



2023 California Walnut Objective Measurement Report

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The 2023 walnut acreage and production forecasts were revised based on additional acreage removal information.

WALNUT PRODUCTION FORECAST UP

The 2023 California walnut production is forecast at **760,000** tons, up **1%** from 2022's production of 752,000 tons. The forecast is based on **375,000** bearing acres, down **6%** from 2022's estimated bearing acreage of 400,000.

The 2023 Walnut O.M. Survey utilized a total of 675 blocks with two sample trees per block. Survey data indicated an average nut set per tree of 1,004, up 2% from 2022's average of 981. Percent of sound kernels in-shell was 99.2% statewide. The average in-shell weight and dimensions for 2023 were: 21.5 grams, suture measurement was 32.7 millimeters, cross-width measurement was 33.3, and the average length was 39.1 millimeters.

The cold winter temperatures ensured chill hours were sufficient for walnut trees. A wet winter and spring helped restore soil moisture in walnut orchards across the state. Percent sound results from the Objective Measurement survey indicate nut quality will be increased from last year. Growers across the state struggled with high production costs.

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

The 2023 Walnut Objective Measurement (O.M.) Survey was officially conducted from July 22 through August 25, 2023. There were a few samples completed before July 22nd for training and scheduling purposes. There were 1,350 trees sampled from 675 orchards.

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, so that the same trees are sampled the following year if that orchard is selected. On the accessible branch, every nut is counted and the first of every 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

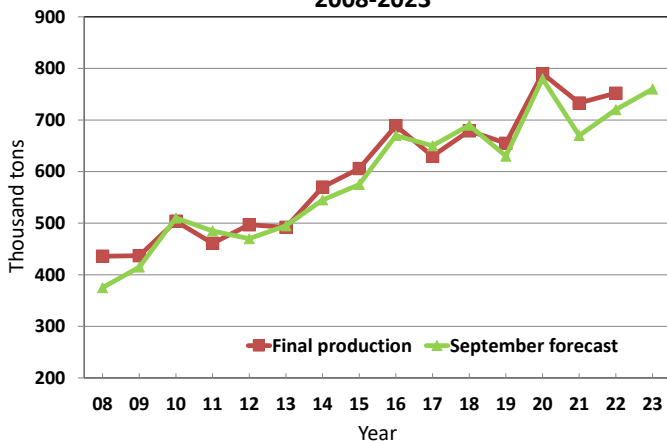
The Objective Measurement Survey is funded by the California Walnut Board.

DATA RELIABILITY

The 80 percent confidence interval is from **685,000** tons to **835,000** tons.

CALIFORNIA WALNUTS

Sept. Objective Forecast vs. Final Production
2008-2023



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
			Tons	Dollars	1,000 Dollars	
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	315,000	73.3	2.19	689,000	1,850	1,274,650
2017	335,000	74.1	1.88	630,000	2,490	1,568,700
2018	350,000	75.5	1.94	679,000	1,350	916,650
2019	365,000	76.9	1.79	655,000	1,890	1,237,950
2020	380,000	76.8	2.08	790,000	1,200	948,000
2021	390,000	78.0	1.88	733,000	1,450	1,062,850
2022 ¹	400,000	80.0	1.88	752,000	630	473,760
2023 ^{2,3}	375,000	81.0	2.03	760,000	NA	NA

¹ Price per ton and total value are May 2023 preliminary data.

² Bearing years include plantings of the following: Chandler, Chico, Howard, Tulare (2019 & 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 (2018 & Earlier); Franquette, Franquette Scharsch, Mayette, Placentia, Poe, Willsons/Willsons Wonder, Woodland (2016 & Earlier); all other varieties not specified (2017 & Earlier).

³ Price per ton and total value preliminary data will be released May 2024.

