



# North San Joaquin Valley Almond Day

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Coffee, donuts & venue provided by:

**Yosemite Farm Credit**

# Field Evaluation of Almond Varieties

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Joe Connell, UCCE Butte County emeritus



There is no such thing as a  
perfect variety

Growers must take many factors into consideration  
when making their choice

# Almond Variety Choice Depends on:

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- Yield

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- Price

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- Yield
  - Price
- } Gross income

# Statewide Average Yield Comparison for Nonpareil vs. Butte & Padre (lbs / acre)\*

\*based on Almond Board of California Almanac

	2000	2001	2002	2003	2004	2006	2007	2008	2009	Avg.
NP	1425	1613	2267	1927	1853	2333	2539	2486	2103	2061
Butte & Padre	1563	1912	2441	2689	2296	1775	2433	2506	2281	2211

Butte & Padre produced 150 lb. per acre more  
than Nonpareil on average

# Price per Pound for Nonpareil vs. Butte & Padre Paid by Blue Diamond Growers\*

\*Does not include premiums for quality or volume

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
NP	\$1.01	\$1.01	\$1.28	\$1.69	\$2.39	\$3.08	\$2.25	\$1.99	\$1.78	\$1.94
Butte & Padre	\$0.79	\$0.86	\$1.05	\$1.50	\$2.16	\$2.75	\$1.90	\$1.54	\$1.17	\$1.30
Diff	\$0.22	\$0.15	\$0.23	\$0.19	\$0.23	\$0.33	\$0.35	\$0.45	\$0.61	\$0.64

# Average Gross Income for Nonpareil vs. Butte & Padre\*

\*based on Almond Board of California Almanac and Blue Diamond Pay Schedule

	2000	2001	2002	2003	2004	2006	2007	2008	2009	Avg.
NP	\$1553	\$1694	\$2924	\$3372	\$4466	\$5319	\$5078	\$4425	\$4080	\$3657
Butte & Padre	\$1375	\$1683	\$2587	\$4141	\$5005	\$3408	\$3771	\$2932	\$2965	\$3096
	+\$178	+\$11	+\$337	-\$769	-\$539	+\$1911	+\$1307	+\$1493	+\$1115	+\$561

## Price Differential of Variety Classes Compared to Nonpareil 2014 vs 2016 – Window to the Future?

	<b>2014</b>	<b>2016</b>
Nonpareil / Sonora Inshell	+ 0.07	+ 0.08
Nonpareil / Supareil Meats	--	--
Independence inshell	+ 0.07	- 0.07
Sonora meats	- 0.13	- 0.18
Independence meats	- 0.13 (3.1%)	- 0.41 (15.4%)
Carmel	- 0.25	- 0.41
Monterey	- 0.29	- 0.46
California	- 0.36 (8.7%)	- 0.51 (19%)
Butte / Padre	- 0.39 (9.4%)	- 0.54 (20.2%)
Mission / NePlus	- 0.45 (10.8%)	- 0.60 (22.5%)

Anticipated 20% increase in almond  
production by 2020

**Kernel quality matters!**

# Almond Variety Choice Depends on Many Things:

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- Yield
  - Price
  - Bloom time (overlap with main variety)
- } Gross income

# Full Bloom Time Relative to Nonpareil\*

\*Data taken from Butte County  
Variety Trial:

average of 1996 – 2003

Fritz not included in Chico trial

Sonora	-6.4
Sano	- 5.3
Winters	- 3.4
Donna	- 3.3
Aldrich	- 1.4
Jenette	- 0.8
Price	+ 0.4
Carmel	+ 1.4
Wood Colony	+ 1.4
Monterey	+ 1.9
Plateau	+ 2.8
Butte	+ 4.3
2-19E	+ 4.4
Padre	+ 5.1
Livingston	+ 5.6
Mission	+ 6.1
Ruby	+ 9.8



