Almond Board of California
Annual Report
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Project No. 91-L18 - Field Evaluation of Almond Varieties and Rootstocks

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Objectives:

(1) Continue data collections from the Butte and Delta Regional Variety Trials (RVTs) on newer varieties and on selected older ones where additional information is needed. Plan three additional RVTs to test newer and/or untested varieties. (2) Make further cross-pollinations to learn the pollen compatibility of new varieties. (3) Continue collection of yield and tree size data from rootstock plots. Determine yield efficiency of various rootstocks used for almond. Continue studies to determine the graft compatibility of newer almond varieties on Marianna 2624. (4) Analyze and summarize the data associated with this project and publish and otherwise disseminate this information as appropriate.

Interpretive Summary:

In the Butte (C.S.U, Chico) and San Joaquin (Delta College) RVTs, production and nut quality data continued to be collected for many but not all varieties. Yields in 1991 were generally good to very good in these two plots; although there was some reduction in production from late blooming varieties, especially at the Delta College plot, caused by the poor weather during the latter part of this season's bloom. Production and nut data are no longer being collected from the Kern and Fresno (RVT's), although leaf nutrient levels for many varieties were obtained from these trials this year as well as from the Butte and Delta College plots. Controlled pollination tests gave preliminary information on the pollen compatibility of Aldrich, Rosetta and Wood Colony.

Peach-almond hybrid rootstocks produced larger trees than peach seedling rootstock in the Fresno county plot, but this trend has not yet been seen in the younger plot in Merced county. Trees on Nemaguard and Bright's Hybrid gave the highest yields in the Fresno county plot.

Experimental Procedure:

The procedures used for variety and rootstock evaluation, including graft compatibility of almond varieties on Marianna 2624 rootstock, were the same as used in previous years as were those for studying pollen compatibility.

Results and Discussion:

Regional Variety Trials (RVTs)

In the older planting at California State University at Chico (Durham), most varieties yielded well with Nonpareil, Padre and Butte producing over 3000 kernel pounds per acre (table 1). However, Price and Sonora both yielded under 2000 kernel pounds per acre. In 1990 Sonora had a very heavy crop and Price a good one, and these varieties appear to be showing the alternate year bearing tendencies for which they have been noted. Four varieties were added to this RVT in 1987, and from these fifth leaf trees Aldrich produced the best, over 1200 kernel pounds per acre. This year Ruby produced 10% double kernels, the only harvested variety to be that high. There was very little worm damage in this planting in 1991.

Nonpareil, Price, Jordanolo, Tokyo, Sonora and Fritz all produced 2400 or more pounds of kernels per acre at the San Joaquin Delta College RVT (table 2). While Price was coming back from a light crop in 1990, Sonora has now produced three consecutive good to large crops in this plot. Of the varieties in the older planting Thompson had the poorest production followed by Sauret 1, Mono, Ruby and Padre. All other harvested varieties in this planting had over 1500 kernel pounds per acre. Seven varieties were added to this RVT in 1984. Of these Dottie Won, Aldrich and Wood Colony all yielded just over 1500 kernel pounds per acre followed closely by Rosetta. Valenta produced 18% double kernels with Pearl, Monterey and Dottie Won also producing 10% or more doubles. Sonora and Price both gave 18% "twin kernels" -- two embryos within a single pellicle (skin). In 1991 there was very little worm damage in this plot.

In 1991 a complete nutrient leaf analysis was run on most varieties in all four RVT's. Differences in leaf nutrient content were generally greater between plots than between varieties within a plot. Varieties that had tended to yield less, often had high potassium levels, while heavier producing varieties frequently showed lower potassium. Other species (such as prunes) have shown similar patterns of potassium levels being related to crop load. There appeared to be some differences among varieties in sodium accumulation. Among varieties tending to have the least sodium accumulation were Butte, Fritz, Ripon, Solano and Jordanolo. However, Mission, Padre and Ruby showed relatively high accumulations.

Pollination

Studies were conducted to determine the pollen compatibility group for three newer varieties, Aldrich, Wood Colony and Rosetta. While these tests were not conclusive and another year's data will be needed to confirm 1991 results, Rosetta is probably in the Ne Plus Ultra group and Wood Colony is very likely in the Thompson group. Aldrich did not appear to fit into any of the established pollination groups.

Rootstock Plots

In a western Fresno county test plot, sixth leaf trees of Nonpareil on Nemaguard peach and Bright's Hybrid rootstocks significantly out produced those on Lovell peach. Trees on Hansen (hybrid) were intermediate and not significantly different than the other rootstocks. After five years in this planting, trees on the two peach-almond hybrid rootstocks were larger than those on peach based on trunk circumference as would be expected based on previous performance. Trees on Lovell rootstock, however, were significantly larger than those on Nemaguard. Several more years of data will be needed to determine if trees on Nemaguard will continue to out produce those on Lovell, and if difference in tree growth (vigor) may be inversely related to the difference in production between these two peach rootstocks at this location.

