

RESEARCH AND DEVELOPMENT
PROJECT
FINAL REPORT

Performance Of Two Seaweed Derived Biostimulants to Improve Almond Yield
And Quality Metrics When Applied In Conjunction With A Standard Fertilizer
Regime.

Trial ID: OLM2103C

San Luis Obispo, CA – Pacific Ag Group

Prepared for:

Alick Osborne // Seasol

Prepared by:



February 2021 – November 2021

Table of Contents

<u>ABSTRACT</u>			<u>Page 3</u>
<u>MATERIALS AND METHODS</u>			<u>Page 4</u>
Treatments			
Experimental Unit			
Pest Description			
Application Equipment			
Evaluations			
<u>RESULTS</u>			
Table 1.	Phytotoxicity		Page 5
Table/Chart 2.	Vigor		Page 6
Table/Chart 3.	Apogee CCM Readings		Page 7
Table/Chart 4.	Flagged Terminal Counts		Page 8
Table/Chart 5.	% Change Bloom to Nut		Page 9
Table/Chart 6.	% Doubles Occurrence		Page 10
Table/Chart 7.	% Crackout		Page 11
Table/Chart 8.	Moisture Adjusted Weights		Page 12
Table/Chart 9.	Estimated Marketable Weight		Page 13
Table/Chart 10.	Estimated Gross Income		Page 14
<u>TRIAL INFORMATION SHEET</u>			<u>Page 15</u>
<u>PRICING, TREATMENT LIST & PLOT MAP</u>			<u>Page 16</u>
<u>APPENDIX A: DAILY METEROLOGICAL SUMMARY – CIMIS FIREBAUGH # 7– MADERA, CA</u>			<u>Page 18</u>
<u>APPENDIX B: PHOTO SET</u>			<u>Page 26</u>

ABSTRACT

Objective: To determine performance of two seaweed derived biostimulants to improve almond yield and quality metrics when applied in conjunction with a standard fertilizer regime in a commercial orchard.

Product(s) tested: Seasol

Location: Madera, CA – Crop planted 2011

Project Duration: February 2021 to November 2021

Key Findings:

- Seasol International fertility treatments significantly increased almond yields relative to the grower standard in this second year of study in a commercial California orchard.

Narrative:

Seasol International drip fertility treatments are tested here in the second year of work for enhancing yield and crop quality of ten-year-old nonpareil almonds in a commercial orchard in Madera, CA. Seasol, at 2 qt/a, was drip applied at pink bud (February 19), petal fall (March 5), and 2 and 5 weeks after petal fall (March 22, April 3).

Crop injury and vigor were assessed with no phytotoxicity reported and significantly higher vigor reported for the Seasol-treated trees.

Five branches per tree were flagged and the number of blooms per branch and the number of blossoms and nuts were higher on trees treated with Seasol, which had higher nut retention overall.

A sample of 250 nuts per tree were collected to determine incidence of doubles and percent crackout, which were uniform. Average sample weights for the Seasol-treated nuts were higher on average, and total yield weight per tree were also higher. Estimated gross returns were based on a value of \$3.275 per lb or a quality-based dollar amount (from \$3.10 to \$3.65 depending on quality per tree). Either way, the Seasol-treated tree gross returns were significantly higher than the grower standard-trees.

MATERIALS AND METHODS

Treatments:

This study consisted of four treatments with applications on February 19 (A), March 5 (B), March 22 (C), and April 10 (D).

1. Grower's Standard (A)
2. Seasol 2 qt/a (ABCD)

Experimental Unit:

Nonpareil variety Almonds were established in 2011, 18' apart on 21' plots. Plots were replicated six times in a randomized block design.

Application Equipment:

All applications were applied via drip operating at 15 PSI.

Evaluations:

Phytotoxicity was rated on a 0-100 scale, where 0 is no display of crop injury and 100 is total crop injury. Evaluations were done on June 15 (66 DA-D) and August 2 (114 DA-D).

Plant vigor was rated on a 0-9 scale, where 9 indicates robust plants. Evaluations were done on June 15 (66 DA-D) and August 2 (114 DA-D).

Apogee CCM measures chlorophyll concentration per square meter of plant leaf area. Evaluation was done on May 18 (45 DA-D).

Terminal bloom and nut counts were taken on March 6, 2020 (Pre-Application), February 24 (5 DA-B), April 29 (19 DA-D), and July 21 (102 DA-D).