# Full Bloom Time Relative to Nonpareil\*

\*Data taken from Butte County  
Variety Trial:

average of 1996 – 2003

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<del>Sonora</del>	<del>- 6.4</del>
<del>Sano</del>	<del>- 5.3</del>
Winters	- 3.4
Donna	- 3.3
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Jenette	- 0.8
Price	+ 0.4
Carmel	+ 1.4
Wood Colony	+ 1.4
Monterey	+ 1.9
Plateau	+ 2.8
<del>Butte</del>	<del>+ 4.3</del>
<del>2-19E</del>	<del>+ 4.4</del>
<del>Padre</del>	<del>+ 5.1</del>
<del>Livingston</del>	<del>+ 5.6</del>
<del>Mission</del>	<del>+ 6.1</del>
<del>Ruby</del>	<del>+ 9.8</del>



# Almond Variety Choice Depends on Many Things:

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- Yield } Gross income
- Price }
- Bloom time (overlap with main variety)
- Harvest date
- Insect pressure
- Disease pressure
- Size of farming operation
- Farming style / personal preference
- Are you a risk taker?

# Self-fruitful Varieties – The Future??

- Cheaper to farm
  - Fewer bees (save ~ \$270 / acre)
  - One harvest (save ~\$37 / acre)
  - One bloom, one hull split to cover
- More consistent yield?
- Less dust (one harvest)

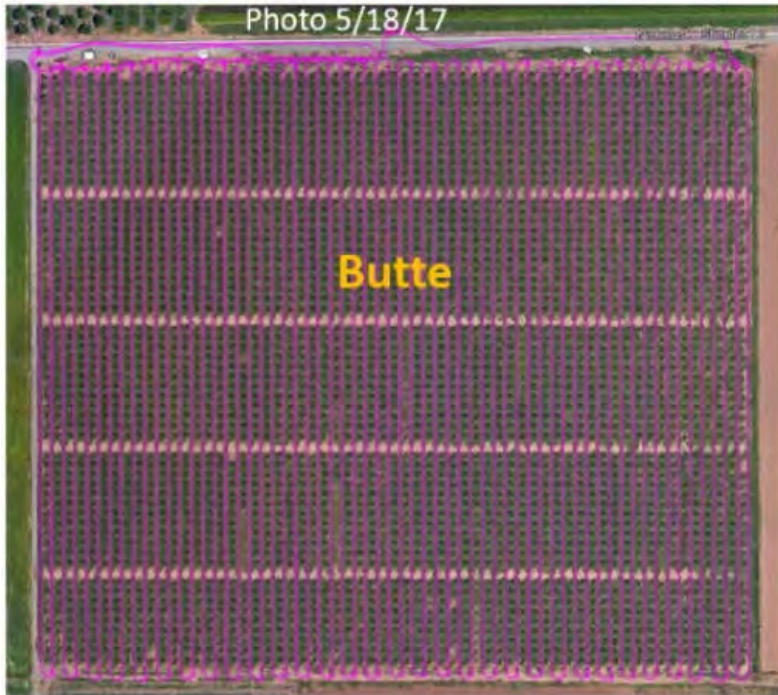
# New Regional Almond Variety Trials Planted 2014

- Butte County: Chico State Farm
- Stanislaus County: Salida
- Madera County: Chowchilla grower
  
