United States Department of Agriculture
National Agricultural Statistics Service

2017 California Walnut Objective Measurement Report

Cooperating with the California Department of Food and Agriculture
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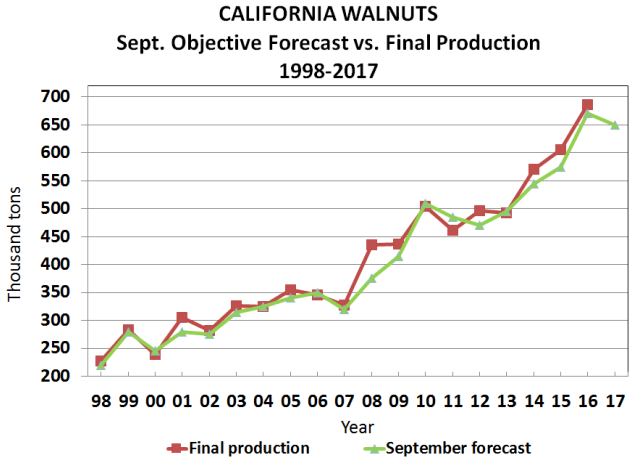
WALNUT PRODUCTION FORECAST DOWN

The 2017 California walnut production is forecast at 650,000 tons, down 5 percent from 2016's record production of 686,000 tons. This forecast is based on the 2017 Walnut Objective Measurement (O.M.) Survey, which was officially conducted August 1 through August 19, 2017. There were a few samples completed before August 1 for training and scheduling purposes.

The 2017 walnut season began with adequate chilling hours and record amounts of rain during the winter and spring months. There were reports of orchards being saturated for several weeks which resulted in a compromised root system. A higher than average insect problem was also reported. During the excessive heat waves over the summer, growers applied sunburn preventative materials. Harvest is expected to begin during the middle of September.

The 2017 Walnut O.M. Survey utilized a total of 737 blocks with two sample trees per block. Survey data indicated a record low average nut set of 1,141 per tree, down 19 percent from 2016's average of 1,406. Percent of sound kernels in-shell was 98.1 percent Statewide. In-shell weight per nut was 23.4 grams, while the average in-shell suture measurement was 32.7 millimeters. The in-shell cross-width measurement was 33.3 and the average length in-shell was 38.6 millimeters. All of the sizing measurements were above the previous year's 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 596,000 tons to 704,000 tons.

California English Walnut Acreage, Production, Price, and Value In-Shell: 1998-2017

