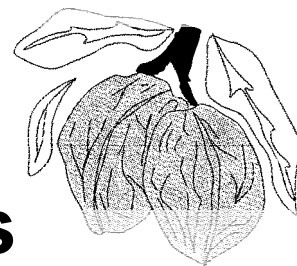


# 1998 California Walnut Objective Measurement Survey Results



Released: September 4, 1998  
12:00 NOON PDT



## WALNUT PRODUCTION FORECAST

The 1998 California walnut production forecast is 220,000 tons, down 18 percent from 1997's production of 269,000 tons. This is 14 percent below the July forecast of 255,000. The September forecast is based on the Walnut Objective Measurement (O.M.) Survey, while the July forecast was based on subjective information provided by growers. The Objective Measurement Survey was conducted August 3 through August 29, 1998. Due to a very wet spring, the crop is about three weeks behind normal. The early varieties, such as Serr, look to be strong. Mid-season varieties, such as Vina, are expected to be about average, while late varieties, such as Hartley and Chandler, look to be off quite a bit from last year. Levels of sunburn are expected to be higher than last year.

The 1998 Objective Measurement Survey utilized a total of 731 blocks with two sample trees per block. Survey data indicated an average nut set of 1,407, down 20 percent from 1997's average of 1,753. The Hartley nut set was down 35 percent; Serr, up 104 percent; Franquette, down 30 percent; Chandler, down 17 percent from 1997. Percent of sound kernels in-shell was 94.4 percent Statewide. In-shell weight per nut was 21.4 grams, while the average in-shell suture measurement was 31.9 millimeters. The average length in-shell was 39.5 millimeters.

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

## SURVEY HISTORY

The Walnut Objective Measurement 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 refusals.

## SAMPLING PROCEDURES

Once a block is randomly selected and permission is granted, two trees are randomly selected. An accessible branch is chosen which is 5 to 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.

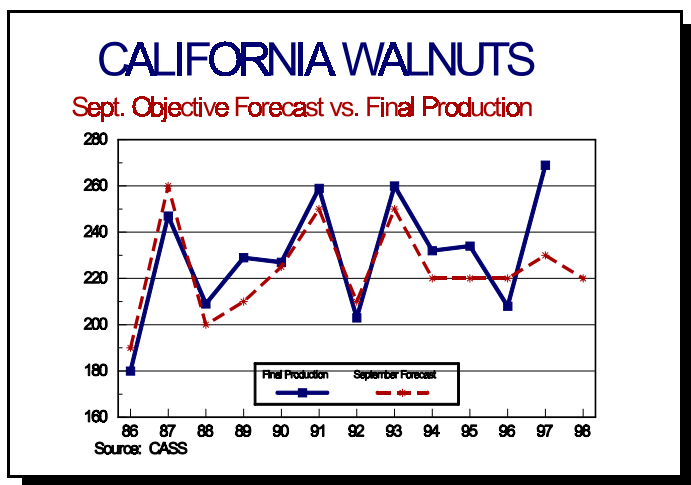
On the accessible branch, every first of five nuts is picked for use in size and grade determinations. If available, at least ten nuts are harvested from the accessible branch for this purpose.

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 200,000 tons to 240,000 tons. This means there is an 80 percent chance the 1998 production will fall within this range.



**TABLE 1 -- California English Walnut Acreage, Production, Price And Value In-Shell**

Year	Bearing Acres <u>a/</u>	Total Production	Per Bearing Acre	Price Per Ton	Total Value
		-- Tons --		-- Dollars --	
1987	176,000	247,000	1.40	984.00	243,048,000
1988	177,000	209,000	1.18	922.00	192,698,000
1989	179,000	229,000	1.28	1,070.00	245,030,000
1990	181,000	227,000	1.25	1,040.00	236,080,000
1991	181,000	259,000	1.43	1,060.00	274,540,000
1992	178,000	203,000	1.14	1,410.00	286,230,000
1993	176,000	260,000	1.48	1,390.00	361,400,000
1994	171,000	232,000	1.36	1,030.00	238,960,000
1995	176,000	234,000	1.33	1,400.00	327,600,000
1996	176,000	208,000	1.18	1,570.00	326,600,000
1997 <u>b/</u>	177,000	269,000	1.52	1,310.00	352,400,000
1998	177,000	220,000	1.24	7/99	7/99

a/ Bearing years include plantings of the following: Chandler, Chico, Howard, Tulare (1994 & 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 (1993 and Earlier); Franquette, Franquette Scharsch, Mayette, Placentia, Poe, Willsons/Willsons Wonder, Woodland (1991 & Earlier); all other varieties not specified (1992 & Earlier).

