Field Evaluation of Almond Varieties

Project No.: **HORT2.Lampinen**

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A. Summary

Selections and varieties from University and USDA breeding programs as well as releases from commercial nurseries are being evaluated in replicated trials in Butte, Stanislaus and Madera Counties. Yields in these trials are trending higher than at similar ages in the previous generation trials most likely due to higher density plantings and less pruning that was done compared to previous generation trials.

B. Objectives *(300 words max.)*

1) The objective is to evaluate new almond varieties and selections in replicated field trials at three locations in the almond growing areas of California and document parameters including bloom and hullsplit timing, disease and insect susceptibility, tree canopy size, kernel quality and yield.
2) Results will be presented at the annual Almond Conference in Sacramento, at field days at the trial sites and at grower meetings as requested

C. Annual Results and Discussion

General comments

Butte. Bloom conditions were wet and cold at the Butte RAVT in 2019. The February rainfall total at the nearby Durham CIMIS station was 11.3 inches, compared to the 4.4-inch historic average. Heavy rainfall in late February and early March prevented orchard access while many varieties were reaching full bloom and prevented bloom density ratings. At both the Butte and Stanislaus sites, bee hours were far fewer than the Madera site. Despite wet and cold bloom conditions, blast development on flowers and leaves at the Butte location was not severe. Minor blast type symptoms were observed on UCD 1-271, Bennett, and Booth. *Botrytis* gray mold was most commonly present in samples sent to Dr. Themis Michailides at the Kearney Ag Center, with a minor presence of *Pseudomonas* bacterial blast on the three sampled varieties. Blast symptoms were very minor at the Butte RVT in 2018 and 2019 compared to 2017 when severe blast was observed in several varieties.

Stanislaus. Bloom conditions were wet, cold and windy at the Stanislaus RAVT with low numbers of bee hours for most varieties in 2019. Some varieties at the Stanislaus RAVT were substantially affected. Bacterial blast and Ps leaf spot ratings were done on 4/2/19. Items with severe bacterial blast included Bennett, P16-013, UCD 1-271, Booth, and Capitola. Items with moderate blast included 8-27, Y116-161-99, 1-16, Eddie, Supareil, 3-40 and Aldrich. As cold

wet weather continued after leafout, some varieties were affected by *Pseudomonas syringae* leaf spot/leaf drop. Varieties severely affected included P16-013, 1-271, Supareil, UCD 8-27 and Booth. Items with moderate leaf spot included Bennett, Kester, Eddie, Y121-42-99 and Folsom. July sampled leaves indicate most varieties are deficient in zinc and nitrogen. Many are borderline deficient in potassium and/or exceed chloride threshold. There is no clear relationship between variety and leaf nutrients but would need more replications to show this definitively

Madera. In 2019, bloom in the Madera trial was hit by flower blast. Samples showed a combination of *Pseudomonas syringae* and *Botrytis cinerea*. Winters, Y117-86-03, UCD 18-20, Jenette, Folsom, Bennett, Capitola, Y121-42-99, Eddie and Nonpareil were affected, and UCD 1-271, Supareil, Durango, Aldrich, Wood Colony, UCD 7-159 were strongly affected. Hull rot was severe in many varieties and selections with UCD1-232, Eddie, Nonpareil, Sterling and Folsom most affected.

Bloom, light interception, yield and quality

Bloom was fairly compact in 2018 (Fig. 1) and in 2019 (Fig. 2). Bloom overlap with Nonpareil was generally good for everything except UCD 3-40 which was quite early at all sites in both years and several of the non-self fertile items such as Durango, UCD 18-20, Jennette, Kester and Sweetheart which reached full bloom 6-9 days after Nonpareil at some sites in some years.

In 2019, PAR interception varied from 48 to 79 percent at the Butte trial, 40 to 66 percent at the Stanislaus trial, and 60 to 91% at the Madera trial (Table 1). The level of PAR interception at the Madera site is among the highest we have seen for an almond orchard this age. This is partly due to the high tree density (173 trees/acre) and vigorous Hansen peach/almond rootstock.

Hull split data is presented for 2018 (Fig. 3) and for 2019 (Fig 4). In 2019, completion of hull split ranged from July 16 to September 9 at the Butte trial. At the Stanislaus trial it ranged from July 13 to September 5. At the Madera trial it ranged from July 21 to September 27th.

Yield data for 2019 and cumulative yield data for 2016 to 2019 is shown in Table 1. In 2019, yields at the Butte site ranged from 870 to 2999 kernel pounds per acre and from 810 to 2630 kernel pounds per acre at the Stanislaus site (Table 1). Yields at the Madera site ranged from 462 to 3521 kernel pounds per acre. Both the highest and lowest cumulative yields were at the Madera site (Table 1).

Cumulative yield by site is presented on the left side of Table 1. The overall cumulative yield averaged over 4 years and all 3 sites is presented in Table 2.

Yield efficiency (expressed as yield per unit PAR intercepted) is presented on the right side of Table 1. This is a useful piece of data since it can show whether a new variety or selection is more efficient at producing yield per unit PAR intercepted or whether it is yielding more simply because it is growing faster.

Main quality defects in 2019 included kernel doubles, twins, chipped/broken, crease, shrivel, stain/discolor and mold. Naval orange worm damage only occurred at the Butte trial (Table 3).

Tree architecture
Tree shape is quite varied in the early years (Fig. 6) but by the 5th year or so most trees look quite similar (Fig. 6). For further information on this see the 2019 report for Almond Board Project 19-Hort33-Lampinen (New Germplasm and Training Systems for High density Catch Frame Almond Systems).

D. Outreach Activities

These results have been presented in oral and poster form at the annual Almond Conference in Sacramento, at a field day at the Butte trial in 2018, at the 2018 North San Joaquin Valley Almond Day, at the 2019 UC Almond Short Course and are available on line on the Almond Board of California website.

