12TH ANNUAL ALMOND RESEARCH CONFERENCE, DECEMBER 4, 1984, SACRAMENTO

Project No. 84-LA11 - Tree and Crop Research
Field Evaluation of Almond Varieties

Project Leader: Dr. Dale E. Kester (916) 752-0914 or 752-0122
Mr. Warren C. Micke (916) 752-2588
Department of Pomology
University of California
Davis, CA 95616

Personnel: Mario Viveros (Kern Co.), Mark Freeman (Fresno Co.), Joe Connell (Butte Co.), Don Rough (San Joaquin Co.), John Edstrom (Colusa Co. & Nickels Estate), Richard Baldy and Dick Jacobs (CSU Chico), Gary Blomgren and Dave Dias (Delta College), Allan Hewitt (CSU Fresno), and almond farm advisors in other counties. Richard Asay, Jim Yeager, and Greg Vogel, University of California, Davis.

Objectives: (1) To obtain and evaluate yield, phenology, performance, and nut characteristics of varieties in Regional Variety Test plots. (2) To obtain information on pollen compatibility relationships among new almond varieties. (3) To continue isozyme tests to identify and categorize parentage of almond varieties. (4) Prepare a summary of variety field performance for distribution to the almond industry.

Interpretative Summary: (1) Variety evaluation - Good to very high yields primarily due to high percent set were obtained in the five Regional Variety Plots. Commercial crops were obtained for the first time at Fresno and in the addition to the Kern plot. Data of blossom density, blooming time, percent set, maturity, yield, and harvested samples were obtained but have not been completely summarized.

Table 1 compares yield of some of the more important varieties in three of the plots. Only number of nuts per tree has been calculated for Chico and is not shown. Overall yields of the Kern plot were highest, mostly one ton or more per acre with some more than 1 $^{1}/_{2}$ tons per acre. Yields in Chico plot also attained a ton to 1 $^{1}/_{2}$ tons per acre in some varieties. The Manteca plot reached to 1 ton and slightly more, and the Arbuckle plot was around 1000 lbs or slightly more.

Among early blooming varieties, 'Jordanolo' and 'Sonora' were uniformly outstanding with 'Ne Plus Ultra' varying by plot. Large kernel size was a major factor in yield in these varieties.

In the mid-blooming group, 'Nonpareil' was the outstanding variety across all plots primarily due to more nuts per tree indicating high percent set. Of the major pollinizers, 'Price', 'Carmel', and 'Merced' approached or were similar to 'Nonpareil' in numbers of nuts per tree in the Arbuckle, Chico, and Manteca plots, but were drastically less in the Kern plot. 'Solano' held up well in number of nuts per tree. Among these varieties lower kernel weights reduced tonnage in 'Price' and 'Solano'. In the younger block at Manteca, 'Sauret #1', 'Sauret #2', and 'Monterey' also showed good yield. 'Harvey' and 'Monarch' were low yielding. 'Fritz' yielded well but also had smaller kernel weight.

Of the later blooming varieties, 'Butte' was outstanding across all plots. 'Ripon' had good yields this year for perhaps the first time. 'Padre' was also good across all plots, but kernel size was small. 'Mission' yields were very good in the younger Manteca plot, but were slightly reduced from the others in the older blocks. 'Thompson' yields were low in all the plots.

(2) Pollen compatibility - Crosses made in 1984 expand the list of cross-incompatible groups. Results show that 'Livingston', 'Sauret #1', and 'Monarch' can be placed into the 'Carmel' incompatibility group, and 'Sauret #2' into the 'Thompson' group.

Pollination studies of 'Jeffries' with other varieties have confirmed that a cross-pollination problem exists when 'Jeffries' is planted with 'Carmel': the 'Carmel' sets low crops, but the 'Jeffries' sets well. Combinations of 'Jeffries' and 'Fritz' have been reciprocally quite satisfactory. Consequently, 'Jeffries' and 'Carmel' combinations should not be planted, and except for the possibility of a 'Jeffries''Fritz' combination, other variety combinations with 'Jeffries' should be avoided until test crosses can be made.

(3) Isozyme studies - Five different isozyme genetic factors have been identified using four enzyme systems that can be identified with electrophoresis. Fingerprinting patterns obtained with about 75 different varieties and selections can be used to aid identification of unknown varieties. These data combined with incompatibility group inheritance were used to trace variety origins providing experimental evidence that all recently introduced varieties are offspring of 'Nonpareil' with the other parent being 'Mission' in a majority of cases.

