

1991 ALMOND OBJECTIVE MEASUREMENT SURVEY RESULTS

PERMANENT RECORD

RELEASED: JULY 3, 1991
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CALIFORNIA AGRICULTURAL
STATISTICS SERVICE

1991 ALMOND CROP DOWN FROM LAST YEAR

The 1991 California almond production is forecast at 460 million meat pounds based on 409,000 acres. The July forecast is up 2 percent from June's forecast but 30 percent below last year's crop. The Nonpareil variety is forecast at 260 million meat pounds, down 24 percent from last season. The Nonpareil variety represents 57 percent of the total almond production.

The average nut set per tree was 6,134, down 34 percent from 1990. The Nonpareil average nut set of 6,163 represents a 34 percent decrease from last year's set. The average kernel weight for all varieties sampled was 1.77 grams, up 16 percent from last year. A total of 97.4 percent of nuts sized were sound.

The California almond crop appears to be in good condition. Cool weather has delayed nut maturity by approximately 7 to 10 days, but the cool temperatures have helped ease possible water shortage and insect problems. Nut drop is complete and tree stress due to water shortages appears to be minimal. Nut sizes are larger than last year, but nut sets are lower. The 1991 bearing acreage forecast of 409 thousand acres is down 2,000 acres from 1990.

SAMPLING PROCEDURES

To determine tree set, nuts are counted along a path within a randomly selected tree starting at the trunk and progressing to the

end of the terminal branch. Each branch at a forking has a given probability of selection proportional to its cross-sectional area. This methodology is used because of its statistical efficiency. The path is random in that, at each forking, only one of the branches is randomly selected to continue the path. In this way it is possible to end up at any of the tree's terminal branches. Along intermediate stages, i.e., the bearing surface between forkings, every fifth nut is picked. All nuts on the terminal branch are picked. The path chosen has a known probability of selection associated with it and thus can be used to expand the counts along the path in order to arrive at an estimated set for the entire tree.

FIELD SAMPLING ACTIVITIES

The Survey began June 5th with sampling completed by June 24th. There were 1,550 trees sampled for the 1991 survey in 775 orchards. An additional 102 orchards were not sampled for one of the following reasons:

- 1) Orchard had been sprayed.
- 2) Orchard was wet.
- 3) Orchard had been pulled.
- 4) Owner refused to cooperate or could not be contacted.

The Objective Measurement Survey is funded by monies provided by the Almond Board of California in cooperation with the California Department of Food and Agriculture.

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

District and Variety	1987		1988		1989		1990		1991	
	Nuts Per Tree	Orchards Sampled	Nuts Per Tree	Orchards Sampled	Nuts Per Tree	Orchards Sampled	Nuts Per Tree	Orchards Sampled	Nuts Per Tree	Orchards Sampled
ALL DISTRICTS (All Varieties)	9,410	835	8,386	850	6,352	796	9,333	796	6,134	775
BY DISTRICTS										
<u>District I</u>										
Sacramento Valley	9,261	175	9,835	177	5,136	172	10,709	165	6,802	166
<u>District II</u>										
San Joaquin Valley	9,600	647	8,123	661	6,765	615	9,045	625	5,952	609
BY VARIETIES										
California Types <u>a/</u>	9,835	144	8,253	154	7,421	153	10,068	142	6,406	144
Carmel <u>b/</u>	N/A	N/A	8,184	88	7,855	90	9,776	88	6,116	94
Merced	10,477	46	7,199	51	6,581	43	8,773	47	5,518	43
Mission	8,699	94	8,479	87	6,768	78	9,018	85	6,197	76
Ne Plus Ultra	7,525	42	6,354	43	5,639	38	7,853	32	6,681	32
Nonpareil	9,793	443	8,843	457	6,018	431	9,378	438	6,163	429

a/ California types include the following varieties: Ballico, Carmel, Davey, Fritz, Harvey, Le Grand, Mono, Monterey, Norman, Price Cluster, Ruby, Tokoyo and Yosemite.

b/ The Carmel breakdown was available for the first time in 1988. Carmel variety is still included in California Types.

