United States Department of Agriculture
National Agricultural Statistics Service

2011 California Almond Objective Measurement Report

Cooperating with the California Department of Food and Agriculture

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2011 CALIFORNIA ALMOND FORECAST UP

California's 2011 almond production is forecast at a record 1.95 billion meat pounds, up 11 percent from May's subjective forecast and 19 percent above last year's crop. The forecast is based on 750 thousand bearing acres. Production for the Nonpareil variety is forecast at 750 million meat pounds, 35 percent above last year's deliveries. The Nonpareil variety represents 38 percent of California's total almond production.

After a good winter with excellent chilling hours, the 2011 almond crop bloom began. A cold spring lengthened the bloom, causing more overlap between varieties. Cold weather can affect bee activity, but the bees came through this year and the 2011 California almonds set an excellent crop. Freezing temperatures did affect the northern regions more heavily than the south, but frost damage was insignificant. Older plantings suffered some damage from the strong winds that accompanied the spring storms, but overall damage was minimal. Spotty damage from hail was also noted. Low disease and insect pressure have been reported and, with all the precipitation California has seen this winter, lack of water for irrigation is not the problem it was a few years ago. Normal levels of shed have been reported. The crop in general is said to be good with heavy sets noted on several varieties.

The average nut set per tree is 7,353, up 23 percent from 2010. The Nonpareil average nut set of 7,482 is up 34 percent from last year's set. The average kernel weight for all varieties sampled was 1.49 grams, 13 percent below last year. The Nonpareil average kernel weight was 1.60, down 15 percent from last year. A total of 98.7 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 June 6 and sampling was completed by June 25. There were 1,714 trees sampled for the 2011 survey in 857 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 1,758 million meat pounds to 2,142 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, 2006-2011

District and Variety	2006		2007		2008		2009		2010		2011	
	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)	6,723	834	7,413	865	7,452	816	5,589	852	5,956	816	7,353	857
BY DISTRICTS												
District I												
Sacramento Valley	6,888	151	7,758	135	8,157	112	6,737	120	6,783	122	7,561	111
District II												
San Joaquin Valley	6,710	683	7,350	730	7,340	704	5,400	732	5,810	694	7,322	746
BY VARIETIES												
Butte	7,624	110	7,866	109	8,038	106	7,505	108	6,562	114	8,666	121
California Types 1/	5,945	268	7,633	285	7,458	273	5,302	284	6,023	263	6,535	283
Carmel 2/	5,415	149	7,159	161	7,259	149	5,129	141	5,442	134	6,256	132
Mission	6,667	21	7,391	16	8,901	12	5,578	10	5,263	8	7,376	6
Nonpareil	6,848	340	7,067	370	7,079	344	5,136	360	5,583	346	7,482	353
Padre	7,801	52	8,000	59	9,195	57	6,791	63	6,476	65	8,521	72

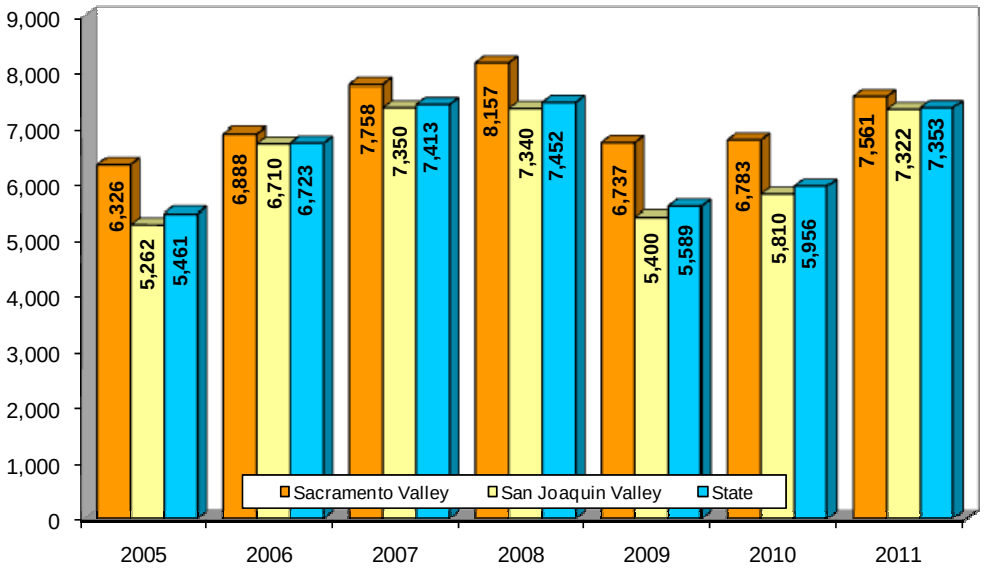
1/ For survey purposes, the California classification includes the following varieties: Aldrich, Ballico, Carmel, Davey, Fritz, Harvey, Le Grand, Mono, Monterey, Norman, Price Cluster, Ruby, Tokoyo and Yosemite.
2/ Carmel variety is also included in California Types.