After two growing seasons, there were no significant differences in tree size (trunk circumference) among six rootstocks (Lovell, Halford, Nemaguard and Red-leaf Nemaguard peach rootstocks and Hansen and Bright's hybrid rootstocks) in a planting on sandy soil in Merced county. In the third growing season (1991) some early production was obtained in this planting. Trees on the four peach rootstocks out producing those on the two peach-almond hybrid rootstocks for both varieties (Nonpareil and Carmel). However, since the yields were only one to two pounds of kernels per tree, little can be interpreted from these findings until future years data are obtained and compared.

Data on yield and compatibility were collected from a 1982 planting to evaluate almond variety compatibility on Marianna 2624 rootstock at the Nickel's Soil Laboratory in Colusa County. Table 3 gives yield (1991 and 1985 - 1990 cumulative), trunk circumference, several compatibility ratings and percent of the original trees that are still alive. Most of these factors need to be considered when evaluating compatibility. Of the factors listed in this table, tree size may be affected less by compatibility than by other influences. Yield can be greatly influenced by weather and other conditions, thus, a six year average in addition to 1991 data is given. Of the compatibility ratings, the union condition and the amount of defoliation seem to be the most useful, while tree vigor may also be helpful. Tree loss is certainly another important factor. When all these factors are considered, Livingston, Mono and Dottie Won show definite incompatibility. Monarch, Planada, Ripon and LeGrand, while apparently compatible, have other faults that limit there usefulness in commercial plantings (based on information gained from RVTs).

The 1991 yields and compatibility ratings and 1990 trunk circumferences are shown in table 4 for the 1986 planting at the Nickel's Soil Laboratory to assess compatibility of nine newer almond varieties on Marianna 2624. Aldrich, Monterey, Wood Colony and Butte were the highest yielding this year. Butte and Aldrich also had the highest production in 1990. Sonora was high yielding in 1990 and appears to be alternating in production. The other four varieties tended to be low yielding in both years. At this time Solano is the only variety that appears to be incompatible; however, the union on Wood Colony needs to be watched closely over the next few years. All trees of Pearl, a tenth variety originally in this planting, died several years ago.

At the Nickel's Soil Laboratory several promising selections of Marianna and other plum rootstocks are being evaluated with Nonpareil and Mission to determine compatibility. At this time none of the trees of Nonpareil on these experimental rootstocks have survived any better than Nonpareil on Marianna 2624, a known incompatible combination. However, selections 16 and 75 have shown limited promise with this variety. With Mission most of the experimental rootstocks have

shown promise with trees having good vigor and leaf color. The exceptions were selections 30 and 9 and Salicina plum. At least 75 percent of the trees on these three rootstocks had poor vigor and/or off-color foliage with Mission.

Two trials were initiated in 1989 to determine if longer interstocks (8 inches and scaffold budding) of Havens 2B between Nonpareil and Marianna 2624 improved compatibility over shorter (4 inch) interstocks. A second objective was to determine if a long interstock of a compatible almond variety would work as well or possibly even better than Havens 2B. One trial is in Butte county and the other is at the Nickel's Soil Laboratory. Some field budding and grafting are still being done (especially at Nickel's), and no data has yet been collected from this trial.

Table 1.

Butte RVT Plot
California State University, Chico (CSUC)
Durham, California
Yield Summary - 1991

Variety	No. of nuts/tree	Ave. wt. (gm)	Kernel no./ oz.	% Kernel	Weight lb/ tree	Weight lb/ acre
1976 Planting						
Early blooming varieties						
Ne Plus Ultra	8989	1.51	19	58	29.9	2301
Sonora	6656	1.46	19	74	21.4	1527
Mid blooming varieties						
Nonpareil	15493	1.37	21	68	46.8	3522
Norman	17955	0.98	29	69	38.7	2492
Fritz	16942	1.03	27	52	38.6	2937
Carmel	11200	1.14	25	55	28.1	2136
Price	6873	1.17	24	63	17.7	1348
Late blooming varieties						
Padre	22705	0.92	31	50	46.2	3509
Butte	19949	1.01	28	51	44.6	3387
Carrion	13894	1.18	24	61	36.1	2741
Mission	13752	1.07	27	46	32.4	2463
1987 Planting						
Aldrich	7536	1.01	28	56	16.7	1269
Rosetta	4433	1.20	24	43	11.7	889
Ruby	4070	1.30	22	56	11.7	886
Mono	3910	1.03	28	45	8.9	673

Table 2.

