

1998 Almond Objective Measurement Survey Results



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**CALIFORNIA AGRICULTURAL
STATISTICS SERVICE**

1998 CALIFORNIA ALMOND FORECAST

California's 1998 almond production is forecast at 540 million meat pounds, down 2 percent from May's subjective forecast and down 29 percent from last year's crop. This is based on 425,000 bearing acres. The Nonpareil variety is forecast at 260 million meat pounds, down 28 percent from last season. The Nonpareil variety represents 48 percent of total almond production.

Statewide bloom reports ranged from fair to good with cool Spring temperatures and intermittent rains throughout the State. The crop was delayed by approximately two weeks. There has been some concern about shrivels, blanks, and other kernel malformations associated with uneven set. The most common nonstandard grade observed in the field has been doubles. The average nut set per tree is 5,314, down 30 percent from 1997. The Nonpareil average nut set of 5,129 represents a 34 percent decrease from last year's set. The average kernel weight for all varieties sampled was 1.76 grams, up 11 percent from last year. A total of 95.8 percent of the nuts sized were sound.

SAMPLING PROCEDURES

To determine tree set, nuts are counted along a path within a randomly selected tree. Work begins at the trunk and progresses to the end of the terminal branch. Using a random number table, one branch is selected at each forking to continue the path. A branch's probability of selection is directly proportional to its cross-sectional area. This methodology is used because of its statistical efficiency. The method also makes it possible to end up at any one of the tree's numerous terminal branches.

Since the selected path has a probability of selection associated with it, this probability is used to expand nut counts arriving at an estimated set for the entire tree.

Along intermediate stages (i.e., the bearing surface between forkings), every fifth nut is picked. All nuts on the terminal branch are picked. These nuts are used to determine size and weight measurements.

FIELD SAMPLING ACTIVITIES

The survey began June 8 and sampling was completed by June 29. There were 1,957 trees sampled for the 1998 survey in 979 orchards. An additional 103 orchards were not sampled for one of the following reasons:

- 1) Orchard had been sprayed.
- 2) Orchard was wet.
- 3) Orchard had been pulled.
- 4) Owner refused to cooperate or could not be contacted.

The Objective Measurement Survey is funded by monies provided by the Almond Board of California in cooperation with the California Department of Food and Agriculture.

DATA RELIABILITY

The 80 percent confidence interval is from 477 million meat pounds to 603 million meat pounds. This means there is an 80 percent chance the 1998 production will fall within this range.

TABLE 1: COMPARISON OF NUT ESTIMATES AND ORCHARDS SAMPLED BY DISTRICT AND VARIETY, JUNE OBJECTIVE MEASUREMENT SURVEY COUNTS

District and Variety	1993		1994		1995		1996		1997		1998	
	Nuts Per Tree	Orchards Sampled	Nuts Per Tree	Orchards Sampled	Nuts Per Tree	Orchards Sampled	Nuts Per Tree	Orchards Sampled	Nuts Per Tree	Orchards Sampled	Nuts Per Tree	Orchards Sampled
ALL DISTRICTS												
(All Varieties)	5,871	767	8,183	766	3,792	798	5,482	872	7,567	887	5,314	979
BY DISTRICTS												
<u>District I</u>												
Sacramento	6,801	173	9,498	176	4,926	176	6,739	175	8,544	190	6,257	200
<u>District II</u>												
San Joaquin	5,652	587	7,830	586	3,471	622	5,194	693	7,347	691	5,116	772
BY VARIETIES												
California Types	5,901	129	9,081	134	3,635	151	6,510	174	7,597	171	5,497	201
Carmel ^{2/}	5,317	85	8,749	86	3,384	99	5,993	116	7,862	107	5,645	118
Merced	6,332	30	8,848	32	2,841	32	4,450	31	6,020	20	4,664	24
Mission	6,117	70	6,909	69	4,534	72	6,320	78	6,831	78	5,722	79
Ne Plus Ultra	4,808	29	9,785	26	2,557	29	3,486	28	7,215	30	2,116	27
Nonpareil	5,849	447	7,869	431	3,851	430	4,963	464	7,714	485	5,129	491

^{1/} For survey purposes, the California classification includes the following varieties: Aldrich, Ballico, Carmel, Davey, Fritz, Harvey, Le Grand, Mono, Monterey, Norman, Price Cluster, Ruby, Tokoyo and Yosemite.

^{2/} Carmel breakdown was first provided in 1988. Carmel variety is also included in California Types.

