892	939	519	1379	1209	970	<sup>4</sup>	.	6583
2-19E	<sup>2</sup>	503	507	1010	903	1008	1245	1405	<sup>4</sup>	.	6581
2-43W	<sup>2</sup>	<sup>2</sup>	776	1198	632	767	1334	1177	<sup>4</sup>	.	5885
Savana	<sup>2</sup>	<sup>2</sup>	184	750	109	536	245	1116	<sup>4</sup>	.	2939

2002 planting												
Avalon	.	.	.	.	.	.	.	.	.	.	94	94

<sup>1</sup> Based on a spacing that gives 75 trees per acre.

<sup>2</sup> Because of poor production in 1996 and poor production and a harvesting error in 1997, some varieties or selections were not harvested in these years. Thus, cumulative yields for these varieties should be somewhat higher than what is shown in the table.

<sup>3</sup> Variety was not harvested due to non-uniform tree stand remaining.

<sup>4</sup> Variety or selection was removed from the Butte RAVT.

**Annual Yield Summary (1995-2005) and Accumulative Yield (1995-2005) for the Regional Variety Trial at Paramount Farming Company, Shafter, Kern County. Planted in 1993.**

Variety	Yield (kernel pounds/acre <sup>1</sup> )											
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Accum.
Padre	802	1624	1624	1883	2416	2841	4068	4559	4079	4434	3446	31776
Ruby	664	1406	2413	2180	2550	3164	3482	4113	3964	3018	3836	30790
Jenette	294	952	3085	1574	2692	2810	4177	2862	3638	2765	3068	27918
Butte	377	1364	2400	2353	1670	1178	3401	4101	4443	2872	3363	27522
Plateau	282	1340	2525	2419	2239	3197	3653	2827	2977	2262	3770	27491
2-19E	341	963	2347	1944	2496	2646	3479	2434	4890	1490	3082	26112
Fritz	<sup>2</sup>	1261	1706	2234	1700	2805	3199	3451	3000	2822	3614	25792
Livingston	323	760	1972	1749	3054	1608	2233	3660	4396	2179	3817	25750
Monterey	591	1141	2184	1914	2194	2429	3342	3293	2886	2383	3350	25706
Aldrich	422	459	2230	1295	2936	1410	3230	4576	2491	3173	3252	25474
<b>Nonpareil</b>	<b>259</b>	<b>782</b>	<b>2428</b>	<b>1963</b>	<b>2560</b>	<b>2216</b>	<b>3022</b>	<b>3504</b>	<b>2523</b>	<b>2890</b>	<b>2714</b>	<b>24862</b>
<b>Mission</b>	<b>545</b>	<b>1353</b>	<b>1949</b>	<b>1816</b>	<b>1716</b>	<b>2285</b>	<b>2296</b>	<b>3161</b>	<b>3516</b>	<b>2832</b>	<b>3142</b>	<b>24611</b>
Yokut	382	1316	1519	1835	2023	3184	2059	3150	3118	2396	2679	23661
Carmel	634	1260	1944	1427	1359	2534	3819	3398	2651	2778	1855	23659
Kahl	383	1319	1852	1683	1926	2696	2634	2874	3115	2385	2785	23652
Morley	176	372	1091	1871	1516	1742	3531	3706	3787	2863	2725	23381
Sano	291	1209	1345	1754	2446	3702	3033	990	3983	1797	2695	23245
Johlyn	291	1221	2195	1936	1287	2084	2313	3453	2900	3037	2032	22748
Chip's	401	882	1417	2004	1709	3106	2419	2905	2798	1935	3120	22695
Rosetta	93	481	2164	1123	2308	1808	2308	3473	3216	3234	2435	22642
Price	297	746	1118	1772	1235	2997	2819	3684	2282	2660	2621	22231
1-87	228	607	1598	1594	2171	1008	2260	3752	3543	2302	2588	21651
1-102W	304	464	2143	1742	1755	661	1685	3958	3785	2641	2087	21226
Winters (13-1)	599	1224	2076	2152	1643	2073	2475	2788	1927	2328	1852	21136
Wood Colony	559	1136	1545	1024	760	1923	2193	3245	3068	2328	2794	20576
Sonora	337	843	1315	1120	2218	3181	1822	3928	2056	1099	2187	20107
2-43W	477	1028	2056	1794	1516	1254	1526	3967	2683	2016	1700	20015
Jiml	107	626	1565	1887	1631	2039	1391	4287	2137	2403	1821	19894
25-75	167	808	1184	1138	1298	2072	2150	2044	1833	2088	1796	16577
Donna	324	935	766	955	1069	2281	1549	1540	2218	1336	2488	15461
Savana	418	697	1008	1271	656	1480	1771	1449	1961	1173	1866	13751
Kapareil	41	110	733	670	1576	618	1486	2010	1520	1097	1303	11164

<sup>1</sup>Based on a spacing that gives 86 trees per acre.

<sup>2</sup>Yield data for Fritz was lost in 1995 due to a harvesting error. Thus the accumulative yield should be somewhat higher than what is shown in this table.

**KERNEL DEFECTS OBSERVED IN 2005**

Significant defects noted in the 2005 harvest nut samples of the three RAVTs are outlined below. The trees from the original planting were in their thirteenth growing season. Avalon, Carmel (young), Durango and Kochi at Chico and Avalon at Delta were in their fourth growing season. Defects listed may only become important if they continue to show in the same varieties over several years as the trees mature.