San Joaquin RVT Plot
Delta College
Manteca, California
Yield Summary - 1991

Variety	No. of nuts/tree	Ave. wt. (gm)	Kernel no./ oz.	% Kernel	Weight lb/ tree	Weight lb/ acre
1978 Planting						
Early blooming varieties						
Jordanolo	8740	1.70	17	67	32.7	2487
Sonora	10398	1.40	20	72	32.1	2438
Ne Plus Ultra	9604	1.42	20	64	30.1	2291
Peerless	8417	1.19	24	40	22.0	1675
Mid blooming varieties						
Nonpareil	12318	1.37	21	67	36.8	2796
Price	14915	1.03	27	68	33.9	2580
Fritz	14525	1.00	28	55	32.0	2428
Carmel	10464	1.19	24	61	27.4	2086
Monterey	7523	1.44	20	52	24.0	1820
Sauret #2	7929	1.31	22	59	22.9	1740
Sauret #1	5817	1.35	21	68	17.3	1314
Late blooming varieties						
Tokyo	12193	1.21	23	56	32.5	2471
Butte	12183	1.08	26	56	29.0	2205
LeGrand	10459	1.23	23	67	28.4	2160
Mission	9956	1.16	24	51	25.5	1937
Livingston	7534	1.36	21	67	22.6	1714
Padre	7833	1.12	25	54	19.3	1466
Ruby	6641	1.31	22	59	19.2	1463
Mono	6343	1.34	21	48	18.7	1420
Thompson	3918	1.42	20	68	12.3	935
1984 Planting						
Dottie Won	8268	1.14	25	55	20.7	1576
Aldrich	8828	1.05	27	60	20.4	1548
Woods Colony	6766	1.33	21	62	19.9	1512
Rosetta	5600	1.51	19	51	18.7	1419
Jeffries	4324	1.53	19	74	14.6	1107
Valenta	5423	1.19	24	57	14.2	1079
Pearl	6034	0.97	29	55	12.9	978

Table 3. 1982 Planting to Study Almond Variety Compatibility on Marianna 2624.

Variety	1991 Yield lbs/tree	1985-90 Avg. Yield lbs/tree	Trunk Circ. (cm) 5/90	Compatibility Rating* October 1991					% Tree Alive
				Union	Defoliation	Vigor	Size	Total	
Monterey	16	9	61	2.4	2.6	2.1	2.8	9.9	100
Ruby	13	8	54	1.8	2.6	1.4	2.8	8.6	100
Fritz	12	9	58	2.5	2.2	1.8	2.6	9.1	100
Sauret 2	12	7	54	2.3	2.7	1.4	2.7	9.1	75
Mission	12	8	55	2.7	2.3	1.3	2.7	9.0	100
LeGrand	11	7	56	2.5	2.7	1.6	3.0	9.8	100
Livingston	10	7	60	1.4	1.2	1.1	2.9	6.6	63
Mono	10	6	57	1.7	2.1	1.3	2.4	7.5	63
Norman	10	5	58	2.3	2.8	1.3	2.8	9.2	100
Dottie won	6	4	50	1.6	1.9	2.2	2.5	8.2	75
Ripon	5	6	57	2.8	2.4	2.8	2.9	10.9	100
Planada	4	7	61	2.0	2.0	1.9	3.0	8.9	100
Monarch	3	5	55	2.5	2.3	1.9	2.5	9.2	100

* Union (smoothness, any gumming or separation, etc) - rated as poor = 1, fair = 2, good = 3
Amount of defoliation - rated as considerable = 1, some = 2, little to none = 3
Tree vigor (new growth) - rated as none = 1, some = 2, considerable = 3
Tree size (for variety) - rated as small = 1, medium = 2, large = 3

Table 4 1986 planting to study almond variety compatability on Marianna 2624

Variety	1991 Yield lbs/tree	Trunk circ (cm) 5/90	Compatibility rating * October 1991				
			Union	Defoliation	Vigor	Size	Total
Aldrich	8.5	33	2.9	2.7	2.0	2.8	10.4
Monterey	8.0	29	2.7	2.7	1.6	2.7	9.7
Wood Colony	7.1	29	1.8	2.8	2.2	2.8	9.6
Butte **	7.1	34	2.1	3.0	2.5	2.1	9.7
Grace	4.5	29	2.7	2.8	2.8	2.6	10.9
Bonita	4.3	29	2.2	2.7	2.5	2.8	10.2
Sonora	4.0	34	2.5	3.0	2.2	2.8	10.5
Valenta	3.6	27	2.6	2.9	2.6	2.4	10.5
Solano	2.7	28	1.8	1.3	2.5	2.8	8.4

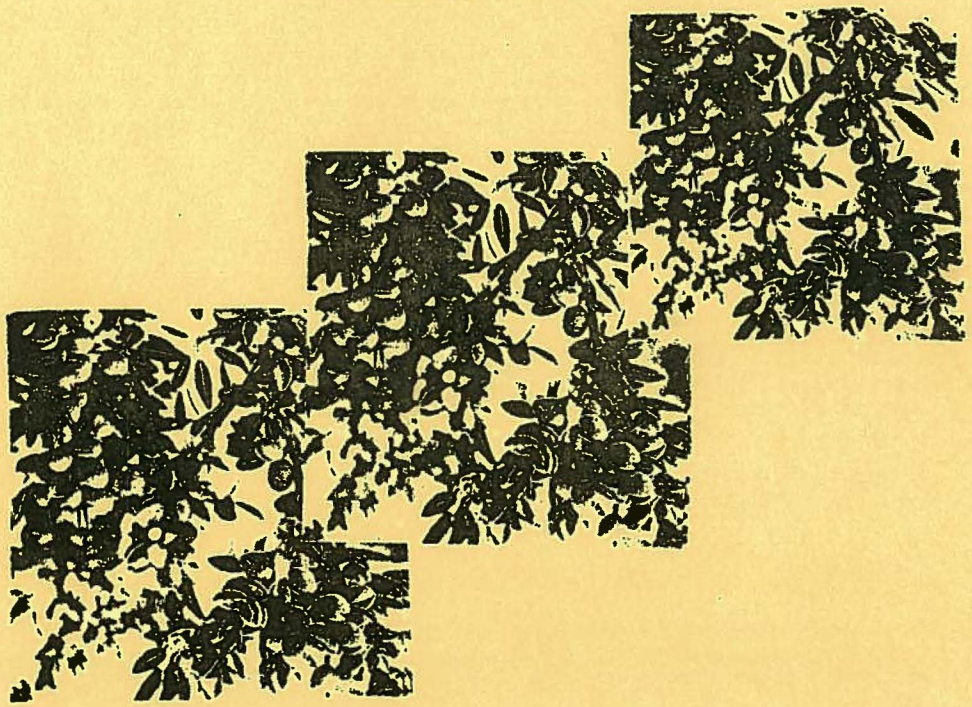
* Union (smoothness, any gumming or separation, etc) - rated as poor = 1, fair = 2, good = 3
Amount of defoliation - rated as considerable = 1, some = 2, little to none = 3
Tree vigor (new growth) - rated as none = 1, some = 2, considerable = 3
Tree size (for variety) - rated as small = 1, medium = 2, large = 3