Almonds were harvested and evaluated on October 28 (201 DA-D).

RESULTS

Table 1. Phytotoxicity (0-100). Phytotoxicity was rated on a 0-100 scale, where 0 is no display of crop injury and 100 is total crop injury. Evaluations were done on June 15 (66 DA-D) and August 2 (114 DA-D).

Trt No.	Treatment Name	6/15/2021 66 DA-D	8/2/2021 114 DA-D
1	Growers Standard	0 a	0 a
2	Seasol	0 a	0 a

RESULTS

Table 2. Vigor (0-9). Plant vigor was rated on a 0-9 scale, where 9 indicates robust plants. Evaluations were done on June 15 (66 DA-D) and August 2 (114 DA-D).

Trt No.	Treatment Name	6/15/2021 66 DA-D	8/2/2021 114 DA-D
1	Growers Standard	4.6 a	4.5 b
2	Seasol	4.8 a	5.3 a

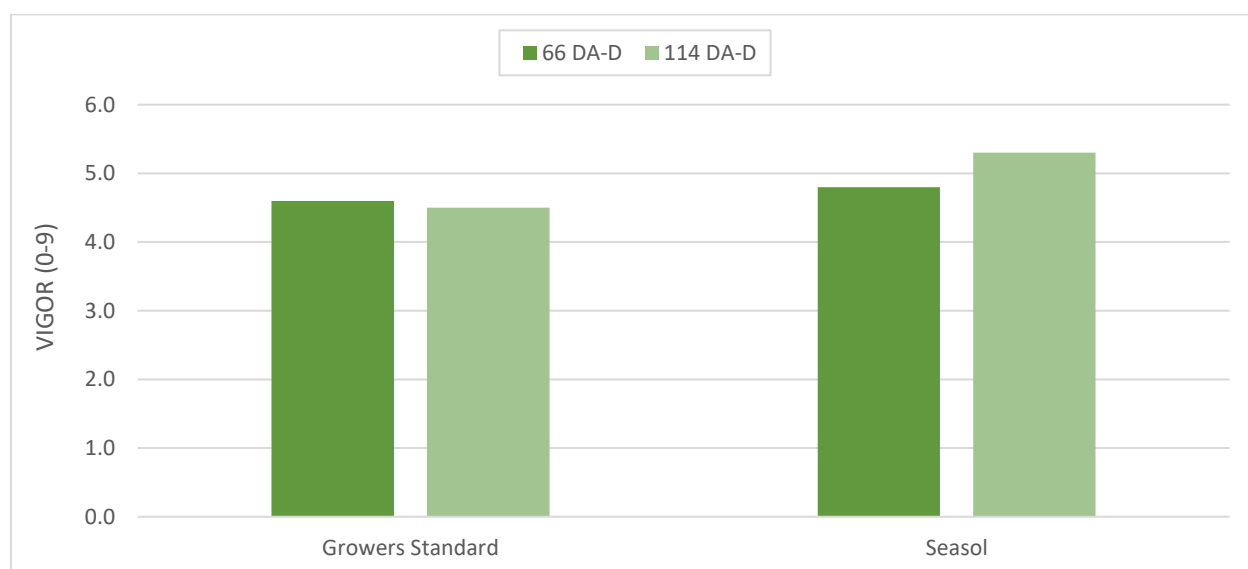


Chart 2. Vigor (0-9). Plant vigor was rated on a 0-9 scale.

RESULTS

Table 3. Apogee CCM Readings. Apogee CCM measures chlorophyll concentration per square meter of plant leaf area. Evaluation was done on May 18 (45 DA-D).

Trt No.	Treatment Name	5/18/2021 45 DA-D
1	Growers Standard	11.5 a
2	Seasol	11.6 a

