

2002 California Almond Objective Measurement Report



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2002 CALIFORNIA ALMOND FORECAST

California's 2002 almond production is forecast at a record 980 million meat pounds, up 4 percent from May's subjective forecast and up 18 percent from last year's crop. The forecast is based on 530 thousand bearing acres. Production for the Nonpareil variety is forecast at 370 million meat pounds, up 18 percent from last season. The Nonpareil variety represents 38 percent of California's total almond production.

The weather during the critical bloom and pollination period was nearly ideal this year. However, a freeze in the Sacramento Valley in early March caused major damage to the crop in Colusa, Glenn, and Yolo counties. The warm temperatures in May and June helped the crop develop near or slightly behind normal progress. The average nut set per tree is 8,100, up 21 percent from 2001. The Nonpareil average nut set of 8,043 represents a 25 percent increase from last year's set. The average kernel weight for all varieties sampled was 1.41 grams, down 12 percent from last year. A total 98.9 percent of all 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 May 27 and sampling was completed by June 21. There were 1,572 trees sampled for the 2002 survey in 786 orchards. An additional 136 orchards were not sampled for one of the following reasons:

- 1) Orchard had been sprayed.
- 2) Orchard had been recently irrigated and 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 917 million meat pounds to 1,043 million meat pounds. This means that the results of our sampling procedures will encompass the true mean 80 percent of the time.

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

District and Variety	1997		1998		1999		2000		2001		2002	
	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)	7,567	887	5,314	979	7,568	838	5,298	686	6,672	798	8,100	786
BY DISTRICTS												
<u>District I</u>												
Sacramento Valley	8,544	190	6,257	200	8,158	188	6,167	126	7,189	165	7,849	141
<u>District II</u>												
San Joaquin Valley	7,347	691	5,116	772	7,440	645	5,111	559	6,537	633	8,128	645
BY VARIETIES												
California Types ^{1/}	7,597	171	5,497	201	7,602	167	5,332	140	6,850	167	7,615	177
Carmel ^{2/}	7,862	107	5,645	118	6,716	99	5,275	84	6,832	99	7,146	99
Merced	6,020	20	4,664	24	6,818	16	2,540	4	5,739	7	3/	---
Mission	6,831	78	5,722	79	6,844	58	4,975	31	5,928	41	8,235	29
Ne Plus Ultra	7,215	30	2,116	27	4,992	24	5,709	4	6,859	14	3,232	7
Nonpareil	7,714	485	5,129	491	8,054	403	4,959	359	6,449	386	8,043	373

^{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.

^{3/} Insufficient data.