TABLE 2: WEIGHT, SIZE AND GRADE OF AVERAGE ALMOND SAMPLE

District and Variety	Kernel Weight (Grams)	Kernel Size (Millimeters)			Grade (Percent of Nuts) <i>a/</i>							
		Length	Width	Thickness	Edible Nuts		Insect Damage	Shrivel	Natural Gum	Blank	Other	
					Singles	Doubles						
ALL DISTRICTS												
1993	1.78	24.59	13.61	10.17	92.6	3.8	<u>b/</u>	2.6	0.4	<u>b/</u>	0.5	
1994	1.63	23.56	12.99	10.12	95.0	2.4	<u>b/</u>	1.7	0.3	<u>b/</u>	0.6	
1995	1.91	24.56	14.09	10.30	91.9	3.5	0.1	3.0	0.5	0.1	0.9	
1996	1.85	23.09	13.54	10.21	93.4	3.6	<u>b/</u>	2.2	0.2	0.1	0.4	
1997	1.59	20.34	11.95	9.22	92.3	5.6	<u>b/</u>	1.8	0.1	0.1	0.2	
1998	1.76	23.51	13.64	10.42	95.8	4.0	<u>b/</u>	<u>b/</u>	0.1	<u>b/</u>	<u>b/</u>	
BY DISTRICT												
Sacramento Valley <i>c/</i>												
1993	1.71	24.84	13.44	9.71	93.1	4.4	0.1	2.0	<u>b/</u>	0.1	0.2	
1994	1.61	23.52	13.06	9.87	94.3	3.1	<u>b/</u>	1.0	0.2	0.1	1.3	
1995	1.82	23.72	13.70	9.88	91.4	5.4	<u>b/</u>	1.2	0.5	<u>b/</u>	1.5	
1996	1.68	22.99	13.70	10.11	92.9	4.7	<u>b/</u>	1.4	0.2	<u>b/</u>	0.9	
1997	1.59	22.54	13.17	9.92	91.5	6.2	<u>b/</u>	1.2	0.1	0.2	0.7	
1998	1.71	23.48	13.54	10.25	93.5	6.2	<u>b/</u>	<u>b/</u>	0.3	<u>b/</u>	<u>b/</u>	
San Joaquin Valley <i>d/</i>												
1993	1.81	24.50	13.67	10.34	92.4	3.6	<u>b/</u>	2.9	0.6	<u>b/</u>	0.6	
1994	1.64	23.57	12.96	10.21	95.2	2.1	<u>b/</u>	2.0	0.4	<u>b/</u>	0.3	
1995	1.95	24.95	14.27	10.51	92.2	2.6	0.2	3.8	0.5	0.2	0.6	
1996	1.91	23.13	13.49	10.25	93.6	3.2	<u>b/</u>	2.5	0.2	0.1	0.3	
1997	1.59	19.61	11.55	8.99	92.5	5.4	<u>b/</u>	2.0	0.1	<u>b/</u>	<u>b/</u>	
1998	1.78	23.52	13.67	10.47	96.6	3.3	<u>b/</u>	<u>b/</u>	<u>b/</u>	<u>b/</u>	<u>b/</u>	
BY VARIETY												
California Types <i>e/</i>												
1993	1.67	24.47	12.69	10.12	89.8	5.8	<u>b/</u>	3.8	0.3	<u>b/</u>	0.3	
1994	1.49	23.00	12.14	10.05	94.9	2.5	<u>b/</u>	2.0	0.1	<u>b/</u>	0.5	
1995	1.81	25.23	13.18	10.25	88.7	5.3	0.1	4.4	0.5	0.1	0.9	
1996	1.68	23.14	12.68	10.12	92.3	4.8	<u>b/</u>	2.1	0.1	0.1	0.7	
1997	1.53	19.90	11.23	9.23	89.3	8.6	<u>b/</u>	1.8	0.1	<u>b/</u>	0.1	
1998	1.70	23.76	12.93	10.33	94.9	9.9	<u>b/</u>	<u>b/</u>	<u>b/</u>	<u>b/</u>	<u>b/</u>	
Carmel <i>f/</i>												
1993	1.69	25.03	12.68	10.06	91.7	5.2	<u>b/</u>	2.6	0.3	<u>b/</u>	0.2	
