Field Evaluation of Almond Varieties

Project No.: **08-HORT2-Lampinen**

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Objectives:

The objective of this project is to continue evaluating bloom and maturity data at the 1993 Butte, Delta and Kern RAVT plantings. And to evaluate performance of pollenizers and Nonpareil clones (including yields) in a replicated field trial in McFarland California. Data presented will include yield and quality data. Bloom and maturity data for the 2007 season for the McFarland Variety Trial and 1993 Chico RAVT as well as bloom and weather data for the Delta RAVT are available in the 2007-2008 final report that is included on a CD distributed at the 2008 Almond Board Conference. The 2008 bloom and hullsplit data available from the 1993 plantings will be available in the 2009 Annual Report.

Interpretive Summary:

This report will concentrate on a replicated variety trial of eight varieties and eight Nonpareil clones that was planted in 2004 in Kern County near McFarland. Soils at the site consist of McFarland loam and Wasco sandy loam (both Class I soils). The irrigation system is double line drip. Tree spacing is 20 feet between tree rows and 18

feet between trees for a density of 121 trees per acre. Varieties planted included Chips, Kahl, Kochi, Marcona, Selection 2-19e, Sweetheart and Winters, Nonpareil clones planted include Nonpareil 3-8-2-70, Nonpareil 5, Nonpareil 6, Nonpareil 7, Nonpareil Dr., Nonpareil-J, Nonpareil-Newell and Nonpareil-Nico. There are six replications of each variety and Nonpareil clone with 34 trees per replication. Pollenizer and Nonpareil rows alternate in the orchard.

The objectives of the trial are to evaluate pollenizers and Nonpareil clones in a replicated trial where relative yield performance as well as bloom dates, maturity dates, disease/insect susceptibility, etc. can be assessed.

Results:

Weather during bloom was generally good at the McFarland trial site. Bloom data for 2008 is shown in Table 1. Marcona, Winters and Sweetheart were the varieties to reach full bloom the earliest and Kochi and Selection 2-19e were the latest. Bloom overlap was very good in 2008. The earliest varieties to begin hullsplit were the Nonpareil clones and Kochi which started July 11-12 followed by selection 2-19e (Table 2). The latest varieties to begin hullsplit were Kahl, Winters and finally Marcona, which did not begin hullsplit until about three and one half weeks after Nonpareil in 2008 (Table 2).

Hullrot was severe in Kochi and moderate in the Nonpareil clones (Table 3). No hullrot was observed on Chips, Kahl, Marcona or Winters and very little in selection 2-19e (Table 3). Alternaria damage was mild to moderate but there were no statistically significant differences among varieties.

Yield data for the McFarland trial from the 2006 through 2008 seasons are shown in Table 4. Selection 2-19e and the Nonpareil clones have had the highest cumulative yields at the McFarland trial (Table 4). The Nonpareil-Nico clone has had a significantly higher cumulative yield than the Nonpareil-7, Nonpareil-6 and Nonpareil-J clones. The cumulative yield for Winters is statistically similar to that for all of the Nonpareil clones except Nonpareil-Nico which was higher (Table 4). These yields are very high for the age of orchard. The replication provided in this trial adds much value to the data.

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Table 1. Bloom data for the McFarland Trial for the 2008 season. Crosshatched area indicates period from onset of bloom to 100% petal fall.