1984 YIELDS ON SELECTED VARIETIES AT 3 REGIONAL VARIETY TRIALS[1/]

Variety	McFarland[2/] Nuts/Tree	McFarland[2/] Meat lbs/A	Arbuckle[2/] Nuts/Tree	Arbuckle[2/] Meat lbs/A	Manteca[2/] Nuts/Tree	Manteca[2/] Meat lbs/A
Early Bloom						
Ne Plus Ultra	13,006	2,555	3,064	578	6,483	1,533
Jordanolo	11,776	3,062	6,822	1,223	5,787	1,532
Peerless	------	-----	5,303	863	5,274	1,091
Sonora	13,071	2,730	8,349	1,178	6,792	1,353
Mid-Bloom						
Nonpareil	17,073	3,116	7,733	1,172	10,135	2,068
Merced	7,054	1,272	-----	-----	11,822	2,525
Carmel	6,606	1,229	5,944	1,035	10,490	2,101
Price	11,759	1,875	7,955	930	10,136	1,712
Fritz	13,788	2,351	7,080	968	13,064	2,293
Sauret #1	[3/]		-----	-----	11,418	2,174
Sauret #2	[3/]		-----	-----	9,988	2,051
Harvey	8,283	1,358	4,874	750	------	-----
Norman	17,555	2,514	7,274	878	------	-----
Solano	13,944	2,356	7,635	960	10,411	1,758
Monterey	[3/]		-----	-----	10,846	2,532
Monarch	[3/]		-----	-----	5,917	1,176
Late Bloom						
Mission	10,977	1,845	4,948	735	12,125	2,320
Thompson	10,830	2,042	4,543	765	10,484	2,204
Butte	17,473	2,610	7,259	915	20,532	3,229
Ruby	10,738	1,963	-----	-----	10,805	2,236
Padre	15,143	2,168	5,781	851[4/]	13,010	2,326
Carrion	13,755	2,540	4,329	690	------	-----
Livingston	[3/]		-----	-----	13,376	2,746
Mono	[3/]		-----	-----	15,433	2,708
Tokyo	[3/]		-----	-----	7,549	1,589
Yosemite	[3/]		-----	-----	11,422	1,815
Le Grand	------	-----	-----	-----	12,030	2,529

[1/] Data on all varieties in all plots will be included in the 1984 annual report to the Almond Board.

[2/] During 1984, trees in McFarland plot were in their 11th growing season, those at Arbuckle in their 10th season and those at Manteca in their 7th season.

[3/] Only in 4th growing season in the McFarland plot.

[4/] Padre in 8th growing season in the Arbuckle plot.

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DATA SUMMARY -- 1984 SEASON

RVT PLOTS

D. E. Kester and W. C. Micke

Following are the data summaries for the varieties in the five RVT plots for 1984:

Part I. Yield

Yield is presented in two ways, first according to number of nuts per tree and, second, according to meat-pounds per tree and per acre. Nut number is considered the most biologically meaningful measure of productivity of different varieties and results from total blossom density, % set and % drop.

Yield in meat-pounds is, of course, the most meaningful economic indicator of interest to producers. Note that average kernel weight is a major factor in total yield. Thus, large-kerneled varieties such as Ne Plus Ultra, Jordanolo and Sonora offset some lower nut numbers and produce good tree yield. On the other hand, smaller-kerneled varieties such as Butte, Price, Fritz, Solano, Padre and Norman have smaller yields or must produce greater numbers of nuts.

Part II. Quality Factors

Varieties in these tables are listed in relation to shape -- from narrow (width/length 40-45) to broad (width/length 60 or more). Varieties also differ by characteristic thickness which tends to be independent of size. These three traits taken together can characterize general shape.

Double kernels have two seeds within one shell. This trait also tends to be more or less characteristic of particular varieties although it varies by season. 1984 produced a high level of doubles. Certain varieties including Robson, Ne Plus Ultra, Monterey, Price, Grace and Sauret No. 2 were relatively high on doubling. Others with significant doubling included Carmel, Peerless, Merced, Mission and 23-122. Many new varieties at Fresno had high doubling but only one year's results are presented.

Twins include two embryos within one seed coat (seed). Sonora, Nonpareil, Price, and 24-5Z are varieties with twins. Worm damage was divided into navel orangeworm (NOW) and twig borer (TB) and was relatively low in all plots.

Blanks are seeds with no embryos. Other refers primarily to partially developed embryos. Broken refers to kernels which were damaged during the shelling operation.

Kern RVT Plot
McFarland, California
Yield Summary - 1984
Planted 1974

Variety	No. of trees	No. of nuts/tree	Ave. kernel wt. gms.	Ave. kernel wt. no./oz.	% kernel	Weight lbs./tree	Weight lbs/acre
Early blooming varieties							
Sonora	25	13,071	1.27	22	72	36.4	2,730
NePlus Ultra	47	13,006	1.19	24	55	34.0	2,555
Jordanolo	52	11,775	1.56	18	71	40.9	3,062
Money Tree	26	9,832	1.41	20	66	30.5	2,288
Mid blooming varieties							
Milow/PA	12	26,891	0.87	33	72	51.3	3,846
K16-14	26	18,964	.95	30	58	39.7	2,978
Norman	26	17,555	0.87	33	70	33.6	2,514
Milow/Nem.	14	17,484	0.89	32	73	34.1	2,551
1-69	26	16,722	0.99	29	63	35.9	2,701
Nonpareil	581	16,444	1.16	25	65	41.4	3,094
Granada	25	15,820	1.05	27	77	36.8	2,755
Jeffries	26	14,529	1.02	28	63	32.9	2,470
Solano	26	13,944	1.03	28	65	31.4	2,356
Robson	25	13,850	1.04	27	59	31.8	2,388
Fritz	26	13,788	1.03	28	56	31.3	2,351
1-46	26	12,689	1.01	28	56	28.2	2,122
2-62	23	13,477	1.14	25	66	33.7	2,528
23-122	26	11,956	1.16	25	60	30.5	2,287
Price	26	11,759	.97	29	61	25.0	1,875
2-17	26	11,430	1.03	28	51	25.8	1,940
2-55	26	10,107	1.19	24	69	26.5	1,986
69-60	26	9,050	1.20	24	52	24.0	1,796
K13N	26	9,151	1.18	24	58	23.5	1,764
Harvey	26	8,283	.99	29	62	18.1	1,358
7-10	25	8,125	1.19	24	70	21.4	1,606
Merced	26	7,054	1.09	26	62	17.0	1,272
Carmel	26	6,606	1.13	25	56	16.4	1,229
Vesta	24	5,507	1.23	23	56	14.9	1,124
Profuse	26	3,420	1.62	17	58	12.1	908
Late blooming varieties							
3-24E	26	21,301	0.76	37	56	35.4	2,650
Butte	26	17,473	0.91	31	54	34.8	2,610
Padre	19	15,143	0.86	33	50	28.9	2,168
Ripon	26	13,755	0.96	30	48	29.5	2,215
Carrion	26	13,755	1.12	26	62	33.9	2,540
Mission	204	10,976	1.02	28	44	24.6	1,847
Thompson	26	10,830	1.14	25	62	27.3	2,042
Ruby	26	10,738	1.11	26	54	26.1	1,963