E. Materials and Methods *(500 word max.)*:

The next generation almond variety trials were planted in the winter of 2014 in Butte (Chico State University), Stanislaus (Salida School District Site), and Madera (Chowchilla grower site) counties. The varieties and selections planted are listed in Table 4. The first 30 items are common to all 3 sites and a few different items added at individual sites are listed at the bottom of Table 4. Trees were planted at a spacing of 18' x 22' at the Butte site (110 trees/acre), 16' x 21' at the Stanislaus site (130 trees/acre) and 12' x 21' at the Madera site (173 trees/acre). Tree densities are significantly higher than the previous generation RAVTs where planting densities for the Butte, San Joaquin and Kern trials were 64, 75 and 86 trees per acre respectively. Of the items planted in the main trials, fourteen are either partially or fully self-fertile indicated by boxes around the variety or selection name (Table 4). All indicated are fully self compatible except Winters and Sweetheart which are partially self compatible.

Bloom, hullsplit, canopy light interception and yield data collection were initiated in 2016. Bloom data were collected approximately three days per week and recorded as onset of bloom, full bloom, and the end of petalfall. Hullsplit was recorded from the beginning of the first non-blank splits to completion of hullsplit

F. Publications that emerged from this work

Since these trials require fairly long term data to draw conclusions, no referred publications have been published to date.

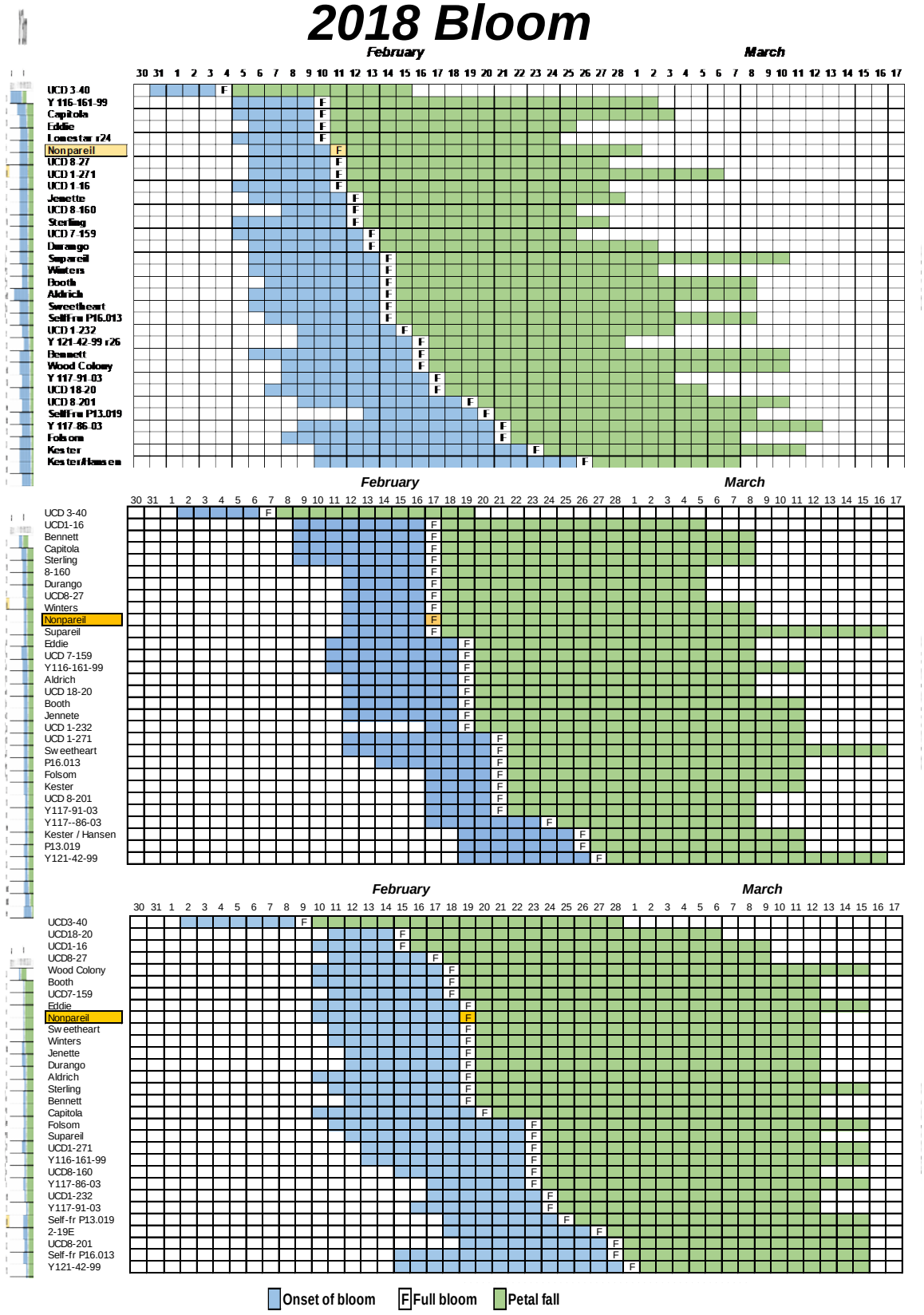

Fig. 1. Bloom data for 2018 by site and variety or selection.

