

# 2004 California Almond Objective Measurement Report



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CALIFORNIA AGRICULTURAL  
STATISTICS SERVICE

## 2004 CALIFORNIA ALMOND FORECAST

California's 2004 almond production is forecast at 1.08 billion meat pounds, down 2 percent from May's subjective forecast, but up 4 percent from last year's crop. The forecast is based on 550 thousand bearing acres. Production for the Nonpareil variety is forecast at 390 million meat pounds, up 3 percent from last year's deliveries. The Nonpareil variety represents 36 percent of California's total almond production.

The almond bloom started in mid-February, but growers thought the heavy rain and wind would affect bee activity and pollination. However, the bloom was very intense with both the variety and pollinators blooming together, which may have helped the set. The bloom was strong and stayed on the trees for much longer than normal. This may have been because of the cool, damp weather. Even the strong winds and heavy rain in late February didn't appear to affect the set. Very warm weather the first three weeks of March advanced crop development and the crop is currently ten days to two weeks ahead of normal. The kernel size appears to be about normal. The younger trees seem to have a very good set. Overall, the crop appears to be fairly uniform throughout the State and growers expect to have a good crop.

The average nut set per tree is 7,162, up 2 percent from 2003. The Nonpareil average nut set of 6,676 represents a 9 percent increase from last year's set. The average kernel weight for all varieties sampled was 1.45 grams, down 13 percent from last year. A total 98.4 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 26 and sampling was completed by June 18. There were 1,498 trees sampled for the 2004 survey in 749 orchards. An additional 184 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 1.02 billion meat pounds to 1.14 billion 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	1999		2000		2001		2002		2003		2004	
	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
<b>ALL DISTRICTS</b> (All Varieties)	7,568	838	5,298	686	6,672	798	8,100	786	7,002	777	7,162	749
<b>BY DISTRICTS</b>												
District I												
Sacramento Valley	8,158	188	6,167	126	7,189	165	7,849	141	7,648	149	6,527	131
District II												
San Joaquin Valley	7,440	645	5,111	559	6,537	633	8,128	645	6,849	628	7,290	618
<b>BY VARIETIES</b>												
Butte <sup>1/</sup>	---	---	---	---	---	---	8,741	99	8,904	110	8,788	112
California Types <sup>2/</sup>	7,602	167	5,332	140	6,850	167	7,615	177	6,815	183	6,665	172
Carmel <sup>3/</sup>	6,716	99	5,275	84	6,832	99	7,146	99	6,727	97	6,380	90
Mission	6,844	58	4,975	31	5,928	41	8,235	29	8,055	28	6,719	26
Nonpareil	8,054	403	4,959	359	6,449	386	8,043	373	6,110	358	6,676	335
Padre <sup>1/</sup>	---	---	---	---	---	---	8,268	48	9,729	57	9,414	54

<sup>1/</sup> Butte and Padre variety breakdowns were initiated in 2002.

<sup>2/</sup> 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.

<sup>3/</sup> Carmel variety is also included in California Types.

