

# United States Department of Agriculture National Agricultural Statistics Service

# 2017 California Almond Objective Measurement Report

### Cooperating with the California Department of Food and Agriculture

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#### 2017 CALIFORNIA ALMOND FORECAST UP 5.1 PERCENT

California's 2017 almond production is forecast at 2.25 billion meat pounds, up 2.3 percent from May's subjective forecast and up 5.1 percent from last year's crop. The forecast is based on 1 million bearing acres. Production for the Nonpareil variety is forecast at 900 million meat pounds, up 10.7 percent from last year's deliveries. The Nonpareil variety represents 40 percent of California's total almond production.

The California almond bloom began in mid-February; chilling hours were described as adequate, but less than 2016. The 2017 bloom was an extended bloom, due to cold temperatures. Significant rains before and during bloom made application of dormant and bloom sprays more difficult. While all the rain complicated orchard work, the water was a welcome relief from years of drought. As nuts continued to develop, a heat wave in June caused growers to irrigate day and night. Reports indicate that the heat wave did not cause much damage to the trees; irrigation helped keep trees from getting stressed. Hull split sprays will begin soon, however some growers may spray a little later as the crop seems to be maturing slower than normal. Mites have not been reported as an issue this year, so far. Report of disease pressure in almonds also remains light.

The average nut set per tree is 5,714, down 7.2 percent from 2016. The Nonpareil average nut set of 5,717 is up 2.4 percent from last year's set of 5,583. The average kernel weight for all varieties sampled was 1.57 grams, up 6.1 percent from the 2016 average weight of 1.48 grams. The Nonpareil average kernel weight was 1.70, up 3.0 percent from last year. A total of 98.3 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 23. There were 1,704 trees sampled for the 2017 survey in 852 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 2,090 million meat pounds to 2,410 million meat pounds. This means that the results of our sampling procedures will encompass the true mean 80 percent of the time.

TABLE 1: JUNE OBJECTIVE MEASUREMENT SURVEY COUNTS; COMPARISON OF NUT ESTIMATES AND ORCHARDS SAMPLED BY DISTRICT AND VARIETY, 2012-2017

	2012		2013		2014		2015		2016		2017	
District and Variety	Nuts per tree	Orchards sampled										
ALL DISTRICTS												
(All Varieties)	7,048	873	6,686	883	6,646	890	5,874	862	6,159	873	5,714	852
BY DISTRICTS												
District I												
Sacramento Valley	7,100	110	7,651	117	5,536	113	6,127	119	6,114	121	5,583	118
District II												
San Joaquin Valley	7,041	763	6,538	766	6,802	777	5,829	742	6,163	752	5,735	734
BY VARIETIES												
Butte	7,532	126	7,535	124	7,443	114	7,034	106	7,051	112	6,574	97
California Types 1/	6,845	286	6,744	291	6,718	291	5,737	283	6,114	311	5,216	306
Carmel 2/	6,583	125	6,571	121	6,962	114	5,714	103	5,849	105	5,456	95
Monterey 2/	6,222	105	6,311	112	5,910	114	5,333	119	5,739	136	4,655	137
Nonpareil	6,571	358	6,141	368	6,121	382	5,239	382	5,583	343	5,717	343
Padre	9,398	74	8,119	74	7,989	72	9,037	66	7,788	70	7,168	65

<sup>&</sup>lt;sup>1/</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, Sonora, Tokyo, and Yosemite.

<sup>&</sup>lt;sup>2/</sup> Carmel and Monterey varieties are also included in California Types.

