



United States Department of Agriculture  
National Agricultural Statistics Service



# 2008 California Almond Objective Measurement Report

Cooperating with the California Department of Food and Agriculture

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## 2008 CALIFORNIA ALMOND FORECAST UP

California's 2008 almond production is forecast at a record 1.50 billion meat pounds, up 3 percent from May's subjective forecast and 8 percent above last year's crop. The forecast is based on 660 thousand bearing acres. Production for the Nonpareil variety is forecast at 538 million meat pounds, 3 percent above last year's deliveries. The Nonpareil variety represents 36 percent of California's total almond production.

The California 2008 almond set is very strong, and a record high yield per acre and production is forecast. This year's bloom arrived three weeks later than normal, but was nearly perfect. It progressed quickly, lasting only 10 days as opposed to the average three weeks. Overlapping bloom between varieties was outstanding, resulting in good cross-pollination, and there was an adequate supply of bees to pollinate the crop. Almond tree limbs in many locations are bowing under the weight of the heavy crop.

The average nut set per tree is 7,452, less than 1 percent above 2007. The Nonpareil average nut set of 7,079 is up less than 1 percent from last year's set. The average kernel weight for all varieties sampled was 1.43 grams, 3 percent below last year. A total 99 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 29 and sampling was completed by June 22. There were 1,632 trees sampled for the 2008 survey in 816 orchards. Additional 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) Grower would not grant permission or could not be contacted.

The Objective Measurement Survey is funded by the Almond Board of California.

## DATA RELIABILITY

The 80 percent confidence interval is from 1,372 million meat pounds to 1,628 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, 2003-2008

District and Variety	2003		2004		2005		2006		2007		2008	
	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)	7,002	777	7,162	749	5,461	838	6,723	834	7,413	865	7,452	816
<b>BY DISTRICTS</b>												
<u>District I</u>												
Sacramento Valley	7,648	149	6,527	131	6,326	142	6,888	151	7,758	135	8,157	112
<u>District II</u>												
San Joaquin Valley	6,849	628	7,290	618	5,262	696	6,710	683	7,350	730	7,340	704
<b>BY VARIETIES</b>												
Butte	8,904	110	8,788	112	7,471	112	7,624	110	7,866	109	8,038	106
California Types 1/	6,815	183	6,665	172	5,275	262	5,945	268	7,633	285	7,458	273
Carmel 2/	6,727	97	6,380	90	4,698	144	5,415	149	7,159	161	7,259	149
Mission	8,055	28	6,719	26	6,410	19	6,667	21	7,391	16	8,901	12
Nonpareil	6,110	358	6,676	335	4,650	347	6,848	340	7,067	370	7,079	344
Padre	9,729	57	9,414	54	7,127	52	7,801	52	8,000	59	9,195	57

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 variety is also included in California Types.