** One tree is affected by borers and is smaller, with a poorer union than the other three trees.

1991

EVALUATION & SELECTION OF CURRENT

ALMOND VARIETIES



SAN JOAQUIN DELTA COLLEGE
REGIONAL ALMOND VARIETY TRIALS

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Delta College Almond Variety Trial
Summary for 1991

After eleven years of data, the decision has been made to begin a second variety trial at the same location in an open block immediately to the west of the current variety trial. This trial will test many new varieties, and some of the yet not fully tested varieties along with "standard" varieties such as Carmel, Butte, Padre and Nonpareil.

Data will still be collected on the first trial until the newer block begins to bear significant crop for evaluation. At that time if the older trial is still in production it will continue to be available for observation, but data will not be gathered. Many questions have been answered but long-term questions remain along with a need to evaluate newer varieties. We hope to continue the valuable efforts of Don Rough, Farm Advisor Emeritus and all the past cooperators with the three new regional trials in Kern, Butte, and San Joaquin County.

Yields were lower in general due to heavy rains at bloom time last February and March. This helped avoid frost problems but county-wide yields were low and orchard sites were affected erratically. Nonpareil, Price, Jordanolo, Tokyo, Sonora and Fritz all produced 2,400 or more pounds of kernels per acre. The March rains hurt yields, but did help lessen drought related problems such as salt build-up and reduced root growth. The 1991 crop for the variety trial was down 24% on average for all the varieties. Most affected were late-blooming varieties, especially Thompson, Mono Ruby and Padre. Of the mid-blooming varieties Sauret #1 and #2 were significantly lower in yield. Early varieties were relatively less damaged by the rains and overall Nonpareil and Butte suffered the least amount of crop loss when compared to 1990.

In 1991, a complete nutrient leaf analysis was run on most varieties. Differences in leaf nutrient content were generally greater between plot sites than between varieties within a plot. Often varieties that have tended to yield less had high potassium levels, while heavier producing varieties frequently showed lower levels. Potassium levels were slightly low in the Fritz, LeGrand, Merced and Sauret #2. These levels although lower, were still adequate.

Most other nutritional levels appear to be in the normal range over all varieties. There were some differences among varieties in sodium accumulation. Varieties tending to have the least sodium accumulation included Butte, Fritz, Ripon, Solano, Jordanolo, Aldrich, Rosetta and Wood Colony. However, Mission, Padre, Carmel, Price Merced, LeGrand and Ruby showed relatively high accumulations.

Insect problems were not significantly different from normal. However, June beetle damage has continued to spread in several rows on the east side of the variety trial. Currently damage is limited to Solano, Merced, Fritz and Pearl along with the Nonpareil rows that are adjacent. An aggressive control program will help minimize its slow but continuing spread.

Several of the varieties have become very popular since the trial was established in 1978. The evidence is seen as increased acreages of Carmel, Butte, Fritz, Price, Monterey and Sonora. The newer varieties planted in 1984 continue to improve in production and appear to be good considerations, but with reservations on their long-term success and statewide adaptability.

Cross pollination studies are continuing on several of the varieties and a definitive study on water use in almonds is ongoing in the production block to the north of the variety trial, under the direction of Terry Prichard, Water Management Specialist, U.C. Davis. The variety trial and orchard continue to provide a valuable site for educational purposes for growers, the industry, and especially for San Joaquin Delta College students.

Many thanks need to be extended to Dave Dias, Farm Manager, for his cooperation and patience. We acknowledge the much needed support of the Delta College board and Faculty. Also, we appreciate the support of local growers, nursery and related industries, and the Almond Board in helping to maintain the variety trial as a working laboratory for education and research.

Lastly I need to acknowledge the efforts of Warren Micke, Extension Pomologist and Jim Yeager, S.R.A., U.C. Davis, along with special thanks to Ted Viss, Research Technician, San Joaquin County and Don Rough, Farm Advisor, Emeritus for their dedicated work and continued enthusiasm.

