

**Almond Board of California
Annual Report
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Project No.: 00-WM-o2- Field Evaluation of Almond Varieties

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Objectives

1. Three new Regional Almond Variety Trials were planted in 1993. Bloom, hullsplit, yield and nut quality data will be collected in 2000. 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 the 2000 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). The Kern trial again tended to have the highest overall yields this year with 6 varieties that produced over 3000 lbs/acre and 15 varieties that produced between 2000 and 3000 lbs/acre. However, this RAVT also has more trees per acre (86) than the Butte (64) or Delta (75) trials. Trees in these trials are still at a young enough age that tree spacing can have a significant impact on production per acre. In the Butte RAVT, only 3 varieties produced over 2000 lbs/acre while most produced between 1000 and 2000 lbs/acre. Nine varieties produced over 2000 lbs/acre, fourteen produced over 1000 lbs/acre and 10 produced under 1000 lbs/acre in the Delta RAVT in 2000.

Yokut at the Butte RAVT was again the only variety to show any indication of possible noninfectious bud failure (BF) symptoms, but these symptoms might be due to a virus condition that mimics BF. No other variety in any of the three trials has shown signs of BF.

Experimental Procedure

Three RAVT's 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).

During bloom, data was collected on the standard and test cultivars by walking the plots on a regular basis (approximately every other day) to assess timing and intensity of bloom. During hullsplit, the plots were walked on a regular basis (approximately weekly) to record the beginning and end of the hullsplit period. Since some trees were lost due to disease, wind damage etc., a tree count was made at each site during summer to allow for the adjustment of yield values for number of trees present that season.

Because of the variability in maturity dates, three to four harvests were required at each location. At harvest, total tree weights were obtained by weighing all nuts from each plot using harvest trailers fitted with load cells and/or drive up load cells. Random sub-samples (approximately 5-8 lbs from each plot) were taken as the nuts left the harvester. These sub-samples were then counted to assess number of nuts per pound. Then approximately 100 nuts were taken from this sub-sample to be dried and used for analysis of kernel weights, insect damage, defects, etc. Trees were observed over the season and any indication of disease symptoms, insect problems or non-infectious bud failure were noted.

More details about these trials can be found in the 1997 Almond Board Research Conference Proceedings and in a leaflet that was distributed at the 2000 Almond Board Research Conference.

Results

In the **Kern RAVT**, with 86 trees per acre, Sano, Plateau, Yokut, Sonora, Ruby and Chip's all produced over 3000 kernel pounds per acre (Table 1). There were fifteen varieties that produced between 2000 and 3000 kernel pounds per acre. Only selection 1-102W and Kapareil produced less than 1000 kernel pounds per acre.

The **Butte RAVT** is located near Chico and has 64 trees per acre. In this trial, selection 13-1, Monterey and Sano were the only varieties to produce more than 2000 kernel pounds per acre in the 2000 season (Table 2). Savana and selection 2-19E produced less than 1000 kernel pounds per acre.

Similar to the results during the 1999 season, in the 2000 season many varieties in the Butte trial produced a considerable number of double kernels. Kahl and Sano both produced over 30% double kernels while Monterey, Mission, and

Plateau produced 20% or more double kernels. Donna, Wood Colony, Price, Yokut and selection 2-43W all produced 10% or more double kernels. Kahl (20%), selection 2-43W (8%) and selection 2-19E (6%) were the only varieties to have over 4% blank kernels in this trial. Monterey (8%) and Chip's (6%) were the only varieties in this trial with more than four percent naval orange worm damage. The only varieties with over four percent of kernels with gum were Johlyn (38%), selection 1-102W (36%) and Yokut (22%).

In the **Delta RAVT** with 75 trees per acre, Padre, Carmel, Ruby, Butte, Sano, Dottie Won, Yokut, Fritz and Mission all produced over 2000 kernel pounds per acre (Table 3). Ten varieties produced less than 1000 kernel pounds per acre.

Plateau (34%), Donna (28%), Kahl (18%), Sano (12%) and Jiml (10%) produced 10% or more double kernels in the Delta trial. Varieties with over four percent blank kernels were Plateau (10%), Donna (8%), Price (8%), selection 2-19E (6%), selection 2-43W (6%) and Sonora (6%). Naval orange worm damage was extensive with Aldrich, Johlyn, Donna, Dottie Won, Savana, selection 1-87, selection 2-43W, selection 1-102W and Kapareil all showing twenty percent or higher damage. In addition, Sano, selection 25-75, Jenette, Sonora, Jiml, Chip's, Livingston, Butte and Monterey all had between ten and twenty percent naval orange worm damage. Varieties with more than four percent gum damage were selection 13-1 (52%), Savana (32%), selection 1-102W (24%), Yokut (16%), Johlyn (8%) and Rosetta (8%).

Plateau (38%), Kahl (28%), Donna (22%), selection 1-102W (22%), and Mission (11%) all produced more than 10% double kernels in this trial. Plateau (14%), Donna (12%), Kahl (8%), and Morley (8%) had the most blank kernels. Naval orange worm damage was highest in Kapareil (22%), selection 1-87 (18%), selection 13-1 (18%), Fritz (14%), Jiml (14%), selection 1-102W (12%), Carmel (10%), Johlyn (10%) and Livingston (10%) and Sonora (10%).

