



# 2013 California Walnut Objective Measurement Report

Cooperating with the California Department of Food and Agriculture

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## WALNUT PRODUCTION FORECAST DOWN SLIGHTLY

The 2013 California walnut production is forecast at 495,000 tons, down less than 1 percent from 2012's production of 497,000 tons. This forecast is based on the 2013 Walnut Objective Measurement (O.M.) Survey, which was officially conducted August 1 through August 23, 2013. There were a few samples completed before August 1 for training and scheduling purposes.

Growers in the Sacramento Valley received above average rainfall during November and December, which helped the trees build a more vigorous root system. Weather during the spring was unusually dry and warm, which contributed to a longer bloom. Favorable weather conditions and dense foliage have helped limit sunburn damage. California experienced several short periods of hot weather; however the healthy conditions of many orchards helped the trees withstand the heat.

The 2013 Walnut O.M. Survey utilized a total of 740 blocks with two sample trees per block. Survey data indicated an average record low nut set of 1,239 per tree, down 10 percent from 2012's average of 1,375. Percent of sound kernels in-shell was 98.8 percent Statewide. In-shell weight per nut was 23.3 grams, while the average in-shell suture measurement was 33.1 millimeters. The in-shell cross-width measurement was 33.1 and the average length in-shell was 39.0 millimeters. All of the sizing measurements were above average levels.

Estimated nut sets, sizing measurements, average number of trees per acre, and estimated bearing acreage were used in the statistical models.

## SURVEY HISTORY

The Walnut O.M. Survey began in 1958 to fulfill industry needs for an accurate walnut production forecast prior to harvest. The original sample was chosen proportionally to county and variety of bearing acreage. With each succeeding year, additions and deletions have been made in the sample to adjust for acreage removed, new bearing acreage, and operations that choose not to participate in the survey.

## SAMPLING PROCEDURES

Once a block is randomly selected and permission is granted by the operation for enumerators to enter the block, two trees are randomly selected. An accessible branch is chosen, which is 5-15 percent of the total cross-sectional area of the primary limbs and reachable with a twelve-foot ladder. Measurements are made on the trunk, each primary, and each split leading to and including the accessible branch. The sample tree and accessible branch are marked by a single tag.

On the accessible branch, every first of five nuts is picked for use in size and grade determinations. If available, at least ten nuts are harvested from the accessible branch for this purpose.

The following measurements are made on nuts selected for sizing:

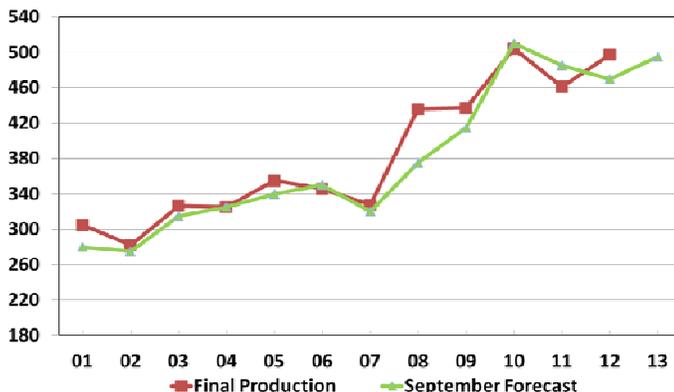
1. Weight of nut including hull
2. Width of shell at suture
3. Width of shell 90 degrees to suture line (cross-suture)
4. Length of shell
5. Kernel grade
6. Weight of nut in-shell

## DATA RELIABILITY

The 80 percent confidence interval is from 447,000 tons to 543,000 tons.