TABLE 2: WEIGHT, SIZE AND GRADE OF AVERAGE ALMOND SAMPLE, 2012-2017

	FABLE 2: WE	:IGH1, 51	ZE AND	GRADE OF	AVERAGE	ALMOND					
D	Kernel	Kernel size (millimeters)					Grade (percent of nuts) 1/				
District and variety	weight		•	<u> </u>		e nuts	Insect	Shrivel	Natural	Blank	Other
ALL DIOTRICTO	(grams)	Length	Width	Thickness	Singles	Doubles	damage		gum		
ALL DISTRICTS	4.40	04.40	40.54	0.04	00.4		2/	0.7	2/	0.4	2/
2012	1.48	21.40	12.51	9.94	93.4	5.7	2/	0.7	2/	0.1	2/
2013	1.36	21.35	12.11	9.76	95.2	3.7	2/	1.1	2/	2/	2/
2014	1.45	21.42	12.69	10.06	96.3	2.4	2/	1.3			2/
2015	1.43	21.43	12.58	9.89	96.0	2.8	2/	0.9	0.1	0.1	2/
2016	1.48	22.09	12.44	9.93	95.9	2.9	2/	1.1		2/	2/
2017	1.57	22.50	12.83	10.40	92.2	6.2	2/	1.5	0.1	21	21
BY DISTRICT											
Sacramento Valley 3/	4.54	00.00	40.00	40.07	0.4.4	0.0	2/	4.0	2/	0.0	0.0
2012	1.54	22.32	13.22	10.07	94.1	3.9	2/	1.3		0.3	0.3
2013	1.44	21.95	12.62	9.90	93.0	5.3	2/	1.1	0.2	2/	0.5
2014	1.60	22.35	13.38	10.43	95.1	2.4	2/	2.0			0.4
2015	1.51	21.84	13.14	9.99	95.5	2.7	2/	0.3	0.6	0.7	0.2
2016	1.51	22.67	13.19	10.02	97.2	1.2	2/	1.4		2/	0.1
2017	1.69	23.85	13.59	10.46	88.3	9.1	2/	2.3	0.3	21	2/
San Joaquin Valley 4/	4.40	04.00	40.40	0.00	00.0	0.0	2/	0.0	2/	0.4	2/
2012	1.48	21.26	12.40	9.93	93.3	6.0	2/	0.6	2/	0.1	2/
2013	1.34	21.25	12.02	9.74	95.5	3.4	2/	1.0	2/	2/	2/
2014	1.43	21.31	12.61	10.01	96.4	2.4	2/	1.2		2/	2/
2015	1.41	21.37	12.48	9.87	96.1	2.9	2/	1.0	0.1	2/	2/
2016	1.48	22.00	12.32	9.91	95.7	3.1	2/	1.1	0.1	2/	2/
2017	1.55	22.29	12.71	10.39	92.8	5.7	21	1.4	0.1	2/	2/
BY VARIETY											
Butte							2/				2/
2012	1.20	18.54	11.77	9.83	92.5	6.4	2/	0.9	0.1	0.1	2/
2013	1.11	18.51	11.48	9.58	94.8	3.9	2/	1.1	2/ 2/	2/	0.1
2014	1.20	18.46	12.04	10.01	96.7	1.8	2/	1.3			0.1
2015	1.14	18.19	11.75	9.76	95.2	3.4	2/	0.9	0.3	0.3	2/
2016	1.20	18.93	11.76	9.84	96.1	2.6	2/	1.2	0.1	2/	2/
2017	1.25	19.14	11.89	10.43	89.3	9.6	21	0.9	0.2	2/	2/
California Types 5/			40.00	40.00			2/		2/	2/	2/
2012	1.53	22.45	12.23	10.00	90.7	8.7	2/	0.5	2/	2/	2/
2013	1.41	22.49	11.79	9.79	93.2	5.6	2/	1.1	2/	2/	2/
2014	1.45	22.14	12.20	10.00	95.5	3.2	2/	1.2		2/	
2015	1.46	22.60	12.28	9.84	94.9	3.7	2/	1.1	0.1	2/	0.1
2016	1.51	23.09	12.08	9.86	94.6	4.3	2/	1.0		2/	2/
2017	1.62	23.51	12.52	10.43	89.3	9.3	21	1.2	0.3	2/	2/
Carmel 6/			40.00				2/		2/	2/	2/
2012	1.51	22.41	12.20	9.90	91.9	7.5	2/	0.6		2/	2/
2013	1.38	22.19	11.47	9.69	92.8	6.0	2/	1.1	0.1	2/	2/
2014	1.48	22.21	12.15	10.04	95.5	3.2	2/	1.3			
2015	1.45	22.70	12.10	9.82	95.0	3.7	2/	1.0	0.1	0.1	0.1
2016	1.51	23.08	12.07	9.86	96.0	3.0	2/	1.0		2/	2/
2017	1.60	23.72	12.31	10.38	89.7	9.2	21	1.0	0.1	21	2/
Monterey 6/		04.00	40.70	10.0=	00.0	40.0	2/	2.4	<b>^</b> .	2.4	2/
2012	1.71	24.06	12.76	10.25	86.8	12.6	2/	0.4	0.1	0.1	
2013	1.56	24.29	12.27	9.84	92.1	6.9	2/	0.8	2/	2/	0.1
2014	1.54	23.26	12.51	10.01	94.8	3.9		1.1		2/	0.1
2015	1.59	23.75	12.67	9.91	94.3	4.5	2/ 2/	1.0	0.1	2/	2/
2016	1.69	24.68	12.49	10.03	92.1	6.9	2/	0.8	0.1	2/	2/ 2/
2017	1.83	25.20	13.06	10.64	85.4	12.8	21	1.3	0.5	2/	2/
Nonpareil			40.00				2/		2/		
2012	1.64	22.55	13.33	9.97	94.8	4.0	2/	0.9	2/ 2/	0.2	0.1
2013	1.48	22.36	12.84	9.79	96.2	2.6		1.0			0.1
2014	1.60	22.57	13.51	10.07	96.8	2.0	2/	1.1	2/	2/	2/
2015	1.61	22.76	13.46	9.96	96.8	2.2	2/	0.7	0.2	0.1	2/
2016	1.65	23.36	13.34	10.01	97.1	1.7	2/	1.1	2/	2/	2/
2017	1.70	23.50	13.60	10.32	95.1	3.0	2/	1.8	0.1	2/	2/
Padre											
2012	1.20	18.15	11.57	9.92	96.8	2.3	2/	0.5	2/	0.3	2/
2013	1.10	18.23	11.35	9.79	98.1	1.0	2/	0.8	2/	0.1	2/
2014	1.22	18.48	11.96	10.17	97.0	1.2	2/	1.8	2/	2/	2/
2015	1.07	17.71	11.41	9.85	97.6	1.5	2/	0.8	2/	2/	2/
2016	1.14	18.47	11.42	9.86	96.7	1.7	2/	1.4	0.1	0.1	2/
2017	1.26	19.13	11.85	10.51	94.0	4.2	2/	1.7	2/	2/	2/
1/ Percentages may not add	d to 100 due to	rounding									