**TABLE 2: WEIGHT, SIZE AND GRADE OF AVERAGE ALMOND SAMPLE, 1999-2004**

District and Variety	Kernel Weight (Grams)	Kernel Size (Millimeters)			Grade (Percent of Nuts) a/							
		Length	Width	Thickness	Edible Nuts		Insect Damage	Shriveled	Natural Gum	Blank	Other	
					Singles	Doubles						
<b>ALL DISTRICTS</b>												
1999	1.47	23.21	13.57	10.64	93.4	5.7	b/	0.8	b/	b/	b/	0.1
2000	1.69	23.55	13.63	10.24	95.8	2.4	b/	1.4	0.2	0.1	b/	0.1
2001	1.60	23.90	12.87	9.89	95.0	3.1	b/	1.4	0.1	b/	b/	0.2
2002	1.41	21.54	12.52	9.86	96.8	2.1	b/	0.7	b/	b/	b/	0.2
2003	1.67	22.24	13.30	10.47	94.6	3.0	b/	1.8	0.2	b/	b/	0.4
2004	1.45	22.44	12.34	9.72	95.2	3.2	b/	1.3	0.1	b/	b/	0.1
<b>BY DISTRICT</b>												
<b>Sacramento Valley c/</b>												
1999	1.42	22.82	12.55	9.33	93.6	5.5	b/	0.7	b/	b/	b/	0.3
2000	1.65	24.11	13.48	10.02	93.5	3.5	b/	1.8	0.6	0.2	b/	0.5
2001	1.61	24.37	13.05	9.68	94.4	3.4	b/	1.1	0.1	b/	b/	1.0
2002	1.47	22.65	12.77	9.90	96.0	2.2	b/	0.9	b/	b/	b/	0.8
2003	1.76	23.21	13.85	10.77	93.2	3.0	b/	2.1	0.3	b/	b/	1.3
2004	1.52	23.62	12.42	9.66	94.3	3.8	b/	1.1	0.1	b/	b/	0.7
<b>San Joaquin Valley d/</b>												
1999	1.49	23.34	13.90	11.06	93.3	5.8	b/	0.8	b/	b/	b/	b/
2000	1.70	23.40	13.68	10.30	96.4	2.1	b/	1.3	0.1	0.1	b/	b/
2001	1.60	23.75	12.82	9.96	95.2	3.0	b/	1.5	0.1	b/	b/	b/
2002	1.39	21.22	12.45	9.84	97.0	2.1	b/	0.7	b/	b/	b/	0.1
2003	1.64	21.92	13.12	10.37	95.1	3.0	b/	1.7	0.1	b/	b/	b/
2004	1.44	22.17	12.32	9.74	95.4	3.0	b/	1.3	0.1	b/	b/	b/
<b>BY VARIETY</b>												
<b>Butte e/</b>												
2002	1.23	18.99	12.14	10.03	95.8	2.9	b/	0.7	b/	b/	b/	0.4
2003	1.41	19.67	12.55	10.49	93.5	3.5	b/	2.5	0.2	b/	b/	0.3
2004	1.22	19.98	11.66	9.76	100.0	b/	b/	b/	b/	b/	b/	b/
<b>California Types f/</b>												
1999	1.41	22.68	12.75	10.58	89.3	9.8	b/	0.6	b/	b/	b/	b/
2000	1.54	23.02	12.84	10.09	94.8	3.6	b/	1.4	0.1	0.2	b/	0.1
2001	1.57	24.45	12.24	9.97	92.6	5.3	b/	1.6	b/	b/	b/	0.3
2002	1.41	21.88	12.08	9.82	94.8	3.7	b/	0.9	0.1	b/	b/	0.4
2003	1.62	22.71	12.68	10.21	94.2	4.1	b/	1.4	0.2	b/	b/	0.1
2004	1.50	23.15	12.20	9.74	95.9	2.3	b/	1.5	0.2	b/	b/	b/
<b>Carmel g/</b>												
1999	1.53	24.70	13.95	11.59	90.6	9.0	b/	0.2	b/	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/	b/
2001	1.53	24.74	12.03	9.83	94.8	3.7	b/	1.2	b/	b/	b/	0.2
2002	1.39	22.20	11.96	9.64	96.6	2.6	b/	0.5	0.1	0.1	b/	0.1
2003	1.59	23.00	12.46	9.97	95.8	3.3	b/	0.9	b/	b/	b/	b/
2004	1.49	24.01	11.83	9.62	95.6	3.2	0.2	0.9	b/	b/	b/	0.1
<b>Mission</b>												
1999	1.34	20.04	12.82	10.71	91.6	7.7	b/	0.7	b/	b/	b/	b/
2000	1.45	20.17	13.04	10.92	90.4	7.6	b/	1.5	0.2	b/	b/	0.2
2001	1.43	21.84	12.42	10.27	92.6	5.3	b/	1.4	0.3	b/	b/	0.3
2002	1.18	18.72	12.08	9.95	98.1	0.5	b/	0.5	0.1	b/	b/	0.8
2003	1.64	20.39	13.42	10.97	93.4	5.1	b/	0.3	0.4	b/	b/	0.9
2004	1.42	19.97	12.26	10.48	90.4	7.8	b/	0.9	0.5	b/	b/	0.3
<b>Nonpareil</b>												
1999	1.51	23.85	13.77	10.39	95.6	3.3	b/	1.0	b/	b/	b/	0.1
2000	1.83	24.55	14.23	10.24	96.7	1.6	b/	1.3	0.2	0.1	b/	0.1
2001	1.73	24.97	13.52	9.82	96.9	1.3	b/	1.3	0.1	0.1	b/	0.2
2002	1.50	22.59	12.91	9.79	97.9	1.3	b/	0.5	b/	b/	b/	0.1
2003	1.85	23.90	14.09	10.42	96.1	1.6	b/	1.7	0.2	b/	b/	0.4
2004	1.58	23.70	12.95	9.66	96.2	2.2	b/	1.3	0.1	b/	b/	0.2
<b>Padre e/</b>												
2002	1.25	18.70	12.15	10.34	97.2	1.5	b/	1.1	b/	0.1	b/	0.1
2003	1.47	19.26	12.65	11.00	93.8	3.0	b/	3.1	0.1	b/	b/	0.1
2004	1.20	19.38	11.65	9.92	96.4	2.0	b/	1.3	0.3	b/	b/	0.1