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

District and Variety	Weight (Grams)		Size (Millimeters)					Grade (Percent of Nuts) <u>a/</u>						
	In-Hull	Kernel	Suture		Kernel			Edible Nuts		Insect Damage	Shrivel	Natural Gum	Blank	Other
			In-Hull	In-Shell	Length	Width	Thickness	Singles	Doubles					
ALL DISTRICTS	(Weighted by Bearing Acreage)													
1987	10.41	1.53	26.38	20.82	23.00	13.53	10.12	93.8	4.4	<u>b/</u>	1.0	<u>b/</u>	0.1	0.7
1988	10.91	1.57	26.30	20.73	22.75	13.20	10.21	93.7	3.1	<u>b/</u>	1.2	0.6	0.1	1.2
1989	11.52	1.54	26.34	20.79	23.84	13.04	9.64	95.1	2.1	<u>b/</u>	1.1	0.3	0.1	1.3
1990	10.51	1.53	25.73	20.71	23.36	12.98	9.94	92.6	5.3	<u>b/</u>	0.9	0.1	0.1	1.0
1991	<u>f/</u>	1.77	<u>f/</u>	<u>f/</u>	23.47	13.97	10.44	93.9	3.5	<u>b/</u>	1.2	0.2	0.1	1.0
BY DISTRICT <u>c/</u>														
Sacramento Valley														
1987	10.34	1.48	26.61	22.15	23.30	13.50	9.91	93.5	5.1	<u>b/</u>	0.6	0.1	0.2	0.5
1988	10.46	1.50	25.69	22.22	22.58	12.74	10.00	93.8	3.9	<u>b/</u>	0.7	0.2	0.2	0.9
1989	12.70	1.60	27.67	23.94	24.60	13.30	9.46	93.0	5.0	<u>b/</u>	0.5	0.4	0.3	0.7
1990	9.31	1.39	24.85	19.58	21.85	12.63	9.70	91.4	7.4	<u>b/</u>	0.3	0.1	<u>b/</u>	0.8
1991	<u>f/</u>	1.68	<u>f/</u>	<u>f/</u>	22.23	13.68	10.19	93.7	4.2	<u>b/</u>	0.4	0.1	<u>b/</u>	1.5
San Joaquin Valley														
1987	10.43	1.54	26.31	20.43	22.92	13.55	10.19	93.9	4.2	<u>b/</u>	1.1	<u>b/</u>	<u>b/</u>	0.7
1988	11.06	1.59	26.49	20.26	22.82	13.35	10.29	93.7	2.8	<u>b/</u>	1.4	0.7	0.1	1.3
1989	11.27	1.53	26.06	20.10	23.69	12.99	9.69	95.6	1.5	<u>b/</u>	1.2	0.3	<u>b/</u>	1.4
1990	10.88	1.57	26.01	21.07	23.84	13.09	10.02	92.9	4.6	<u>b/</u>	1.1	0.1	0.1	1.1
1991	<u>f/</u>	1.79	<u>f/</u>	<u>f/</u>	23.84	14.06	10.51	94.0	3.2	<u>b/</u>	1.5	0.2	0.2	0.8
BY VARIETY														
California Types <u>d/</u>														
1987	9.00	1.42	24.31	18.94	22.40	12.49	10.15	91.9	6.4	<u>b/</u>	0.9	<u>b/</u>	<u>b/</u>	0.8
1988	9.28	1.45	24.29	18.87	22.22	12.31	10.07	93.0	3.3	<u>b/</u>	1.8	0.7	0.1	1.2
1989	9.58	1.38	23.87	18.76	23.58	11.98	9.48	94.4	2.3	<u>b/</u>	1.4	0.1	<u>b/</u>	1.7
1990	8.57	1.39	23.47	18.96	23.19	12.01	9.93	89.9	7.8	<u>b/</u>	1.0	<u>b/</u>	<u>b/</u>	1.2
1991	<u>f/</u>	1.46	<u>f/</u>	<u>f/</u>	21.77	12.42	10.14	91.5	5.5	<u>b/</u>	1.2	0.4	0.1	1.3