Kern County RVT Plot
McFarland, California
Yield Summary - 1984

Variety	No. of trees	No. of nuts/tree	Ave. kernel wt. gms.	Ave. kernel wt. no./oz.	% kernel	Weight lbs./tree	Weight lbs/acre
Group II - 1981 Planting							
Mid blooming varieties							
Sauret #1	25	4,574	1.20	24	62	12.1	907
3-63	21	3,818	0.87	33	52	7.3	550
Sauret #2	24	3,335	1.30	22	58	9.5	717
Nonpareil	213	3,065	1.16	25	66	7.8	584
Monterey	26	2,837	1.40	20	49	8.7	653
Bonita	26	2,236	1.05	27	60	5.2	389
Monarch	26	1,834	1.17	25	54	4.7	355
Late blooming varieties							
2-43E	26	3,176	1.22	23	65	8.5	640
2-19E	26	3,121	1.06	27	54	7.3	545
Mission	148	1,953	1.28	22	51	5.5	411
Livingston	20	1,875	0.82	35	44	3.4	254
Yosemite	25	1,156	1.12	26	54	2.8	212
Yokyo	26	788	1.06	27	40	1.8	129
Mono	26	568	1.27	22	46	1.6	119

Colusa RVT Plot
Nickels Estate
Arbuckle, California
Yield Summary - 1984

Variety	No. of trees	No. of nuts/tree	Ave. kernel wt. gms.	Ave. kernel wt. no./oz.	% kernel	Weight lbs./tree	Weight lbs/acre
Variety Block I - Planted 1975							
Early blooming varieties							
Sonora	15	8,349	0.88	32	64	16.4	1,231
Jordanolo	14	6,822	1.07	27	51	16.3	1,229
Peerless	28	5,303	0.97	29	30	11.5	861
Money Tree	11	3,415	1.17	25	55	8.7	656
NePlus Ultra	28	3,064	1.14	27	51	7.7	580
Mid blooming varieties							
Price	15	7,955	0.71	40	47	12.4	930
Nonpareil	190	7,733	0.92	31	56	15.6	1,175
Solano	14	7,635	0.76	37	52	12.8	963
Norman	12	7,274	0.73	39	55	11.7	881
Granada	14	7,111	0.75	38	46	11.8	885
Fritz	14	7,080	0.83	34	48	12.9	964
23-122	13	6,719	0.90	32	43	13.4	1,005
Milow	15	6,531	0.70	41	70	10.5	754
Carmel	14	5,944	1.05	27	48	13.8	1,035
Robson	12	5,597	0.86	33	39	10.7	805
69-60	9	4,985	1.04	27	45	11.5	864
Harvey	15	4,874	0.92	31	53	10.0	752
Vesta	14	4,859	0.99	29	40	10.6	793
Late blooming varieties							
Butte	15	7,259	0.76	37	47	12.2	913
Granada	14	7,111	0.75	38	46	11.8	885
Mission	69	4,948	0.89	32	41	9.8	731
Thompson	13	4,543	1.02	28	50	10.2	767
Carrion	14	4,329	0.96	30	50	9.2	689
Variety Block II - Planted 1977							
Mid blooming varieties							
K16-14	14	10,709	0.71	40	49	16.9	1,268
2-62	14	9,396	0.85	34	53	17.5	1,316
Nonpareil	128	8,736	1.00	41	57	19.4	1,451
1-69	15	8,059	0.86	33	48	15.3	1,150
88-55	15	8,037	0.89	32	36	15.8	1,186
24-52	15	7,825	0.86	33	44	14.8	1,113
88-66	15	7,102	0.93	31	38	14.6	1,094
23.5-16-40B	15	6,698	0.93	31	47	13.7	1,027
2-13	8	6,298	0.96	30	50	13.3	1,000
79-49	15	5,209	0.88	32	39	10.0	752
1-46	15	5,179	1.00	29	45	11.4	855