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

b/ Not shown if less than 0.07 percent.

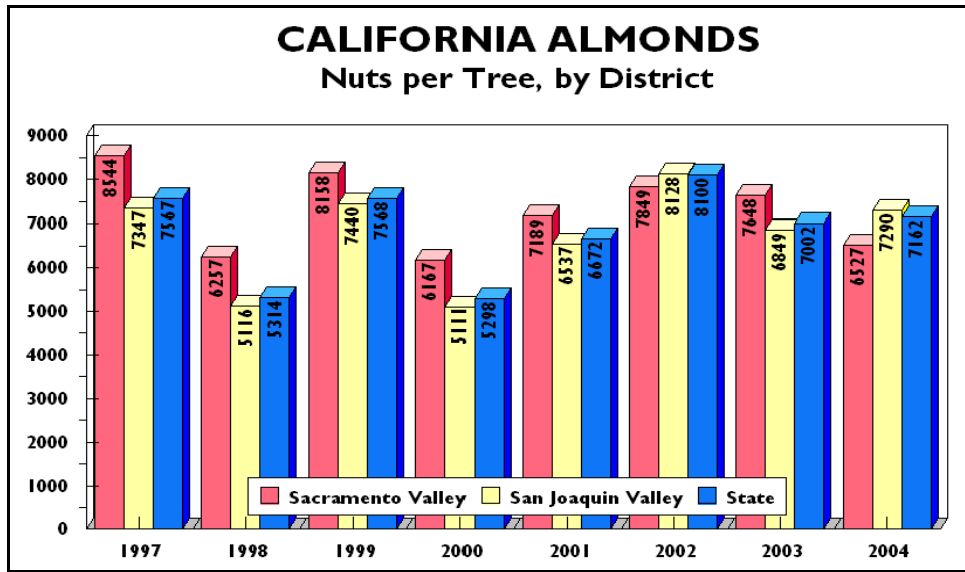
c/ Sacramento Valley includes these counties: Butte, Colusa, Glenn, Solano, Sutter, Tehama, Yolo and Yuba.

