Almond Board of California
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Project No.: 99-WM-o2 Field Evaluation of Almond Varieties

Project Leader: Mr. Warren Micke – (530) 752-2588
University of California
Department of Pomology
Davis, CA 95616

Cooperating Personnel: T. Gradziel, J. Yeager, M. Thorpe, and D. Kester (UCD), J. Connell (Butte Co.), P. Verdegaal (San Joaquin Co.), M. Viveros (Kern Co.), R. Watkins, R. Jacobs and J. Floyd (CSU, Chico), J. Burkhard and L. Sheffield (S. J. Delta College), and Paramount Farming Company (Kern Co.).

Objectives:

1. Three new Regional Almond Variety Trials were planted in 1993. Bloom, hullsplit, yield and nut quality data will be collected in 1999. Trees will be observed and evaluated for growth, pest and disease susceptibility, and noninfectious bud failure symptoms.

2. Summarize and analyze data associated with this project and publish and otherwise disseminate this information as appropriate, including publishing a leaflet reporting the1999 results from these three trials.

Abstract:

Three new Regional Almond Variety Trials (RAVTs) were planted in 1993 at Paramount Farming Company near Shafter in Kern County (Kern), California State University at Chico farm in Butte County (Butte) and San Joaquin Delta College farm near Manteca in San Joaquin County (Delta). In 1999 yields for most varieties were very good for trees in their seventh growing season; although, a few varieties produced poorly this season. The Kern trial tended to have the highest overall yields this year; however, this RAVT also has more trees per acre (86) than the other two trials (Butte - 64 and Delta - 75 trees per acre). In the early bearing years tree spacing can have a significant impact on production per acre

To date only Yokut at the Butte trial and possibly at the Delta trial has shown any definite indication of possible noninfectious bud failure (BF) symptoms, and these symptoms might be due to a virus condition that mimics BF. In 1999 there was less disease pressure in these trials than in 1998. However, some of the 1999 variety yields may have been adversely affected by disease incidence that occurred in 1998.

Experimental Procedure:

Three RAVTs were planted in 1993 at Paramount Farming Company in Kern County (Kern), California State University, Chico farm in Butte County (Butte) and San Joaquin Delta College farm in San Joaquin County (Delta). Details about these trials can be found in the 1997 Almond Board Research Conference Proceedings and in a leaflet that was distributed at the 1999 Almond Board Research Conference. The procedures used for variety evaluation were the same as in previous years.

Results and Discussion:

In the early bearing years tree spacing can have a significant impact on production per acre. While the trees in these trials are reaching maturity many are not yet at full size. Trees per acre vary in these RAVTs with 86 trees per acre in the Kern trial, 64 trees per acre in the Butte trial and 75 trees per acre in the Delta trial.

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In the **Kern RAVT** with 86 trees per acre Livingston, Aldrich, Jenette, Nonpareil and Ruby all yielded over 2500 kernel (meat) pounds per acre (Table 1). These varieties were followed closely in production by selection 2-19E, Sano and Padre. Savana and Wood Colony were the only varieties in this trial to yield less than 1000 kernel pounds per acre.

Plateau (34%), Sano (24%), Kahl (16%) and selection 25-75 (12%) were the only varieties to produce more than 10% double kernels in the Kern trial. Carmel, Chip's, Kahl and selection 13-1 all had 6% blank kernels the most for any varieties in this trial. Johlyn with 4% worm damage was the only variety to have more than 2% damage. This damage was caused by navel orangeworm (NOW).

The **Butte RAVT** is located near Chico and has 64 trees per acre. In this trial selection 13-1 and Plateau were the only varieties to produce more than 2000 kernel pounds per acre. The next highest yielding varieties were Nonpareil, Johlyn and Ruby (Table 2). Kapareil and Savana were the only varieties in this trial to produce less than 1000 kernel pounds per acre.