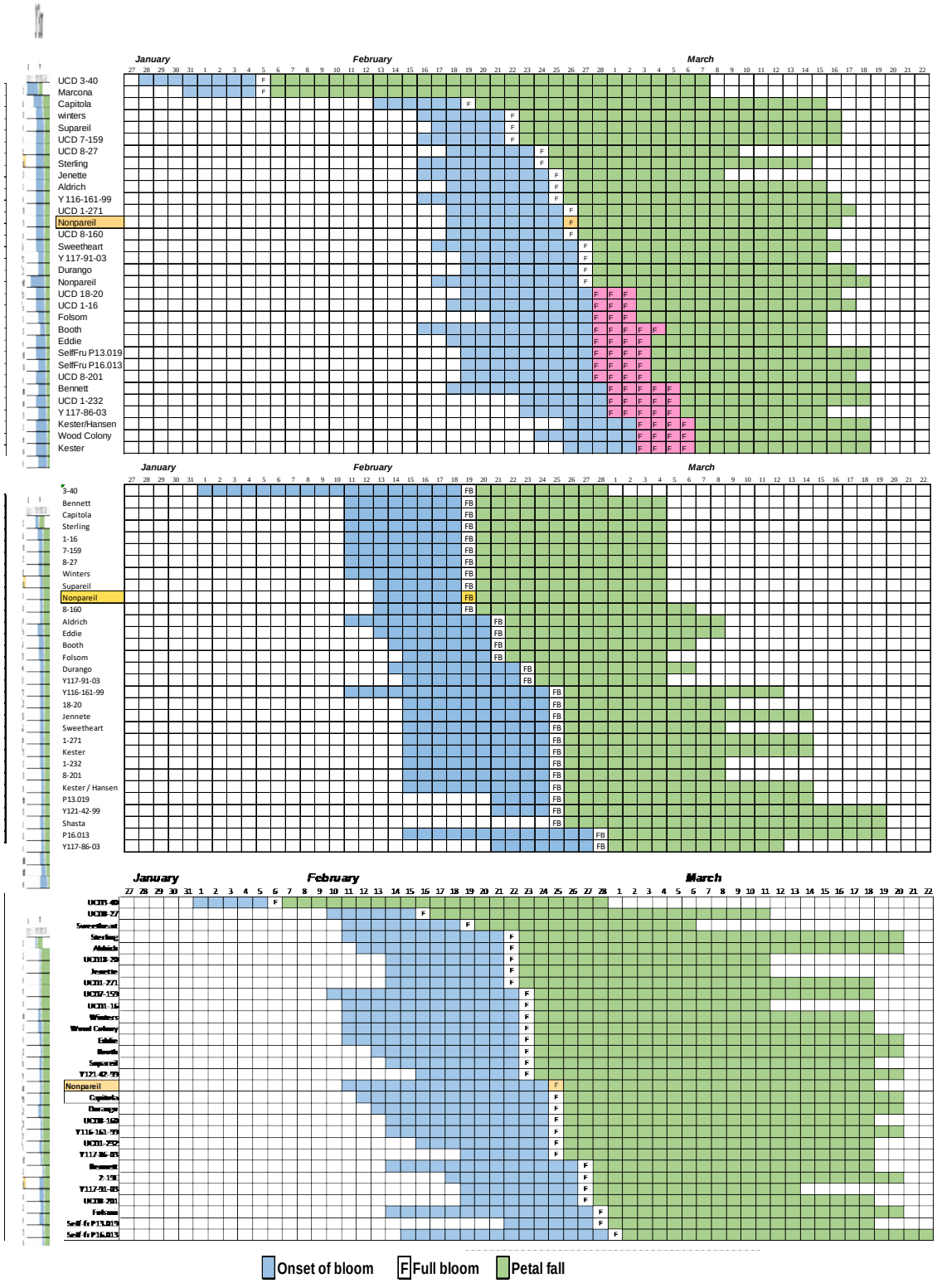

Fig. 2. Bloom data for 2019 by site and variety or selection. Pink area on 2019 bloom chart for Butte indicates time when orchard was inaccessible due to muddy conditions.