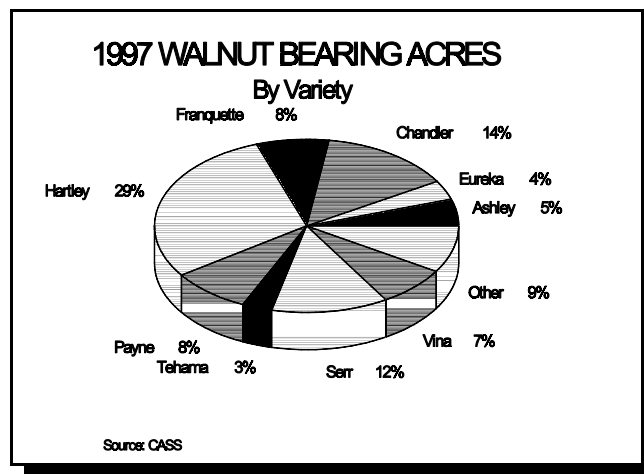
b/ Price Per Ton and Total Value are July 1, 1998 preliminary figures.

**TABLE 2 -- Walnut Acreage By County As Of 1997**

County	Bearing	Non-Bearing	Total
Alameda	94	0	94
Amador	564	30	594
Butte	17,108	1,903	19,011
Calaveras	716	18	734
Colusa	4,641	139	4,780
Contra Costa	1,035	69	1,104
El Dorado	260	1	261
Fresno	3,089	418	3,507
Glenn	6,021	1,585	7,606
Kern	1,440	18	1,458
Kings	5,450	1,137	6,587
Lake	6,364	94	6,458
Madera	968	63	1,031
Mendocino	84	3	86
Merced	5,325	673	5,999
Monterey	327	0	328
Napa	192	29	222
Placer	1,552	0	1,552
Sacramento	117	2	119
San Benito	2,739	135	2,874
San Joaquin	27,143	3,327	30,470
San Luis Obispo	2,823	113	2,936
Santa Barbara	753	13	767
Santa Clara	563	24	587
Shasta	938	36	974
Solano	4,199	688	4,887
Sonoma	225	20	244
Stanislaus	19,346	2,986	22,332
Sutter	14,316	1,724	16,040
Tehama	11,391	1,125	12,516
Tulare	22,451	3,044	25,495
Ventura	250	0	250
Yolo	8,044	945	8,989
Yuba	6,595	552	7,147
Other Counties	83	0	83
STATE	177,206	20,913	198,120

**TABLE 3 -- Walnut Acreage By Variety As Of 1997**

County	Bearing	Non-Bearing	Total
Ashley	8,898	63	8,961
Chandler	24,850	13,283	38,142
Eureka	6,365	156	6,521
Franquette	13,694	378	14,072
Hartley	51,853	2,148	54,000
Payne	14,997	481	15,478
Serr	22,005	1,146	23,151
Tehama	5,706	42	5,748
Vina	13,278	1,202	14,480
All Others	15,551	2,014	17,565
CROP TOTAL	177,206	20,913	198,119



Percentages in the pie chart do not add to 100 due to rounding.