Paul S. Verdegaal
Farm Advisor
May, 1992

San Joaquin Delta College
Regional Almond Variety Trial

Row #	Variety	Row #	Variety	Row #	Variety
1	Ne Plus Ultra	21	Wood Colony	41	Monterey
2	Jordanolo	22	Nonpareil	42	Nonpareil
3	Ne Plus Ultra	23	Valenta	43	Grace
4	Sonora	24	Nonpareil	44	LeGrand
5	Peerless	25	24-52	45	Mission
6	Nonpareil	26	Nonpareil	46	Padre
7	Sauret #1	27	Aldrich	47	Mission
8	Nonpareil	28	Nonpareil	48	Thompson
9	Rosetta	29	Monarch	49	Mission
10	Jeffries	30	Nonpareil	50	Livingston
11	Dottie Won	31	Solano	51	Mission
12	Nonpareil	32	Nonpareil	52	Butte
13	Carmel	33	Merced	53	Mission
14	Nonpareil	34	Nonpareil	54	Ruby
15	Price	35	Fritz	55	Mission
16	Nonpareil	36	Nonpareil	56	Tokyo
17	1-46	37	Pearl	57	Mono
18	Nonpareil	38	Nonpareil	58	Yosemite
19	1-69	39	Sauret #2	59	Planada
20	Nonpareil	40	Nonpareil	60	Ripon

1991-92 CHILLING HOURS
DELTA COLLEGE ALMOND VARIETY TRIAL

Month	60°F and Above	45°F and Below
10/1 - 10/28	379	11
10/29 - 11/25	145	126
11/26 - 12/30	9	449
12/31 - 11/27	0	507
Total	533	1093

Nutrient Analysis Sampled July, 1991

Description	N	P	K	S	Ca	Mg	Na	Cl	B	Zn	Mn	Cu
	%	%	%	ppm	%	%	%	%	ppm	ppm	ppm	ppm
Aldrich	2.74	0.14	0.93	1670	4.32	1.13	0.13	0.21	35	95	42	6.2
Butte	2.73	0.13	1.18	1760	3.38	1.09	0.35	0.22	40	777	43	5.8
Carmel	2.75	0.13	1.11	2700	3.72	1.09	0.51	0.23	37	103	50	6.2
Fritz	2.67	0.14	0.98	1970	4.57	1.20	0.47	0.23	38	109	61	8.2
Jeffries	2.77	0.13	1.89	1990	3.42	1.06	0.09	0.18	40	73	56	5.5
Jordanola	2.56	0.12	1.74	1770	3.41	0.93	0.26	0.23	43	118	49	6.2
LeGrand	2.80	0.14	1.01	2120	3.38	1.04	0.44	0.26	42	114	43	7.0
Livingston	2.81	0.14	1.29	1980	3.98	1.10	0.33	0.30	44	81	39	5.5
Merced	2.80	0.14	1.04	1950	4.52	1.25	0.51	0.32	41	89	64	10.8
Mono	2.49	0.13	1.97	1840	3.38	0.98	0.31	0.23	47	101	44	6.2
Monterey	2.81	0.14	1.24	1930	3.64	1.17	0.29	0.23	43	91	44	6.2
Ne Plus Ultra	2.97	0.14	1.64	2210	3.89	1.10	0.30	0.27	41	107	50	7.0
Padre	2.88	0.15	1.51	1930	3.42	1.00	0.37	0.25	44	83	39	7.4
Peerless	2.87	0.13	1.41	1890	3.24	0.97	0.28	0.25	43	121	45	6.6
Price	2.85	0.13	1.46	2010	4.67	1.23	0.42	0.27	39	97	45	6.2
Ripon	2.63	0.14	2.30	1820	3.09	0.90	0.16	0.19	51	50	49	5.8
Rosetta	2.42	0.13	1.58	2020	3.57	1.05	0.15	0.22	45	119	47	7.0
Ruby	2.61	0.13	1.35	1780	4.19	1.09	0.42	0.26	43	92	29	5.5
Sauret 1	2.73	0.14	1.26	1750	3.43	1.07	0.37	0.26	40	73	49	6.2
Sauret 2	2.58	0.13	1.04	2070	4.23	1.21	0.38	0.26	43	120	51	7.4
Solano	2.89	0.14	1.37	2000	3.72	1.02	0.10	0.23	37	123	55	9.3
Sonora	2.82	0.13	1.54	1980	3.90	1.11	0.23	0.25	41	111	58	8.6
Thompson	2.61	0.13	1.27	1800	4.04	1.08	0.36	0.22	44	107	34	7.4
Wood Colony	2.84	0.14	1.28	2040	4.63	1.09	0.18	0.21	36	107	49	6.6
Nonpareil - Row 6	2.74	0.14	1.35	1920	3.94	1.14	0.28	0.27	41	115	64	8.2
" " 14	2.93	0.13	1.36	1880	3.72	1.11	0.29	0.26	38	107	49	7.0
" 34	2.95	0.14	1.30	2080	4.20	1.16	0.19	0.23	39	106	54	9.7
" " 38	2.70	0.14	1.36	1990	4.23	1.15	0.13	0.24	42	122	64	10.8
Mission -Row 47	2.86	0.14	1.03	2670	4.09	1.09	0.49	0.27	38	84	46	7.0
" " 51	2.88	0.14	1.11	3250	3.52	1.02	0.54	0.28	36	79	37	6.2
" " 53	2.84	0.14	1.20	1930	3.92	1.07	0.53	0.26	40	88	35	7.4