### CALIFORNIA WALNUTS

Sept. Objective Forecast vs. Final Production



**California English Walnut Acreage, Production, Price And Value In-Shell**

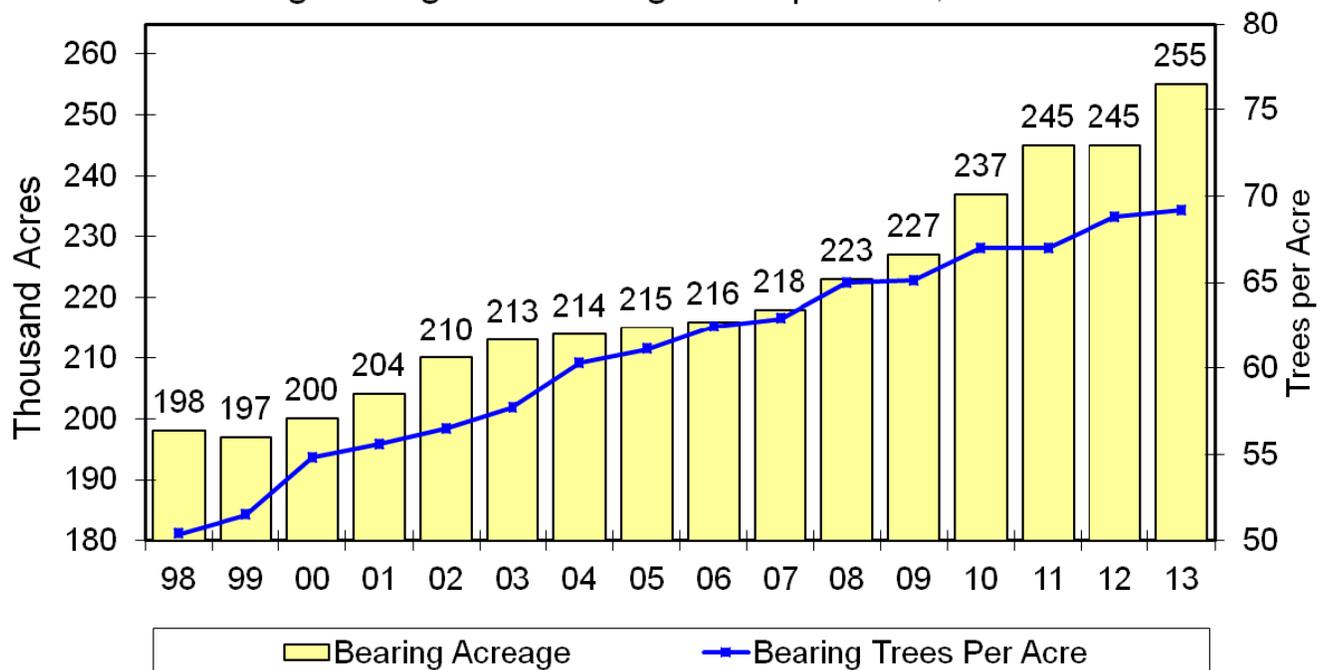
Year	Bearing Acres	Trees Per Acre	Per Bearing Acre	Total Production	Price Per Ton	Total Value
			<i>Tons</i>	<i>Dollars</i>	<i>1,000 Dollars</i>	
1988	177,000	43.8	1.18	209,000	922	192,698
1989	179,000	45.3	1.28	229,000	1,070	245,030
1990	181,000	45.7	1.25	227,000	1,040	236,080
1991	181,000	46.8	1.43	259,000	1,060	274,540
1992	178,000	47.5	1.14	203,000	1,410	286,230
1993	185,000	47.9	1.41	260,000	1,390	361,400
1994	189,000	48.7	1.23	232,000	1,030	238,960
1995	193,000	49.0	1.21	234,000	1,400	327,600
1996	192,000	49.4	1.08	208,000	1,580	328,640
1997	193,000	50.4	1.39	269,000	1,430	384,670
1998	198,000	50.4	1.15	227,000	1,050	238,350
1999	197,000	51.5	1.44	283,000	886	250,738
2000	200,000	54.8	1.20	239,000	1,240	296,360
2001	204,000	55.6	1.50	305,000	1,120	341,600
2002	210,000	56.5	1.34	282,000	1,170	329,940
2003	213,000	57.7	1.53	326,000	1,160	378,160
2004	214,000	60.3	1.52	325,000	1,390	451,750
2005	215,000	61.1	1.65	355,000	1,570	557,350
2006	216,000	62.4	1.60	346,000	1,630	563,980
2007	218,000	62.9	1.50	328,000	2,290	751,120
2008	223,000	65.0	1.96	436,000	1,280	558,080
2009	227,000	65.1	1.93	437,000	1,710	747,270
2010	237,000	67.0	2.13	504,000	2,040	1,028,160
2011	245,000	67.0	1.88	461,000	2,900	1,336,900
2012 a/ b/	245,000	68.6	2.03	497,000		
2013 c/	255,000	69.2	1.94	495,000	n/a	n/a