**TABLE 2: WEIGHT, SIZE AND GRADE OF AVERAGE ALMOND SAMPLE, 2003-2008**

District and Variety	Kernel Weight (Grams)	Kernel Size (Millimeters)			Grade (Percent of Nuts) <sup>a/</sup>							
					Edible Nuts		Insect Damage	Shrivel	Natural Gum	Blank	Other	
		Length	Width	Thickness	Singles	Doubles						
<b>ALL DISTRICTS</b>												
2003	1.67	22.24	13.30	10.47	94.6	3.0	b/	1.8	0.2	b/	0.4	
2004	1.45	22.44	12.34	9.72	95.2	3.2	b/	1.3	0.1	b/	0.1	
2005	1.79	23.73	13.35	10.45	95.0	2.7	b/	1.9	0.1	b/	0.3	
2006	1.57	21.64	12.91	10.31	92.0	5.3	b/	1.9	0.1	b/	0.5	
2007	1.47	21.81	12.39	9.96	94.6	3.9	b/	1.2	0.2	b/	0.2	
2008	1.43	21.59	12.30	9.66	96.2	2.8	b/	0.6	0.1	0.2	0.1	
<b>BY DISTRICT</b>							b/					
<b>Sacramento Valley <sup>c/</sup></b>							b/					
2003	1.76	23.21	13.85	10.77	93.2	3.0	b/	2.1	0.3	b/	1.3	
2004	1.52	23.62	12.42	9.66	94.3	3.8	b/	1.1	0.1	b/	0.7	
2005	1.82	24.63	13.75	10.73	94.5	2.7	b/	1.5	b/	b/	1.1	
2006	1.55	22.30	13.24	10.39	87.1	8.0	b/	1.9	0.2	b/	2.8	
2007	1.59	22.97	13.26	10.34	93.4	4.5	b/	0.7	0.2	b/	1.2	
2008	1.43	22.52	12.80	9.69	95.1	3.6	b/	0.8	0.1	b/	0.5	
<b>San Joaquin Valley <sup>d/</sup></b>							b/					
2003	1.64	21.92	13.12	10.37	95.1	3.0	b/	1.7	0.1	b/	b/	
2004	1.44	22.17	12.32	9.74	95.4	3.0	b/	1.3	0.1	b/	b/	
2005	1.78	23.46	13.23	10.37	95.1	2.6	b/	2.1	0.1	b/	b/	
2006	1.58	21.49	12.84	10.29	93.1	4.8	b/	1.9	0.1	b/	b/	
2007	1.44	21.58	12.22	9.89	94.8	3.8	b/	1.3	0.2	b/	b/	
2008	1.43	21.41	12.21	9.66	96.4	2.6	b/	0.5	0.1	0.3	b/	
<b>BY VARIETY</b>							b/					
<b>Butte</b>							b/					
2003	1.41	19.67	12.55	10.49	93.5	3.5	b/	2.5	0.2	b/	0.3	
2004	1.22	19.98	11.66	9.76	100.0	b/	b/	b/	b/	b/	b/	
2005	1.47	20.79	12.62	10.45	95.6	2.5	b/	1.7	b/	b/	0.2	
2006	1.32	19.08	12.37	10.26	93.9	4.9	b/	0.9	b/	b/	0.2	
2007	1.22	19.18	11.74	9.87	94.8	4.2	b/	0.7	b/	b/	0.3	
2008	1.21	18.72	11.76	9.70	95.5	3.6	b/	0.6	b/	0.3	b/	
<b>California Types <sup>e/</sup></b>							b/					
2003	1.62	22.71	12.68	10.21	94.2	4.1	b/	1.4	0.2	b/	0.1	
2004	1.50	23.15	12.20	9.74	95.9	2.3	b/	1.5	0.2	b/	b/	
2005	1.77	23.90	13.07	10.45	92.9	5.6	b/	1.4	b/	b/	b/	
2006	1.60	21.75	12.74	10.42	87.6	9.9	b/	2.0	b/	b/	0.5	
2007	1.44	22.20	11.85	9.88	93.3	5.0	b/	1.2	0.2	b/	0.2	
2008	1.41	22.14	11.79	9.60	95.6	3.5	b/	0.4	0.1	0.3	b/	
<b>Carmel <sup>f/</sup></b>							b/					
2003	1.59	23.00	12.46	9.97	95.8	3.3	b/	0.9	b/	b/	b/	
2004	1.49	24.01	11.83	9.62	95.6	3.2	0.2	0.9	b/	b/	0.1	
2005	1.83	25.65	12.74	10.19	94.0	3.9	b/	1.6	0.4	b/	0.1	
2006	1.59	23.12	12.38	10.06	90.6	7.0	b/	1.8	0.3	b/	0.3	
2007	1.47	22.78	11.74	9.86	93.5	4.8	b/	1.4	0.2	b/	b/	
2008	1.43	22.75	11.79	9.63	96.1	3.1	b/	0.6	b/	0.1	b/	
<b>Mission</b>							b/					
2003	1.64	20.39	13.42	10.97	93.4	5.1	b/	0.3	0.4	b/	0.9	
2004	1.42	19.97	12.26	10.48	90.4	7.8	b/	0.9	0.5	b/	0.3	
2005	1.63	20.78	13.29	11.16	94.0	2.2	b/	3.2	0.2	b/	0.4	
2006	1.53	19.30	13.56	11.23	92.9	5.4	b/	1.7	b/	b/	b/	
2007	1.33	19.41	12.44	10.43	96.0	3.5	b/	0.6	b/	b/	b/	
2008	1.32	18.81	12.19	9.99	95.8	2.7	b/	b/	0.3	0.9	0.4	
<b>Nonpareil</b>							b/					
2003	1.85	23.90	14.09	10.42	96.1	1.6	b/	1.7	0.2	b/	0.4	
2004	1.58	23.70	12.95	9.66	96.2	2.2	b/	1.3	0.1	b/	0.2	
2005	1.99	25.23	14.13	10.43	95.5	1.5	b/	2.4	b/	b/	0.5	
2006	1.68	22.45	13.39	10.30	92.8	3.8	b/	2.5	0.1	b/	0.8	
2007	1.61	22.87	13.17	10.06	95.3	3.2	b/	1.1	0.1	b/	0.2	
2008	1.55	22.68	13.02	9.68	96.9	2.1	b/	0.7	b/	0.1	0.1	
<b>Padre</b>							b/					
2003	1.47	19.26	12.65	11.00	93.8	3.0	b/	3.1	0.1	b/	0.1	
2004	1.20	19.38	11.65	9.92	96.4	2.0	b/	1.3	0.3	b/	0.1	
2005	1.60	20.96	13.10	10.92	96.5	1.3	b/	2.0	b/	b/	b/	
2006	1.34	18.82	12.37	10.49	95.1	2.8	b/	1.6	0.3	0.1	b/	
2007	1.22	19.03	11.61	9.98	95.3	2.2	b/	2.1	0.3	b/	0.1	
2008	1.23	18.86	11.64	9.84	97.3	1.4	b/	0.8	0.2	0.2	b/	