2018

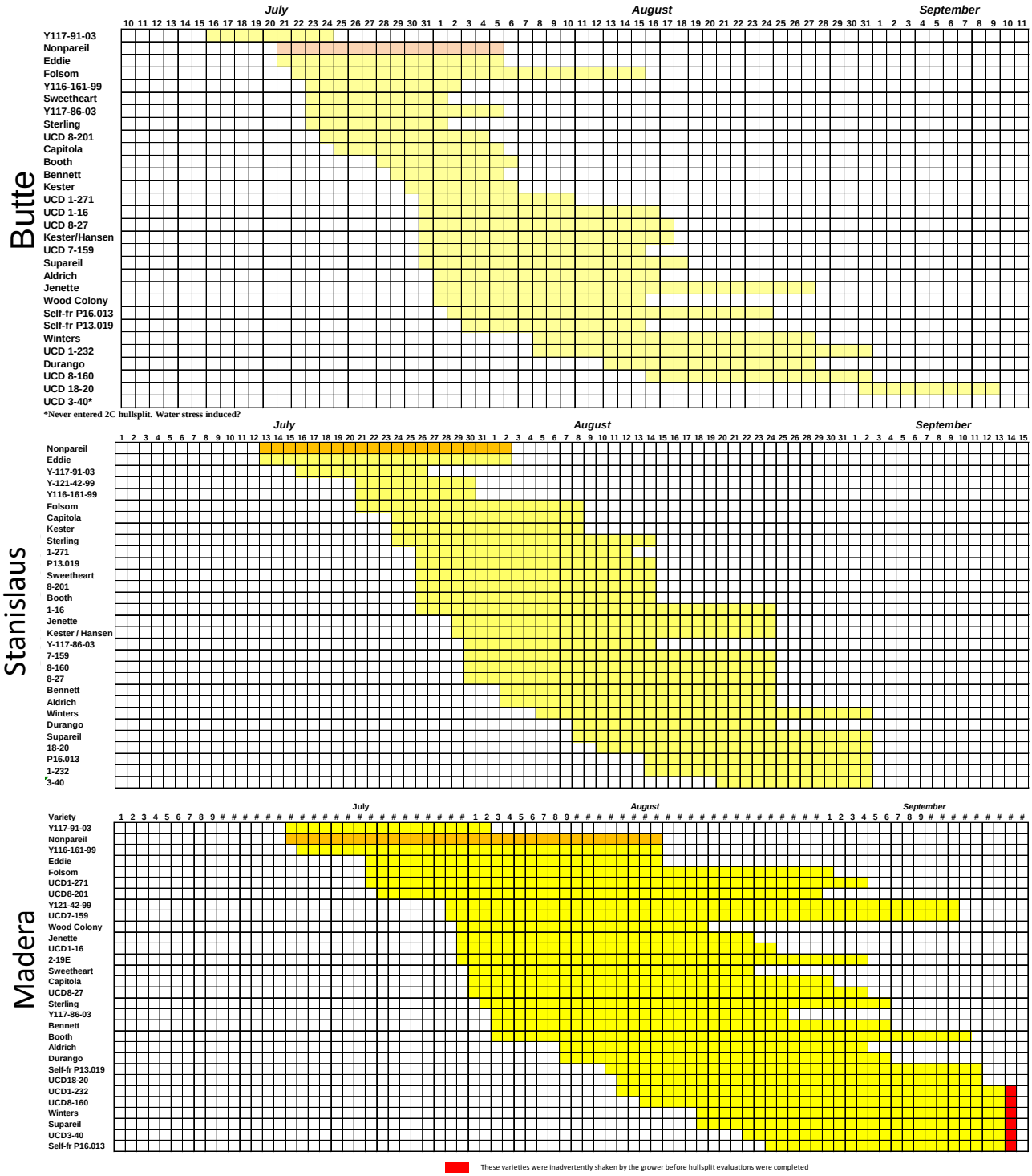

Fig. 3. Hullsplit by site, variety and selection for 2018.

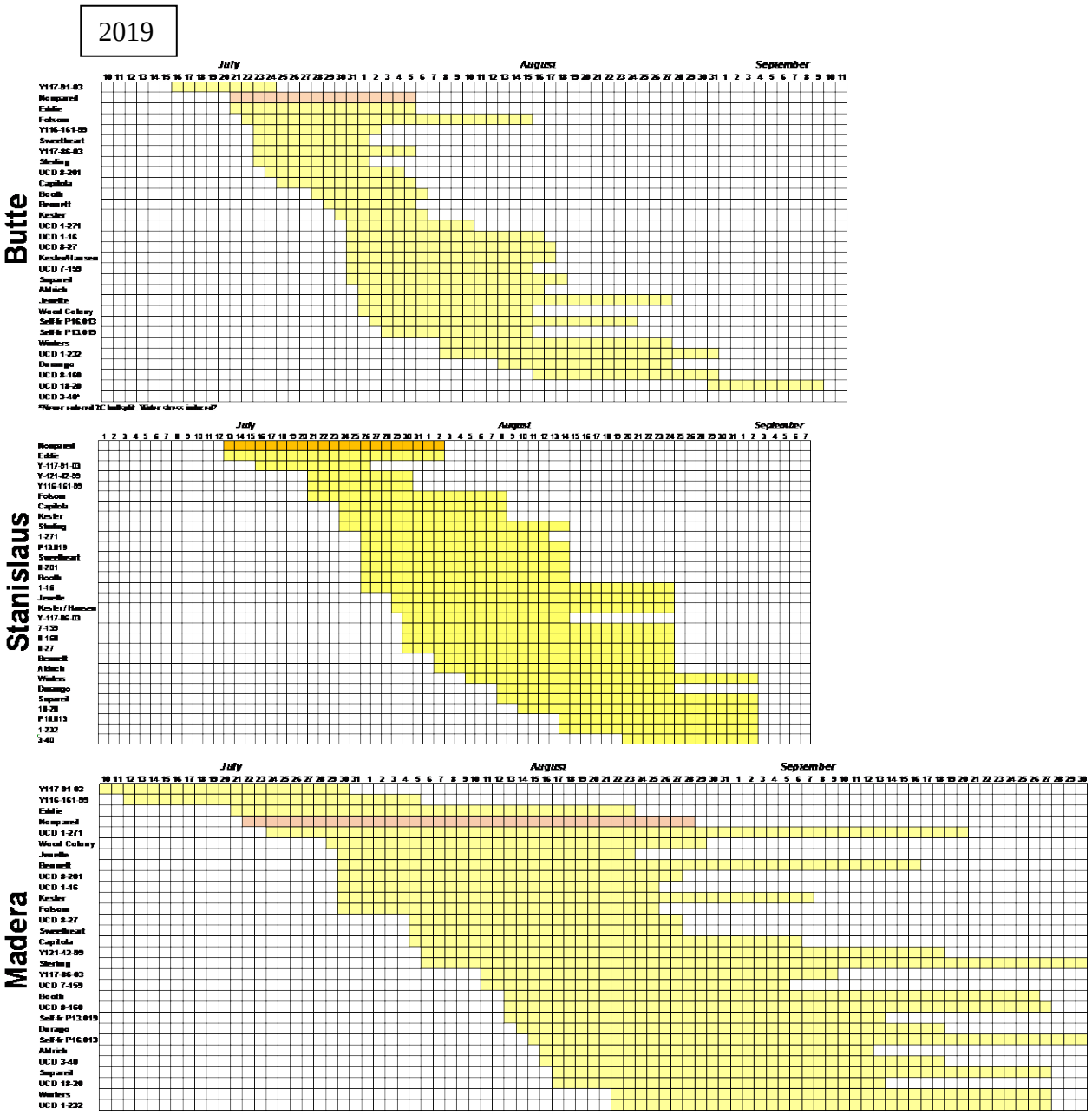

Fig. 4. Hullsplit by site, variety and selection for 2019.