a/ Production based on California Walnut Board receipts from handlers.

b/ Price Per Ton will be available in October 2013.

c/ Bearing years include plantings of the following: Chandler, Chico, Howard, Tulare (2009 & Earlier); 50-55, 59-124, 4946, Amigo, Ashley, Bardoni, Cisco, Earhorn, Grove, Gustine, Honeycutt, Houston, Jensen, Lompoc, Marchetti, Nuggett, Payne, Pedro, Serr, Sunland, Tehama, Trinta, UCD 67-13, Vina, Westside (2008 and Earlier); Franquette, Franquette Scharsch, Mayette, Placentia, Poe, Willsons/Willsons Wonder, Woodland (2006 & Earlier); all other varieties not specified (2007 & Earlier).

**CALIFORNIA WALNUTS**  
Bearing Acreage vs. Bearing Trees per Acre, 1998-2013



**Walnut Objective Measurement Survey Data, By District**

Measurement	Year	Coast 1/	Sacramento Valley 2/	San Joaquin Valley 3/	State 4/
In-Shell Weight (gm)	2002	19.1	22.9	20.5	22.0
	2003	23.0	24.6	19.2	22.4
	2004	22.0	24.1	19.7	22.5
	2005	23.1	21.3	18.1	20.0
	2006	19.8	24.1	21.0	22.7
	2007	19.1	21.4	18.7	20.3
	2008	20.0	23.5	20.7	22.2
	2009	17.0	23.1	20.6	22.0
	2010	20.8	22.5	19.3	21.3
	2011	20.6	25.1	21.3	23.6
	2012	17.6	23.7	19.8	22.1
	2013	19.5	24.9	20.8	23.3
	In-Shell Width (mm)	2002	31.4	32.2	32.7
2003		32.1	32.8	32.0	32.5
2004		31.4	32.5	32.7	32.6
2005		32.9	31.4	32.1	31.7
2006		29.5	30.3	32.9	31.4
2007		31.6	31.5	32.4	31.9
2008		31.4	32.7	32.6	32.6
2009		29.8	32.5	32.9	32.5
2010		32.1	32.1	32.1	32.1
2011		31.6	32.8	32.6	32.7
2012		30.5	32.3	32.0	32.1
2013		31.3	33.3	32.8	33.1
In-Shell Cross-Width (mm)		2002	31.0	32.6	33.1
	2003	31.7	32.7	32.0	32.4
	2004	31.5	32.2	33.1	32.5
	2005	32.2	31.3	32.0	31.6
	2006	32.3	34.0	33.2	33.6
	2007	31.6	32.5	32.9	32.6
	2008	31.4	33.2	32.6	32.9
	2009	29.9	33.1	33.1	33.0
	2010	31.6	32.2	32.0	32.1
	2011	31.3	33.3	32.9	33.1
	2012	30.5	32.9	32.3	32.6
	2013	30.6	33.0	33.4	33.1
	In-Shell Length (mm)	2002	37.5	38.4	38.8
2003		38.8	39.7	38.3	39.1
2004		37.7	39.1	38.7	39.0
2005		42.0	38.4	38.7	38.6
2006		38.6	39.6	39.5	39.5
2007		37.4	37.3	38.1	37.6
2008		39.2	39.5	39.1	39.3
2009		36.9	39.6	39.1	39.3
2010		39.8	38.4	38.7	38.5
2011		39.0	39.4	39.3	39.4
2012		36.9	38.7	38.4	38.5
2013		37.8	39.1	38.8	39.0
Kernel Grade - Percent Sound		2002	96.0	95.3	98.7
	2003	95.5	95.4	99.3	97.0
	2004	97.6	97.7	99.2	98.2
	2005	97.4	96.5	98.8	97.5
	2006	98.1	98.5	97.2	98.0
	2007	97.8	97.9	99.2	98.4
	2008	96.4	98.6	97.3	98.0
	2009	94.9	97.0	99.6	97.9
	2010	98.9	97.8	97.8	97.8
	2011	99.4	98.2	99.6	98.7
	2012	97.2	97.5	99.1	98.0
	2013	97.9	98.8	99.0	98.8
	Nuts Set Per Tree	2002	1,254	1,982	1,142
2003		640	1,846	1,429	1,599
2004		924	1,943	1,168	1,526
2005		818	1,854	1,372	1,575
2006		1,316	1,660	1,267	1,458
2007		1,221	1,548	1,162	1,357
2008		973	1,592	1,270	1,416
2009		1,531	1,758	1,250	1,523
2010		1,263	2,047	1,313	1,690
2011		1,594	1,606	1,119	1,388
2012		1,461	1,582	1,120	1,375
2013		857	1,402	1,050	1,239