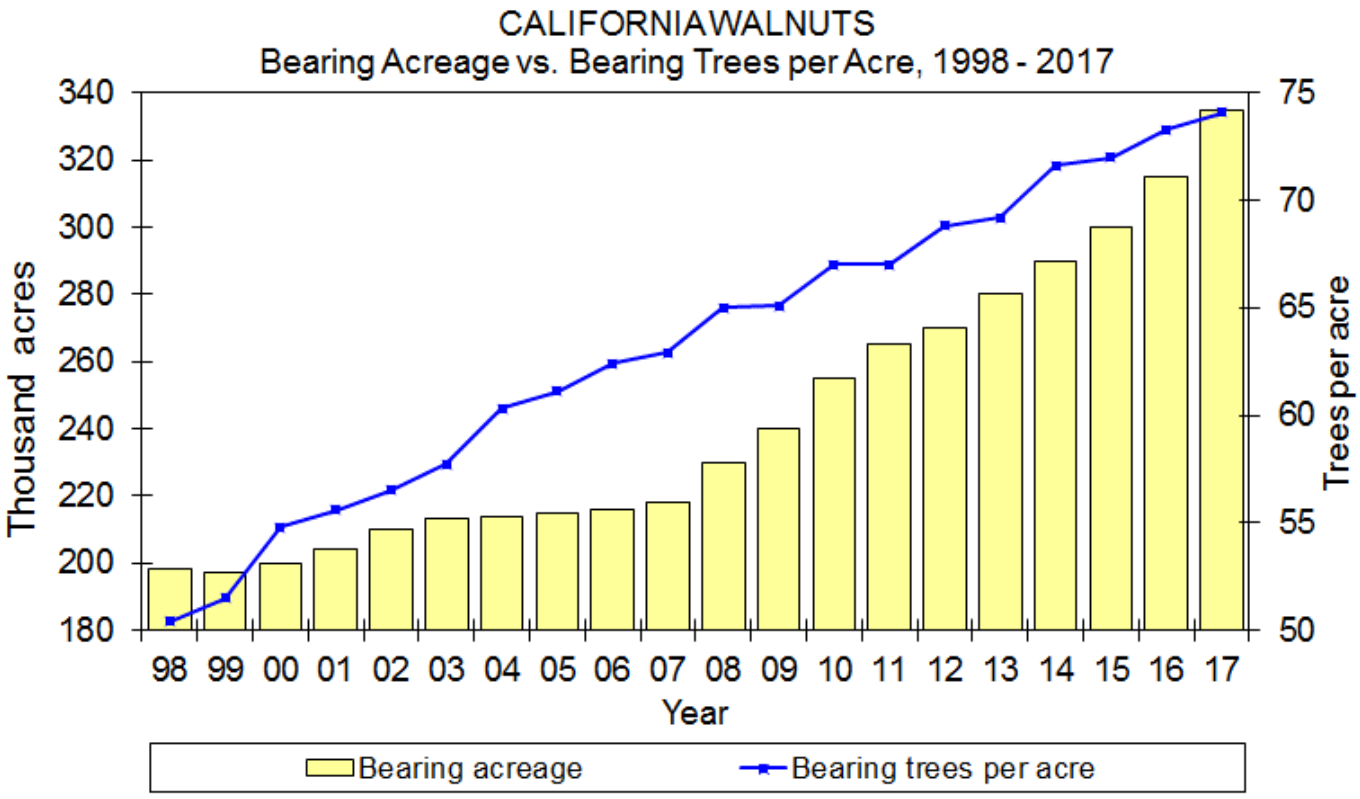
Year	Bearing acres	Trees per acre	Per bearing acre	Total production	Price per ton	Total value
			Tons		*Dollars*	*1,000 Dollars*
1998	198,000	50.4	1.15	227,000	1,050	238,350
1999	197,000	51.5	1.44	283,000	886	250,738
2000	200,000	54.8	1.20	239,000	1,240	296,360
2001	204,000	55.6	1.50	305,000	1,120	341,600
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	230,000	65.0	1.90	436,000	1,280	558,080
2009	240,000	65.1	1.82	437,000	1,710	747,270
2010	255,000	67.0	1.98	504,000	2,040	1,028,160
2011	265,000	67.0	1.74	461,000	2,900	1,336,900
2012	270,000	68.6	1.84	497,000	3,030	1,505,910
2013	280,000	69.2	1.76	492,000	3,710	1,825,320
2014	290,000	71.6	1.97	571,000	3,340	1,907,140
2015	300,000	72.0	2.02	606,000	1,670	1,012,020
2016 1/	315,000	73.3	2.18	686,000	1,810	1,241,660
2017 2/ 3/	335,000	74.1	1.94	650,000	(NA)	(NA)

1/ Price per ton and Total value are June 2017 preliminary data.

2/ Bearing years include plantings of the following: Chandler, Chico, Howard, Tulare (2013 & 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 (2012 and Earlier); Franquette, Franquette Scharsch, Mayette, Placentia, Poe, Willsons/Willsons Wonder, Woodland (2010 & Earlier); all other varieties not specified (2011 & Earlier).

3/ Price per ton and Total value preliminary data will be released June 2018.

(NA) Not Available.