Table 1. Cumulative yield (left), 2019 yield (center left), midday PAR interception (center right) and yield per unit PAR intercepted (right). Note that Wood Colony at the Madera site is one year younger. Common letters indicate differences are not significantly different at the 5% level of significance.

Butte

Variety or selection	Cumulative kernel lbs/ac	
Booth	7736	a
UCD18-20	7666	a
Jenette	6855	a b
Y117-91-03	6638	a b c
Aldrich	6636	a b c
Durango	6188	b c d
UCD8-160	6127	b c d
UCD8-201	5933	b c d e
Nonpareil	5845	b c d e
Y116-161-99	5833	b c d e
Folsom	5785	b c d e
Kester	5662	b c d e
Capitola	5611	b c d e
Y117-86-03	5503	b c d e f
Winters	5449	b c d e f
Bennett	5391	c d e f
Self-fruitful	5343	c d e f
Wood Colony	5338	c d e f
Eddie	5314	c d e f
UCD1-16	5300	c d e f
Kester/Hansen	5217	c d e f
Sterling	4732	d e f g
UCD8-27	4642	e f g
UCD1-232	4568	e f g
UCD7-159	4464	e f g
UCD3-40	4136	f g
Sweetheart	4125	f g
Supareil	3810	g
self-fruitful	3810	g
UCD1-271	2472	h

Variety or selection	2019 yield kernel lbs/ac	
Nonpareil	2999	a
UCD3-40	2701	a b
Booth	2613	a b c
Jenette	2505	a b c d
Capitola	2461	a b c d
UCD18-20	2368	a b c d
Winters	2283	a b c d
UCD7-159	2114	b c d
Durango	2086	b c d
Supareil	2071	b c d
Aldrich	2024	b c d
Folsom	2016	b c d
Kester	2006	b c d
Wood Colony	1989	b c d
Bennett	1958	b c d
UCD1-16	1947	b c d
Y117-91-03	1878	c d
Y117-86-03	1846	d
UCD8-201	1842	d
Sterling	1828	d
UCD1-232	1819	d
Y116-161-99	1811	d
UCD8-160	1808	d
Self-fruitful P13.019	1803	d
Sweetheart	1801	d
UCD8-27	1790	d
Kester/Hansen	1785	d
Eddie	1748	d e
self-fruitful P16.013	1049	e
UCD1-271	870	e

Variety or selection	PAR interception (%)	
Capitola	78.8	a
Supareil	78.6	a b
Nonpareil	75.7	a b
Sweetheart	73.8	a b c
Y117-91-03	73.6	a b c
Folsom	72.9	a b c d
UCD3-40	72.2	a b c d e
Kester	72.0	a b c d e
Booth	71.3	a b c d e
Winters	70.9	a b c d e f
UCD18-20	70.7	a b c d e f
Durango	68.7	b c d e f g
UCD1-16	67.9	b c d e f g
Sterling	67.6	b c d e f g
Bennett	67.1	b c d e f g
UCD8-27	66.9	b c d e f g h
Y117-86-03	66.6	c d e f g h i
Aldrich	65.0	c d e f g h i
Kester/Hansen	65.0	c d e f g h i
Self-fruitful P13.019	63.8	d e f g h i j
Eddie	62.9	e f g h i j
UCD8-201	61.5	f g h i j k
UCD7-159	60.6	g h i j k
UCD1-232	57.8	h i j k
Jenette	57.5	i j k
Y116-161-99	55.6	j k l
UCD1-271	53.8	k l
self-fruitful P16.013	53.6	k l
Wood Colony	53.1	k l
UCD8-160	48.5	l

Variety or selection	Yield per unit PAR intercepted	
Jenette	43.6	a
UCD3-40	41.1	a b
Nonpareil	39.8	a b c
UCD8-160	37.4	a b c d
Wood Colony	37.3	a b c d
Booth	36.5	a b c d e
UCD7-159	34.9	a b c d e f
Marcona	34.0	a b c d e f g
UCD18-20	33.5	b c d e f g
Y116-161-99	32.6	b c d e f g
Winters	32.1	b c d e f g
UCD1-232	31.4	b c d e f g
Aldrich	31.1	c d e f g
UCD8-201	30.4	c d e f g
Durango	30.3	c d e f g
UCD1-16	29.7	d e f g h
Capitola	29.6	d e f g h
Bennett	28.7	d e f g h
Self-fruitful P13.019	28.5	d e f g h
Folsom	28.5	d e f g h
Kester	27.8	d e f g h
Y117-86-03	27.7	d e f g h
Eddie	27.2	d e f g h
Sterling	27.1	d e f g h
Kester/Hansen	27.0	e f g h
UCD8-27	26.8	e f g h
Supareil	26.1	f g h
Y117-91-03	25.5	f g h
Sweetheart	24.4	g h i
self-fruitful P16.013	19.9	h i
UCD1-271	16.2	i

Stanislaus

Variety or selection	Cumulative kernel lbs/ac	
Kester/Hansen	7287	a
UCD18-20	6722	a b
Y117-91-03	6419	a b c
UCD8-160	6280	a b c d
Self-fr-P13-019	5778	b c d e
Kester	5612	b c d e f
Y116-161-99	5608	b c d e f
Bennett	5570	b c d e f
UCD7-159	5483	b c d e f g
Y121-42-99	5476	b c d e f g
Booth	5402	c d e f g
Y117-86-03	5247	c d e f g h
Winters	5216	c d e f g h
Aldrich	5064	d e f g h i
Sterling	5062	d e f g h i
Durango	5046	d e f g h i
Capitola	5034	d e f g h i
UCD8-201	4900	e f g H i
Nonpareil	4851	e f g h i
UCD1-232	4773	e f g h i j
UCD1-271	4562	e f g h i j
Folsom	4411	f g h i j
Eddie	4385	f g h i j
Jenette	4296	f g h i j
Sweetheart	4281	f g h i j
UCD1-16	4228	g h i j
Supareil	4047	h i j
Self-fr-P16-013	3888	i j
UCD3-40	3856	i j
UCD8-27	3748	i j