1/ Coast includes: Contra Costa, Lake, Monterey, Napa, San Benito, San Luis Obispo, Santa Clara, and Sonoma counties.

2/ Sacramento Valley includes: Butte, Colusa, El Dorado, Glenn, Sacramento, Solano, Sutter, Tehama, Yolo, and Yuba counties.

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

4/ District and State averages are derived by weighting county averages by county bearing acreage figures.

**Walnut Objective Measurement Survey Date, By Variety**

Measurement	Year	Ashley	Chandler	Eureka	Franquette	Hartley	Howard	Payne	Serr	Tehama	Tulare	Vina	Other 1/
In-Shell Weight (gm)	2002	18.0	24.1	20.8	18.3	23.6	---	19.3	19.4	19.6	---	20.0	21.0
	2003	17.1	23.6	21.0	23.7	25.2	---	16.6	17.2	20.8	---	19.8	22.1
	2004	18.4	23.4	20.4	22.1	24.5	---	17.7	18.5	20.3	---	19.1	22.2
	2005	16.3	19.8	18.9	20.3	22.9	---	16.4	16.7	16.6	---	18.1	20.0
	2006	18.1	23.0	22.3	19.2	24.8	---	19.0	20.4	21.8	---	21.3	22.6
	2007	15.8	21.5	21.0	18.6	22.2	22.5	17.2	15.7	16.8	22.2	18.2	17.5
	2008	19.7	22.2	21.1	20.3	25.0	23.8	18.4	18.6	22.5	22.8	20.0	19.3
	2009	19.9	22.9	21.0	19.3	23.7	22.3	18.2	18.5	20.6	21.8	18.7	17.3
	2010	18.5	21.7	19.7	20.4	23.4	21.9	18.1	16.8	18.9	22.1	18.7	18.0
	2011	21.0	23.7	20.4	20.4	25.7	23.5	20.3	20.5	19.9	23.6	21.1	21.5
	2012	18.6	22.8	20.8	18.9	23.6	23.2	18.3	18.3	20.7	21.4	19.9	20.5
	2013	21.4	23.8	22.7	21.6	24.3	25.3	18.9	17.8	20.6	22.6	21.4	18.5
	In-Shell Width (mm)	2002	31.7	32.9	31.8	29.8	32.8	---	33.0	32.9	31.7	---	31.0
2003		31.0	32.9	32.1	32.4	33.2	---	31.7	31.5	31.6	---	30.8	32.3
2004		32.1	32.5	31.5	31.8	32.8	---	32.9	33.4	31.5	---	30.8	33.4
2005		31.4	31.1	30.7	31.6	32.5	---	31.7	32.2	31.0	---	31.4	32.4
2006		31.0	31.1	31.9	28.8	31.4	---	32.7	32.9	31.4	---	30.5	32.1
2007		31.0	31.7	31.1	29.9	32.3	32.0	32.1	32.5	31.0	34.5	30.3	30.3
2008		32.0	32.3	31.2	31.0	33.6	32.1	32.6	32.7	32.8	34.8	31.4	31.1