- Comparing 30 varieties

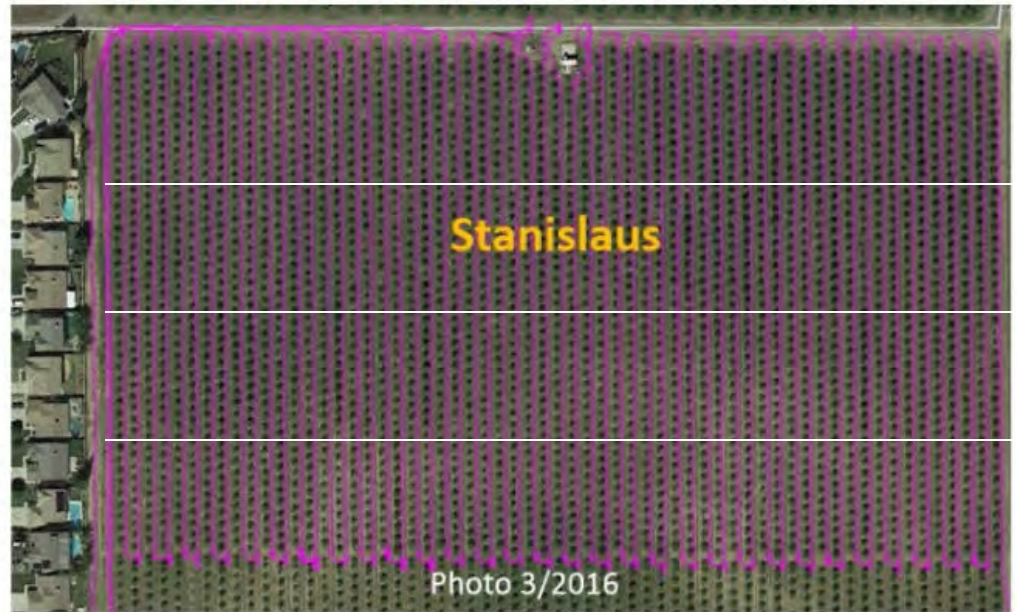
Site	Rootstock	Spacing	#trees/acre
<b>Butte</b>	Krymsk 86	18' x 22'	110
<b>Stanislaus</b>	Nemaguard	16' x 21'	130
<b>Madera</b>	Hansen 536	12' x 21'	173

Variety	Source	Self-fruitful	Category
Eddie	Brights	No	Non or Sonora
Capitola	Burchell	No	CA
Supareil	Burchell	No	Nonpareil
P16-013	Burchell	Yes	CA
P13-019	Burchell	Yes	CA
Booth	Burchell	No	CA
Sterling	Burchell	No	CA or Sonora
Bennett	Duarte	No	Non or CA
Durango	Fowler	No	CA
Jenette	Fowler	No	Mission or CA
Winters	UC Davis	No	Carmel
Sweetheart	UC Davis	No	CA
Kester	UC Davis	No	Padre or Carmel
UCD 3-40	UC Davis	No	Carmel
UCD 18-20	UC Davis	No	Monterey
UCD 1-16	UC Davis	No	Sonora or Carmel
UCD 8-160	UC Davis	Yes	Wood Colony
UCD 8-127	UC Davis	Yes	CA
UCD 1-232	UC Davis	Yes	CA
UCD 7-159	UC Davis	Yes	CA
UCD 8-201	UC Davis	Yes	Non or CA
Y-121-42-99	USDA	Yes	CA
Y117-86-03	USDA	Yes	Carmel
Y116-161-99	USDA	Yes	Nonpareil
Y117-91-03	USDA	Yes	CA
Folsom	Wilson	No	CA
Nonpareil		No	
Aldrich		Np	CA

Photo 5/18/17



**Butte**



**Stanislaus**

Photo 3/2016



**Madera**

Photo 3/31/17

Nonpareil

Folsom

Nonpareil

UCD8-160

Nonpareil

Supareil

Nonpareil

Y117-86.013

Nonpareil

Aldrich

Nonpareil

Eddie

Nonpareil

P15.013

Nonpareil

UCD8-201

Nonpareil



	Salida	Chico
UCD 3-40	-7	-10
Capitola	0	-3
Nonpareil	--	--
UCD 7-159*	0	0
Y116-161-99*	0	0
Booth	0	0
Aldrich	0	0
Supareil	0	0
Durango	0	+1
Bennett	0	+3
Y117-91-03*	+2	0
Eddie	+2	0
UCD 1-232*	+2	0
UCD 8-27*	+2	0
Winters	+2	0
UCD 1-271*	+2	0
Jenette	+2	0
UCD 8-160*	+2	-2
Kester	+2	+1
UCD 8-201*	+2	+1
UCD 18-20	+2	+2
Sterling	+2	+3
Y121-42-99*	+2	+3
Y117-86-03*	+2	+4
Folsom	+2	+5
UCD 1-16	+2	+5
P16-013*	+5	+3
P13-019*	+5	+1
Sweetheart	+8	+5