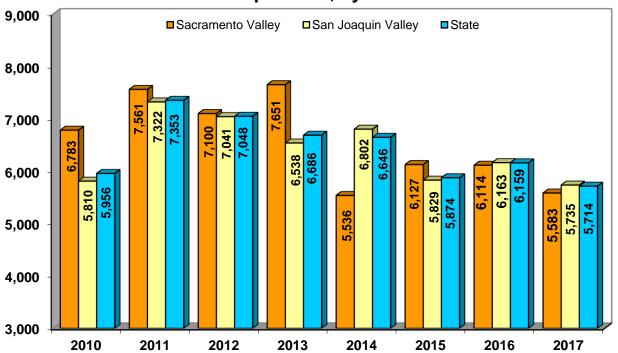
Percentages may not add to 100 due to rounding.

Not shown if less than 0.07 percent.

Sacramento Valley includes these counties: Butte, Colusa, Glenn, Solano, Sutter, Tehama, Yolo and Yuba.
San Joaquin Valley includes these counties: Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare.

For survey purposes, the California classification includes the following varieties: Aldrich, Ballico, Carmel, Davey, Fritz, Harvey, Le Grand, Mono, Monterey, Norman, Price Cluster, Ruby, Sonora, Tokyo, and Yosemite. Carmel and Monterey varieties are also included in California Types.