2009		32.4	32.4	31.6	30.1	33.2	32.1	32.7	33.1	32.0	34.3	30.7	31.5
2010		31.6	31.8	30.3	30.9	32.8	31.6	32.1	32.2	32.0	34.3	30.3	30.3
2011		32.3	32.5	30.9	30.8	33.3	31.9	33.7	33.5	33.2	34.6	31.0	31.2
2012		31.7	32.0	30.1	29.9	32.7	31.7	32.0	32.4	32.3	33.3	30.5	31.1
2013		32.8	32.8	31.9	31.3	33.5	33.4	33.1	33.4	33.0	34.8	31.8	30.5
In-Shell Cross-Width (mm)		2002	31.8	33.7	32.7	30.1	32.9	---	33.1	32.6	31.8	---	31.8
	2003	30.6	33.1	32.2	32.3	33.1	---	31.2	30.6	31.6	---	31.3	32.2
	2004	32.0	32.6	32.3	31.3	32.8	---	33.1	33.4	31.0	---	30.9	33.1
	2005	30.9	31.1	31.7	31.4	32.1	---	31.4	31.5	30.1	---	31.6	32.6
	2006	32.1	33.9	32.9	32.2	34.0	---	32.6	33.0	32.9	---	33.1	34.0
	2007	31.6	32.7	32.0	30.9	32.8	34.1	32.4	32.3	31.4	34.8	31.7	31.9
	2008	32.0	32.9	31.6	31.5	33.4	34.1	32.2	31.9	32.5	34.5	32.2	32.1
	2009	32.6	33.0	32.3	30.7	33.2	33.8	32.7	32.7	32.4	34.3	32.0	32.5
	2010	31.4	32.2	31.0	31.0	32.4	32.5	31.7	31.0	31.5	34.1	30.8	30.8
	2011	31.9	33.3	31.5	30.5	33.4	33.0	32.8	32.2	32.3	34.6	31.7	31.7
	2012	31.3	32.9	31.2	30.6	32.6	33.2	31.9	31.7	32.1	33.3	31.2	31.9
	2013	32.4	33.0	33.0	31.0	33.0	33.6	33.5	32.8	32.6	34.8	32.4	30.8
	In-Shell Length (mm)	2002	36.1	39.7	41.4	37.0	38.7	---	38.2	37.5	36.8	---	37.6
2003		35.7	39.7	41.7	40.9	40.4	---	36.5	36.0	37.6	---	38.0	39.1
2004		36.4	39.6	41.3	39.3	39.7	---	37.0	37.1	36.4	---	37.4	38.8
2005		36.3	38.4	41.6	40.3	39.8	---	37.2	37.0	36.0	---	38.0	38.4
2006		37.4	39.5	44.2	38.5	40.4	---	38.1	39.2	37.8	---	39.3	38.7
2007		35.7	38.1	43.3	36.8	37.9	37.4	37.3	36.4	36.7	38.9	36.8	37.7
2008		37.4	39.2	43.4	39.3	40.9	38.0	37.4	37.6	37.7	39.3	38.4	39.7
2009		38.0	39.9	43.5	38.1	40.2	38.0	38.6	38.2	37.7	38.9	37.9	40.1
2010		36.9	38.6	41.8	39.1	39.6	36.6	38.7	37.4	36.7	39.4	37.6	38.8
2011		38.0	39.5	43.6	37.8	40.5	37.1	39.3	38.6	37.8	39.4	38.7	39.2