San Joaquin Delta College Regional Almond Variety Trial
Weather Data During Bloom - 1991

Date				
	Max	Min	Rain	Wind Avg MPH
February 1	63	28		
2	56	42		
3	64	42		
4	53	40		
5	60	48		
6	62	40		
7				
8				
9				
10				
11				
12	67			
13	70	44		
14	72	48	0	3
15	68	48	0	3
16	67	50	0	10
17	65	50	0	8
18	72	44	0	6
19	74	42	0	2
20	72	42	0	2
21	73	43	0	2
22	65	43	0	5
23	71	39	0	2
24	74	38	0	2
25	77	40	0	2
26	69	44	0	3
27	56	49	.59	4
28	59	53	.32	8

Shaded Area = Approximate Bloom Period

San Joaquin Delta College Regional Almond Variety Trial
Weather Data During Bloom - 1991

Date				
	Max	Min	Rain	Wind Avg MPH
March 1	60	51	.59	8
2	64	50	.08	11
3	58	52	.91	14
4	64	56	.20	13
5	56	45	0	6
6	58	38	0	5
7	64	38	0	4
8	67	36	0	2
9	64	42	0	4
10	62	38	.08	7
11	60	36	0	4
12	60	44	.12	7
13	58	43	.20	7
14	59	38	0	7
15	54	39	.08	4
16	56	37	0	8
17	51	44	.39	8
18	54	44	.08	4
19	59	44	.12	9
20	58	42	.08	7
21	58	40	0	4
22	59	40	0	3
23	62	44	.12	7
24	57	46	1.34	7
25	58	45	0.04	7
26	46	39	.43	9
27	62	35	0	6
28	64	39	0	3
29	67	41	0	4
30	74	47	0	5
31	66	48	0	4

San Joaquin Delta College
Regional Variety Trial

Bloom Data - 1991

Date of 10% and 90% Bloom by Variety

Variety	10% Bloom	90% Bloom
Ne Plus Ultra	2/16	2/21
Sonora	2/17	2/22
Peerless	2/17	2/22
Rosetta	2/17	2/22
Jeffries	2/22	3/1
Dottie Won	2/22	2/25
Price	2/21	2/25
Wood Colony	2/20	2/25
Valenta	2/23	2/28
Nonpareil	2/18	2/24
Aldrich	2/17	2/25
Pearl	2/18	2/22
Padre	2/24	2/28
Livingston	2/24	3/1
Mission	2/24	2/27
Butte	2/23	2/27
Mono	2/24	3/1

Almond Variety Trial Set Data
1991 (5/21/91)

Variety	Nuts/Half Tree				Nut Total	Bud Total	% Set
(Tree #)	North	South	North	South			
Ne Plus Ultra (2,3)	9	22	17	25	73	383	19
Sonora (6,7)	50	37	45	46	178	382	47
Peerless (4,7)	12	36	39	48	135	360	38
Rosetta (2,4)	32	48	33	70	183	404	45
Jeffries (2,4)	14	42	11	24	91	412	22
Dottie Won (3,6)	12	17	30	33	92	403	23
Price (2,4)	42	30	41	47	160	365	44
Wood Colony (2,5)	51	59	34	55	199	407	49
Valenta (3,6)	20	26	29	16	91	412	22
Nonpareil (2,5)	20	29	9	20	78	382	20
Aldrich (2,3)	70	66	54	64	254	418	61
Pearl (3,4)	50	60	65	62	237	391	61
Padre (4,5)	16	25	13	8	62	409	15
Livingston (3,4)	9	12	22	17	60	421	14
Mission (4,6)	7	19	17	34	77	405	19
Butte (3,5)	18	14	17	17	66	380	17
Mono (5,7)	29	11	15	23	78	382	20

San Joaquin Delta College
Regional Almond Variety Trial

Hullsplit Data - 1991

Date of 10% and 90% Hullsplit by Variety

Variety	10% Bloom	90% Bloom
Ne Plus Ultra	8/16	8/29
Sonora	8/11	8/22
Peerless	8/13	8/21
Rosetta	8/13	8/21
Jeffries	8/07	8/16
Dottie Won	8/27	9/07
Price	8/20	9/01
Wood Colony	8/19	9/03
Valenta	8/17	8/26
Nonpareil	7/31	8/12
Aldrich	8/21	9/08
Pearl	8/17	8/26
Padre	8/16	8/27
Livingston	8/16	8/30
Mission	8/30	9/16
Butte	8/24	9/07
Mono	8/09	8/15

Table 2 **San Joaquin RVT Plot - Delta College - Manteca, California**
Yield Summary
1991