In the Butte RAVT many varieties had a considerable number of double kernels. Those with 20% or more double kernels were Kahl (the highest with 32%), Mission, Donna, Sano, Wood Colony, selection 2-43W, Price and Plateau. Varieties with between 12 and 20% double kernels included Livingston, Monterey, Ruby, selection 2-19E, Aldrich and Butte. Monterey with 6% blank kernels was the only variety to have more

than 4%. In this trial selection 1-102W had 22% and Johlyn had 4% kernels with gum, the only varieties to have more than 2%. Kapareil with 4% worm damage was the only variety to have more than 2% damage.

In the **Delta RAVT**, with 75 trees per acre, Livingston, Carmel, Butte, Jenette, Plateau, Jiml and Sonora all produced over 2400 kernel pounds per acre in 1999 (Table 3). Selections 25-75 and 1-102W and Savana yielded less than 1000 kernel pounds per acre.

Varieties producing more than 20% double kernels in the Delta trial were Kahl (highest with 46%), Plateau and Sano; while Price, Dottie Won, Monterey, Wood Colony, Aldrich, Donna, Fritz and Jiml had between 10 and 20% double kernels. Sonora had 16% and selection 1-87 had 10% twin kernels (two kernels within the some pellicle). Six varieties in this trial had 6% or more blank kernels; Kahl (with 18%), Dottie Won, Donna and Fritz (all with 8%) and Morley and selection 1-102W (both with 6%). Selection 1-102W had 10% and Price had 4% kernels with gum, the only varieties in this trial to have more than 2% of this damage. Eight varieties had more than 2 % worm damage. These varieties were Aldrich, Chip's, Donna and Dottie Won each with 6% and Carmel, Johlyn, Ruby and Sonora each with 4%. This damage was all caused by NOW.

Dissemination of Information:

In an effort to make information developed from this project available to almond growers and others associated with this industry, presentations on the results from this project were make at the Almond Board Research Conference and other meetings as appropriate. A booklet on the 1999 results from the 1993 planted RAVTs was published and distributed at the Almond Board Research Conference, other meetings, and through the Almond Board and Cooperative Extension Offices. Similar booklets were also published and distributed for the 1996, 1997 and 1998 results.

Table 1. 1999 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[1]
Livingston	16794	0.96	72.7	35.5	3054
Aldrich	20391	0.76	50.7	34.1	2936
Jenette	14801	0.96	65.8	31.3	2692
Nonpareil	13518	1.00	63.2	29.8	2560
Ruby	13460	1.00	51.0	29.6	2550
2-19E	14974	0.88	51.2	29.0	2496
Sano	11738	1.10	52.9	28.4	2446
Padre	14830	0.86	51.8	28.1	2416
Rosetta	11493	1.06	44.9	26.8	2308
Plateau	10553	1.12	48.7	26.0	2239
Sonora	11046	1.06	69.7	25.8	2218
Monterey	9984	1.16	50.4	25.5	2194
1-87	15281	0.75	52.8	25.2	2171
Yokut	9886	1.08	51.4	23.5	2023
Kahl	10816	0.94	43.9	22.4	1926
1-102W	6814	1.36	61.8	20.4	1755
Mission	8847	1.02	44.9	20.0	1716
Chip's	9208	0.98	59.0	19.9	1709
Fritz	9754	0.92	53.5	19.8	1700
Butte	9798	0.90	51.7	19.4	1670
13-1	9634	0.90	57.7	19.1	1643
Jiml	7552	1.14	55.9	19.0	1631
Kapareil	11246	0.74	66.1	18.3	1576
Morley	9308	0.86	48.9	17.6	1516
2-43W	8164	0.98	53.3	17.6	1516
Carmel	5881	1.22	54.5	15.8	1359
25-75	9016	0.76	52.1	15.1	1298
Johlyn	5660	1.20	65.9	15.0	1287
Price	6148	1.06	59.6	14.4	1235
Donna	6719	0.84	48.8	12.4	1069
Wood Colony	3518	1.14	49.6	8.8	760
Savana	3266	1.06	61.6	7.6	656

[1]Based on a spacing that gives 86 trees per acre.