Carmel <u>e/</u>														
1988	9.44	1.48	24.34	18.70	22.84	12.29	10.01	93.9	2.6	<u>b/</u>	1.4	1.0	0.1	1.1
1989	9.44	1.39	23.56	18.37	23.96	11.89	9.47	95.3	1.7	<u>b/</u>	1.0	0.1	<u>b/</u>	1.8
1990	8.77	1.42	23.56	19.41	23.91	11.95	9.91	90.3	7.7	<u>b/</u>	1.1	<u>b/</u>	<u>b/</u>	0.7
1991	<u>f/</u>	1.61	<u>f/</u>	<u>f/</u>	24.22	12.74	10.11	94.7	2.8	<u>b/</u>	1.3	0.2	<u>b/</u>	1.0
Merced														
1987	9.74	1.53	25.99	20.03	21.33	13.51	10.77	88.2	8.4	<u>b/</u>	2.2	0.3	<u>b/</u>	0.7
1988	11.04	1.59	26.34	20.08	21.92	13.35	10.65	88.0	4.1	<u>b/</u>	2.0	3.6	0.3	2.1
1989	10.42	1.49	25.28	19.18	22.30	12.77	10.07	92.6	3.6	<u>b/</u>	1.5	1.2	<u>b/</u>	1.1
1990	10.03	1.53	25.55	20.74	22.55	12.91	10.33	90.1	6.6	<u>b/</u>	2.1	0.4	<u>b/</u>	0.8
1991	<u>f/</u>	1.71	<u>f/</u>	<u>f/</u>	22.13	13.73	10.87	90.5	5.6	<u>b/</u>	2.1	0.8	<u>b/</u>	0.9
Mission														
1987	8.53	1.28	25.09	19.33	19.94	12.89	10.67	93.4	4.5	<u>b/</u>	0.8	0.1	0.1	1.2
1988	8.22	1.33	24.77	19.19	19.36	12.61	10.76	95.5	1.4	<u>b/</u>	0.7	0.2	<u>b/</u>	2.0
1989	8.60	1.25	24.69	18.92	20.23	12.14	9.84	96.6	1.4	<u>b/</u>	0.4	0.2	<u>b/</u>	1.4
1990	7.45	1.31	23.46	18.17	19.43	12.17	10.62	85.9	11.1	<u>b/</u>	0.9	<u>b/</u>	0.1	1.9
1991	<u>f/</u>	1.43	<u>f/</u>	<u>f/</u>	19.68	13.11	10.74	95.2	2.2	<u>b/</u>	0.9	0.2	0.5	1.0
Ne Plus Ultra														
1987	11.12	1.84	26.96	21.35	26.36	13.72	10.42	79.9	17.8	<u>b/</u>	1.7	<u>b/</u>	<u>b/</u>	0.5
1988	12.61	1.88	27.65	21.95	26.64	13.65	10.27	78.3	16.3	<u>b/</u>	3.0	0.6	<u>b/</u>	1.4
1989	12.04	1.77	26.84	21.36	26.91	13.22	9.71	86.3	9.7	<u>b/</u>	1.9	0.2	<u>b/</u>	1.8
1990	11.44	1.79	26.35	20.97	26.84	13.39	10.20	85.1	12.2	<u>b/</u>	1.1	0.1	<u>b/</u>	1.3
1991	<u>f/</u>	1.98	<u>f/</u>	<u>f/</u>	26.58	13.99	10.37	85.2	12.0	<u>b/</u>	0.6	0.1	<u>b/</u>	1.8
Nonpareil														
1987	11.21	1.59	27.24	21.70	23.78	13.97	9.95	96.3	2.1	<u>b/</u>	1.0	<u>b/</u>	<u>b/</u>	0.6
1988	11.82	1.64	27.20	21.65	23.52	13.59	10.13	95.5	2.2	<u>b/</u>	1.0	0.3	0.1	0.8
1989	12.99	1.67	27.80	22.06	24.73	13.73	9.64	96.5	1.1	<u>b/</u>	1.0	0.2	0.1	1.1
1990	11.74	1.61	26.94	21.83	24.14	13.46	9.78	95.7	2.3	<u>b/</u>	0.8	<u>b/</u>	0.1	0.8
1991	<u>f/</u>	1.91	<u>f/</u>	<u>f/</u>	24.28	14.65	10.47	95.4	2.2	<u>b/</u>	1.3	0.1	0.1	0.8