TABLE 2: WEIGHT, SIZE AND GRADE OF AVERAGE ALMOND SAMPLE, 1997-02

District and Variety	Kernel Weight (Grams)	Kernel Size (Millimeters)			Grade (Percent of Nuts) ^{a/}							
		Length	Width	Thickness	Edible Nuts		Insect Damage	Shrivel	Natural Gum	Blank	Other	
					Singles	Doubles						
ALL DISTRICTS												
1997	1.59	20.34	11.95	9.22	92.3	5.6	b/	1.8	0.1	0.1	0.2	
1998	1.76	23.51	13.64	10.42	95.8	4.0	b/	b/	0.1	b/	b/	
1999	1.47	23.21	13.57	10.64	93.4	5.7	b/	0.8	b/	b/	0.1	
2000	1.69	23.55	13.63	10.24	95.8	2.4	b/	1.4	0.2	0.1	0.1	
2001	1.60	23.90	12.87	9.89	95.0	3.1	b/	1.4	0.1	b/	0.2	
2002	1.41	21.54	12.52	9.86	96.8	2.1	b/	0.7	b/	b/	0.2	
BY DISTRICT												
Sacramento Valley ^{c/}												
1997	1.59	22.54	13.17	9.92	91.5	6.2	b/	1.2	0.1	0.2	0.7	
1998	1.71	23.48	13.54	10.25	93.5	6.2	b/	b/	0.3	b/	b/	
1999	1.42	22.82	12.55	9.33	93.6	5.5	b/	0.7	b/	b/	0.3	
2000	1.65	24.11	13.48	10.02	93.5	3.5	b/	1.8	0.6	0.2	0.5	
2001	1.61	24.37	13.05	9.68	94.4	3.4	b/	1.1	0.1	b/	1.0	
2002	1.47	22.65	12.77	9.90	96.0	2.2	b/	0.9	b/	b/	0.8	
San Joaquin Valley ^{d/}												
1997	1.59	19.61	11.55	8.99	92.5	5.4	b/	2.0	0.1	b/	b/	
1998	1.78	23.52	13.67	10.47	96.6	3.3	b/	b/	b/	b/	b/	
1999	1.49	23.34	13.90	11.06	93.3	5.8	b/	0.8	b/	b/	b/	
2000	1.70	23.40	13.68	10.30	96.4	2.1	b/	1.3	0.1	0.1	b/	
2001	1.60	23.75	12.82	9.96	95.2	3.0	b/	1.5	0.1	b/	b/	
2002	1.39	21.22	12.45	9.84	97.0	2.1	b/	0.7	b/	b/	0.1	
BY VARIETY												
California Types ^{e/}												
1997	1.53	19.90	11.23	9.23	89.3	8.6	b/	1.8	0.1	b/	0.1	
1998	1.70	23.76	12.93	10.33	94.9	9.9	b/	b/	b/	b/	b/	
1999	1.41	22.68	12.75	10.58	89.3	9.8	b/	0.6	b/	b/	b/	
2000	1.54	23.02	12.84	10.09	94.8	3.6	b/	1.4	0.1	0.2	0.1	
2001	1.57	24.45	12.24	9.97	92.6	5.3	b/	1.6	b/	b/	0.3	
2002	1.41	21.88	12.08	9.82	94.8	3.7	b/	0.9	0.1	b/	0.4	