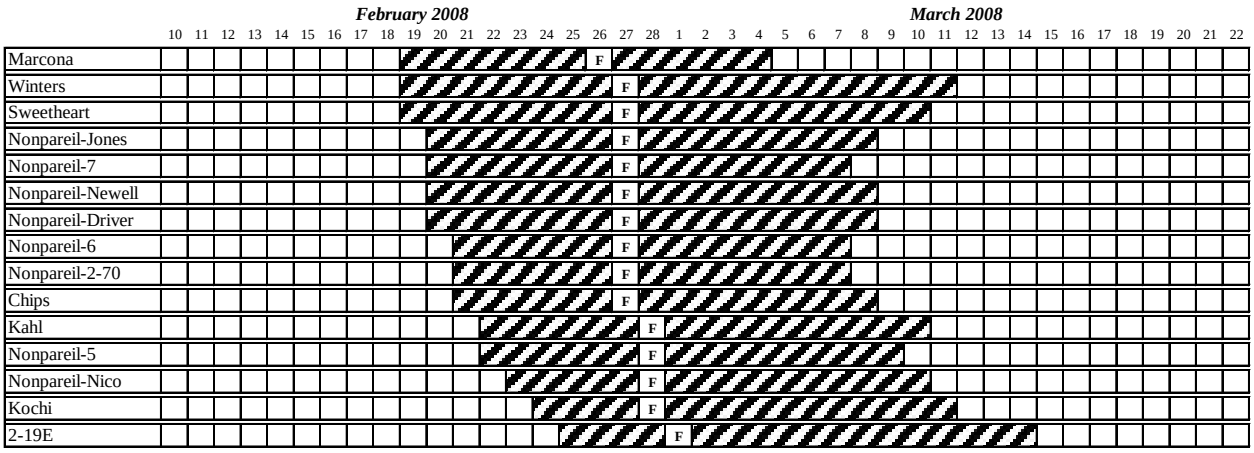

Table 2. Onset of hullsplit for the 2008 season at the McFarland trial.

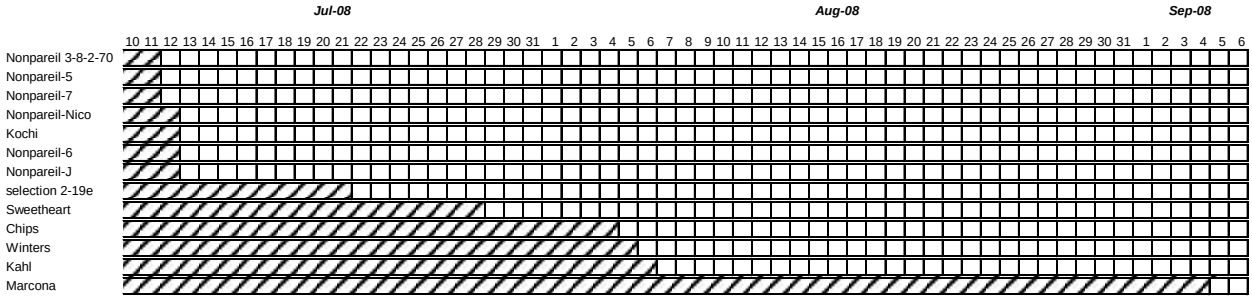

Table 3. Hullrot and *Alternaria* leaf spot ratings for the 2008 season at the McFarland trial. A higher number indicates a more severe disease incidence. Letters indicate significant difference at the 5% level of significance.

Alternaria

Kahl	1	a
Winters	0.83	a
Solano	0.72	a
Marcona	0.5	a
Nonpareil 3-8-2-70	0.5	a
Kochi	0.5	a
Nonpareil-7	0.33	a
Nonpareil-DR	0.33	a
Nonpareil-6	0.33	a
2-19E	0.33	a
Sweetheart	0.17	a
Nonpareil-Newell	0.17	a
Nonpareil-5	0.17	a
Nonpareil-Nico	0.17	a
Chips	0.05	a
Nonpareil-J	0	a

Hull rot

Kochi	2.83	a
Nonpareil-6	2.33	ab
Nonpareil-Newell	2	bc
Nonpareil-7	2	bc
Nonpareil-5	1.67	cd
Nonpareil-J	1.5	cd
Nonpareil 3-8-2-70	1.33	cd
Nonpareil-DR	1.17	d
Nonpareil-Nico	1	d
Sweetheart	0.33	e
2-19E	0.17	e
Marcona	0	e
Winters	0	e
Chips	0	e
Kahl	0	e
Solano	0	e

Table 4. Yield, number of nuts, average kernel weight, shelling percentage and kernel pound per acre yield for the 2006 through 2008 seasons. Data for each year is sorted by cumulative yield.

2006				Kernel pounds per		Cumulative kernel
Variety	No. of nuts/tree	Average kernel wt (g)	Shelling percentage	Tree	Acre	lbs/acre
2-19e	6852 a	0.94 g	53.0 d	14.2 a	1718 a	1718 a
Winters	6648 a	0.87 h	53.4 d	12.7 a	1540 a	1540 a
Marcona	3611 bcd	1.31 a	30.7 f	10.4 b	1258 b	1258 b
Nonpareil-Ni	4246 b	1.09 cde	67.2 a	10.2 b	1232 bc	1232 bc
Nonpareil-5	3713 bcd	1.12 bcd	67.9 a	9.1 bcd	1110 bcd	1110 bcd
Nonpareil-D	3867 bc	1.07 def	63.4 abc	9.1 bcd	1103 bcd	1103 bcd
Nonpareil-3-8-2-70	3848 bc	1.07 cde	64.6 ab	9.1 bcd	1101 bcd	1101 bcd
Nonpareil-Ne	3815 bc	1.07 cde	67.7 a	9.0 bcd	1086 bcd	1086 bcd
Nonpareil-6	3886 bcd	1.12 bc	67.0 a	8.9 bcd	1075 bcd	1075 bcd
Nonpareil-J	3717 bcd	1.08 cde	64.0 abc	8.8 bcd	1066 bcd	1066 bcd
Chips	3623 bcd	1.02 f	53.8 d	8.1 bcde	985 bcde	985 bcde
Kochi	3134 cd	1.16 b	59.9 c	8.0 cdef	965 cdef	965 cdef
Nonpareil-7	3288 bcd	1.08 cde	65.1 a	7.8 def	940 def	940 def
Kahl	3139 cd	1.06 ef	47.8 e	7.3 def	889 def	889 def
Sweetheart	2777 d	0.95 g	67.8 a	5.8 f	588 f	588 f