TABLE 2: WEIGHT, SIZE AND GRADE OF AVERAGE ALMOND SAMPLE, 2006-2011

District and Variety	Kernel Weight (Grams)	Kernel Size (Millimeters)			Grade (Percent of Nuts) 1/						
					Edible Nuts		Insect Damage	Shrivel	Natural Gum	Blank	Other
		Length	Width	Thickness	Singles	Doubles					
ALL DISTRICTS											
2006	1.57	21.64	12.91	10.31	92.0	5.3	2/	1.9	0.1	2/	0.5
2007	1.47	21.81	12.39	9.96	94.6	3.9	2/	1.2	0.2	2/	0.2
2008	1.43	21.60	12.30	9.66	96.2	2.8	2/	0.6	0.1	0.2	0.1
2009	1.58	22.96	13.10	9.93	97.1	1.8	2/	0.7	0.2	0.1	0.1
2010	1.72	23.38	13.20	10.30	94.7	4.0	2/	1.0	2/	0.1	0.1
2011	1.49	21.84	12.52	9.92	94.6	4.1	2/	0.8	0.1	0.2	0.2
BY DISTRICT											
Sacramento Valley 3/											
2006	1.55	22.30	13.24	10.39	87.1	8.0	2/	1.9	0.2	2/	2.8
2007	1.59	22.97	13.26	10.34	93.4	4.5	2/	0.7	0.2	2/	1.2
2008	1.43	22.52	12.80	9.69	95.1	3.6	2/	0.8	0.1	2/	0.5
2009	1.65	22.90	13.63	10.16	97.4	1.2	2/	0.5	0.1	2/	0.8
2010	1.75	23.86	13.44	10.23	93.7	4.5	2/	1.1	2/	2/	0.7
2011	1.60	22.73	13.33	10.02	92.1	6.2	2/	0.6	2/	2/	1.1
San Joaquin Valley 4/											
2006	1.58	21.49	12.84	10.29	98.1	4.8	2/	1.9	0.1	2/	2/
2007	1.44	21.58	12.22	9.89	94.8	3.8	2/	1.3	0.2	2/	2/
2008	1.43	21.41	12.21	9.66	96.4	2.6	2/	0.5	0.1	0.3	2/
2009	1.57	22.98	13.00	9.89	97.0	1.9	2/	0.7	0.2	0.1	2/
2010	1.71	23.28	13.15	10.31	94.9	3.9	2/	1.0	2/	0.2	2/
2011	1.48	21.70	12.40	9.90	95.0	3.8	2/	0.8	0.1	0.2	0.1
BY VARIETY											
Butte											
2006	1.32	19.08	12.37	10.26	93.9	4.9	2/	0.9	2/	2/	0.2
2007	1.22	19.18	11.74	9.87	94.8	4.2	2/	0.7	2/	2/	0.3
2008	1.21	18.72	11.76	9.70	95.5	3.6	2/	0.6	2/	0.3	2/
2009	1.26	19.86	12.19	9.78	96.9	2.3	2/	0.6	0.1	2/	0.1
2010	1.43	20.54	12.39	10.15	94.2	4.3	2/	1.1	2/	0.1	0.1
2011	1.24	19.33	11.84	9.78	94.5	4.5	2/	0.7	2/	0.1	0.2
California Types 5/											
2006	1.60	21.75	12.74	10.42	87.6	9.9	2/	2.0	2/	2/	0.5
2007	1.44	22.20	11.85	9.88	93.3	5.0	2/	1.2	0.2	2/	0.2
2008	1.41	22.14	11.79	9.60	95.6	3.5	2/	0.4	0.1	0.3	2/
2009	1.62	24.12	12.77	9.85	96.7	2.4	2/	0.6	0.2	0.1	0.1