Walnut Objective Measurement Survey Date, by District: 2008-2017

Measurement	Year	Coast [1/]	Sacramento Valley [2/]	San Joaquin Valley [3/]	State [4/]
In-Shell Weight (gm)	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
	2014	17.2	22.6	19.2	21.2
	2015	19.6	24.0	20.8	22.7
	2016	19.2	22.7	19.5	21.6
	2017	20.2	24.0	22.4	23.4
In-Shell Width (mm)	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
	2014	30.6	32.8	32.2	32.5
	2015	31.6	33.0	32.6	32.8
	2016	31.3	32.1	32.3	32.2
	2017	31.3	32.5	33.3	32.7
In-Shell Cross-Width (mm)	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
	2014	30.7	32.3	32.7	32.4
	2015	31.9	32.7	33.0	32.8
	2016	31.4	32.8	32.7	32.7
	2017	31.1	33.1	33.9	33.3
In-Shell Length (mm)	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
	2014	36.6	38.1	38.1	38.1
	2015	38.4	38.6	38.4	38.5
	2016	37.9	38.1	38.4	38.2
	2017	38.4	38.2	39.4	38.6
Kernel Grade - Percent Sound	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
	2014	99.0	98.5	99.0	98.7
	2015	99.0	97.8	99.6	98.5
	2016	93.4	98.4	99.5	98.7
	2017	97.2	97.5	99.4	98.1
Nuts Set Per Tree	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
	2014	1,021	1,509	1,214	1,372
	2015	851	1,355	1,164	1,272
	2016	950	1,561	1,215	1,406
	2017	879	1,302	938	1,141

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: 2008-2017

Measurement	Year	Ashley	Chandler	Eureka	Franquette	Hartley	Howard	Payne	Serr	Tehama	Tulare	Vina	Other
In-Shell Weight (gm)	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
	2014	17.8	21.8	20.7	19.8	22.8	22.2	21.2	16.1	14.6	20.5	19.2	20.5
	2015	19.9	23.2	20.4	20.5	24.7	23.8	19.3	18.0	18.5	22.5	20.1	22.3
	2016	17.8	21.9	21.2	20.8	23.1	22.2	19.9	17.1	18.7	20.5	19.6	18.8
	2017	22.5	23.6	21.9	19.6	25.6	22.6	18.6	18.7	20.5	23.2	22.1	19.0
In-Shell Width (mm)	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
	2014	31.6	32.4	31.1	31.1	33.3	32.6	32.2	32.1	31.2	33.7	31.1	31.6
	2015	32.1	32.6	31.1	31.6	33.5	32.9	32.9	32.8	31.7	34.3	31.3	32.5
	2016	31.9	31.9	31.8	31.0	33.2	31.4	33.3	32.6	32.7	33.6	31.2	31.1
	2017	32.2	32.6	31.7	30.3	33.2	31.9	32.2	33.2	33.3	34.8	32.1	30.9
In-Shell Cross-Width (mm)	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
	2014	31.0	32.4	32.2	30.9	33.0	32.3	32.5	31.5	30.2	33.9	31.8	30.7
	2015	32.2	32.7	32.1	31.5	33.5	32.6	33.0	32.4	31.3	34.3	32.0	32.5
	2016	31.7	32.8	31.8	31.6	33.0	33.0	32.7	31.7	32.2	33.5	32.0	32.4
	2017	33.0	33.4	32.0	31.1	33.5	32.8	32.8	32.2	32.6	34.9	33.0	32.1
In-Shell Length (mm)	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
	2014	36.7	38.2	42.6	37.1	39.3	36.7	40.4	36.5	36.3	38.1	37.7	37.1
	2015	36.9	38.9	41.6	36.9	39.5	37.3	39.0	36.0	35.7	38.4	37.8	40.2
	2016	37.1	38.3	42.9	37.6	39.2	36.4	40.7	36.8	37.3	38.3	38.1	38.4
	2017	38.7	38.7	41.3	37.2	40.1	36.0	39.7	37.0	37.3	39.2	39.0	37.0
Kernel Grade - Percent Sound	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
	2014	99.2	98.8	99.8	99.7	98.6	98.2	93.5	98.1	99.3	98.9	99.3	98.9
	2015	95.7	99.1	100.0	96.3	97.1	98.4	100.0	97.7	96.7	99.1	99.1	97.7
	2016	94.1	99.4	98.8	97.0	97.4	98.6	98.3	98.1	99.9	99.0	99.7	92.2
	2017	97.2	98.5	97.4	95.7	97.5	98.3	97.7	97.7	91.5	98.3	98.0	94.2
Nuts Set Per Tree	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
	2014	2,380	1,338	1,274	2,360	1,615	1,137	2,165	1,399	2,864	1,054	1,313	888
	2015	2,082	1,263	1,580	2,673	1,537	994	1,613	1,431	911	1,048	1,062	977
	2016	1,781	1,446	996	3,332	1,806	1,070	1,510	1,292	1,136	1,076	1,262	1,052
	2017	1,543	1,194	947	2,048	1,491	1,032	724	993	486	748	774	1,123