## Bloom time for Salida and Chico Regional Variety Trials

\* = self-fruitful



Nonpareil	--
Y117-91-03*	+0
Eddie	+0
Y116-161-99*	+3
Y121-42-99*	+8
Kester	+8
Capitola	+14
Booth	+14
UCD 1-16	+14
Sterling	+14
Folsom	+14
Sweetheart	+14
UCD 7-159*	+18
UCD 1-271*	+18
Y117-86-03*	+18
P13-019*	+24
Bennett	+25
Durango	+25
UCD 8-201*	+25
Aldrich	+30
Supareil	+30
UCD 8-160*	+30
UCD 8-27*	+30
Winters	+30
Jenette	+30
UCD 1-232*	+36
UCD 18-20	+36
P16-013*	+36
UCD 3-40	+42

Harvest time  
(100% Hullsplit)

Salida RAVT

\* = self-fruitful



2c



stage 5

	Yield (lb / acre)	P < 0.05	Classification (?)
8-160*	2282	a	Wood Colony
P13-019*	2243	ab	CA
18-20	2233	ab	Monterey
Kester	2127	abc	Padre / Carmel
Y117-91-03*	2096	abcd	CA
Aldrich	1837	abcde	CA
Bennett	1808	abcde	Nonpareil / CA
Y121-42-99*	1785	abcde	CA
Y116-161-99*	1783	abcde	Nonpareil
Y117-86-03*	1749	abcdef	Carmel
Winters	1739	abcdef	Carmel
8-201*	1692	abcdef	Nonpareil / CA
Booth	1678	bcdefgh	CA
Durango	1633	cdefghi	CA
1-232*	1629	cdefghi	CA
Eddie	1595	cdefghi	Nonpareil / Sonora
<b>Nonpareil</b>	<b>1587</b>	<b>cdefghi</b>	<b>Nonpareil</b>
1-16	1580	cdefghi	Sonora or Carmel
Folsom	1522	defghi	CA
Jenette	1515	defghi	Mission / CA
Sterling	1497	defghi	Sonora / CA
Capitola	1488	efghi	CA
7-159*	1456	efghi	CA
P16-013*	1401	efghi	CA
1-271*	1319	efghi	CA
3-40	1149	fghi	Carmel
Sweetheart	1115	ghi	CA
8-27*	1085	hi	CA
Supareil	1056	i	Nonpareil

## 3<sup>rd</sup> & 4<sup>th</sup> Leaf Cumulative Yield - Salida

Spacing = 16' x 21"  
(130 trees / acre)

Rootstock: Nemaguard

\* = self-fruitful

	Yield (lb / acre)	P < 0.05	Classification (?)
Booth	2778	a	CA
18-20	2650	ab	Monterey
1-232*	2581	abc	CA
Nonpareil	2579	abc	Nonpareil
Winters	2509	abcd	Carmel
8-160*	2379	abcde	Wood Colony
Folsom	2106	abcdef	CA
Y117-91-03*	1981	bcdefg	CA
Capitola	1955	bcdefg	CA
8-201*	1922	cdefgh	Nonpareil / CA
P13-019*	1881	cdefgh	CA
Wood Colony	1801	defghi	
Jenette	1795	defghi	Mission / CA
Kester	1763	efghi	Padre / CA
Durango	1662	efghi	CA
8-27*	1612	fghi	CA
Eddie	1537	fghij	Nonpareil / Sonora
1-16	1520	fghij	Sonora / Carmel
Y117-86-03*	1392	fghij	Carmel
Y116-161-99*	1352	ghij	Nonpareil
Aldrich	1347	ghij	CA
P16-013*	1314	ghij	CA
Sterling	1258	ghijk	Sonora / CA
7-159*	1230	ghijk	Sonora / CA
Bennett	1193	hijk	Nonpareil / CA
Supareil	1081	ijk	Nonpareil
3-40	1077	ijk	Carmel
Sweetheart	838	jk	CA
1-271*	565	k	CA

## 3<sup>rd</sup> & 4<sup>th</sup> Leaf Cumulative Yield – Butte County

Spacing = 18' x 22'  
(110 trees / acre)