<sup>a/</sup> Percentages may not add to 100 due to rounding.

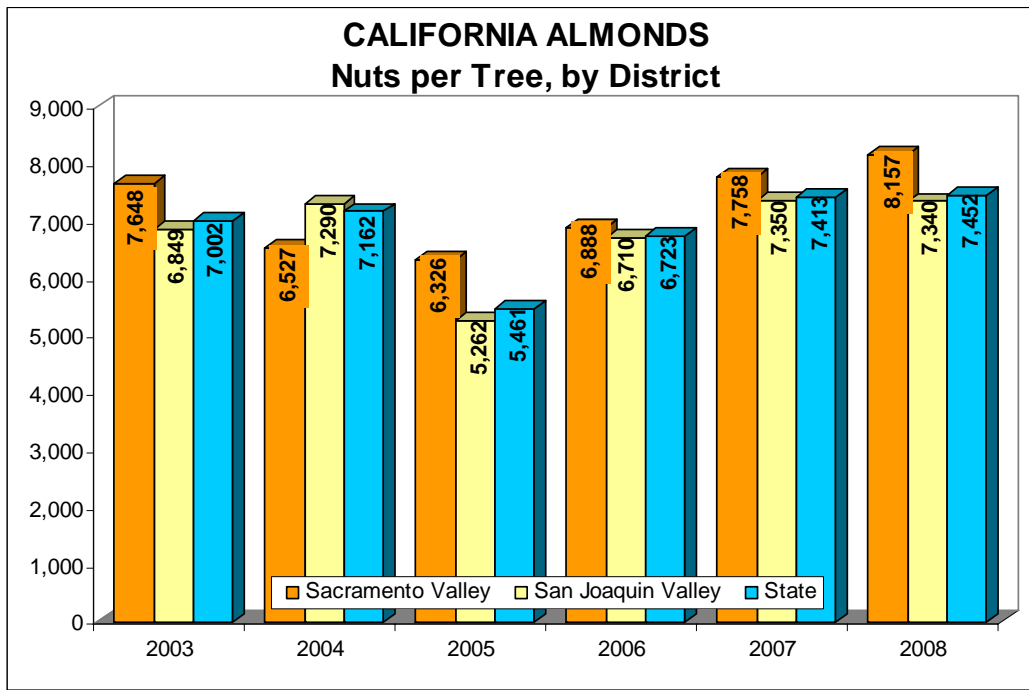
<sup>b/</sup> Not shown if less than 0.07 percent.