**TABLE 4 -- Walnut Objective Measurement Survey Data, By District**

Measurement	Year	Coast <sup>1/</sup>	Sacramento Valley <sup>2/</sup>	San Joaquin Valley <sup>3/</sup>	State <sup>4/</sup>
In-Shell Weight (gm)	1987	20.7	22.5	20.9	21.5
	1988	20.6	22.0	20.5	21.2
	1989	19.7	22.0	21.4	21.5
	1990	21.3	21.8	21.9	21.8
	1991	20.7	22.1	19.6	20.8
	1992	21.4	23.8	21.6	22.7
	1993	23.5	23.7	21.7	22.9
	1994	20.9	23.6	20.7	22.1
	1995	19.8	21.3	20.3	20.8
	1996	20.0	24.4	19.9	22.1
	1997	20.9	23.7	22.2	22.9
	1998	21.2	22.4	20.3	21.4
In-Shell Width (mm)	1987	31.9	33.0	32.6	32.7
	1988	31.7	32.6	32.6	32.5
	1989	31.2	32.3	32.7	32.3
	1990	31.5	31.9	33.0	32.3
	1991	31.1	31.4	31.7	31.5
	1992	32.1	32.7	32.6	32.6
	1993	32.2	32.4	32.9	32.6
	1994	31.4	32.4	32.2	32.2
	1995	30.6	31.7	32.0	31.7
	1996	31.4	32.5	32.2	32.3
	1997	32.3	33.0	31.1	32.3
	1998	31.4	32.2	31.5	31.9
In-Shell Cross-Width (mm)	1987	32.2	33.8	32.9	33.2
	1988	32.3	32.9	32.4	32.7
	1989	32.0	33.0	32.2	32.6
	1990	31.6	32.3	32.7	32.4
	1991	30.5	31.2	31.2	31.1
	1992	32.5	33.1	32.8	32.9
	1993	32.0	32.3	32.9	32.5
	1994	31.3	32.4	32.3	32.2
	1995	30.2	31.3	31.7	31.3
	1996	31.4	32.6	32.5	32.5
	1997	32.3	33.2	31.9	32.6
	1998	31.2	32.1	31.5	31.8
In-Shell Length (mm)	1987	38.9	40.2	39.5	39.7
	1988	39.0	39.4	38.9	39.1
	1989	38.2	39.1	39.3	39.1
	1990	38.5	38.3	39.5	38.8
	1991	38.9	39.0	39.1	39.0
	1992	39.0	39.7	39.5	39.5
	1993	39.9	40.1	39.8	40.0
	1994	38.7	39.7	39.3	39.4
	1995	39.2	39.0	39.5	39.2
	1996	38.4	39.4	38.7	39.0
	1997	38.2	39.4	37.6	38.6
	1998	39.1	40.0	39.0	39.5
Kernel Grade -- Percent Sound	1987	99.1	97.9	96.6	97.3
	1988	88.7	97.8	95.9	96.2
	1989	94.4	97.8	96.8	97.0
	1990	96.1	97.1	95.4	96.3
	1991	97.3	96.6	94.1	95.5
	1992	93.6	96.9	97.6	96.9
	1993	93.2	95.2	97.2	95.8
	1994	92.6	94.7	97.5	95.6
	1995	89.2	91.4	96.1	93.1
	1996	92.6	93.8	95.3	94.4
	1997	97.8	97.4	97.3	97.3
	1998	79.9	93.2	98.3	94.4
Nuts Set Per Tree	1987	1,883	2,696	2,143	2,320
	1988	1,359	2,390	1,837	2,008
	1989	1,427	2,182	1,537	1,785
	1990	1,637	2,380	1,835	2,028
	1991	1,955	2,620	2,210	2,340
	1992	1,567	1,902	1,380	1,604
	1993	1,530	2,703	1,596	2,068
	1994	1,813	1,961	1,602	1,773
	1995	1,420	2,253	1,451	1,777
	1996	1,362	1,836	1,497	1,630
	1997	1,128	2,233	1,439	1,753
	1998	1,070	1,654	1,253	1,407