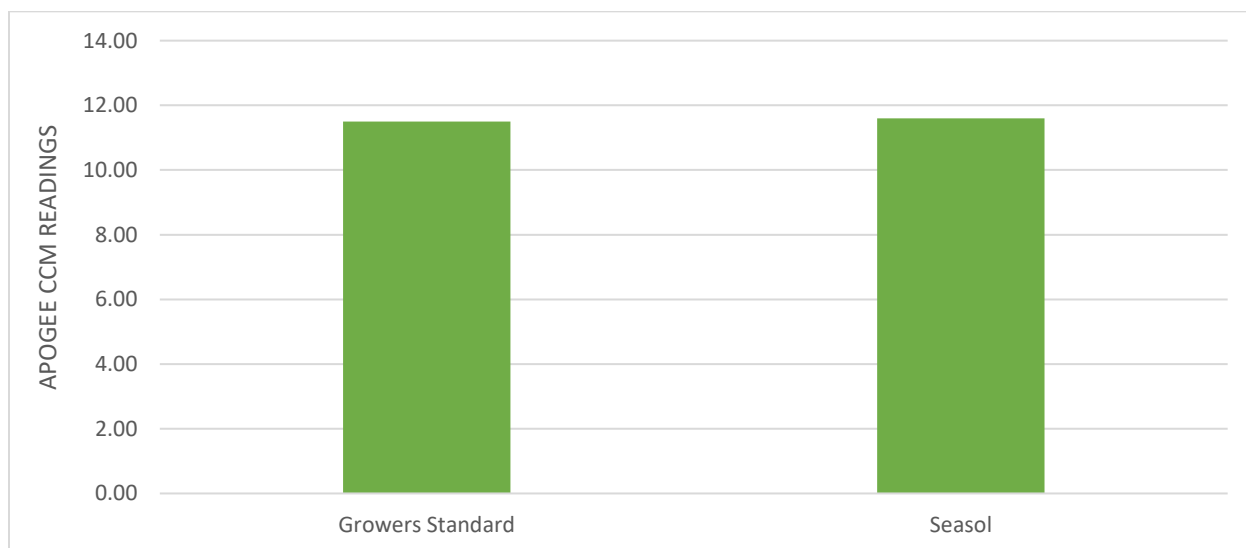


Chart 3. Apogee CCM Readings.

RESULTS

Table 4. Flagged Terminal Bloom and Nut Counts. Blossom and nut counts were taken from five flagged branches (terminals) per tree on March 6, 2020 (Pre-Application), February 24 (5 DA-B), April 29 (19 DA-D), and July 21 (102 DA-D).

Trt No.	Treatment Name	3/6/2020 Pre-App	2/24/2021 5 DA-A	4/29/2021 19 DA-D	7/21/2021 102 DA-D
1	Growers Standard	31.7 a	23.3 b	13.1 b	11.9 b
2	Seasol	25.6 a	28.1 a	15.0 a	13.6 a

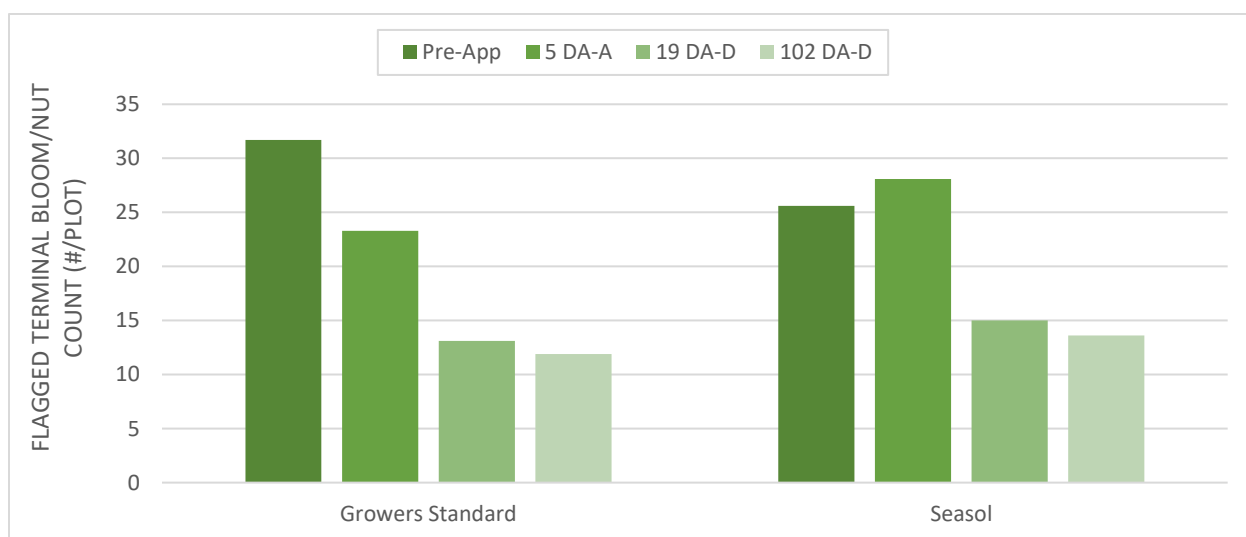


Chart 4. Flagged Terminal Bloom and Nut Counts.