2012		37.3	38.6	45.0	36.7	39.4	37.2	38.7	37.6	37.8	38.8	38.0	39.4
2013		37.0	39.3	42.2	38.5	39.8	37.6	38.4	37.1	37.3	39.0	38.2	37.5
Kernel Grade - Percent Sound		2002	96.4	96.8	98.6	97.2	96.1	---	96.8	93.3	98.3	---	97.0
	2003	97.5	97.4	98.8	97.0	97.2	---	99.2	96.1	91.8	---	96.9	95.1
	2004	97.9	99.0	98.4	95.6	98.2	---	99.4	98.3	99.1	---	98.0	96.7
	2005	96.7	96.9	99.8	95.7	97.0	---	98.4	99.5	97.0	---	99.1	97.9
	2006	98.4	99.2	95.1	99.6	97.7	---	91.8	96.0	99.1	---	98.2	97.7
	2007	96.5	99.4	99.5	96.0	98.5	98.5	99.3	98.5	93.5	99.0	97.7	95.9
	2008	93.5	98.7	91.7	97.6	99.2	99.0	99.0	94.5	96.5	98.1	99.1	93.5
	2009	96.9	98.6	99.2	98.3	97.3	98.1	99.2	98.8	99.7	96.3	97.7	91.0
	2010	98.4	98.5	99.9	98.4	98.2	96.7	96.1	96.3	95.1	97.3	95.2	98.3
	2011	95.5	99.3	100.0	96.7	98.2	98.2	99.7	97.7	97.5	99.5	99.1	97.9
	2012	94.6	98.8	100.0	96.9	97.6	97.0	94.9	96.9	98.7	98.3	98.0	97.3
	2013	95.4	99.4	99.9	98.9	98.7	98.4	95.7	97.8	99.3	98.5	99.0	98.1
	Nuts Set Per Tree	2002	1,534	1,315	1,246	2,072	1,961	---	1,246	1,259	1,446	---	1,611
2003		1,421	1,594	1,858	1,195	1,735	---	1,995	1,679	1,021	---	1,544	1,377
2004		1,504	1,381	1,223	2,108	2,046	---	1,152	1,172	1,488	---	1,471	1,167
2005		1,323	1,783	1,639	1,267	1,729	---	1,443	1,429	1,067	---	1,251	1,256
2006		1,129	1,386	1,687	2,004	1,883	---	1,345	1,172	462	---	1,266	1,319
2007		1,875	1,069	1,731	1,569	1,738	1,197	1,202	1,710	2,058	963	1,183	1,640
2008		1,688	1,425	2,271	1,343	1,498	1,156	1,395	1,371	1,127	1,438	1,235	1,712
2009		1,691	1,346	1,512	2,220	2,001	1,419	1,306	1,066	1,893	1,281	1,755	1,074
2010		2,630	1,683	1,165	1,891	2,076	1,609	1,294	1,647	1,383	1,000	1,407	1,729
2011		1,093	1,415	1,052	1,670	1,840	1,272	906	1,129	721	1,065	1,197	984
2012		1,535	1,344	1,373	1,710	1,750	1,020	1,175	1,298	1,627	1,239	1,195	1,532
2013		1,966	1,229	1,786	832	1,525	1,192	1,032	1,089	1,312	908	1,196	1,056