Colusa County RVT Plot
Nickels Estate
Arbuckle, California
Yield Summary - 1984

Variety	No. of trees	No. of nuts/tree	Ave. kernel wt. gms.	Ave. kernel wt. no./oz.	% kernel	Weight lbs./tree	Weight lbs/acre
Late blooming varieties							
3-63	15	10,416	0.65	43	42	15.0	1,124
3-5W	14	7,046	0.64	45	39	9.9	743
Padre	14	5,781	0.89	32	49	11.4	851
Mission	58	5,633	0.93	30	44	12.3	921
Marianna 2624 Rootstock Block							
Mid blooming varieties							
Carmel	12	5,749	1.16	25	50	14.7	1,107
24-52	5	4,091	0.94	30	47	8.5	636
K16-14	1	3,846	0.75	38	51	6.5	484
1-46	5	3,194	1.09	26	47	7.5	565
2-62	4	3,138	0.98	29	51	6.8	509
Nonpareil	3	2,514	1.00	28	42	5.6	416
1-69	2	1,983	0.76	37	46	3.3	250
Early blooming varieties							
Sonora	1	3,467	1.05	27	56	8.0	603
Late blooming varieties							
Mission	10	8,015	0.97	29	40	17.1	1,285
Butte	11	6,063	0.84	34	66	11.1	833
Padre	9	5,693	0.86	33	47	16.5	1,234
Carrion	10	3,770	0.99	29	51	6.5	478

Butte RVT Plot
California State University, Chico (CSUC)
Durham, California
Yield Summary - 1984
Planted 1976

Variety	No. of trees	No. of nuts/tree	Ave. kernel wt. gms.	Ave. kernel wt. no./oz.	% kernel	Weight lbs./tree	Weight lbs/acre
Early blooming varieties							
NePlus Ultra	39	13,823	1.50	19	60	45.8	3,433
Jordanolo	20	13,240	1.57	18	64	45.9	3,442
Sonora	21	12,275	1.30	22	71	35.2	2,642
Mid blooming varieties							
Price	24	17,324	0.97	29	68	37.3	2,800
Nonpareil	380	16,272	1.25	23	67	44.4	3,369
Milow	24	16,132	1.01	28	74	36.0	2,698
Solano	22	14,792	1.07	27	62	34.9	2,621
Norman	26	13,363	1.00	28	67	29.5	2,212
23-122	26	12,819	1.16	25	53	32.8	2,462
Fritz	30	12,312	1.06	27	51	28.8	2,161
Vesta	23	12,131	1.16	25	50	31.1	2,329
Merced	21	11,110	1.28	22	66	31.4	2,354
K 13 N	27	10,278	1.17	25	66	26.6	1,991
Carmel	22	10,193	1.29	22	57	29.0	2,177
Granada	23	9,482	.94	30	59	19.9	1,476
Harvey	25	7,818	1.19	24	63	20.5	1,540
Late blooming varieties							
Butte	25	18,638	1.03	28	56	42.4	3,178
Padre	63	18,213	1.06	27	54	42.6	3,196
Ripon	31	16,576	1.12	26	50	41.0	3,074
Carrion	33	13,149	1.24	23	62	36.0	2,699
Mission	190	11,955	1.13	25	46	32.2	2,416
Robson	26	8,343	1.23	23	60	22.6	1,699
Thompson	32	7,018	1.25	23	63	19.4	1,452
Group 2 - Planted 1978							
1-69	24	11,437	1.05	27	54	26.5	1,988
24-5z	23	10,200	1.05	27	64	23.6	1,773
23.5-16-40B	20	10,052	1.24	23	67	27.5	2,064
1-46	17	9,246	1.21	24	55	24.7	1,852
Nonpareil	23	8,302	-	-	-	-	-

San Joaquin Co. RVT Plot
Delta College
Manteca, California
Yield Summary - 1984
Planted 1978

Variety	No. of trees	No. of nuts/tree	Ave. kernel wt. gms.	Ave. kernel wt. no./oz.	% kernel	Weight lbs./tree	Weight lbs/acre
Early blooming varieties							
Sonora	27	6,792	1.21	24	81	18.0	1,353
NePlus Ultra	46	6,483	1.43	20	62	20.4	1,533
Jordanolo	24	5,787	1.60	18	69	20.4	1,532
Peerless	27	5,274	1.25	23	39	14.6	1,091
Mid blooming varieties							
Fritz	26	13,064	1.06	27	55	30.6	2,293
Merced	27	11,822	1.29	22	74	33.7	2,525
Sauret #1	27	11,418	1.15	25	68	29.0	2,174
Monterey	26	10,846	1.41	20	53	33.8	2,532
Carmel	27	10,490	1.21	24	65	28.0	2,101
Solano	27	10,411	1.02	28	70	23.4	1,758
Price	27	10,136	1.02	28	60	22.8	1,712
Nonpareil	468	10,135	1.24	23	72	27.6	2,068
Sauret #2	26	9,988	1.24	23	59	27.3	2,051
1-69	27	8,572	1.09	27	65	20.6	1,547
24-5z	27	8,195	.96	30	57	17.4	1,303
1-46	27	6,538	1.11	26	56	16.0	1,202
Grace (1)	24	2,245	1.04	27	63	5.2	387
Late blooming varieties							
Butte	23	20,532	.95	30	61	43.1	3,229
Mono	22	15,433	1.06	27	48	36.1	2,708
Livingston	23	13,376	1.24	23	65	36.6	2,746
Padre	18	13,010	1.08	26	58	31.0	2,326
Mission	138	12,125	1.17	25	51	30.9	2,320
LeGrand	25	12,030	1.27	22	57	33.7	2,529
Yosemite	21	11,422	.96	30	56	24.2	1,815
Ripon	21	11,370	1.09	26	53	27.4	2,052
Ruby	22	10,805	1.25	23	67	29.8	2,236
Thompson	22	10,484	1.27	22	68	29.4	2,204
Tokyo	22	7,549	1.27	22	53	21.2	1,587
Planada	20	6,635	1.23	23	52	18.0	1,351
Monarch	27	5,917	1.20	24	58	15.7	1,176

(1) Replant.