RESULTS

Table 5. Flagged Terminal Counts: % Change Bloom to Nut. Percent change in April bloom count to final nut count in July.

Trt No.	Treatment Name	7/21/2021 102 DA-D
1	Growers Standard	-49.56% a
2	Seasol	-51.21% a

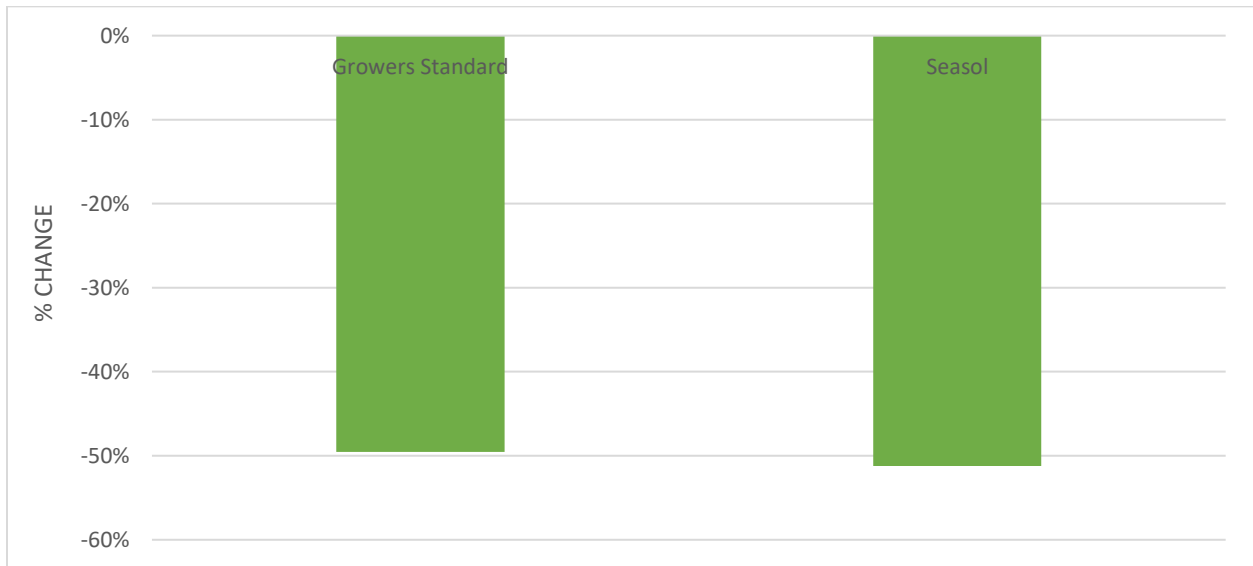


Chart 5. % Change Bloom to Nut.

RESULTS

Table 6. Harvested Almond Evaluation: % Doubles Occurrence. Percentage of shells with two kernels from a sample of almonds harvested and evaluated on October 28 (201 DA-D).

Trt No.	Treatment Name	10/28/2021 201 DA-D
1	Growers Standard	3.3% a
2	Seasol	2.8% a