NA Not Available



WEIGHT, SIZE, PERCENT SOUND AND SET BY COUNTY, 2021-2023

District and variety	In-shell weight (grams)	In-shell size (millimeters)			Kernel Grade - Percent Sound	Nuts per Tree
		Length	Width	Cross-Width		
STATE LEVEL						
2021	22.2	37.9	32.4	33.4	99.5	992
2022	20.2	37.9	32.4	33.2	98.0	981
2023	21.5	39.1	32.7	33.3	99.2	1,004
BY COUNTY						
Butte						
2021	21.7	37.1	32.1	33.1	99.1	1,034
2022	19.7	37.7	31.9	33.1	94.3	1,015
2023	20.1	39.0	31.9	32.4	99.8	967
Glenn						
2021	22.7	36.8	31.7	33.1	99.8	934
2022	18.7	37.1	31.4	32.7	97.5	1,043
2023	20.5	38.7	31.9	32.6	99.8	833
Kings						
2021	18.9	38.5	33.0	33.7	98.4	1,284
2022	16.2	37.5	32.6	33.1	99.7	1,264
2023	19.6	40.1	33.6	34.0	98.8	1,336
San Joaquin						
2021	22.5	39.0	32.9	33.7	99.9	1,087
2022	22.6	38.5	32.9	33.5	99.9	1,115
2023	23.1	38.9	33.0	33.4	99.0	1,167
Stanislaus						
2021	24.4	38.5	32.9	33.9	99.6	671
2022	23.1	38.1	32.9	33.5	99.8	871
2023	23.6	38.9	33.2	33.8	100.0	759
Sutter						
2021	22.8	37.5	31.7	33.0	99.7	785
2022	22.9	38.1	32.5	33.4	100.0	720
2023	23.4	39.2	32.6	33.5	99.9	922
Tehama						
2021	23.9	37.0	32.2	33.6	99.8	1,012
2022	19.3	37.7	31.9	33.0	91.7	870
2023	20.0	38.5	31.6	32.3	100.0	884
Tulare						
2021	18.6	37.8	32.7	33.3	99.0	1,127
2022	14.9	37.3	32.8	33.1	98.6	1,168
2023	18.3	39.2	33.3	33.6	96.7	1,288
Yuba						
2021	23.9	37.6	32.1	33.1	98.4	875
2022	23.2	38.9	33.2	34.2	99.8	785
2023	20.4	38.9	31.8	32.4	100.0	695
Other						
2021 ¹	22.2	38.0	32.5	33.6	99.8	1,062
2022 ¹	21.1	37.9	32.2	33.1	99.1	960
2023 ²	23.5	39.5	32.9	33.7	99.7	1,021

¹ Other includes: Colusa, Fresno, Lake, Madera, Merced, Placer, Sacramento, San Luis Obispo, Shasta, Solano, and Yolo.

² Other includes: Colusa, Fresno, Kern, Lake, Madera, Merced, Monterey, Placer, Sacramento, Solano, and Yolo.

WEIGHT, SIZE, PERCENT SOUND AND SET BY VARIETY, 2021-2023

District and variety	In-shell weight (grams)	In-shell size (millimeters)			Kernel Grade - Percent Sound	Nuts per Tree
		Length	Width	Cross-Width		
BY VARIETY						
Chandler						
2021	22.5	37.9	32.1	33.3	99.8	988
2022	20.3	38.0	32.0	32.9	98.5	1,009
2023	21.5	39.5	32.3	32.9	99.4	1,018
Hartley						
2021	22.9	38.8	32.7	32.9	99.0	1,272
2022	22.5	38.7	33.1	33.4	97.3	1,029
2023	23.0	38.9	33.1	33.1	99.8	1,204
Howard						
2021	22.5	36.2	31.7	33.5	99.1	838
2022	20.4	36.5	32.0	33.7	95.1	849
2023	21.0	37.1	31.9	33.4	100.0	811
Serr ¹						
2021	18.3	37.5	33.4	33.0	95.6	847
2022	16.3	36.4	32.6	32.2	98.1	980
2023	--	--	--	--	--	--
Tulare						
2021	20.9	37.9	34.1	34.4	98.9	972
2022	19.4	37.8	34.2	34.2	98.3	996
2023	22.1	38.9	35.0	34.9	98.3	980
Vina ¹						
2021	21.7	38.7	32.3	33.1	100.0	1,056
2022	20.1	37.9	32.4	32.7	100.0	751
2023	--	--	--	--	--	--
Other						
2021 ²	19.4	39.0	33.0	34.0	99.0	1,157
2022 ²	17.8	38.8	32.6	33.6	99.2	950
2023 ³	19.5	39.3	32.4	33.0	97.2	1,123

¹ Beginning in 2023, the Serr and Vina varieties were included in "Other" and not published separately.