1994	1.51	23.42	12.13	10.06	95.7	1.9	<u>b/</u>	1.5	<u>b/</u>	<u>b/</u>	0.7	
1995	1.83	25.97	13.13	10.19	91.7	4.3	0.1	2.5	0.8	0.2	0.4	
1996	1.77	23.90	12.78	10.14	94.0	4.2	<u>b/</u>	1.5	0.1	<u>b/</u>	0.2	
1997	1.52	20.13	11.28	9.31	89.4	8.6	<u>b/</u>	1.6	0.2	<u>b/</u>	<u>b/</u>	
1998	1.71	24.30	12.85	10.31	96.0	3.8	<u>b/</u>	<u>b/</u>	<u>b/</u>	<u>b/</u>	<u>b/</u>	
Merced												
1993	1.70	23.13	13.32	10.53	88.1	8.5	<u>b/</u>	2.3	0.4	<u>b/</u>	0.6	
1994	1.60	22.20	12.69	10.65	92.5	4.4	<u>b/</u>	2.3	0.6	<u>b/</u>	0.2	
1995	1.86	23.91	13.90	10.67	87.8	4.3	<u>b/</u>	4.1	2.7	<u>b/</u>	1.2	
1996	1.58	21.22	13.14	10.36	91.8	4.2	<u>b/</u>	1.9	1.9	<u>b/</u>	0.1	
1997	1.54	20.82	12.66	10.01	93.0	5.8	<u>b/</u>	1.1	0.1	<u>b/</u>	<u>b/</u>	
1998	1.84	22.27	13.55	10.61	94.7	5.2	<u>b/</u>	<u>b/</u>	0.1	<u>b/</u>	<u>b/</u>	
Mission												
1993	1.45	20.61	12.34	10.62	90.1	7.5	0.1	1.6	0.1	<u>b/</u>	0.7	
1994	1.39	19.97	12.36	10.73	94.7	2.5	<u>b/</u>	1.0	1.3	<u>b/</u>	0.4	
1995	1.66	21.39	13.47	10.89	91.1	5.2	<u>b/</u>	1.8	0.7	<u>b/</u>	1.3	
1996	1.56	19.46	12.61	10.37	91.9	4.9	<u>b/</u>	2.7	0.1	0.2	0.2	
1997	1.37	17.28	11.31	9.49	91.6	6.8	<u>b/</u>	1.3	<u>b/</u>	<u>b/</u>	0.4	
1998	1.59	20.51	13.20	11.35	88.6	11.4	<u>b/</u>	<u>b/</u>	<u>b/</u>	<u>b/</u>	<u>b/</u>	
Ne Plus Ultra												
1993	2.11	28.50	14.22	10.12	87.9	8.5	<u>b/</u>	2.6	0.4	<u>b/</u>	0.6	
1994	1.88	26.78	13.14	10.36	81.8	11.4	<u>b/</u>	4.7	0.2	<u>b/</u>	1.6	
1995	2.17	26.59	14.32	10.32	76.5	13.2	<u>b/</u>	4.8	2.3	<u>b/</u>	3.2	
1996	2.20	27.53	14.65	10.39	87.1	7.1	<u>b/</u>	3.7	0.9	<u>b/</u>	1.2	
1997	1.85	21.74	11.44	8.78	82.3	15.0	<u>b/</u>	2.7	<u>b/</u>	<u>b/</u>	<u>b/</u>	
1998	2.03	27.20	14.58	9.89	90.1	9.3	<u>b/</u>	<u>b/</u>	0.6	<u>b/</u>	<u>b/</u>	
Nonpareil												
1993	1.89	25.37	14.12	10.10	95.0	1.4	<u>b/</u>	2.6	0.4	0.1	0.4	
1994	1.72	24.36	13.44	10.00	96.8	1.1	<u>b/</u>	1.4	0.2	<u>b/</u>	0.5	
1995	2.01	25.24	14.58	10.19	93.7	2.1	0.1	2.9	0.3	0.1	0.7	
1996	2.06	24.27	14.26	10.22	94.7	2.6	<u>b/</u>	2.2	0.2	<u>b/</u>	0.3	
1997	1.67	21.05	12.29	9.09	94.3	3.4	<u>b/</u>	1.9	<u>b/</u>	0.1	0.2	
1998	1.90	24.61	14.22	10.30	97.8	2.1	<u>b/</u>	<u>b/</u>	<u>b/</u>	<u>b/</u>	<u>b/</u>	