2010	1.71	24.08	12.73	10.34	93.2	5.9	2/	0.7	0.1	2/	0.1
2011	1.55	22.94	12.27	9.94	92.1	6.8	2/	0.6	0.1	0.2	0.2
Carmel 6/											
2006	1.59	23.12	12.38	10.06	90.6	7.0	2/	1.8	0.3	2/	0.3
2007	1.47	22.78	11.74	9.86	93.5	4.8	2/	1.4	0.2	2/	2/
2008	1.43	22.75	11.79	9.63	96.1	3.1	2/	0.6	2/	0.1	2/
2009	1.64	24.62	12.62	9.79	97.1	1.8	2/	0.7	0.1	0.1	2/
2010	1.70	24.56	12.57	10.20	94.8	4.2	2/	0.8	0.1	2/	0.1
2011	1.50	22.81	12.08	9.79	94.6	4.5	2/	0.7	2/	2/	2/
Mission											
2006	1.53	19.30	13.56	11.23	92.9	5.4	2/	1.7	2/	2/	2/
2007	1.33	19.41	12.44	10.43	96.0	3.5	2/	0.6	2/	2/	2/
2008	1.32	18.81	12.19	9.99	95.8	2.7	2/	2/	0.3	0.9	0.4
2009	1.43	20.68	13.04	10.36	97.4	0.7	2/	2/	0.5	1.1	0.5
2010	1.60	20.22	13.18	11.16	97.7	2.3	2/	2/	2/	2/	2/
2011	1.44	18.90	12.48	10.78	91.3	8.3	2/	0.4	2/	2/	2/
Nonpareil											
2006	1.68	22.45	13.39	10.30	92.8	3.8	2/	2.5	0.1	2/	0.8
2007	1.61	22.87	13.17	10.06	95.3	3.2	2/	1.1	0.1	2/	0.2
2008	1.55	22.68	13.02	9.68	96.9	2.1	2/	0.7	2/	0.1	0.1
2009	1.74	23.97	13.93	10.03	97.5	1.3	2/	0.7	0.2	0.1	0.2
2010	1.89	24.49	14.02	10.29	95.8	2.5	2/	1.3	2/	0.2	0.2
2011	1.60	22.75	13.12	9.95	96.1	2.4	2/	1.0	0.1	0.2	0.3
Padre											
2006	1.34	18.82	12.37	10.49	95.1	2.8	2/	1.6	0.3	0.1	2/
2007	1.22	19.03	11.61	9.98	95.3	2.2	2/	2.1	0.3	2/	0.1
2008	1.23	18.86	11.64	9.84	97.3	1.4	2/	0.8	0.2	0.2	2/
2009	1.32	20.09	12.24	10.08	96.6	1.6	2/	1.4	0.2	2/	0.2
2010	1.49	20.65	12.73	10.55	96.3	2.1	2/	1.2	2/	0.4	2/
2011	1.25	18.94	11.85	9.90	97.3	1.9	2/	0.7	2/	2/	2/

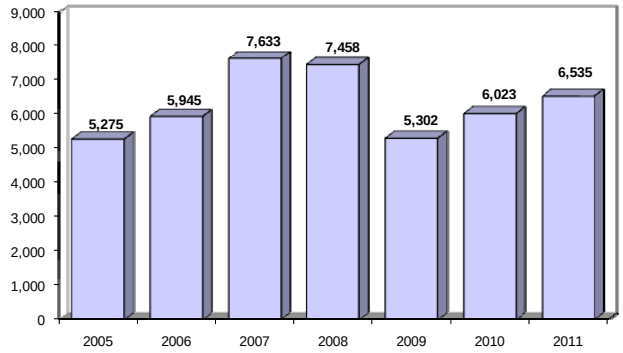
1/ Percentages may not add to 100 due to rounding.
2/ Not shown if less than 0.07 percent.
3/ Sacramento Valley includes these counties: Butte, Colusa, Glenn, Solano, Sutter, Tehama, Yolo and Yuba.
4/ San Joaquin Valley includes these counties: Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus and Tulare.
5/ 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.
6/ Carmel variety is also included in California Types.