Varieties with defect	Trial		
	CSU-Chico	Delta College	Kern
6% or more double kernels:	Donna (44%) Kahl (42%) Livingston (16%) Wood Colony (16%) Butte (14%) Mission (13%) Durango (12%) Avalon (8%) Ruby (8%) Carmel (6%) Kochi (6%) Price (6%)	Kahl (42%) Plateau (34%) Avalon(26%) Donna (22%) Dottie Won (22%) Monterey (18%) Price (18%) Jiml (14%) Livingston (14%) Aldrich (10%) Mission (10%) Winters (8%) Carmel (6%) Chips (6%) Fritz (6%) Wood Colony (6%)	Donna (34%) Kahl (26%) Plateau (26%) Carmel (10%) Aldrich (8%) Sano (8%) Wood Colony (8%) 2-43W (6%) Chips (6%) Jenette (6%) Mission (6%)
6% or more twin kernels (two kernels within the same pellicle):	Price (12%) Jenette (8%) 1-87 (6%)	Sonora (30%) Carmel (24%) Livingston (18%) Price (18%) 1-87 (14%) Jenette (14%) Johlyn (14%) Avalon (12%) Nonpareil (12%) Rossetta (8%) Jiml (6%)	Sonora (16%) Jenette (14%) Price (14%) Nonpareil (7%) 25-75 (6%) Jiml (6%)
<b>Varieties with defect</b>	<b>CSU-Chico</b>	<b>Delta College</b>	<b>Kern</b>

---

6% or more blank kernels:	Avalon (18%) Donna (18%) Kahl (18%) Kapareil (10%) Kochi (8%) Butte (6%) Price (6%) Yokut (6%)	Kahl (24%) Dottie Won (16%) Avalon (14%) Donna (12%) Price (12%) Aldrich (8%) Jiml (8%) Johlyn (8%) Chips (6%) Fritz (6%) Monterey (6%) Morley (6%) Plateau (6%) Ruby (6%) Winters (6%)	Kahl (14%) Donna (10%) Morley (8%) Carmel (6%) Savana (6%)
6% or more kernels with gum:	Livingston (10%) Avalon (6%)	Avalon (8%) Carmel (6%) Kahl (6%) Yokut (6%)	(none)
6% or more worm damage:	Sonora (12%) Yokut (12%) Kapareil/PA (6%) Winters (6%) Wood Colony (6%)	Johlyn (6%)	Johlyn (16%) Carmel (14%) Kahl (10%) Chips (8%) Kapareil (8%) 1-87 (6%) 1-102W (6%) Donna (6%) Jiml (6%) Livingston (6%) Nonpareil (6%) Plateau (6%) Savana (6%)



**ALTERNARIA LEAFSPOT 2005**  
RAVT - Paramount Farming Company (Kern Co.)

<b>Variety</b>	<b>Infestation in 100 Leaf Samples (07-25-05)</b>	<b>Infestation of Leaves Per 30 Sec. Counts (07-20-05)</b>	<b>Percent of Defoliation (07-20-05)</b>	<b>Percent of Defoliation (09-29-05)</b>	<b>Amount of Nut Drop Per Tree (08-19-05)</b>
Chips	100	60	20	72	52
Donna	100	143	28	100	124
Johlyn	100	121	13	95	8
Kahl	100	115	28	93	800
Morley	100	123	14	97	336
Price	100	130	23	95	1152
Sonora	100	130	22	100	192
Winters (13-1)	100	134	33	88	8
Yokut	100	105	15	95	468
2-43W	83	114	30	95	256
<b>Mission</b>	81	136	18	90	872
Fritz	80	65	2	77	232
Monterey	75	129	53	98	1416
Livingston	75	84	1	90	244
Sano	75	93	28	98	404
Wood Colony	74	162	73	99	144
1-87	74	98	0	68	372
1-102W	72	74	14	97	64
2-19E	71	57	8	100	196
Carmel	69	132	89	100	5380
Jenette	67	133	15	98	316
Butte	57	97	2	80	228
Aldrich	57	86	0	18	80
Jiml	53	103	56	98	48
Savana	50	117	5	98	336
25-75	50	92	13	65	324
Padre	48	17	0	60	64
<b>Nonpareil</b>	43	50	3	86	16
Plateau	41	94	28	100	588
Rosetta	38	134	28	57	208
Kapareil	37	32	40	100	12
Ruby	30	132	3	100	528

**HULL ROT 2005**  
**RAVT - Paramount Farming Company (Kern Co.)**

<b>Variety</b>	<b>No. Strikes / Tree*</b>
Kapareil	318
Winters (13-1)	317
Kahl	182
Chips	144
<b>Nonpareil</b>	<b>139</b>
1-102W	132
Johlyn	112
Sonora	58
Jenette	39
Sano	37
<b>Mission</b>	<b>30</b>
Jiml	27
Morley	27
Rosetta	25
2-43W	25
Wood Colony	24
Monterey	22
Donna	21
2-19E	20
Fritz	14
Savana	13
Aldrich	12
Plateau	11
Butte	11
Price	11
25-75	10
Livingston	10
Ruby	9
Padre	4
1-87	1
Yokut	0
Carmel	0