² Other includes: Chico, Eureka, Franquette, Ivanhoe, Payne, Poe, Solano, and Tehama.

³ Other includes: Chico, Durham, Eureka, Franquette, Ivanhoe, Livermore, Payne, Solano, Serr, Tehama, and Vina.

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

District and Variety	U.S. Standards Size Intervals ¹																	
	2021						2022						2023					
	Mth	Jmb	Lge	Med	Bby	Oth	Mth	Jmb	Lge	Med	Bby	Oth	Mth	Jmb	Lge	Med	Bby	Oth
STATE LEVEL	1	63	18	13	5	0	1	64	17	12	6	0	2	66	17	10	5	0
COUNTIES	----- Percent of Total ² -----																	
Butte	0	57	21	14	8	0	0	59	17	14	9	0	1	58	20	13	8	0
Glenn	0	52	21	17	10	0	0	45	25	18	11	1	1	57	22	13	7	0
Kings	0	72	16	8	3	0	1	68	16	11	4	0	5	76	12	5	1	0
San Joaquin	1	75	14	8	2	0	2	70	15	9	3	0	1	70	17	9	3	0
Stanislaus	1	71	13	10	5	0	1	71	12	11	5	0	2	71	17	8	3	0
Sutter	0	50	22	19	8	0	1	64	17	13	5	0	1	66	19	11	3	0
Tehama	0	58	20	14	7	0	0	57	18	14	10	0	0	54	22	15	9	0
Tulare	1	67	16	11	4	0	1	69	16	10	4	0	3	74	12	8	3	0
Yuba	0	55	23	14	8	0	0	82	11	6	1	0	0	55	19	15	10	1
Other ^{3,4}	1	62	21	12	4	0	1	61	18	13	7	0	2	66	17	11	4	0
VARIETIES:	----- Percent of Total ² -----																	
Chandler	0	59	20	14	6	0	0	59	19	14	7	0	1	65	19	11	4	0
Hartley	0	72	16	9	3	0	1	76	11	8	5	0	1	75	9	10	5	0
Howard	0	48	23	18	11	0	1	57	18	14	9	0	1	52	22	15	10	0
Serr ⁵	0	77	10	8	5	0	1	69	13	11	6	0	--	--	--	--	--	--
Tulare	3	84	7	5	1	0	4	81	9	4	1	0	8	78	6	5	1	0
Vina ⁵	0	54	28	12	5	0	1	60	21	13	6	0	--	--	--	--	--	--
Other ^{6,7}	1	77	13	6	3	0	1	70	17	7	6	0	0	65	17	11	6	0
Number of Shells Measured	13,539						13,921						13,189					

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.

³ For 2021 & 2022, Other includes: Colusa, Fresno, Lake, Madera, Merced, Placer, Sacramento, San Luis Obispo, Shasta, Solano, and Yolo.

⁴ For 2023, Other includes: Colusa, Fresno, Kern, Lake, Madera, Merced, Monterey, Placer, Sacramento, Solano, and Yolo.

⁵ Beginning in 2023, the Serr and Vina varieties were included in "Other" and not published separately.

⁶ For 2021 & 2022, Other includes: Chico, Eureka, Franquette, Ivanhoe, Payne, Poe, Solano, and Tehama.

⁷ For 2023, Other includes: Chico, Durham, Eureka, Franquette, Ivanhoe, Livermore, Payne, Solano, Serr, Tehama, and Vina.

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

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