a/ Percentages may not add to 100 due to rounding.

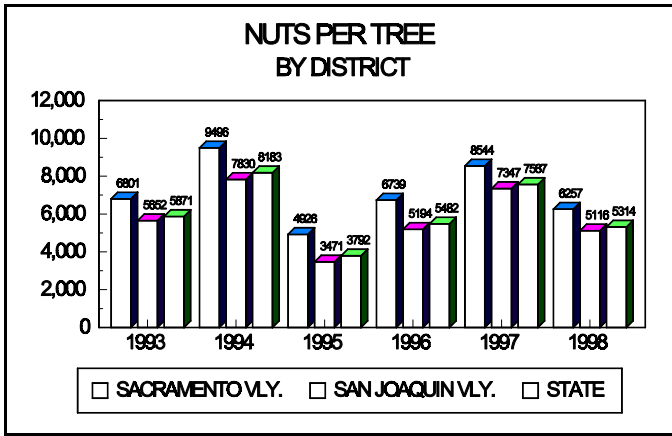
b/ Not shown if less than 0.07 percent.

c/ Sacramento Valley includes these counties: Butte, Colusa, Glenn, Solano, Sutter, Tehama, Yolo and Yuba.

d/ San Joaquin Valley includes these counties: Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus and Tulare.

e/ For survey purposes, the California classification includes the following varieties: Aldrich, Ballico, Carmel, Davey, Fritz, Harvey, Le Grand, Mono, Monterey, Norman, Price Cluster, Ruby, Tokoyo and Yosemite.

f/ Carmel breakdown was available for the first time in 1988. Carmel variety is also included in California Types.