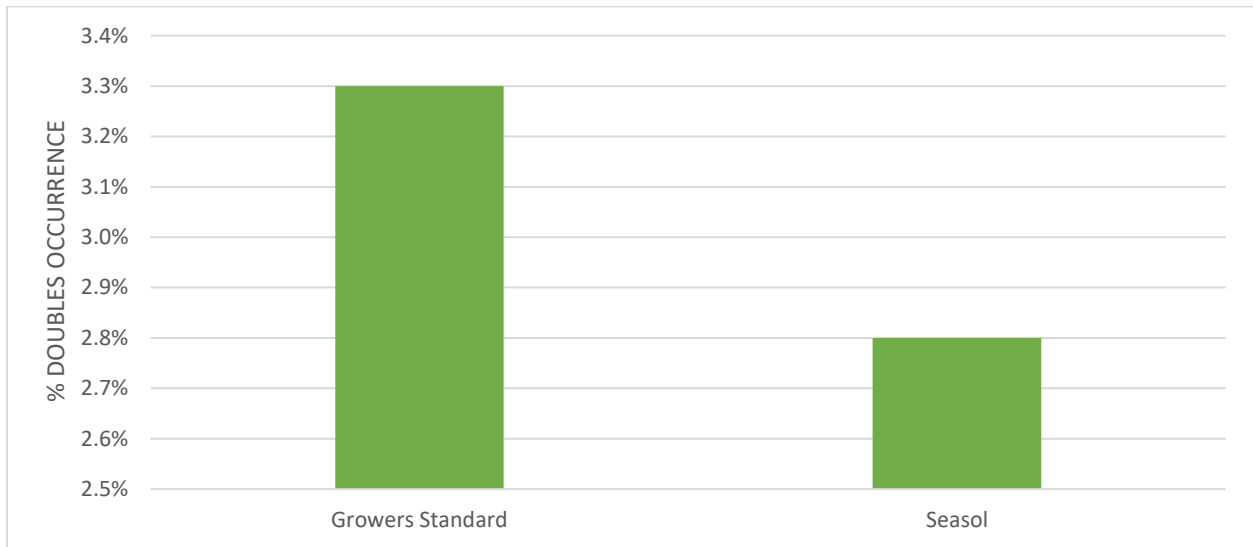


Chart 6. % Doubles Occurrence.

RESULTS

Table 7. Harvested Almond Evaluation: % Crackout. Percent crackout, or shelling weight, from almonds harvested and evaluated on October 28 (201 DA-D).

Trt No.	Treatment Name	10/28/2021 201 DA-D
1	Growers Standard	33.22% a
2	Seasol	34.01% a

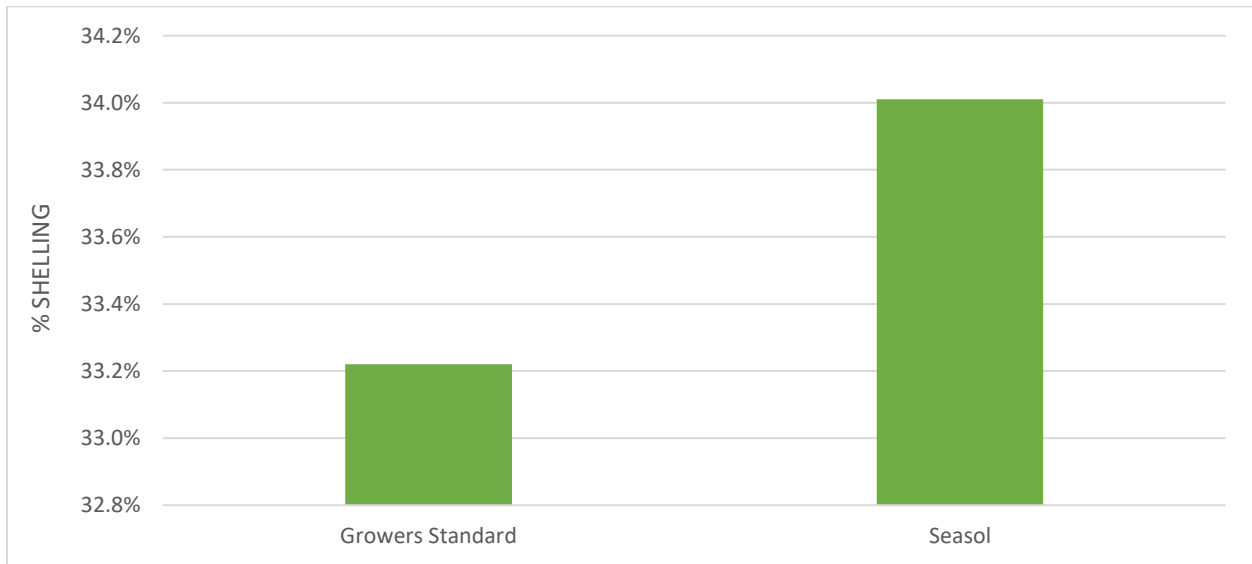


Chart 7. % Crackout.

RESULTS

Table 8. Harvested Almond Evaluation: Moisture Adjusted Weight (kg, with and without Shelling). Estimated dried weight of almonds per tree, with and without shells, following harvest on October 28 (201 DA-D).