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

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

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

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

TABLE 5 -- Walnut Objective Measurement Survey Data, By Variety

Measurement	Year	Ashley	Chandler	Eureka	Franquette	Hartley	Payne	Serr	Tehama	Vina	Other
In-Shell Weight (gm)	1987	20.3	N/A	23.1	19.7	23.7	19.3	20.5	22.1	18.8	22.1
	1988	18.7	N/A	21.9	19.7	23.4	19.3	20.9	19.0	19.5	21.3
	1989	19.1	24.8	21.0	20.4	24.7	20.4	19.6	21.5	20.1	20.2
	1990	19.5	23.2	22.1	19.9	23.7	20.5	20.9	19.8	19.4	20.7
	1991	18.7	22.8	20.1	19.2	23.4	18.2	18.7	20.3	18.8	19.9
	1992	19.1	24.9	22.3	20.7	25.5	19.4	21.4	21.8	20.5	19.9
	1993	19.8	23.5	21.7	21.2	25.2	20.8	20.8	20.3	20.2	21.7
	1994	19.3	24.3	20.9	20.3	24.7	19.7	20.0	21.1	19.7	21.0
	1995	18.0	20.7	19.1	18.6	23.1	19.5	18.6	18.7	18.4	19.3
	1996	20.0	23.3	20.6	20.1	24.8	18.1	19.8	21.2	20.1	21.1
1997	19.8	24.4	23.2	21.1	24.8	20.4	21.3	20.5	20.5	22.2	
1998	19.2	21.9	20.8	20.2	24.0	19.6	19.5	19.5	19.2	19.9	
In-Shell Width (mm)	1987	32.6	N/A	32.4	31.1	33.6	32.5	34.2	33.8	30.9	32.6
	1988	32.0	N/A	31.4	30.9	33.5	32.4	34.1	31.8	31.2	32.2
	1989	31.9	33.1	31.2	31.0	33.7	32.1	33.0	32.8	31.3	31.5
	1990	32.3	32.8	31.1	30.7	33.1	33.0	34.2	31.4	30.0	31.4
	1991	31.4	31.9	30.4	30.0	32.4	31.6	32.7	32.0	29.8	30.3
	1992	32.0	33.3	31.6	30.9	33.6	32.3	34.1	33.1	31.3	31.0
	1993	32.3	32.5	30.9	31.3	33.2	33.3	33.6	31.5	30.5	31.6
	1994	31.8	32.7	30.9	30.8	33.2	32.1	33.3	32.4	30.5	30.8
	1995	31.0	31.7	30.6	30.1	32.6	31.9	32.4	31.6	29.7	30.6
	1996	31.7	32.4	31.6	31.1	33.0	32.2	33.0	32.3	30.9	31.2
1997	31.8	32.3	30.7	30.6	33.3	31.5	33.3	32.0	31.0	30.8	
1998	31.2	31.8	30.2	30.7	33.0	31.4	32.1	31.2	30.6	31.1	
In-Shell Cross-Width (mm)	1987	33.2	N/A	32.7	32.0	34.0	32.7	33.4	34.1	32.7	33.5
	1988	32.1	N/A	32.1	31.4	33.4	32.5	33.5	31.6	32.1	32.9
	1989	31.8	33.9	31.0	31.8	34.1	31.8	32.4	32.6	32.2	32.4
	1990	32.3	32.8	31.2	31.1	33.1	32.8	33.4	31.5	31.1	32.3
	1991	30.7	32.3	30.5	30.1	32.1	30.7	30.7	31.0	30.2	30.5
	1992	32.0	34.3	32.4	31.6	33.9	32.1	33.0	33.0	32.6	32.1
	1993	32.2	32.9	31.7	31.4	33.0	33.0	32.7	31.3	30.8	32.1
	1994	31.6	33.2	31.4	31.3	33.0	31.9	32.3	31.9	31.6	31.9
	1995	30.6	31.7	30.5	30.1	32.1	31.3	30.9	30.7	30.1	31.0
	1996	31.7	33.1	32.1	31.5	32.9	32.2	32.1	32.5	32.1	32.3
1997	31.9	33.0	32.2	31.3	33.2	32.0	33.0	32.1	32.1	32.0	
1998	31.2	30.9	30.5	31.2	32.5	31.4	31.6	30.8	30.8	31.7	
In-Shell Length (mm)	1987	38.7	N/A	44.0	38.2	40.3	38.1	39.5	39.4	39.2	41.4
	1988	37.3	N/A	43.0	38.6	39.6	37.6	39.1	37.5	39.1	40.5
	1989	37.3	40.8	42.5	38.4	40.1	37.6	38.1	38.8	39.3	39.3
	1990	36.9	39.7	42.6	37.5	39.7	38.1	38.9	37.1	37.3	38.4
	1991	36.7	39.9	43.3	38.2	39.8	37.2	37.4	36.8	38.6	39.2
	1992	37.2	40.5	42.8	37.9	40.6	38.0	38.8	38.3	39.3	38.7
	1993	37.5	40.2	42.5	39.6	41.1	39.2	37.7	37.0	38.9	39.8
	1994	37.1	40.9	43.0	38.7	40.3	37.9	37.9	38.0	38.6	39.2
	1995	36.8	39.6	41.2	38.8	40.1	38.4	37.5	37.8	38.6	38.6
	1996	37.0	39.4	41.4	38.6	40.0	37.8	37.3	37.6	38.8	39.2
1997	36.2	39.2	41.0	37.8	39.5	36.6	37.4	37.2	38.1	38.5	
1998	37.2	40.0	40.8	39.6	40.9	38.0	37.7	37.7	38.4	39.6	
Kernel Grade -- Percent Sound	1987	95.1	N/A	98.1	98.1	97.4	96.2	96.7	98.5	97.8	97.6
	1988	94.3	N/A	97.9	95.1	98.1	93.2	94.9	95.0	97.6	97.1
	1989	97.3	98.3	93.9	97.8	97.5	95.2	97.0	97.2	98.7	96.8
	1990	96.6	99.5	94.2	96.7	97.7	94.5	91.0	98.5	94.1	96.8
	1991	91.0	99.9	87.1	97.2	96.1	94.7	94.2	96.7	98.1	98.5
	1992	94.7	99.2	96.1	96.7	97.2	95.4	96.5	99.1	98.0	96.9
	1993	89.8	99.0	92.5	93.9	97.4	94.0	95.3	94.5	94.9	94.8
	1994	91.3	96.6	95.7	95.7	95.3	96.9	96.9	96.4	94.0	97.3
	1995	91.6	93.6	93.4	89.8	93.8	95.2	95.6	88.7	92.4	93.5
	1996	92.3	95.1	93.4	89.8	95.1	95.4	96.6	92.7	95.8	94.2
1997	96.2	97.8	94.9	96.6	98.1	96.5	97.0	96.7	97.5	96.6	
1998	94.4	91.4	99.8	89.5	94.4	96.3	97.9	94.3	95.2	95.2	
Nuts Set Per Tree	1987	2,029	N/A	2,633	3,267	2,595	1,853	1,204	2,031	2,561	2,424
	1988	1,599	N/A	1,789	2,482	2,414	1,885	1,084	2,224	2,006	1,799
	1989	1,338	2,761	2,051	2,411	1,767	1,543	1,603	1,461	1,645	1,877
	1990	1,399	2,716	2,058	2,706	2,662	1,648	884	1,683	2,216	1,708
	1991	1,372	3,092	3,212	3,116	2,712	2,067	1,553	1,487	2,055	2,161
	1992	1,072	1,645	1,585	2,012	2,008	1,487	915	1,082	1,385	1,626
	1993	1,147	2,099	1,452	2,532	2,742	1,444	1,626	1,653	1,654	1,818
	1994	1,391	1,711	1,905	2,781	1,974	1,540	1,154	1,207	1,619	1,643
	1995	1,392	1,912	1,590	2,348	2,284	1,404	984	1,961	1,260	1,157
	1996	1,353	1,659	1,296	2,356	1,853	1,285	1,417	958	1,355	1,472
1997	1,406	1,570	1,414	2,162	2,228	1,304	796	1,703	1,894	1,839	
1998	1,221	1,306	1,380	1,512	1,457	1,170	1,622	1,347	1,504	1,290	