Fresno County RVT Plot
California State University, Fresno (CSUF)
Fresno, California
Yield Summary - 1984
Planted 1981

Variety	No. of trees	No. of nuts/tree	Ave. kernel wt. gms.	Ave. kernel wt. no./oz.	% kernel	Weight lbs./tree	Weight lbs/acre
Early blooming varieties							
Sonora	20	1,922	1.51	19	78	6.4	480
Jordanolo	20	1,853	1.37	21	69	5.6	420
Peerless	20	1,670	1.22	23	40	4.5	337
NePlus Ultra	80	1,411	1.44	20	55	4.4	330
Janice	20	1,488	1.21	24	66	4.0	298
Mid blooming varieties							
Solano	20	3,399	0.95	30	60	7.1	535
DB-OW	20	3,237	1.03	28	54	7.4	552
Sorrenti	26	2,438	1.15	25	57	6.2	464
Carmel	40	2,720	1.12	26	60	6.7	502
Hoover	20	2,621	1.06	27	60	6.1	460
Milow	20	2,511	0.87	33	74	4.8	362
Sauret #2	20	2,464	1.06	27	56	5.8	432
Monterey	20	2,432	1.24	23	76	6.7	499
DB-OJ	20	2,388	1.00	28	46	5.3	395
Price	20	2,381	0.92	31	62	4.8	363
23.516-40B	20	2,298	1.01	28	57	5.1	384
1-46	20	2,163	0.98	30	54	4.7	351
Valenta	20	2,155	1.08	26	52	4.8	357
Sauret #1	20	2,128	1.07	27	65	5.0	377
Norman	20	2,041	0.95	30	68	4.3	321
Grace	20	1,916	0.80	36	49	3.4	254
Nonpareil	520	1,895	1.13	26	65	4.7	351
Merced	20	1,811	1.16	25	65	4.6	348
Jeffries	20	1,551	1.01	28	66	3.5	259
1-69	20	1,501	1.16	25	60	3.8	288
Fritz	20	1,489	1.00	28	55	3.3	246
Elsie	20	1,363	1.25	23	57	3.8	282
Heart	20	920	1.58	18	57	3.2	241
Bonita	20	839	1.13	25	61	2.1	157
Monarch	20	728	1.26	23	56	2.0	147
88-66	20	232	1.08	26	60	.6	41
79-49	20	221	1.02	28	51	.5	37

Fresno County RVT Plot
California State University, Fresno (CSUF)
Fresno, California
Yield Summary - 1984

Variety	No. of trees	No. of nuts/tree	Ave. kernel wt. gms.	Ave. kernel wt. no./oz.	% kernel	Weight lbs./tree	Weight lbs/acre
Late blooming varieties							
2-19E	20	4,255	0.95	30	52	8.9	669
Padre	20	3,282	0.84	34	52	6.1	456
Butte	20	3,057	1.02	28	55	6.9	516
Livingston	20	2,553	1.07	27	63	6.0	452
K10-26	20	2,060	1.11	26	58	5.0	379
LeGrand	40	2,006	1.19	25	59	5.3	395
Thompson	20	1,949	1.19	24	68	5.1	384
Tioga	20	1,693	0.94	30	55	3.5	263
Ruby	20	1,672	1.34	21	51	5.0	371
Tokyo	20	1,080	1.18	24	45	2.8	211
2-43W	20	1,018	1.05	27	62	2.4	177
Planada	20	820	1.21	24	43	2.2	164
Mono	20	784	1.13	25	42	2.0	147
Yosemite	20	627	1.17	25	51	1.6	121
Ripon	20	583	1.09	26	48	1.4	105
K-1614	20	517	1.15	25	55	1.3	98