2007				Kernel pounds per		Cumulative kernel
Variety	No. of nuts/tree	Average kernel wt (g)	Shelling percentage	Tree	Acre	lbs/acre
2-19e	13149 a	0.78 e	54.3 d	22.8 a	2756 a	4474 a
Winters	11972 ab	0.83 de	60.2 b	21.8 ab	2634 ab	4173 a
Nonpareil-Newell	10659 bc	0.90 bc	67.3 a	20.9 abc	2536 abc	3626 b
Nonpareil-Nico	9260 cde	0.92 bc	66.0 a	18.8 abcde	2279 abcde	3511 b
Nonpareil-Driver	9793 cd	0.91 bc	65.6 a	19.6 abcd	2370 abcd	3474 b
Nonpareil-3-8-2-70	9340 cde	0.92 bc	66.3 a	18.9 abcde	2291 abcde	3393 b
Nonpareil-5	8905 cdef	0.95 b	67.0 a	18.6 abcde	2251 bcde	3323 bc
Marcona	6938 fg	1.08 a	29.8 f	16.5 defg	1995 defg	3252 bcd
Kahl	9594 cd	0.91 bc	47.6 e	19.3 abcd	2332 abcd	3222 bcd
Nonpareil-J	9137 cde	0.89 bcd	65.5 a	17.8 bcde	2152 bcdef	3218 bcd
Nonpareil-6	8396 def	0.94 b	67.1 a	17.4 def	2103 def	3178 bcd
Nonpareil-7	9517 cd	0.92 bc	67.9 a	19.3 abcd	2332 abcd	3140 bcd
Chips	7681 defg	0.87 cd	54.4 d	14.7 efg	1780 efg	2766 bcd
Kochi	6006 g	1.08 a	59.4 bc	14.3 fg	1729 fg	2694 de
Sweetheart	6767 fg	0.89 bcd	66.6 a	13.1 g	1588 g	2165 e

2008				Kernel pounds per		Cumulative kernel
Variety	No. of nuts/tree	Average kernel wt (g)	Shelling percentage	Tree	Acre	lbs/acre
2-19e	13472 a	0.93 g	54.3 d	27.5 cd	3321 cd	7795 a
Nonpareil-Nico	13879 a	1.10 cd	66.0 a	33.5 a	4056 a	7567 ab
Nonpareil-Newell	11916 bcd	1.09 de	67.3 a	28.6 cd	3456 cd	7110 bc
Nonpareil-3-8-2-70	12506 bcd	1.17 cd	66.3 a	30.7 b	3714 b	7106 bc
Nonpareil-Driver	12729 abc	1.07 de	65.6 a	29.8 bc	3611 bc	7085 bc
Nonpareil-5	12883 ab	1.08 de	67.0 a	30.5 b	3692 b	7001 bc
Winters	9872 e	1.02	60.2 b	22.1 fg	2670 fg	6843 c
Nonpareil-7	13250 ab	1.06 de	67.9 a	31.1 ab	3763 ab	6802 c
Nonpareil-6	10707 de	1.16 c	67.1 a	27.3 cd	3300 cd	6478 cd
Nonpareil-J	11071 d	1.09 cde	65.5 a	26.6 de	3224 de	6442 cd
Kahl	10720 de	0.96 fg	47.6 e	22.6 fg	2733 fg	5954 de
Chips	11465 cd	0.97 fg	54.4 d	24.4 ef	2956 ef	5722 e
Sweetheart	13149 ab	0.82 g	66.6 a	23.9 ef	2893 ef	5059 f
Marcona	4721 f	1.39 a	29.8 f	14.4 h	1748 h	5001 f
Kochi	5882 f	1.28 b	59.5 bc	16.5 h	2002 h	4996 f