**TABLE 6 -- Percentage Distribution Of Walnut Shell Suture Sizes, By District And Variety**

District And Variety	U.S. Standards Size Intervals 1/																													
	1994						1995						1996						1997						1998					
	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
<b>DISTRICTS:</b>	----- Percent of Total 2/ -----																													
Coast	1	47	16	15	19	1	0	36	16	20	26	1	0	47	20	15	17	1	1	62	16	9	12	0	0	46	15	15	21	2
Sacramento Valley	0	64	12	12	10	1	0	53	16	14	15	1	0	65	14	11	9	0	0	73	11	9	6	0	0	62	15	12	10	1
San Joaquin Valley	0	60	18	13	9	0	0	59	17	13	10	1	0	61	18	12	8	0	0	51	14	12	19	4	0	49	19	16	14	1
<b>VARIETIES:</b>																														
Ashley	0	54	18	16	12	0	0	42	22	18	18	1	0	54	17	13	15	1	0	62	15	9	10	4	0	48	19	12	19	1
Chandler	0	69	17	9	5	0	1	52	19	19	10	0	1	67	16	9	7	0	1	67	11	10	10	1	1	53	20	15	11	0
Eureka	0	28	38	20	13	0	0	29	30	22	17	1	0	49	29	12	10	0	0	36	29	12	20	2	1	23	24	19	32	1
Franquette	0	39	21	18	21	1	0	24	21	24	28	2	0	41	25	17	16	1	0	35	19	21	23	1	0	35	20	24	20	1
Hartley	0	78	10	7	4	0	0	69	13	9	8	0	0	74	12	9	5	0	0	79	9	5	5	1	1	73	12	8	5	1
Payne	1	56	17	15	9	1	0	59	15	15	11	1	0	62	16	11	10	1	0	55	13	12	19	2	0	48	18	17	16	1
Serr	1	78	9	7	5	0	0	66	16	10	6	1	1	75	11	7	5	0	1	75	8	8	7	1	0	62	17	12	8	1
Tehama	0	66	12	11	10	0	1	53	15	15	16	1	0	59	22	11	7	0	0	61	15	11	14	0	0	46	21	13	20	1
Vina	0	30	22	26	21	1	1	25	16	22	31	5	0	38	19	22	20	1	0	45	18	18	15	3	0	32	19	25	23	1
Other	0	38	15	24	21	1	0	40	14	18	27	1	1	46	16	18	18	1	1	43	17	15	18	7	0	39	19	17	24	1
STATE	0	60	15	13	10	1	0	54	16	14	14	1	0	62	16	11	9	0	0	64	13	10	11	2	0	55	17	14	13	1
Number of Shells Measured	12,215						12,558						13,242						13,220						14,231					

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.