Kern RVT Plot
McFarland, California
II. Quality Factors 1984

Variety	Samples	Shape W/L %	Thickness mm	Size no./oz.	Worms: Doubles %	Twins %	TB %	NOW %	Blank %	Other %	Broken %
Group I Planted 1974											
Jordanolo	2	41	6.6	18	3	0	1	0	0	4	8
Sonora	1	45	7.4	22	0	1	0	0	1	1	2
NePlus	2	46	7.6	24	46	<1	0	0	0	3	<1
Carmel	1	46	7.8	25	5	1	0	1	0	0	0
UC 1-69	1	47	7.7	29	0	0	0	0	0	0	0
Carrion	1	48	9.0	26	0	1	1	0	0	2	17
MoneyTree	1	48	7.9	20	2	0	7	3	3	1	0
Price	1	49	8.0	29	8	3	1	0	2	8	1
Solano	1	50	7.7	28	0	0	0	0	1	0	4
Harvey	1	50	7.8	29	1	1	0	0	0	2	0
Robson	1	50	8.2	27	5	0	0	0	0	1	0
Fritz	1	51	8.5	28	2	1	0	0	2	0	8
Jeffries	1	51	7.7	28	3	1	0	0	0	1	1
UC 2-55	1	51	7.1	24	4	3	0	2	0	6	0
Thompson	1	52	7.8	25	2	0	0	0	1	0	2
Nonpareil	23	53	7.8	25	3	1	<1	<1	1	1	2
USDA 23-122	1	53	7.5	25	1	0	0	0	1	0	0
USDAK 7-10	1	53	7.6	24	0	0	0	0	3	1	2
UC 3-24E	1	55	8.1	37	7	1	0	0	1	0	18
Norman	1	55	7.7	33	2	3	0	0	2	4	2
Peerless	1	55	8.3	25	18	0	0	0	0	0	0
Milow	2	56	7.7	32	1	<1	0	0	1	1	<1
Merced	1	56	8.2	26	13	0	1	1	0	4	4
UC 2-62	1	56	7.3	25	4	0	2	0	1	1	1
USDA K16-14	1	56	7.1	30	1	0	0	0	1	2	3
UC 1-46	1	57	7.6	28	0	0	0	0	0	0	0
Profuse	1	57	8.0	17	1	1	0	0	3	12	0
Mission	8	58	8.9	28	9	<1	0	0	1	1	2
Butte	1	58	8.7	31	4	1	0	0	1	0	10
Padre	1	59	8.9	33	1	0	0	0	0	0	5
Ripon	1	59	7.8	29	1	0	0	0	2	1	17
UC 2-17	1	59	7.8	28	2	1	0	0	3	1	0
Vesta	1	60	8.2	23	1	0	0	0	3	0	4
USDA 69-60	1	61	7.0	24	0	3	0	0	1	6	0
Ruby	1	63	7.8	26	2	0	0	0	0	0	1
USDA K13-N	1	63	6.9	24	0	4	0	0	3	2	0
Granada	1	69	7.9	27	0	0	0	0	1	8	1

Kern RVT Plot
McFarland, California
II. Quality Factors 1984

Variety	Samples	Shape W/L %	Thickness mm	Size no./oz.	Worms: Doubles %	Twins %	TB %	NOW %	Blank %	Other %	Broken %
Group II Planted 1981											
Sauret #2	1	44	8.2	22	9	12	1	0	0	2	3
Monterey	1	47	8.4	20	10	0	0	1	2	1	6
UC 3-63	1	50	8.1	33	0	3	0	0	2	1	4
Monarch	1	51	7.5	25	2	0	4	0	0	4	0
Livingston	1	52	7.9	35	2	1	0	0	3	17	3
Nonpareil	6	53	8.1	25	<1	4	2	<1	3	3	8
Sauret #1	1	55	8.4	24	8	2	0	0	1	1	5
Mono	1	55	7.4	22	8	2	0	0	0	13	0
Yosemite	1	55	8.1	26	5	0	0	0	10	22	0
UC 2-43	1	56	8.4	23	2	1	0	0	2	7	3
UC 2-19E	1	57	7.7	27	0	6	0	0	1	1	1
Bonita	1	58	7.3	27	0	4	0	0	0	8	8
Tokyo	1	62	8.0	27	0	1	0	0	0	13	0
Mission	6	63	9.5	22	<1	<1	<1	0	<1	1	3

Colusa RVT Plot
Nickels Estate
Arbuckle, California
II. Quality Factors - 1984

Variety	Samples	Shape W/L %	Thickness mm	Size no./oz.	Worms: Doubles %	Twins %	TB %	NOW %	Blank %	Other %	Broken %
Variety Block - 1											
Jordanolo	1	45	7.2	27	0	0	0	2	0	4	28
Sonora	1	45	7.6	32	0	2	0	2	2	8	10
Carrion	1	47	8.7	30	2	0	2	2	2	0	2
Carmel	1	48	8.2	27	2	0	0	0	0	0	12
Moneytree	3	49	7.5	25	0	0	<1	3	0	5	6
Fritz	1	50	8.8	34	0	0	2	0	0	2	32
Harvey	1	51	8.8	31	2	2	8	4	0	6	12
Price	1	51	7.3	40	2	0	0	0	2	4	0
Robson	1	52	8.2	33	32	0	0	0	0	0	4
NePlusUltra	4	52	7.1	27	7	0	0	<1	0	5	11
Thompson	1	53	7.6	28	2	0	0	2	0	0	22
Solano	1	54	6.6	37	0	0	0	0	0	12	2
Nonpareil	16	55	7.3	31	<1	<1	<1	<1	<1	1	6
Vesta	1	55	7.4	29	0	0	0	0	2	0	12
Norman	1	55	8.0	39	0	0	0	0	0	0	4
69-60	1	56	7.1	27	2	0	0	0	2	2	2
Milow	2	57	7.4	41	8	0	0	1	1	10	0
Peerless	2	57	7.2	29	1	0	0	0	1	0	30
Mission	4	58	8.4	32	<1	<1	<1	1	<1	<1	2
Butte	1	58	7.7	37	2	0	2	0	0	4	20
23-122	1	60	7.0	32	8	0	0	0	0	0	-
K-13N	1	62	6.3	-	0	2	0	0	2	4	2
Granada	1	63	7.8	38	2	0	0	0	6	2	12
Variety Block - 2											
2-13	3	43	7.4	30	0	0	0	<1	5	3	1
2-62	3	49	7.0	34	1	0	0	0	2	<1	2
1-69	3	49	7.6	33	1	0	0	0	3	0	1
3-63	3	51	7.6	43	0	0	0	0	0	0	19
Nonpareil	18	53	7.4	31	<1	<1	<1	<1	3	<1	6
79-49	3	54	5.8	30	1	1	0	<1	<1	2	1
88-66	3	55	6.6	31	3	<1	0	0	<1	<1	3
23.5.16.40B	3	56	6.9	31	0	0	0	0	1	4	1
K-16-14	3	57	6.6	40	0	0	0	<1	0	0	0
88-55	3	58	6.3	32	0	0	0	0	3	2	3
1-46	3	59	7.4	29	0	0	0	0	0	<1	2