NUTS PER TREE

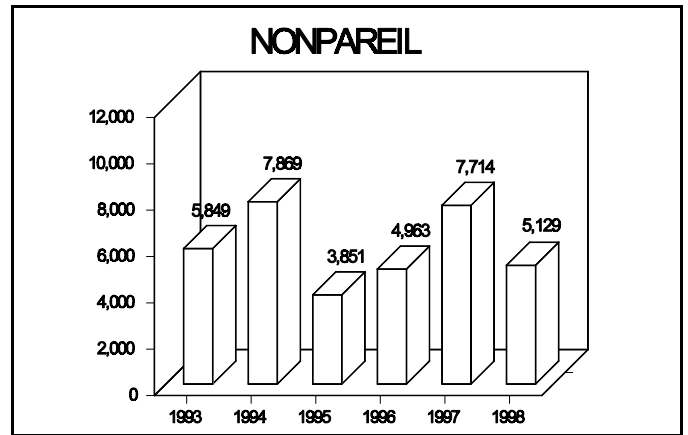
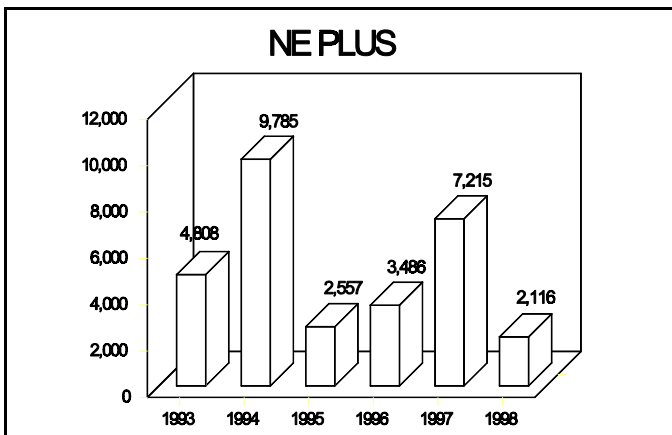
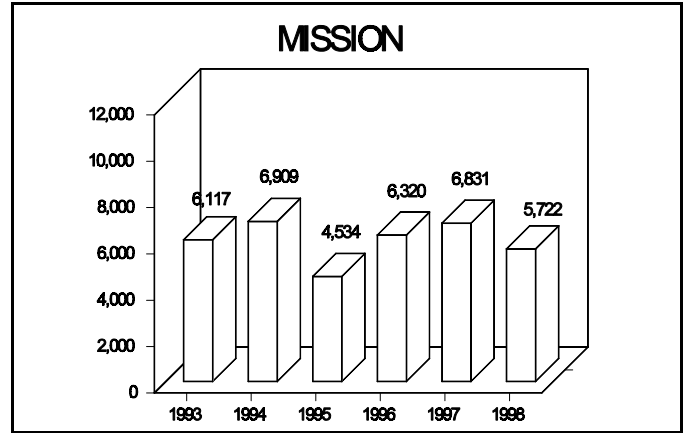
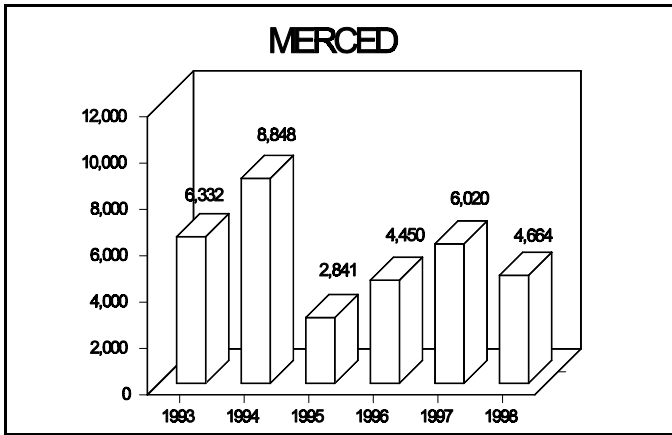
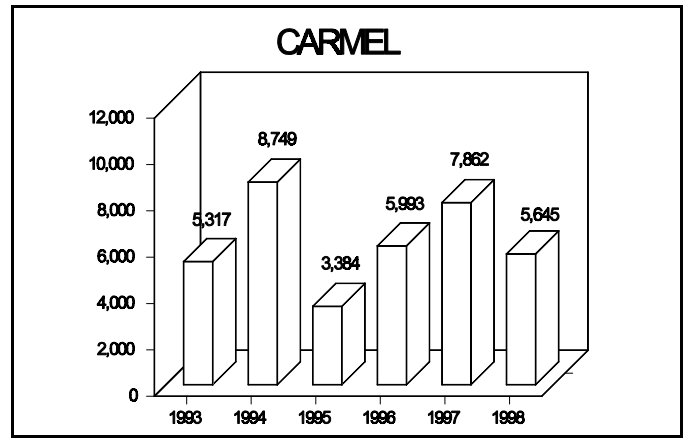
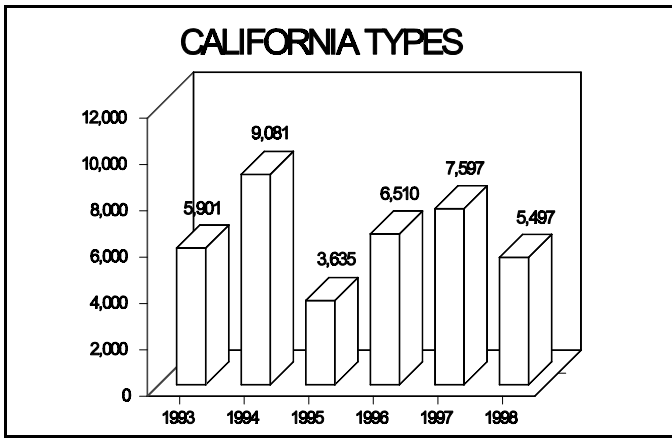


TABLE 3: CALIFORNIA ALMOND ACREAGE, PRODUCTION AND TREES/ACRE, 1980-98

Year	Bearing Acres ^{1/}	Total Meat Production			Average Trees Per Acre
		Metric Ton ^{2/}	Million Lbs.	Lbs. Per Acre	
1980	327,000	146,000	322	985	N/A
1981	326,000	185,000	408	1,250	N/A
1982	339,000	157,000	347	1,020	N/A
1983	360,000	110,000	242	673	N/A
1984	381,000	268,000	590	1,550	N/A
1985	409,000	211,000	465	1,140	N/A
1986	416,000	113,000	250	601	84.5
1987	417,000	299,000	660	1,580	84.0
1988	419,000	268,000	590	1,410	86.3
1989	411,000	222,000	490	1,190	87.3
1990	411,000	299,000	660	1,610	88.4
1991	405,000	222,000	490	1,210	89.6
1992	401,000	249,000	548	1,370	90.5
1993	402,000	222,000	490	1,220	92.0
1994	409,000	333,000	735	1,800	92.6
1995	400,000	168,000	370	930	93.7
1996	405,000	230,000	510	1,260	94.4
1997	410,000	340,000	757	1,850	95.5
1998	425,000	245,000	540	1,270	95.5

^{1/} Bearing acreage is defined as plantings four years and older.

^{2/} Rounded to nearest thousand, metric ton = 2,204.62 pounds.

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