1/ Beginning in 2007, the Howard and Tulare varieties were taken out of "Other" and published separately.

**Percentage Distribution of Walnut Shell Suture Size, By District and Variety**

District and Variety	U.S. Standards Size Intervals 1/																													
	2009						2010						2011						2012						2013					
	Mth	Jmb	Lge	Med	Bby	Oth	Mth	Jmb	Lge	Med	Bby	Oth	Mth	Jmb	Lge	Med	Bby	Oth	Mth	Jmb	Lge	Med	Bby	Oth	Mth	Jmb	Lge	Med	Bby	Oth
	----- Percent of Total 2/ -----																													
<b>DISTRICTS:</b>																														
Coast	0	25	13	25	37	0	1	60	15	16	8	0	0	50	20	18	12	0	1	29	22	26	23	0	0	44	26	14	16	0
Sacramento Valley	0	66	14	11	8	0	0	60	18	13	8	0	1	71	15	9	4	0	0	62	19	12	6	0	2	77	11	7	4	0
San Joaquin Valley	1	70	14	9	5	0	1	55	20	15	8	0	1	66	16	10	7	0	0	56	21	15	8	0	2	66	16	10	6	0
<b>VARIETIES:</b>																														
Ashley	0	66	13	11	10	0	0	45	30	18	6	1	0	67	12	9	10	2	1	49	19	23	8	0	0	74	10	8	8	0
Chandler	0	67	16	10	6	0	0	54	21	16	8	0	0	68	18	10	4	0	0	56	22	15	6	0	1	69	15	9	5	0
Eureka	0	46	40	9	5	0	0	21	37	27	13	1	0	43	24	17	16	0	0	14	51	12	24	0	0	54	39	4	4	0
Franquette	0	27	18	25	31	0	0	34	21	28	16	1	0	37	24	20	18	1	0	22	18	25	31	3	0	47	19	13	21	0
Hartley	0	79	11	6	4	0	0	74	13	8	5	0	1	79	12	6	2	0	0	70	16	9	5	0	1	81	10	6	2	0
Howard	0	61	18	12	9	0	0	53	21	16	9	1	1	56	18	14	10	1	0	49	24	16	9	1	3	76	10	7	4	0
Payne	2	70	13	9	6	0	2	56	18	13	11	0	1	80	6	8	6	0	0	61	17	14	9	0	3	67	10	9	11	0
Serr	0	74	13	7	6	0	1	62	16	13	8	0	1	81	9	6	4	0	0	67	18	11	5	0	1	78	12	7	3	0
Tehama	0	62	19	10	9	0	0	67	15	13	4	1	0	78	6	8	7	0	0	68	22	8	2	0	0	70	17	10	3	0
Tulare	5	80	6	4	3	0	7	75	9	6	3	0	7	79	7	3	3	0	1	79	10	7	3	0	8	81	6	3	2	0
Vina	0	31	21	27	20	1	0	27	22	27	22	1	0	39	24	21	15	2	0	30	26	23	20	1	1	56	17	15	11	0
Other	3	42	13	18	23	1	0	32	16	21	30	1	0	48	14	16	20	1	0	42	21	23	13	0	0	29	17	23	29	1
STATE	1	66	14	11	8	0	1	58	18	14	9	0	1	69	15	9	5	0	0	59	20	14	7	0	2	72	13	8	5	0
Number of Shells Measured	14,625						14,154						14,427						14,627						14,631					

1/ Sizes used are as follows: Mammoth -- Larger than 96/64" in diameter; Jumbo -- 80/64" to 96/64"; Large -- 76/64" to 80/64" for Eureka variety, 77/64" to 80/64" for all other varieties; Medium -- 73/64" to 76/64" for Eureka, 73/64" to 77/64" for all others; Baby -- 60/64" to 73/64"; and Others -- below 60/64".

2/ Percentage distributions based upon nut samples taken in the field may not equal 100 percent due to rounding.

***The California Walnut Industry has been very supportive.  
We appreciate your continued cooperation!***

VIC TOLOMEO, Director  
DAVE DEWALT – KELLY KRUG, Deputy Directors

DOUG FLOHR – JENNIFER VAN COURT  
Statisticians – Estimates Group



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