1978 Planting
Early Blooming Varieties

Variety	No. of nuts/tree	Ave. wt. (gm)	Kernel no./oz.	% Kernel	Weight lb/tree	lb/acre
Jordanolo	8740	1.70	17	67	32.7	2487
Sonora	10398	1.40	20	72	32.1	2438
Ne Plus Ultra	9604	1.42	20	64	30.1	2291
Peerless	8417	1.19	24	40	22.0	1675
Mid Blooming Varieties						
Nonpareil	12318	1.37	21	67	36.8	2796
Price	14915	1.03	27	68	33.9	2580
Fritz	14525	1.00	28	55	32.0	2428
Carmel	10464	1.19	24	61	27.4	2086
Monterey	7523	1.44	20	52	24.0	1820
Sauret #2	7929	1.31	22	59	22.9	17.40
Sauret #1	5817	1.35	21	68	17.3	1314
Late Blooming Varieties						
Tokyo	12193	1.21	23	56	32.5	2471
Butte	12183	1.08	26	56	29.0	2205
LeGrand	10459	1.23	23	67	28.4	2160
Mission	9956	1.16	24	51	25.5	1937
Livingston	7534	1.36	21	67	22.6	1714
Padre	7833	1.12	25	54	19.3	1466
Ruby	6641	1.31	22	59	19.2	1463
Mono	6343	1.34	21	48	18.7	1420
Thompson	3918	1.42	20	68	12.3	935
1984 Planting						
Dottie Won	8268	1.4	25	55	20.7	1576
Aldrich	8828	1.05	27	60	20.4	1548
Wood Colony	6766	1.33	21	62	19.9	1512
Rosetta	5600	1.51	19	51	18.7	1419
Jeffries	4324	1.53	19	74	14.6	1107
Valenta	5423	1.19	24	57	14.2	1079
Pearl	6034	0.97	29	55	12.9	978

Varieties previously reported but not included here have yielded less than 1000 meat pounds per acre.

Crop Reduction by Variety 1991 vs 1990
(primarily due to rain during bloom)

MEAT POUNDS PER ACRE					
VARIETY	1990	1991	DECREASE	% CHANGE	AVERAGE FOR GROUP
Sonora (early)	2972	2438	534	.18	
Ne Plus Ultra	2872	2291	581	.20	
Jordanolo	2796	2487	309	.11	
Peerless	2034	1675	359	.18	.17
Sauret #1 (mid)	2961	1314	1647	.56	
Carmel	2936	2086	850	.29	
Nonpareil	2907	2796	111	.04	
Sauret #2	2859	1740	1119	.39	
Fritz	2809	2428	381	.14	
Monterey	2675	1820	855	.32	
Price	1775	2580	-805	-.45	.18
Mono (late)	3530	1420	2110	.60	
Tokyo	3160	2471	689	.22	
LeGrand	3150	2160	990	.31	
Mission	3136	1937	1199	.38	
Butte	2988	2205	783	.26	
Livingston	2936	1714	1222	.42	
Ruby	2694	1463	1231	.46	
Padre	2646	1466	1180	.45	
Thompson	2337	935	1402	.60	.41
Rosetta (1984 planting)	2003	1419	584	.29	
Dottie Won	1786	1576	210	.12	
Aldrich	1721	1548	173	.10	
Valenta	1685	1079	606	.36	
Wood Colony	1639	1512	127	.08	
Jeffries	1602	1107	495	.31	
Pearl	718	978	-260	-.36	.13

1990 - Was a very large crop year with no rain during bloom.

1991 - Most varieties were down approximately 15% on average here and county wide. Some orchards were down by 50-60%.

SAN JOAQUIN DELTA COLLEGE ALMOND REGIONAL VARIETY TRIAL
Yield Summary 1981-91 - Meat Pounds Per Acre

Variety	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	Total Yld	Avg Yield	Full Maturity Yld
Sonora	441	1037	714	1353	2575	516	3227	1456	2044	2972	2438	18773	1707	2073
Ne Plus Ultra	423	877	1358	1533	2484	558	1712	2960	2344	2872	2291	19412	1765	2094
Jordanolo	402	770	1270	1532	2313	1080	2892	3131	1767	2796	2487	20440	1858	2250
Peerless	474	671	783	1091	2334	744	504	1723	1598	2034	1675	13631	1239	1463
Sauret #1	554	1573	937	2174	1597	1106	2005	2364	1302	2961	1314	17887	1626	1853
Carmel	382	1157	1106	2101	3125	786	3264	2168	2554	2936	2086	21665	1970	2378
Nonpareil	394	937	472	2068	2116	540	3021	2467	1979	2907	2796	19697	1791	2237
Sauret #2	221	785	899	2051	2224	1692	2128	2410	1900	2859	1740	18909	1719	2126
Fritz	421	1172	804	2293	1943	716	3082	1758	1692	2809	2428	19118	1738	2090
Monterey	513	1300	1315	2532	2267	1225	2861	2512	2396	2675	1820	21416	1947	2286
Price	498	787	868	1712	2441	619	2995	1745	2563	1775	2580	18583	1689	2054
Mono	176	1037	1254	2708	1859	1888	1116	2259	1397	3530	1420	18644	1695	2022
Tokyo	165	672	677	1587	2931	829	1853	2960	1446	3160	2471	18751	1705	2155
LeGrand	391	1282	1137	2529	2862	1163	2918	2484	1606	3150	2160	21682	1971	2359
Mission	378	846	698	2320	2100	1391	2012	2322	1562	3136	1937	18702	1700	2098
Butte	177	1309	1542	3229	2361	1299	3229	2766	2892	2988	2205	23997	2182	2621
Livingston	493	1244	1104	2746	2277	1838	2599	2709	1882	2936	1714	21542	1958	2338
Ruby	157	937	852	2236	2107	1719	1734	2368	2136	2694	1463	18403	1673	2057
Padre	387	1037	717	2326	1722	1731	2131	2304	1949	2646	1466	18416	1674	2034
Thompson	400	1068	845	2204	2009	1100	1801	2182	1631	2337	935	16512	1501	1775
Rosetta						45	407	1164	1084	2003	1419	6122	1020	1711
Dottie Won						60	403	725	1129	1786	1576	5679	947	1681
Aldrich						15	489	1446	1134	1721	1548	6353	1059	1635
Valenta						0	582	810	1260	1685	1079	5416	903	1382
Wood Colony						105	368	1190	901	1639	1512	5715	953	1579
Jeffries						60	339	648	798	1602	1107	4554	759	1355
Pearl						45	216	481	687	718	978	3125	521	848