Variety or selection	2019 yield kernel lbs/ac	
Kester/Hansen	2630	a
UCD18-20	2121	b
UCD8-160	1992	b c
Supareil	1968	b c d
UCD7-159	1780	b c d e
Y117-91-03	1763	b c d e f
Y116-161-99	1739	b c d e f g
UCD8-201	1660	c d e f g h
UCD1-232	1646	c d e f g h
UCD1-271	1630	c d e f g h
Kester	1618	c d e f g h
Folsom	1573	c d e f g h
Self-fruitful P13.019	1558	d e f g h
Sweetheart	1554	e f g h
Booth	1498	e f g h i
Durango	1495	e f g h i
Aldrich	1480	e f g h i
Y117-86-03	1465	e f g h i
Sterling	1447	e f g h i
Bennett	1442	e f g h i
Nonpareil	1377	e f g h i
Y121-42-99	1356	e f g h i
UCD3-40	1341	e f g h i
Winters	1341	e f g h i
Jenette	1322	f g h i
UCD1-16	1295	g h i
Capitola	1284	h i
UCD8-27	1062	i
Eddie	964	
self-fruitful P16-013	810	

Variety or selection	PAR interception (%)	
Kester/Hansen	65.6	a
Sweetheart	61.8	a b
Supareil	60.2	a b c
Y117-91-03	58.6	a b c
Booth	56.8	a b c d
Eddie	55.4	a b c d e f
Capitola	54.7	a b c d e f
UCD3-40	54.5	a b c d e f
Self-fruitful P13.019	53.3	a b c d e f g
UCD18-20	51.6	b c d e f g
Sterling	51.5	b c d e f g
UCD8-27	51.3	b c d e f g
Kester	50.0	b c d e f g
UCD1-271	49.8	b c d e f g
Bennett	49.5	b c d e f g
Folsom	49.5	b c d e f g
Durango	47.4	c d e f g
UCD1-232	46.3	d e f g
Aldrich	45.7	d e f g
Jenette	45.6	d e f g
UCD1-16	44.9	d e f g
Nonpareil	44.9	d e f g
UCD7-159	44.4	d e f g
Y121-42-99	43.4	d e f g
Y117-86-03	43.4	d e f g
Y116-161-99	42.8	e f g
UCD8-201	42.6	e f g
Winters	41.9	f g
self-fruitful P16-013	40.7	g
UCD8-160	40.4	g

Variety or selection	Yield per unit PAR intercepted	
Y116-161-99	57.0	a
UCD8-160	49.4	a b
Nonpareil	48.6	a b
Y121-42-99	44.1	b c
Y117-91-03	42.1	b c d
UCD18-20	41.6	b c d
Kester/Hansen	40.6	b c d
UCD7-159	40.1	b c d e
UCD8-201	39.0	b c d e f
Winters	36.4	b c d e f g
UCD1-232	36.2	b c d e f g
Y117-86-03	33.9	c d e f g h
Folsom	33.7	c d e f g h
UCD1-271	32.8	c d e f g h
Supareil	32.6	c d e f g h
Aldrich	32.5	c d e f g h
2-19E	32.4	c d e f g h
Durango	31.6	c d e f g h
Self-fruitful P13.019	29.7	d e f g h
Sterling	29.2	d e f g h
UCD1-16	29.1	d e f g h
Jenette	29.1	d e f g h
Bennett	28.7	d e f g h
Booth	26.4	e f g h
Sweetheart	25.2	f g h
Eddie	25.0	f g h
UCD3-40	24.9	g h
Capitola	23.4	g h
self-fruitful P16-013	23.4	g h
UCD8-27	20.6	h

Madera

Variety or selection	Cumulative kernel lbs/ac	
Y-116-161-99	10278	a
UCD-18-20	9566	a b
Y-117-86-03	9180	a b c
Kester	8497	a b c d
Y-117-91-03	8465	a b c d
Nonpareil	8442	a b c d
Jenette	8107	a b c d
Capitola	8020	a b c d
Y-121-42-99	7946	a b c d
Booth	7776	b c d
Bennett	7568	b c d
Sweetheart	7468	b c d e
Eddie	7409	b c d e
UCD-8-201	7395	b c d e
Winters	7295	b c d e
UCD-8-160	7201	b c d e
UCD-1-16	7132	b c d e
Folsom	6974	c d e
Self-fr-P16-013	6874	c d e
Aldrich	6863	c d e
Sterling	6764	c d e
Self-fr-P13-019	6633	d e
Durango	6218	d e f
UCD-8-27	6072	d e f
Supareil	6069	d e f
UCD-7-159	6036	d e f
UCD-1-232	5035	e f g
Wood Colony	4184	f g
UCD-1-271	3176	g h
UCD-3-40	1923	h

Variety or selection	2019 yield kernel lbs/ac	
Winters	3521	a
Capitola	2925	a b
Sweetheart	2833	a b
UCD-1-16	2741	a b c
Y-116-161-99	2716	a b c
Folsom	2668	a b c
Booth	2536	a b c d
Supareil	2468	a b c d
Kester	2467	a b c d
UCD-18-20	2434	a b c d
Nonpareil	5815	a b c d
UCD-7-159	2306	a b c d e
Sterling	2285	a b c d e
UCD-8-160	2280	a b c d e
Jenette	2200	a b c d e
Y-117-91-03	2124	b c d e
Wood Colony	2088	b c d e
Y-121-42-99	1981	b c d e
Y-117-86-03	1896	b c d e
UCD-1-232	1890	b c d e
UCD-8-27	1846	b c d e
Eddie	1824	b c d e
Aldrich	1819	b c d e
Self-fr-P13-019	1802	b c d e
UCD-8-201	1770	b c d e
Durango	1406	c d e f
Self-fr-P16-013	1183	d e f
Bennett	1021	e f
UCD-3-40	507	f
UCD-1-271	462	f