Percentage Distribution of Walnut Shell Suture Size, by District, and Variety: 2013-2017

District and Variety	U.S. Standards Size Intervals [1]																											
	2013						2014						2015						2016						2017					
	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] - - - - - - - - - - - - - - -																											
DISTRICTS:																												
Coast	0	44	26	14	16	0	0	36	21	19	23	1	0	58	22	12	7	1	0	42	25	19	13	0	0	43	21	16	19	1
Sacramento Vly.	2	77	11	7	4	0	1	71	14	9	5	0	1	73	14	8	4	0	0	61	20	13	5	0	1	65	16	11	8	0
San Joaquin Vly.	2	66	16	10	6	0	1	57	22	15	6	0	1	63	19	11	6	0	0	59	21	14	5	0	1	77	13	7	1	0
VARIETIES:																												
Ashley	0	74	10	8	8	0	0	54	19	11	14	2	0	62	16	12	10	1	0	52	25	13	10	0	2	55	22	11	10	0
Chandler	1	69	15	9	5	0	1	63	19	13	5	0	0	67	18	10	4	0	0	56	24	15	5	0	0	68	16	10	5	0
Eureka	0	54	39	4	4	0	0	33	45	17	5	1	0	35	37	16	11	0	0	43	32	13	12	1	0	50	30	8	12	1
Franquette	0	47	19	13	21	0	0	44	28	15	13	1	0	55	20	12	12	0	0	34	23	32	12	0	0	26	20	29	25	0
Hartley	1	81	10	6	2	0	0	80	10	7	3	0	1	80	11	5	3	0	0	80	11	6	3	0	0	79	11	7	3	0
Howard	3	76	10	7	4	0	1	65	16	11	6	1	2	67	15	9	7	0	0	47	24	19	10	1	1	56	17	12	13	1
Payne	3	67	10	9	11	0	0	64	18	12	6	0	0	69	21	5	4	0	0	80	12	5	2	0	0	58	18	21	3	0
Serr	1	78	12	7	3	0	0	60	16	14	9	0	0	70	14	10	5	0	0	68	18	9	5	0	1	77	14	5	2	0
Tehama	0	70	17	10	3	0	0	33	38	19	9	0	0	53	19	10	15	2	0	73	21	4	1	0	0	84	7	5	5	0
Tulare	8	81	6	3	2	0	3	76	11	7	3	0	5	82	7	4	3	0	2	80	10	6	3	0	5	84	5	3	2	0
Vina	1	56	17	15	11	0	0	42	23	19	15	1	0	44	25	17	14	0	0	39	28	23	11	0	0	57	24	10	7	1
Other	0	29	17	23	29	1	0	56	15	14	14	0	1	64	17	10	8	0	0	40	19	24	16	0	0	37	18	20	24	1
STATE	2	72	13	8	5	0	1	65	17	12	6	0	1	69	16	9	5	0	0	60	21	13	5	0	1	69	15	10	6	0
Number of Shells Measured	14,631						14,803						14,813						14,426						14,369					

[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!

California agricultural publications are available free-of-charge on the Internet at:

www.nass.usda.gov/ca