Average of All Original Planting 1755
Average of All 1984 Planting 880

Full Maturity Yield = Average Yield Year 6 thru 13

Delta College Almond Regional Variety Trial - Reject Summary 1981-1991

	87-91 % Worms	81-86 % Worms	87-91 % Doubles	81-86 % Doubles	87-91 % Twins	81-86 % Twins	87-91 % Blanks	81-86 % Blanks	87-91 % Broken	81-86 NA	87-91 % Other	81-86 % Other Includes Broken
Ne Plus Ultra	1.6	1.5	14	3.3	.4	.3	.8	1	1.5	--	4.4	5.8
Jordanolo	3.2	4.7	1.6	3.3	0	3	17.8	4.5	1	--	40.4	9.7
Sonora	1.2	1.3	2.4	6.7	6.4	17.3	2.8	8.5	2	--	4.4	3.7
Peerless	.4	0	14.4	21.3	0	0	.8	.5	4.5	--	1.6	1.7
Nonpareil	.78	1.9	1.54	3.3	2.02	9.2	1.4	7.3	.1	--	1.92	6
Sauret #1	3.76	3	1.6	4	0	.7	2	2	.5	--	.4	2.3
Carmel	.8	.7	6.8	5.3	1.2	8.3	.8	1.5	1.5	--	3.6	0
Price	1.6	0	6.8	19.7	11.2	9	2.8	10.5	1.5	--	7.6	7
Monarch	--	0	--	1.7	--	1.7	--	9.5	--	--	--	3
Solano	--	0	--	.2	--	1.8	--	2.5	--	--	--	3.7
Merced	11	1	12	6.3	6	1.3	3	3.5	0	--	5	4
Fritz	.8	0	4.4	8.3	.8	1.7	1.6	0	4	--	5.2	2.7
Sauret #2	1.2	1.7	9.2	12.7	2.8	4	.8	3.5	1	--	8.8	2.3
Monterey	.8	.3	15.2	23.7	2	1.3	2.8	.5	.5	--	2.4	0
Jeffries	0	4	.4	0	.4	.7	7.6	0	0	--	5.6	12
Grace	--	.8	--	14	--	.8	--	7	--	--	--	.8
LeGrand	3.6	4	4.8	4	.4	.7	.8	3.5	2.5	--	4.4	1.7
Mission	0	.7	2.08	4.2	.08	.3	6.3	2.5	3.3	--	11.56	1.7
Padre	.4	0	1.2	0	.4	.7	2	1	9	--	5.2	2
Thompson	.8	3	1.2	2.3	.4	2	2.8	3	1.5	--	8	2
Livingston	4.4	0	2.8	6	.8	1.3	3.2	3	1.5	--	6.4	2.7
Butte	.4	1.3	3.6	4	1.6	2.3	.4	1	.5	--	2.4	1.3
Ruby	.4	4	.4	2.3	0	.7	2.8	4.5	0	--	8.4	4.3
Tokyo	.8	.3	.4	1.3	.8	1	1.6	1	2.5	--	4.4	3.3
Mono	.4	0	1.6	3.7	.8	1.7	2	2.5	0	--	5.6	1.3
Yosemite	--	2.7	--	1	--	.3	--	7.5	--	--	--	1.7
Planada	--	2	--	.3	--	0	--	20.5	--	--	--	9.7
Ripon	--	1	--	0	--	1.3	--	11	--	--	--	7
Rosetta	.4	0	2.8	8	0	0	.4	2	3	--	1.2	2
Dottie Won	3.6	0	14.8	8	0	0	4	0	1.5	--	7.2	0
Wood Colony	.8	0	6	8	0	0	5.2	0	1	--	14.4	0
Valenta	4.4	1.7	32.4	5.6	0	.3	4	2	3	--	2.8	0
Aldrich	.4	0	6.8	1.7	.4	.3	.8	2	.5	--	4	2
Pearl	2.4	0	25.2	20	1.6	0	7.6	4	1.5	--	10.8	4

-- Indicates: Not Available

Other Includes: Ant, gumming, sticktight, creased, wrinkled and shriveled

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