Variety or selection	PAR interception (%)	
Folsom	91.2	a
Capitola	89.2	a b
Booth	89.1	a b
Supareil	88.1	a b c
Sterling	87.6	a b c d
Eddie	83.8	a b c d e
Y-121-42-99	82.9	a b c d e f
UCD-1-271	81.4	a b c d e f g
Nonpareil	79.0	a b c d e f g h
Aldrich	78.6	a b c d e f g h
Sweetheart	78.5	a b c d e f g h
Kester	78.1	a b c d e f g h
Self-fr-P16-013	77.9	a b c d e f g h
UCD-3-40	76.9	a b c d e f g h
Durango	76.7	a b c d e f g h
UCD-8-27	74.2	b c d e f g h i
UCD-7-159	72.3	c d e f g h i
Self-fr-P13-019	72.2	c d e f g h i
Bennett	72.0	c d e f g h i
Winters	71.2	d e f g h i
UCD-1-232	70.9	d e f g h i
Y-116-161-99	70.2	e f g h i
UCD-1-16	68.8	e f g h i
UCD-18-20	68.3	e f g h i
Y-117-91-03	67.7	e f g h i
Jenette	67.0	e f g h i
Wood Colony	66.6	f g h i
Y-117-86-03	65.1	g h i
UCD-8-201	64.0	h i
UCD-8-160	59.7	i

Variety or selection	Yield per unit PAR intercepted	
Winters	50.234	a
UCD-1-16	40.697	a b
Y-116-161-99	40.548	a b
UCD-8-160	39.184	a b c
Sweetheart	37.007	a b c
UCD-18-20	36.5	a b c d
Jenette	33.37	a b c d e
Capitola	32.854	a b c d e
UCD-7-159	32.647	a b c d e
Wood Colony	32.591	a b c d e
Y-117-91-03	31.715	a b c d e
Kester	31.553	a b c d e
UCD-8-201	29.612	a b c d e
Y-117-86-03	29.475	a b c d e
Self-fr-P13-019	29.373	a b c d e
Folsom	29.061	a b c d e
Supareil	28.112	b c d e
Nonpareil	28.061	b c d e
Booth	27.906	b c d e
UCD-1-232	27.51	b c d e
Sterling	26.097	b c d e f
UCD-8-27	24.675	b c d e f
Y-121-42-99	23.89	b c d e f
Aldrich	22.872	b c d e f
Eddie	22.134	b c d e f
Durango	18.624	c d e f
Self-fr-P16-013	15.293	d e f
Bennett	14.353	e f
UCD-3-40	6.755	f
UCD-1-271	5.742	f

Table 2. Average cumulative yield for 2016 to 2019 seasons for all 3 sites combined.

Variety or selection	average cumulative kernel lbs/ac	Variety or selection	average cumulative kernel lbs/ac
UCD18-20	7985	Self-fr-P13-019	5918
Y116-161-99	7240	Durango	5817
Y117-91-03	7174	Folsom	5723
Kester/Hansen	7000	Eddie	5703
Booth	6971	Kester	5637
Y121-42-99	6711	UCD1-16	5553
Y117-86-03	6643	Sterling	5519
UCD8-160	6536	UCD7-159	5328
Jenette	6419	Sweetheart	5291
Nonpareil	6379	Self-fr-P16-013	4857
Capitola	6221	UCD8-27	4821
Aldrich	6188	UCD1-232	4792
Bennett	6177	Supareil	4642
UCD8-201	6076	UCD1-271	3403
Winters	5986	UCD3-40	3305

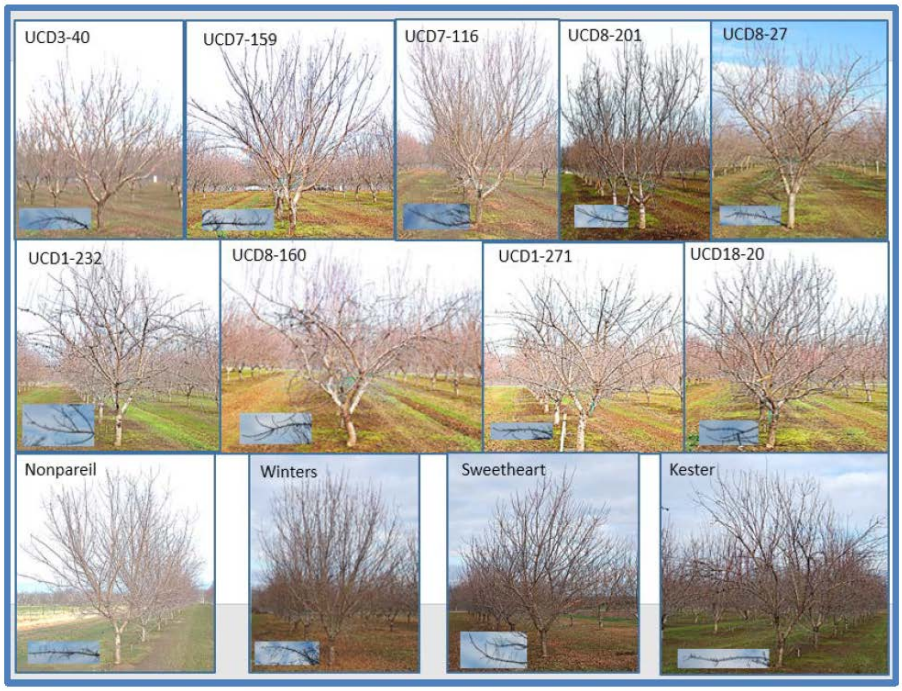

Fig. 5. Tree shapes from the Chico State University RAVT for material from the UCD breeding program. Inset photos show details of shoot growth patterns.