Carmel ^{f/}												
1997	1.52	20.13	11.28	9.31	89.4	8.6	b/	1.6	0.2	b/	b/	
1998	1.71	24.30	12.85	10.31	96.0	3.8	b/	b/	b/	b/	b/	
1999	1.53	24.70	13.95	11.59	90.6	9.0	b/	0.2	b/	b/	0.2	
2000	1.69	24.69	13.12	10.16	96.3	2.3	b/	1.0	0.2	0.1	b/	
2001	1.53	24.74	12.03	9.83	94.8	3.7	b/	1.2	b/	b/	0.2	
2002	1.39	22.20	11.96	9.64	96.6	2.6	b/	0.5	0.1	0.1	0.1	
Merced												
1997	1.54	20.82	12.66	10.01	93.0	5.8	b/	1.1	0.1	b/	b/	
1998	1.84	22.27	13.55	10.61	94.7	5.2	b/	b/	0.1	b/	b/	
1999	1.50	24.40	15.61	12.84	94.1	5.0	b/	0.7	b/	b/	0.3	
2000	1.88	23.22	14.14	10.57	84.5	7.8	b/	0.3	2.0	b/	5.4	
2001	1.52	23.04	12.23	10.00	92.6	6.3	b/	0.6	0.4	b/	b/	
2002	1.41	20.04	12.50	10.03	100.0	b/	b/	b/	b/	b/	b/	
Mission												
1997	1.37	17.28	11.31	9.49	91.6	6.8	b/	1.3	b/	b/	0.4	
1998	1.59	20.51	13.20	11.35	88.6	11.4	b/	b/	b/	b/	b/	
1999	1.34	20.04	12.82	10.71	91.6	7.7	b/	0.7	b/	b/	b/	
2000	1.45	20.17	13.04	10.92	90.4	7.6	b/	1.5	0.2	b/	0.2	
2001	1.43	21.84	12.42	10.27	92.6	5.3	b/	1.4	0.3	b/	0.3	
2002	1.18	18.72	12.08	9.95	98.1	0.5	b/	0.5	0.1	b/	0.8	
Ne Plus Ultra												
1997	1.85	21.74	11.44	8.78	82.3	15.0	b/	2.7	b/	b/	b/	
1998	2.03	27.20	14.58	9.89	90.1	9.3	b/	b/	0.6	b/	b/	
1999	1.76	26.27	13.85	10.64	83.5	15.7	b/	0.7	b/	b/	0.1	
2000	1.73	23.67	13.28	10.35	95.0	4.2	b/	b/	b/	0.8	b/	
2001	1.85	26.75	13.31	9.64	88.5	9.5	b/	1.0	0.2	b/	0.6	
2002	1.65	23.83	12.79	9.95	100.0	b/	b/	b/	b/	b/	b/	
Nonpareil												
1997	1.67	21.05	12.29	9.09	94.3	3.4	b/	1.9	b/	0.1	0.2	
1998	1.90	24.61	14.22	10.30	97.8	2.1	b/	b/	b/	b/	b/	
1999	1.51	23.85	13.77	10.39	95.6	3.3	b/	1.0	b/	b/	0.1	
2000	1.83	24.55	14.23	10.24	96.7	1.6	b/	1.3	0.2	0.1	0.1	
2001	1.73	24.97	13.52	9.82	96.9	1.3	b/	1.3	0.1	0.1	0.2	
2002	1.50	22.59	12.91	9.79	97.9	1.3	b/	0.5	b/	b/	0.1	