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

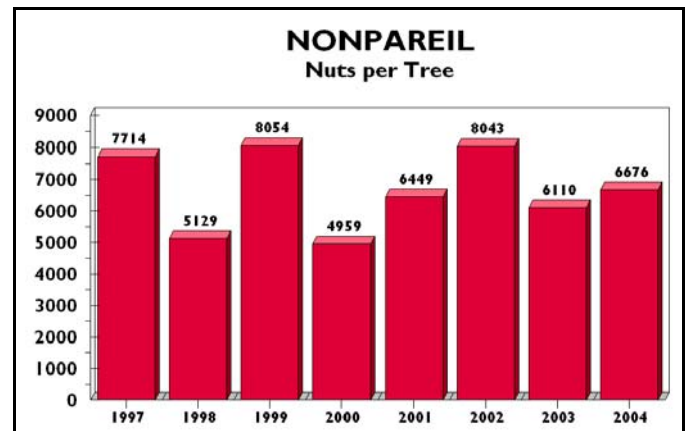
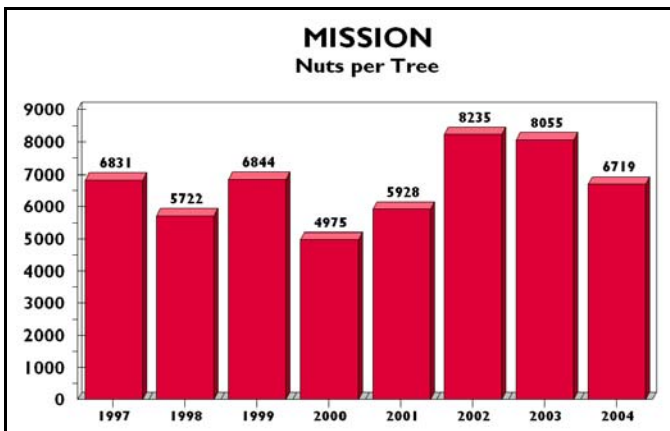
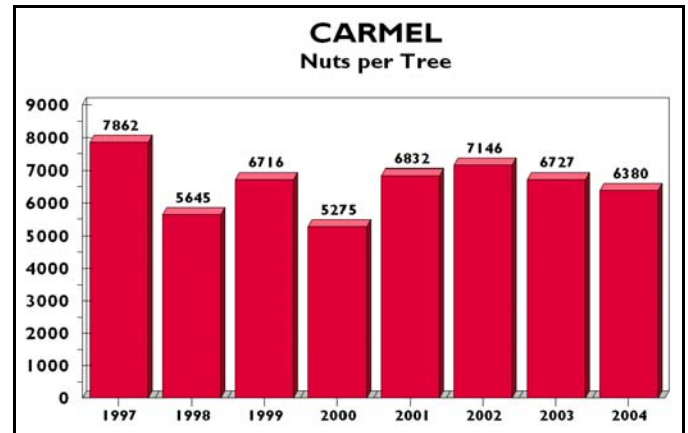
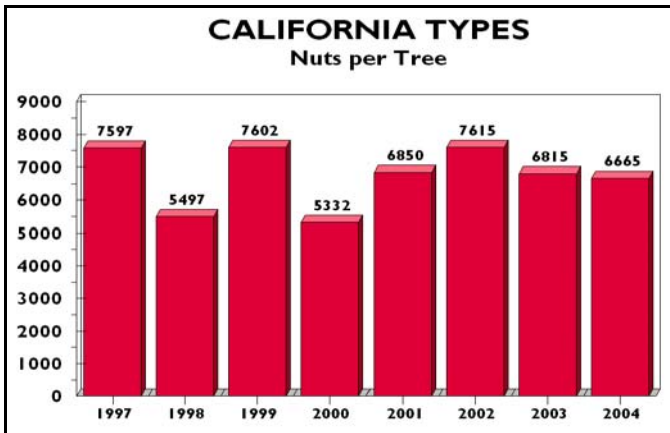
e/ Butte and Padre variety breakdowns were initiated in 2002.

f/ 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.

g/ Carmel variety is also included in California Types.



### ALMONDS BY VARIETY



**TABLE 3: CALIFORNIA ALMOND ACREAGE, PRODUCTION AND TREES PER ACRE, 1980-2004**

Year	Bearing Acres <sup>1/</sup>	Total Meat Production			Average Trees Per Acre
		Metric Tons <sup>2/</sup>	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	485,000	378,000	833	1,720	97.3
2000	510,000	319,000	703	1,380	99.0
2001	530,000	376,000	830	1,570	101.0
2002	545,000	494,000	1,090	2,000	101.0
2003	550,000	472,000	1,040	1,890	103.0
2004	550,000	490,000	1,080	1,960	103.0

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

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

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