Trt No.	Treatment Name	Adjusted Wt.	
		Total	with Shelling
1	Growers Standard	52.02 b	17.22 b
2	Seasol	60.43 a	20.57 a

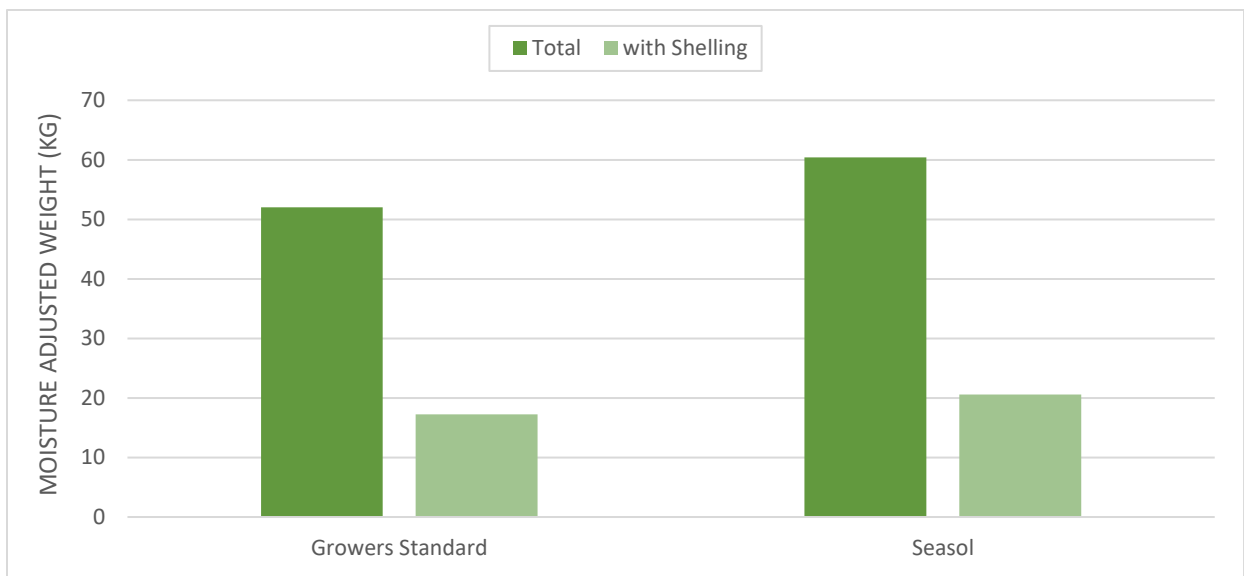


Chart 8. Moisture Adjusted Weight (kg, with and without Shelling).

RESULTS

Table 9. Estimated Marketable Weight Yield (lbs/a). Yield weight per acre, in pounds, October 28 (201 DA-D).

Trt No.	Treatment Name	10/28/2021 201 DA-D
1	Growers Standard	4355.58 b
2	Seasol	5203.55 a