^{a/} Percentages may not add to 100 due to rounding.

^{b/} Not shown if less than 0.07 percent.

^{c/} San Luis Obispo County will no longer be published separately to maintain data integrity.

^{d/} California types include the following varieties: Ballico, Carmel, Davey, Fritz, Harvey, Le Grand, Mono, Monterey, Norman, Price Cluster, Ruby, Tokoyo and Yosemite.

^{e/} The Carmel breakdown was available for the first time in 1988. Carmel variety is still included in California Types.

^{f/} In-Hull and In-Shell measurements and In-Hull weight were not taken in 1991 and will not be shown in future reports.

NOTE: 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.

**TABLE 3: CALIFORNIA ALMOND ACREAGE,
PRODUCTION AND TREES/ACRE, 1986-91**

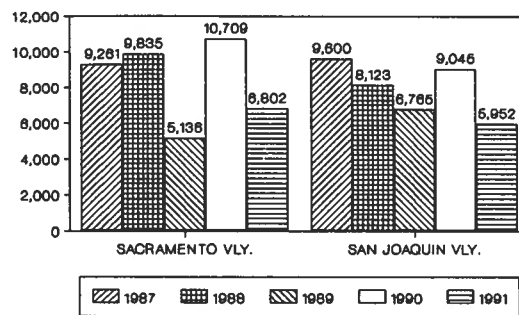
Year	Bearing Acres <u>a/</u>	Total Meat Production			Average Trees Per Acre
		Metric Ton <u>b/</u>	Million Lbs.	Lbs Per Acre	
1986	416,000	113,000	250	601	84.0
1987	417,000	299,000	660	1,580	85.4
1988	419,000	268,000	590	1,410	86.3
1989	411,000	222,000	490	1,190	87.3
1990	411,000	299,000	660	1,610	88.4
1991 <u>c/</u>	409,000	209,000	460	1,120	88.4

a/ Bearing acreage defined to be plantings 4 years and older.

b/ Rounded to nearest thousand.

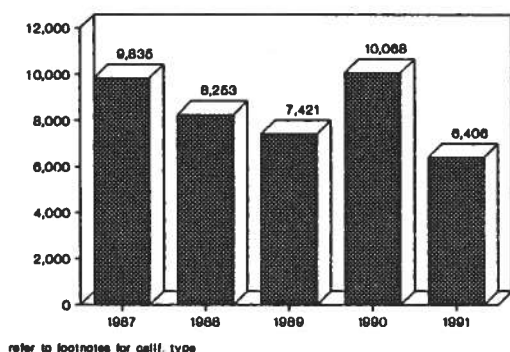
c/ July forecast.