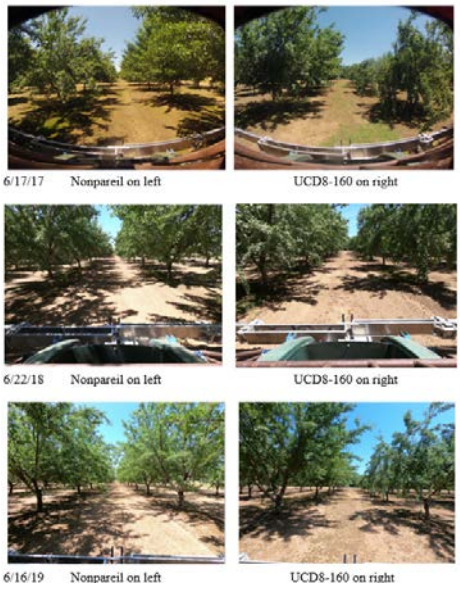

Fig. 6. Photos of Nonpareil trees (left side of left hand photos) and UCD8-160 (right hand side of right hand photo) in 2017, 2018 and 2019. In 2017, there was some droopiness on a number of items including Nonpareil and UCD8-160 but by 2019, the droopiness has largely gone away and tree structure among the varieties and selections are quite similar.

	Trial					
Varieties with defect	Butte	(%)	Stanislaus	(%)	Madera	(%)
6% or more double kernels	UCD18-20	29	UCD 18-20	20	UCD 18-20	19
	UCD 8-201	18	UCD 1-16	13	UCD 8-27	15
	Wood Colony	18	UCD 8-201	13	UCD 8-201	13
	SF P16.013	15	UCD 8-27	12	Booth	10
	Durango	13	Capitola	6	P16.013	8
	Aldrich	9.7				
	UCD 8-27	9.7				
	Booth	9.3				
	UCD 1-16	8.7				
	UCD 8-160	8.3				
	UCD 3-40	8.3				
	SF P13.019	7				
6% or more twin kernels	Nonpareil	15	UCD 3-40	14	UCD 3-40	17
(two kernels within the same pellicle)	Folsom	13	Sweetheart	13	UCD 8-27	13
	UCD 3-40	13	UCD 8-27	11	Jennette	7
	Sweetheart	12	Folsom	9	UCD 8-201	7
	UCD 8-27	12	UCD 1-232	7		
	Jenette	12	P16.013	7		
	UCD 7-159	9.7				
	UCD 8-201	6				
6% or more chipped/broken	SF P16.013	16	P16.013	8	P16.013	8
	SF P13.019	11	P13.019	6		
	UCD18-20	7.7				
6% or more crease	Y117-86-03	15	Sterling	8	UCD 8-160	15
	UCD 8-160	13	Jenette	6	Sterling	10
	Sterling	12	Durango	6	Sweetheart	8
	Capitola	11			Jennette	8
	Jenette	9.7			Capitola	7
	Folsom	8.7			UCD 1-232	6
	UCD1-232	7.7			Folsom	6
	Wood Colony	7.3				
	Durango	7				
	Eddie	6.3				
6% or more shrivel	UCD 8-201	7.3			Folsom	8
	Capitola	7				
	Y117-86-03	6.3				
6% or more stain/discolor	Capitola	6.3	UCD 1-271	11	UCD 3-40	50
			Shasta	7	UCD 1-271	30
					UCD 1-232	24
					Eddie	21
					UCD 8-160	17
					Supareil	9
					P16.013	9
					Sweetheart	8
					Y116-161-99	8
					UCD 18-20	7
					P13.019	7
					UCD 8-201	6
6% or more mold			UCD 1-271	8	Eddie	11
			Eddie	7	Nonpareil	9
					UCD 1-271	8
6% or more navel orange worm damage	UCD 8-27	6.3		0		0

Table 3. Main quality defects by site for 2019. Items are listed if they had over 6% damage.

Table 4. Varieties and selections planted at the 2014 Regional Almond Variety Trials. Items 1-29 are planted at all 3 sites while additional material planted at individual sites is listed at the end. Trees at the Butte, Stanislaus and Madera sites were planted on Krymsk 86, Nemaguard and Hansen 536 rootstock respectively (exceptions are noted at the bottom of table.

	Variety or selection	Source
1	Eddie	Bright's
2	Capitola	Burchell
3	Supareil	Burchell
4	Self-fruitful P16.013	Burchell
5	Self-fruitful P13.019	Burchell
6	Booth	Burchell
7	Sterling	Burchel
8	Bennett	Duarte
9	Nonpareil	Fowler
10	Durango	Fowler
11	Jenette	Fowler
12	Aldrich	Fowler
13	Marcona	Spain
14	Winters	UCD
15	Sweetheart	UCD
16	Kester (2-19e)*	UCD
17	UCD3-40	UCD
18	UCD18-20	UCD
19	UCD1-16	UCD
20	UCD8-160	UCD
21	UCD8-27	UCD
22	UCD1-271	UCD
23	UCD1-232	UCD
24	UCD7-159	UCD
25	UCD8-201	UCD
26	Y121-42-99	USDA
27	Y117-86-03	USDA
28	Y116-161-99**	USDA
29	Y117-91-03	USDA
30	Folsom	Wilson
31	Wood Colony on Krymsk 86 (Butte site only)	
32	Wood Colony on Nemaguard (Madera site only- planted one year later after Lone Star was removed)	

*Kester was planted at all three sites on the usual rootstock for the site. In addition at the Butte and Stanislaus sites it was also planted in the replicated trial on Hansen 536 rootstock

**Y116-161-99 was planted only in two reps outside of the main trial at the Butte site