^{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

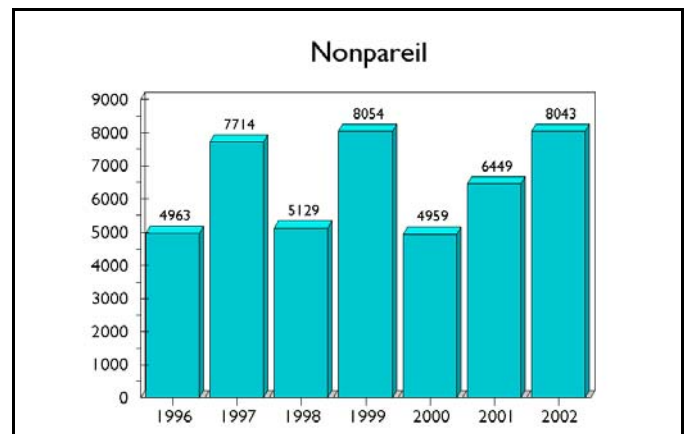
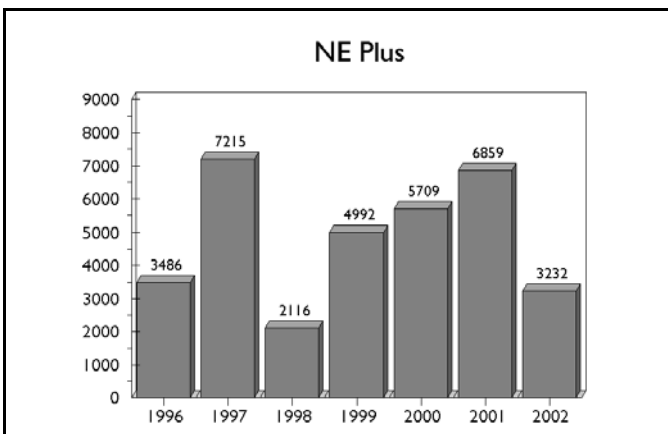
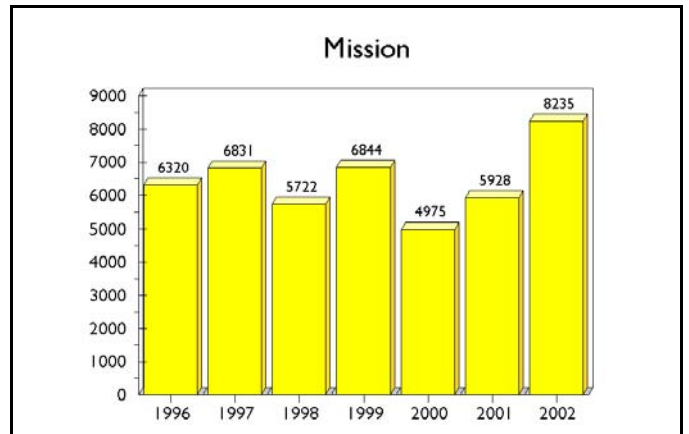
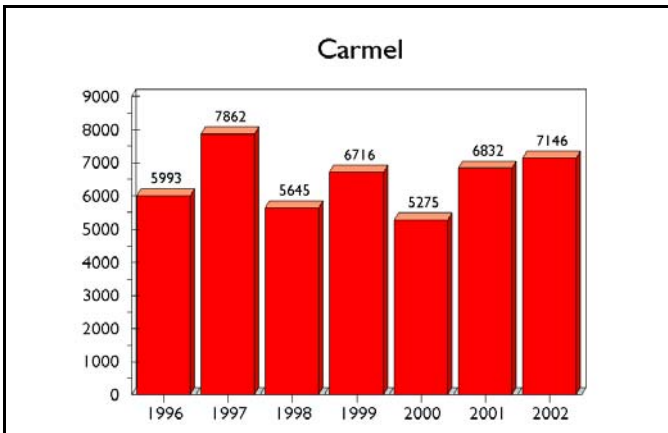
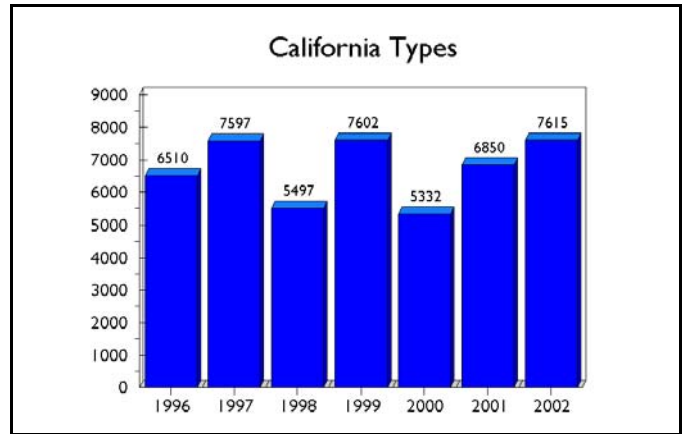
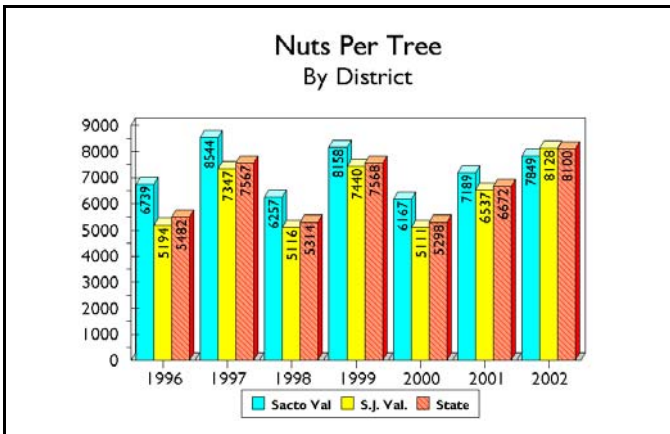


TABLE 3: CALIFORNIA ALMOND ACREAGE, PRODUCTION AND TREES PER ACRE, 1980-02

Year	Bearing Acres <u>1/</u>	Total Meat Production			Average Trees Per Acre
		Metric Tons <u>2/</u>	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	413,000	222,000	490	1,190	92.0
1994	433,000	333,000	735	1,700	92.6
1995	418,000	168,000	370	885	93.7
1996	428,000	231,000	510	1,190	94.4
1997	442,000	344,000	759	1,720	95.5
1998	460,000	236,000	520	1,130	96.3
1999	480,000	378,000	833	1,740	97.3
2000	500,000	319,000	703	1,410	99.0
2001	525,000	376,000	830	1,580	100.0
2002	530,000	445,000	980	1,850	101.0

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

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