Rootstock = Krymsk 86

\* = self-fruitful

	Yield (lb / acre)	P < 0.05	Classification (?)
Y-116-161-99*	4782*	a	Nonpareil
Booth	4103	ab	CA
Capitola	3971	abc	CA
18-20	3905	abcd	Monterey
P16-013	3842	abcd	CA
Y117-86-03*	3801	abcd	Carmel
Bennett	3747	abcd	Nonpareil / CA
Nonpareil	3641	bcdef	Nonpareil
Kester	3623	bcdef	Padre / CA
Y117-91-03*	3469	bcdefg	CA
Winters	3436	bcdefg	Carmel
Eddie	3429	bcdefg	Nonpareil / Sonora
Jenette	3427	bcdefg	Mission / CA
Y121-42-99*	3290	bcdefgh	CA
Durango	3242	bcdefghi	CA
Aldrich	3137	bcdefghi	CA
1-16	3116	bcdefghi	Sonora / Carmel
P13-019*	3023	bcdefghi	CA
Sterling	3001	bcdefghi	Sonora / CA
8-201*	2981	cdefghi	Nonpareil / CA
Folsom	2870	cdefghi	CA
Supareil	2801	defghi	Nonpareil
Sweetheart	2639	efghi	CA
8-160*	2559	fghi	Wood Colony
1-232*	2444	ghij	CA
7-159*	2240	hijk	CA
8-27*	2167	ijk	CA
1-271*	1546	jk	CA
3-40	1285	k	Carmel

## 3<sup>rd</sup> & 4<sup>th</sup> Leaf Cumulative Yield – Madera County

Spacing = 12' x 21'  
(173 trees / acre)

Rootstock = Hansen

\* = self-fruitful

# Disease Issues Noted at Chico Trial:

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## **Varieties with *serious* bacterial blast:**

UCD 1-271

Wood Colony

Bennett

Self-Fruitful P13.019

Self-Fruitful P16.013

Aldrich

## **Varieties noted with *some* bacterial blast:**

Jenette

Sterling

UCD 7-159

Y 121-42-99

# Disease Issues Noted at Chico Trial:

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## Varieties noted to have bacterial spot:

UCD 18-20

UCD 1-271

Booth

Self-Fruitful P13.019

Self-Fruitful P16.013

Aldrich (*slight case*)

# Disease Issues Noted at Chico Trial:

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## Varieties with noticeable hull rot:

Folsom

UCD 3-40

Supareil

UCD 8-160

Eddie

UCD 1-232

UCD 8-201

Capitola

# Double Kernels:

Varieties with defect	Butte	%	Stanislaus	(%)	Madera	%
6% or more double kernels	UCD 18-20	41	UCD 18-20	22	UCD 8-201	36
	Self-fru P16.013	37	UCD 8-201	18	Booth	22
	Booth	30	Booth	16	UCD 18-20	20
	UCD 8-201	26	Y121-42-99	16	UCD 8-27	18
			Self-fru		Self-fru	
	Wood Colony	24	P16.013	15	P16.013	13
	UCD 8-27	21	UCD 8-27	15	UCD 1-16	8
			Self-fru			
	UCD 8-160	20	P16.013	14	Durango	7
	UCD 1-232	19	UCD 1-16	11	UCD 1-232	7
	Self-fru p13.019	19	Jenette	8		
	UCD 1-16	18	Durango	7		
	Jenette	14	Y117-91-03	6		
	Durango	13				
	Aldrich	9				
	Winters	9				
	Folsom	8				
	Kester	7				
	Bennett	7				

# Navel Orangeworm:

Varieties with defect	Butte	%	Stanislaus	(%)	Madera	%
6% or more NOW Damage	UCD 8-27	6	UCD 8-27	8	UCD 1-271	14
					UCD 8-27	11
					UCD 8-201	8
					Supareil	7
					Bennett	7
					UCD 3-40	7

Finally,

Talk to sellers / marketers

# Early (Premature?) Conclusions:

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- High quality varieties include Bennett, Eddie, Supareil, Y116-161-99, 8-201, 1-16 & Sterling
- 3-40 blooms way too early to be Np pollinizer
- 1-16, Sweetheart and Folsom may bloom too late
- Eddie harvests at same time as Np – problem
- Good quality kernels with high yield potential include Y116-161-99, UCD 8-201 and Bennett
- 8-27 is a NOW magnet



# Questions? Comments?

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