CALIFORNIA ALMONDS
Nuts per Tree, by District

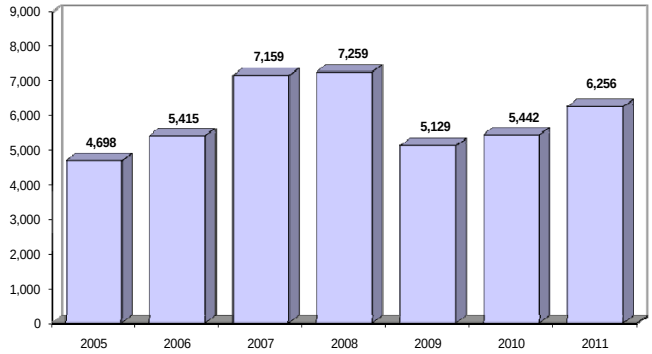


ALMONDS BY VARIETY

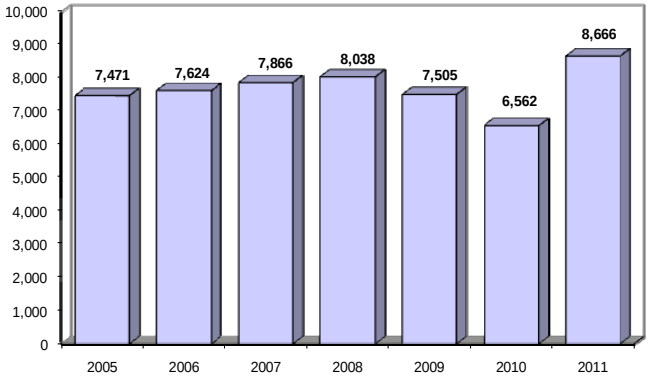
CALIFORNIA TYPE
Nuts per Tree



CARMEL TYPE
Nuts per Tree



BUTTE TYPE
Nuts per Tree



NONPAREIL TYPE
Nuts per Tree

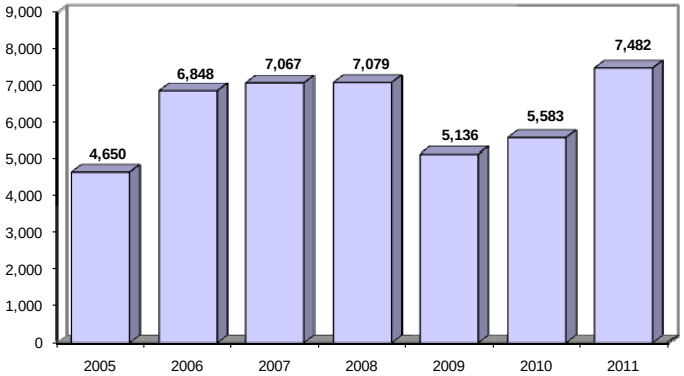


TABLE 3: CALIFORNIA ALMOND ACREAGE, PRODUCTION AND TREES PER ACRE, 1982-2011

Year	Bearing Acres 1/	Total Meat Production			Acreage
		Metric Tons 2/	Million Lbs.	Lbs. Per Acre	Trees Per Acre
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	590,000	415,000	915	1,550	104.0
2006	610,000	508,000	1,120	1,840	105.0
2007	640,000	630,000	1,390	2,170	105.0
2008	680,000	739,000	1,630	2,400	107.0
2009	720,000	640,000	1,410	1,960	108.0
2010	740,000	744,000	1,640	2,220	108.0
2011	750,000	885,000	1,950	2,600	111.0

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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