DISTRICTS NUTS PER TREE

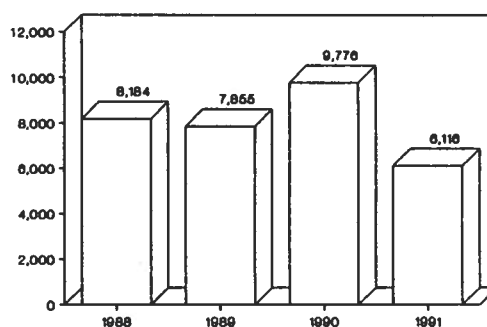


NUTS PER TREE

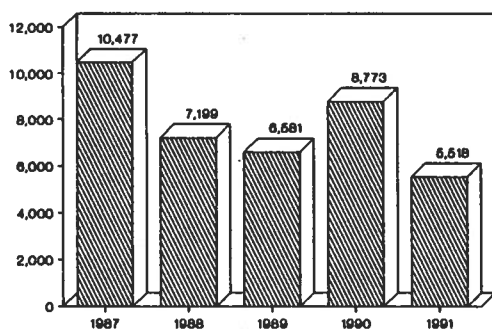
CALIFORNIA TYPES



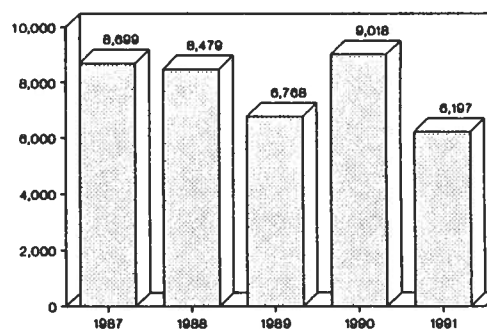
CARMEL



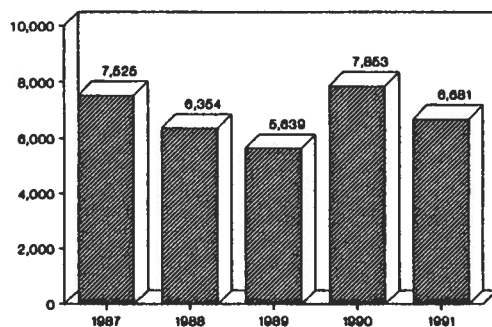
MERCED



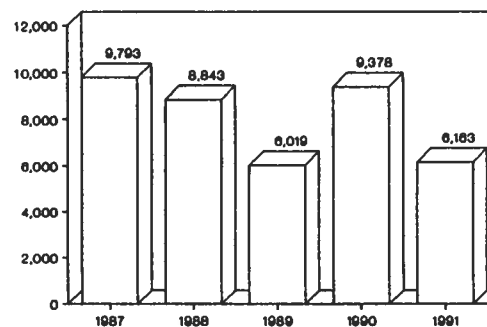
MISSION



NE PLUS



NONPAREIL



CALIFORNIA FRUIT AND NUT ACREAGE AS OF 1990--VARIETIES AND AGE GROUPS--STATE SUMMARY
ACREAGE PLANTED DURING YEARS SHOWN AND STANDING IN 1990