Dissemination of Information

The information from this project was made available to growers by presentations at the Almond Board Research Conference and other meetings. The booklet on the 2000 results was published and distributed at the Almond Board Research Conference, other meetings, and through the Almond Board and Cooperative Extension Offices. Similar booklets have been published and distributed for the 1996, 1997, 1998, and 1999 results.

Table 1. 2000 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)	Kernel Pounds Per	
			Tree	Acre ¹
Sano	13552	1.44	43.0	3702
Plateau	10627	1.59	37.2	3197
Yokut	11973	1.40	37.0	3184
Sonora	12475	1.35	37.0	3181
Ruby	12501	1.34	36.8	3164
Chip's	13825	1.19	36.1	3106
Price	14461	1.09	34.8	2997
Padre	13180	1.14	33.0	2841
Jenette	10842	1.37	32.7	2810
Fritz	13561	1.09	32.6	2805
Kahl	11859	1.20	31.3	2696
2-19E	11896	1.17	30.8	2646
Carmel	9382	1.43	29.5	2534
Monterey	8198	1.56	28.2	2429
Mission	9560	1.26	26.6	2285
Donna	11108	1.08	26.5	2281
Nonpareil	8491	1.27	23.2	2216
Johlyn	7803	1.41	24.2	2084
13-1	8868	1.23	24.1	2073
25-75	12127	0.90	24.1	2072
Jiml	6735	1.60	23.7	2039
Wood Colony	7169	1.42	22.4	1923
Rosetta	6520	1.46	21.0	1808
Morley	8467	1.09	20.3	1742
Livingston	5752	1.48	18.7	1608
Savana	5956	1.31	17.2	1480
Aldrich	5936	1.25	16.4	1410
2-43W	4578	1.45	14.6	1254
Butte	5130	1.21	13.7	1178
1-87	4661	1.14	11.7	1008
1-102W	2043	1.71	7.7	661
Kapareil	3109	1.05	7.2	618

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

Table 2. 2000 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)	Kernel Pounds Per	
			Tree	Acre ¹
13-1	15116	1.15	38.2	2446
Monterey	11959	1.35	35.6	2279
Sano	11438	1.32	33.3	2128
Jiml	9773	1.41	30.4	1948
Plateau	9277	1.49	30.4	1943
Carmel	9984	1.37	30.2	1934
Jenette	10641	1.29	30.2	1932
1-102W	9899	1.38	30.1	1926
25-75	14504	0.93	29.8	1910
Morley	13204	0.99	28.9	1846
Ruby	10592	1.22	28.6	1828
Nonpareil	9174	1.37	27.5	1762
2-43W	12008	1.03	27.2	1740
Rosetta	9024	1.36	27.0	1727
Wood Colony	9667	1.24	26.5	1695
Mission	9900	1.16	25.2	1616
Livingston	8946	1.27	25.1	1607
Johlyn	8688	1.30	24.9	1595
Sonora	7760	1.38	23.6	1510
Butte	11247	0.95	23.6	1509
Aldrich	9186	1.15	23.3	1494
1-87	10439	0.99	22.7	1454
Chip's	8696	1.17	22.4	1434
Padre	9751	1.02	21.9	1402
Donna	8354	1.07	19.6	1255
Yokut	5663	1.41	17.6	1126
Price	6039	1.25	16.7	1066
Kahl	6012	1.22	16.2	1034
Kapareil	7405	0.99	16.1	1029
Savana	6033	1.13	15.0	958
2-19E	5707	1.13	14.2	906

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

Table 3. 2000 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)	Kernel Pounds Per	
			Tree	Acre ¹
Padre	14705	1.15	37.1	2784
Carmel	12096	1.27	33.8	2538
Ruby	12213	1.25	33.6	2518
Butte	14141	0.96	29.9	2243
Sano	9601	1.39	29.4	2205
Dottie Won	12991	0.99	28.4	2133
Yokut	9834	1.27	27.5	2060
Fritz	12302	1.00	27.0	2024
Mission	10887	1.12	26.7	2001
Plateau	7879	1.51	26.2	1968
Chip's	10112	1.09	24.4	1828
Livingston	8625	1.22	23.1	1736
Monterey	8523	1.22	22.9	1718
Jenette	7311	1.38	22.2	1667
Kahl	9471	1.03	21.4	1605
Wood Colony	7086	1.32	20.6	1543
Rosetta	6569	1.37	19.8	1487
Nonpareil	5753	1.40	17.8	1333
1-87	7954	0.99	17.3	1296
Johlyn	5472	1.38	16.6	1246
Sonora	4725	1.53	15.9	1194
Donna	6092	1.15	15.4	1153
Jiml	5104	1.30	14.6	1098
Price	4585	1.23	12.4	932
25-75	5039	1.10	12.2	912
2-19E	4306	1.27	12.0	903
Aldrich	4425	1.23	12.0	902
Morley	4669	1.09	11.2	842
2-43W	3095	1.24	8.4	632
1-102W	1936	1.62	6.9	519
Kapareil	2747	1.07	6.5	485
13-1	1884	1.26	5.2	392
Savana	470	1.40	1.5	109

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