Colusa RVT Plot
Nickels Estate
Arbuckle, California
II. Quality Factors - 1984

Variety	Samples	Shape W/L %	Thickness mm	Size no./oz.	Worms						
					Doubles %	Twins %	TB %	NOW %	Blank %	Other %	Broken %
Padre	3	60	8.9	32	0	0	0	0	1	<1	12
3-5W	3	63	6.9	45	2	0	0	0	<1	0	9
Mission	1	63	8.8	30	8	0	<1	0	1	2	9
24-5Z	3	66	8.3	33	11	10	0	0	<1	1	2

Butte County RVT Plot
CSUC
Durham, California
II. Quality Factors - 1984

Variety	Samples	Shape W/L %	Thickness mm	Size no./oz.	Worms: Doubles %	Twins %	TB %	NOW %	Blank %	Other %	Broken %
Jordanolo	1	41	8.1	18	2	0	0	2	0	0	0
Sonora	1	43	7.8	22	0	4	0	2	0	2	6
Carmel	1	46	8.4	22	16	4	0	0	0	2	2
NePlusUltra	1	46	8.4	19	26	0	0	0	0	2	2
Carrion	1	48	9.5	23	34	0	0	4	2	0	4
Solano	1	48	8.3	27	0	0	0	0	0	0	0
1-69	1	50	8.7	27	1	0	0	0	2	0	8
Vesta	1	50	8.4	25	2	0	0	0	0	0	20
Nonpareil	14	52	8.6	23	4	2	<1	<1	1	1	11
Price	1	52	8.5	29	10	10	0	0	0	2	8
Thompson	1	52	8.6	23	8	0	2	0	0	2	6
23.5.16WB	1	52	8.9	23	4	0	2	0	2	4	2
Robson	1	53	9.6	23	24	0	2	0	4	2	2
Harvey	1	53	9.0	24	6	0	0	4	0	0	2
Butte	1	55	9.8	28	2	0	0	0	0	0	14
K13N	1	56	7.5	25	0	4	2	4	0	0	1
Milow	1	57	8.3	24	8	0	0	2	0	0	2
Norman	1	57	8.7	28	0	0	0	2	0	4	10
Padre	1	58	9.8	27	4	0	0	0	0	0	2
Fritz	1	59	1.0	27	18	0	0	0	0	2	4
Merced	1	59	9.4	22	20	0	0	2	2	0	0
Ripon	1	59	8.7	26	0	0	0	0	0	4	0
23-122	1	59	7.6	25	22	0	0	0	0	0	2
1-46	1	59	8.6	24	0	0	2	0	0	2	2
Mission	9	61	9.8	26	13	<1	0	0	<1	2	2
24-5Z	1	62	9.0	27	14	4	0	0	0	0	0
Granada	1	71	9.6	30	6	2	0	0	0	0	0

San Joaquin County RVT Plot
Delta College
Manteca, California
II. Quality Factors - 1984

Variety	Samples	Shape W/L %	Thickness mm	Size no./oz.	Worms: Doubles %	Twins %	TB %	NOW %	Blank %	Other %	Broken %
Sonora	1	41	7.7	24	0	14	0	0	10	2	10
Jordanolo	1	41	8.7	18	4	0	0	0	4	2	2
Sauret #2	1	42	8.9	23	20	4	0	0	10	2	2
Carmel	1	45	9.0	24	8	6	2	0	2	0	6
Monterey	1	45	9.3	20	42	0	0	0	0	0	0
Solano.	1	45	7.8	28	0	0	0	0	4	0	6
NePlus Ultra	2	46	8.6	20	36	0	1	0	4	0	2
Monarch	1	47	7.6	24	0	0	0	0	10	2	2
Livingston	1	48	8.2	23	10	0	0	0	2	0	0
Nonpareil	18	51	8.2	23	3	7	<1	<1	6	<1	3
Price	1	51	8.8	28	20	12	0	0	8	4	2
1-69	1	51	8.5	27	0	2	2	0	2	0	2
Mono	1	51	7.6	27	8	0	0	0	0	0	2
Fritz	1	52	9.1	27	12	0	0	0	0	0	12
Thompson	1	53	9.1	22	0	0	0	6	4	0	2
Yosemite	1	53	8.1	30	0	0	0	0	4	0	0
Grace	1	54	8.9	27	20	0	0	2	2	2	20
Planada	1	55	8.3	23	6	0	0	2	20	6	0
LeGrand	1	56	10.2	22	2	0	4	8	6	0	0
Butte	1	57	9.1	30	2	4	0	0	2	0	4
Peerless	1	57	8.7	23	20	0	0	0	0	2	0
Sauret #1	1	57	9.5	25	6	0	0	0	2	2	6
Tokyo	1	57	8.4	22	0	2	0	0	0	0	4
Padre	1	59	9.5	26	0	2	0	0	2	2	10
Ruby	1	59	8.6	23	4	2	0	0	6	4	0
1-46	1	59	8.4	26	0	2	2	0	2	0	2
Merced	1	60	9.4	22	6	0	0	0	6	2	4
Mission	1	60	9.7	25	<6	<1	0	<1	2	<1	3
Ripon	1	60	8.7	26	0	2	0	0	8	8	0
24-5Z	1	61	8.7	30	4	22	0	0	12	0	2