CROP AND VARIETY	1978 AND EARLIER	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	ACRES STANDING IN 1990:		
														BEARING	NON- BEARING	TOTAL
ALMONDS																
ALDRICH	7	0	0	0	1	6	7	13	7	10	12	2	0	51	14	65
BALLICO	65	0	0	0	0	0	0	0	0	0	0	0	0	65	0	65
BUTTE	340	242	628	1,049	794	375	244	143	165	444	841	381	411	4,624	1,633	6,257
CALIFORNIA/CA PAPERSHELL	12	0	10	0	0	13	0	2	0	0	19	0	0	37	19	56
CARMEL	13,404	6,028	6,171	9,654	6,431	2,434	1,929	1,468	1,195	1,367	1,948	1,621	666	50,081	4,235	54,316
CARRIENS	29	4	28	50	9	18	0	1	7	11	12	12	0	157	24	181
DAVEY	971	0	0	0	0	0	0	1	0	1	0	0	0	973	0	973
DRAKE	1,862	0	0	0	0	0	0	0	0	0	0	0	0	1,862	0	1,862
EARLY MISSION	63	6	1	5	0	0	0	0	0	13	0	20	0	88	20	108
FRITZ	618	131	278	589	292	99	102	295	176	147	386	477	110	2,727	973	3,700
HARVEY	1,764	385	73	124	68	0	8	2	4	5	0	0	3	2,433	3	2,436
HASHAM	187	230	145	0	78	62	0	31	40	0	0	0	0	773	0	773
IXL	705	0	0	0	0	0	0	0	0	0	0	0	0	705	0	705
JEFFRIES	60	158	152	261	0	0	0	0	0	0	0	0	0	631	0	631
JORDANOLO	368	6	0	0	0	1	0	0	0	0	0	0	0	376	0	376
JUBILEE	59	0	0	0	0	0	0	0	0	1	0	0	0	59	0	59
KAPAREIL	319	3	25	4	32	11	1	2	0	0	0	0	0	397	0	397
LE GRAND	943	86	133	268	88	43	0	3	0	0	0	0	0	1,564	0	1,564
LIVINGSTON	84	25	30	7	11	4	0	0	6	15	28	6	0	182	34	216
MERCED	20,557	470	169	125	44	31	24	99	21	20	25	9	0	21,560	34	21,594
MIL0	195	0	0	0	0	0	0	0	0	0	0	0	0	195	0	195
MONO	878	187	217	39	48	20	35	13	0	15	0	0	0	1,452	0	1,452
MONTEREY	113	299	459	670	1,224	327	177	167	25	202	262	139	110	3,663	511	4,174
N-43	0	0	60	0	0	0	0	0	0	0	0	0	0	60	0	60
NE PLUS ULTRA	14,735	520	802	662	350	72	99	35	29	44	115	6	37	17,368	158	17,526
NONPAREIL	130,880	11,953	12,852	17,089	8,100	2,879	2,715	2,240	1,701	1,771	3,151	3,429	1,918	212,180	8,498	220,678
NORMAN	792	63	1	0	12	0	0	0	1	0	0	0	0	869	0	869
PADRE	7	0	0	0	37	14	3	0	6	105	224	83	108	172	415	587
PEERLESS	6,156	634	1,159	1,374	598	196	198	182	90	104	217	74	36	10,691	327	11,018
PRICE CLUSTER	4,771	2,073	2,506	4,292	1,901	622	587	477	263	341	571	365	449	17,833	1,385	19,218
RUBY	736	248	280	465	426	177	101	102	40	142	246	53	15	2,717	314	3,031
SAURET #1	34	187	112	55	6	7	2	15	0	1	1	0	0	419	1	420
SAURET #2	71	117	124	44	0	0	3	10	0	1	0	0	0	370	0	370
SMITH XL	20	12	0	1	34	0	0	1	0	0	0	0	0	68	0	68
SONORA	0	0	0	0	0	0	18	40	4	29	90	615	202	91	907	998
TEXAS/MISSION	34,205	982	1,558	1,621	1,106	583	365	151	218	385	615	181	95	41,174	891	42,065
THOMPSON	9,055	160	95	58	167	57	23	9	3	3	5	0	0	9,630	5	9,635
TIOGA	10	0	34	12	1	0	0	0	0	0	0	0	0	57	0	57
TOKOYO	444	82	128	49	40	0	0	24	0	0	1	0	0	767	1	768
WOOD COLONY	0	0	0	0	0	0	2	0	0	19	26	68	7	21	101	122
YOSEMITE	452	137	152	49	40	8	0	0	0	0	0	0	4	838	4	842
OTHER	866	79	107	64	79	21	10	5	40	43	56	34	59	1,314	149	1,463
CROP TOTAL	267,057	25,507	28,489	38,680	22,017	8,080	6,653	5,531	4,041	5,239	8,851	7,575	4,230	411,294	20,656	431,950

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