Table 2. 1999 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[1]
13-1	21094	0.92	51.1	42.7	2736
Plateau	11863	1.20	47.6	31.4	2007
Nonpareil	12540	1.10	62.3	30.5	1952
Johlyn	13006	1.02	68.9	29.2	1870
Ruby	11971	1.08	47.8	28.5	1823
Livingston	11810	1.06	58.9	27.6	1765
Carmel	10052	1.20	56.6	26.6	1700
Jiml	9820	1.18	56.7	25.5	1633
Sano	8773	1.26	53.8	24.3	1558
2-43W	11285	0.96	51.1	23.9	1527
1-102W	7613	1.38	62.2	23.1	1481
Wood Colony	8953	1.16	51.8	22.9	1464
Rosetta	8007	1.26	48.8	22.2	1422
Monterey	8333	1.20	45.5	22.0	1410
Jenette	8315	1.20	67.4	22.0	1407
Butte	10711	0.93	47.9	21.9	1404
Aldrich	10477	0.94	54.0	21.7	1388
Morley	10993	0.88	51.2	21.3	1364
2-19E	10840	0.88	47.8	21.0	1345
1-87	11884	0.80	48.8	20.9	1340
Kahl	9226	1.00	42.0	20.3	1301
Sonora	7218	1.24	71.3	19.7	1262
Padre	9297	0.96	51.1	19.7	1258
Price	8902	0.98	56.3	19.2	1230
Yokut	6779	1.26	54.8	18.8	1204
25-75	9100	0.86	54.4	17.2	1103
Chip's	7773	0.94	56.0	16.1	1030
Mission	6770	1.07	40.6	15.9	1018
Donna	7565	0.94	46.5	15.7	1003
Savana	7177	0.98	62.0	15.5	992
Kapareil	8344	0.80	65.6	14.7	941

[1]Based on a spacing that gives 64 trees per acre.

Table 3. 1999 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[1]
Livingston	15575	1.08	66.7	37.1	2779
Carmel	13154	1.24	58.5	35.9	2695
Butte	15988	1.00	58.1	35.2	2641
Jenette	12390	1.26	73.3	34.4	2579
Plateau	10135	1.50	50.7	33.5	2511
Jiml	13092	1.16	63.0	33.5	2509
Sonora	11749	1.24	79.5	32.1	2407
Sano	10232	1.36	56.7	30.7	2299
Nonpareil	12036	1.13	69.5	30.0	2252
13-1	12937	1.04	59.8	29.6	2223
Wood Colony	10622	1.24	57.9	29.0	2176
Aldrich	12872	1.02	56.7	28.9	2169
Chip's	12419	1.04	59.8	28.4	2134
Fritz	11276	1.12	55.4	27.8	2086
Monterey	9340	1.30	50.0	26.7	2006
Ruby	9850	1.22	53.0	26.5	1985
Yokut	8707	1.36	55.3	26.1	1956
Kahl	10103	1.10	47.0	24.5	1836
Mission	9371	1.15	46.4	23.7	1780
Rosetta	8001	1.32	51.2	23.3	1745
Price	10693	0.98	61.3	23.1	1731
Dottie Won	9518	1.06	53.0	22.2	1667
1-87	10766	0.90	57.7	21.3	1601
Johlyn	7881	1.16	72.5	20.1	1510
Morley	8480	1.00	46.3	18.7	1401
Donna	8441	1.00	53.2	18.6	1394
Padre	7372	1.10	55.0	17.9	1340
Kapareil	10093	0.72	70.6	16.0	1200
2-43W	6973	1.04	62.7	16.0	1198
2-19E	5770	1.06	58.2	13.5	1010
1-102W	3643	1.56	69.0	12.5	939
Savana	3912	1.16	65.9	10.0	750
25-75	3564	0.92	60.5	7.2	542

[1]Based on a spacing that gives 75 trees per acre.