Fresno RVT Plot
CSUF
II. Quality Factors - 1984

Variety	Samples	Shape W/L %	Thickness mm	Size no./oz.	Worms: Doubles %	Twins %	TB %	NOW %	Blank %	Other %	Broken %
Jordanolo	1	37	8.3	21	2	0	0	0	4	10	2
Sauret #2	1	41	8.4	27	24	8	0	0	0	0	4
Sonora	1	42	8.4	19	2	4	0	0	0	20	2
Janice	1	43	8.2	24	2	2	0	0	6	20	10
NePlus Ultra	4	45	8.4	20	26	0	0	0	0	9	<1
Solano	1	46	8.0	30	0	0	0	0	2	6	8
1-69	1	47	7.9	25	10	0	0	0	0	6	0
79-49	1	47	6.4	28	2	0	0	0	0	16	0
Monarch	1	47	7.3	23	0	4	0	0	6	14	2
Carmel	2	48	8.7	26	8	6	0	0	0	2	12
Price	1	48	8.3	31	12	10	0	0	4	4	10
K10-26	1	48	8.2	26	10	0	0	0	2	8	0
Mono	1	49	7.6	25	12	4	0	0	4	10	0
Monterey	1	49	8.7	23	10	0	0	0	0	10	0
Fritz	1	50	8.8	28	0	0	0	0	0	10	4
Livingston	1	50	8.3	27	8	0	0	0	0	22	0
Tioga	1	50	8.6	30	0	4	0	0	0	0	0
Valenta	1	50	8.7	26	40	0	0	0	0	2	4
88-66	1	50	7.4	26	0	0	2	0	10	36	0
Sorrenti	1	51	9.9	25	40	0	0	0	0	10	4
Nonpareil	26	51	8.2	26	4	3	<1	0	1	12	2
Jeffries	1	52	8.4	28	0	2	0	0	1	6	2
Norman	1	53	8.1	30	2	2	0	0	0	16	8
DB-OJ	1	53	8.2	28	2	2	0	0	0	14	0
Peerless	1	53	9.3	23	8	0	0	0	4	0	2
Padre	1	53	8.6	34	4	0	0	0	0	0	8
Thompson	1	54	8.5	24	0	0	0	0	0	4	0
K16-14	1	54	7.3	25	4	0	0	0	0	4	2
23.5-16-40B	1	54	7.1	28	0	0	0	0	0	6	0
2-43W	1	54	8.5	27	6	0	0	0	0	4	4
Grace	1	55	8.2	36	20	4	0	0	0	0	18
Milow	1	55	7.5	33	4	0	0	0	2	42	10
Sauret #1	1	55	8.6	27	2	0	0	0	2	6	4
Tokyo	1	55	8.0	24	0	2	0	0	4	6	0
2-19E	1	55	8.0	30	4	6	0	0	2	8	0
Yosemite	1	55	8.5	25	0	0	0	0	0	16	0
LeGrand	1	57	9.7	24	4	3	0	0	1	6	9
Merced	1	57	8.9	25	8	2	0	0	0	10	0
Planada	1	57	7.2	24	0	0	0	0	22	2	0
1-46	1	57	7.5	29	0	0	0	0	2	16	0
Mission/Hyb	1	57	9.7	25	4	0	4	0	0	10	0
Butte	1	58	9.4	28	6	0	0	0	0	2	10
Mission	13	59	9.4	27	2	1	0	0	<1	<1	3
Ripon	1	59	7.9	26	0	10	0	0	0	5	0

Fresno RVT Plot
CSUF
II. Quality Factors - 1984

Variety	Samples	Shape W/L %	Thick-ness mm	Size no./oz.	Worms						
					Doubles %	Twins %	TB %	NOW %	Blank %	Other %	Broken %
Elsie	1	60	8.8	23	10	0	0	0	2	16	2
Bonita	1	60	8.0	25	4	0	0	0	2	6	0
Hoover	1	60	9.7	27	26	0	0	0	0	20	0
Ruby	1	61	8.6	21	2	4	0	0	2	4	2
DB-OW	1	61	9.1	28	14	4	0	0	2	2	0
Heart	1	66	8.7	18	22	8	2	0	0	8	2