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

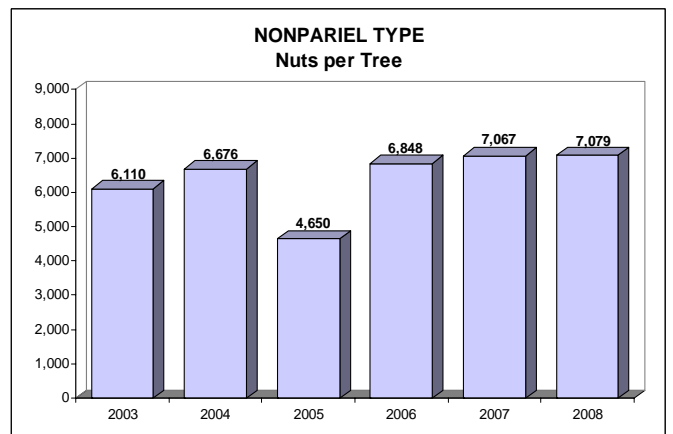
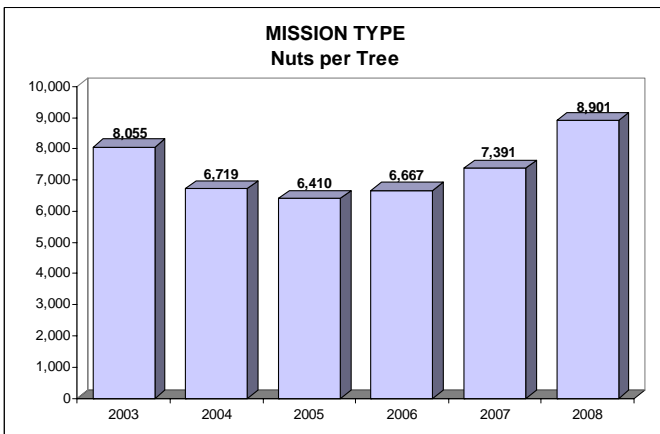
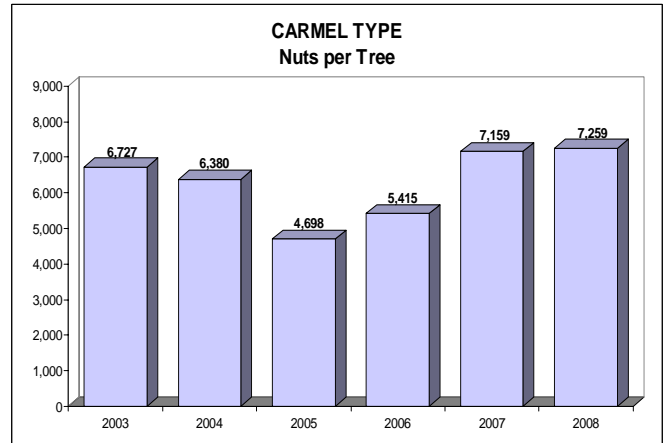
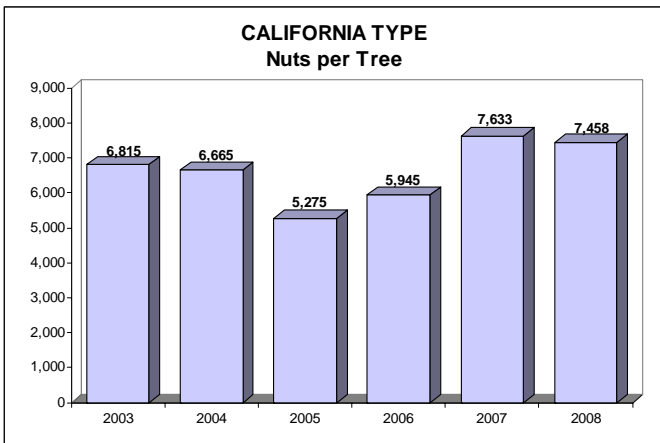
<sup>d/</sup> San Joaquin Valley includes these counties: Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus and Tulare.

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



### ALMONDS BY VARIETY



**TABLE 3: CALIFORNIA ALMOND ACREAGE, PRODUCTION AND TREES PER ACRE, 1981-2008**

Year	Bearing Acres <u>1/</u>	Total Meat Production			Average Trees Per Acre
		Metric Tons <u>2/</u>	Million Lbs.	Lbs. Per Acre	
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	570,000	456,000	1,005	1,760	103.0
2005	580,000	415,000	915	1,580	104.0
2006	585,000	508,000	1,120	1,910	105.0
2007	615,000	630,000	1,390	2,260	105.0
2008	660,000	680,000	1,500	2,270	107.0

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

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