# ALMONDS Nuts per Tree, by District



### **ALMONDS BY VARIETY**

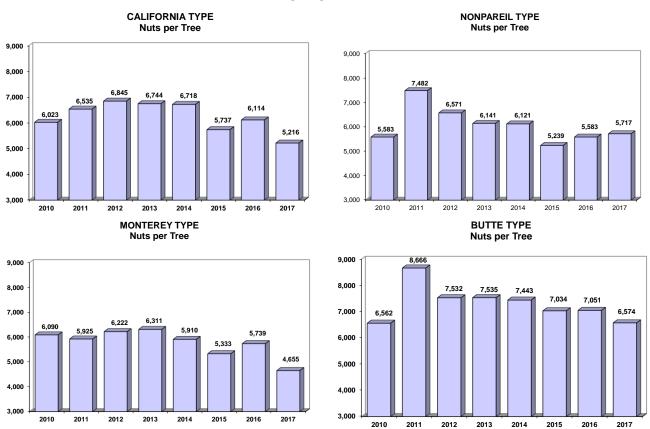


TABLE 3: CALIFORNIA ALMOND ACREAGE, PRODUCTION AND TREES PER ACRE, 1986-2017

V	Bearing	Trees	Tota	I meat production	Price per lb.	Value of production		
Year	acres 17	per acre	Metric tons 2/	Million lbs.	Lbs. per acre	Dollars	1,000 dollars	
1986	416,000	84.5	113,000	250	601	1.92	461,568	
1987	417,000	84.0	299,000	660	1,580	1.00	648,000	
1988	419,000	86.3	268,000	590	1,410	1.05	600,075	
1989	411,000	87.3	222,000	490	1,190	1.02	480,930	
1990	411,000	88.4	299,000	660	1,610	0.93	597,990	
1991	405,000	89.6	222,000	490	1,210	1.19	564,179	
1992	401,000	90.5	249,000	548	1,370	1.30	691,340	
1993	413,000	92.0	222,000	490	1,190	1.94	930,618	
1994	433,000	92.6	333,000	735	1,700	1.34	965,202	
1995	418,000	93.7	168,000	370	885	2.48	880,896	
1996	428,000	94.4	231,000	510	1,190	2.08	1,018,368	
1997	442,000	95.5	344,000	759	1,720	1.56	1,160,640	
1998	460,000	96.3	236,000	520	1,130	1.41	703,590	
1999	485,000	97.3	378,000	833	1,720	0.86	687,742	
2000	510,000	99.0	319,000	703	1,380	0.97	666,487	
2001	530,000	101.0	376,000	830	1,570	0.91	740,012	
2002	545,000	101.0	494,000	1,090	2,000	1.11	1,200,687	
2003	550,000	103.0	472,000	1,040	1,890	1.57	1,600,144	
2004	570,000	103.0	456,000	1,005	1,760	2.21	2,189,005	
2005	590,000	104.0	415,000	915	1,550	2.81	2,525,909	
2006	610,000	105.0	508,000	1,120	1,840	2.06	2,258,790	
2007	640,000	105.0	630,000	1,390	2,170	1.75	2,401,875	
2008	710,000	107.0	739,000	1,630	2,300	1.45	2,343,200	
2009	750,000	108.0	640,000	1,410	1,880	1.65	2,293,500	
2010	770,000	108.0	744,000	1,640	2,130	1.79	2,903,380	
2011	800,000	111.0	921,000	2,030	2,540	1.99	4,007,860	
2012	820,000	112.0	857,000	1,890	2,300	2.58	4,816,860	
2013	850,000	112.0	912,000	2,010	2,360	3.21	6,384,690	
2014	870,000	114.0	848,000	1,870	2,150	4.00	7,388,000	
2015	920,000	114.0	862,000	1,900	2,070	3.13	5,868,750	
2016	040,000	116.0	074 000	0.440	2.000	2.44	E 4E0 400	
2016 2017 <sup>3/ 4/</sup>	940,000	116.0	971,000	2,140	2,280	2.44	5,158,160	
ZU1/ 3 3	1,000,000	117.0	1,021,000	2,250	2,250	_	_	

 $<sup>^{\</sup>mbox{\scriptsize 1/}}$  Bearing acreage is defined as plantings four years and older.

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

<sup>&</sup>lt;sup>3/</sup> Price and value will be available in the annual Noncitrus Fruits & Nuts publication, released in June 2018.

<sup>4/</sup> Preliminary estimate of bearing acres.

Not available.