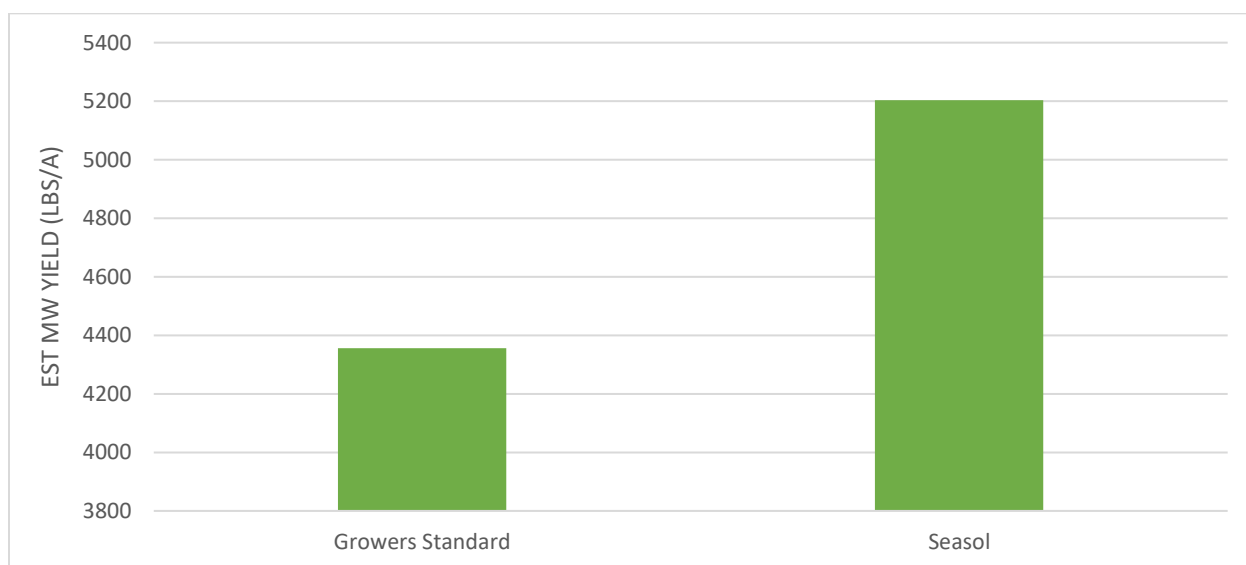


Chart 9. Estimated Marketable Weight Yield (lbs/a).

RESULTS

Table 10. Estimated Gross Income Return (\$/a). Estimated gross returns per acre based on a regional value of \$3.275/lb, or a quality-based value assigned based on the number of nutmeats per ounce (ranging from \$3.23 to \$3.36).

Trt No.	Treatment Name	Est \$/A		
		\$1.8/lbs	\$3.275/lbs	Est Value
1	Growers Standard	\$ 7,840.05 b	\$ 14,264.54 b	\$ 14,253.72 b
2	Seasol	\$ 9,366.39 a	\$ 17,041.63 a	\$ 17,522.34 a



Chart 10. Estimated Gross Income Return (\$/a).

TRIAL INFORMATION SHEET

Trial ID:	SEA2101C	Location (City):	Madera, CA
Protocol ID:	Almond Seaweed COMBO	Grower:	Olam Farming
Client Contact:	Alick Osborne	Farm & Block:	Olam KG Ranch, Block 26
Sponsor Company:	Seasol	Principal Investigator:	Nick Badasci
# Treatments:	2	Plot Width:	21'
# Replicates:	6	Plot Length:	108'
Discipline:	Fertilizer	Trial Initiation Date:	2/1/2021
Statistical Design:	RBD	Trial End Date:	11/1/2021

Objective:

To determine performance of two seaweed derived biostimulants to improve Almond yield and quality metrics when applied in conjunction with a standard fertilizer regime.

Crop and Pest Info:

Crop:	Almond	Pests:	N/A
Variety:	Nonpareil		
Planting Date:	2011		
Planting Method:	Transplanted		
Plant Spacing:	18'		
Row Spacing:	21'	Harvest Width:	21'
Planting Density:	115 trees per acre	Harvest Length:	108'
Irrigation Method:	Dual Line Drip	Harvest Equipment:	Mechanical

Applications:

Application A:	2/19, Pre-Bloom	Application C:	3/22, 2 weeks after Petal Fall (Drip)
Application B:	3/5, Petal Fall (Drip)	Application D:	4/10, 5 weeks after Petal Fall (Drip)

Application Notes:

All applications were applied via drip operating at 15 PSI.

Evaluations:

Phytotoxicity:	6/15, 8/2
Vigor:	6/15, 8/2
Terminal Counts:	3/6/2020 (Bloom), 2/24, 4/29, 7/21
Apogee CCM Readings:	5/18
Nut Harvest:	10/28

CONFIDENTIAL BUSINESS INFORMATION - PACIFIC AG GROUP

Treatment List

Reps: 6

Plots: 21 by 108 feet

Appl. Amount: 100 GAL/AC

Mix Size: 35 GAL (total for 6 plots; minimum=31.24 GAL)

Trt No.	Treatment Name	Formulation		Rate		Application Timing	Application Code	Amount	Unit	Amt Product to Measure	Rep					
		Conc	Unit Type	Rate	Unit						1	2	3	4	5	6
1	Growers Standard										101	203	303	402	501	603
2	Seasol	100 %	L	2 qt/a		Pre-Bloom/Pink-Bud - Drip	A	0.1 acre inch		591.3 mL/mx	104	204	304	403	503	604
						Petal Fall - Drip	B									
						2 Weeks After Petal Fall - Drip	C									
						5 Weeks After Petal Fall - Drip	D									

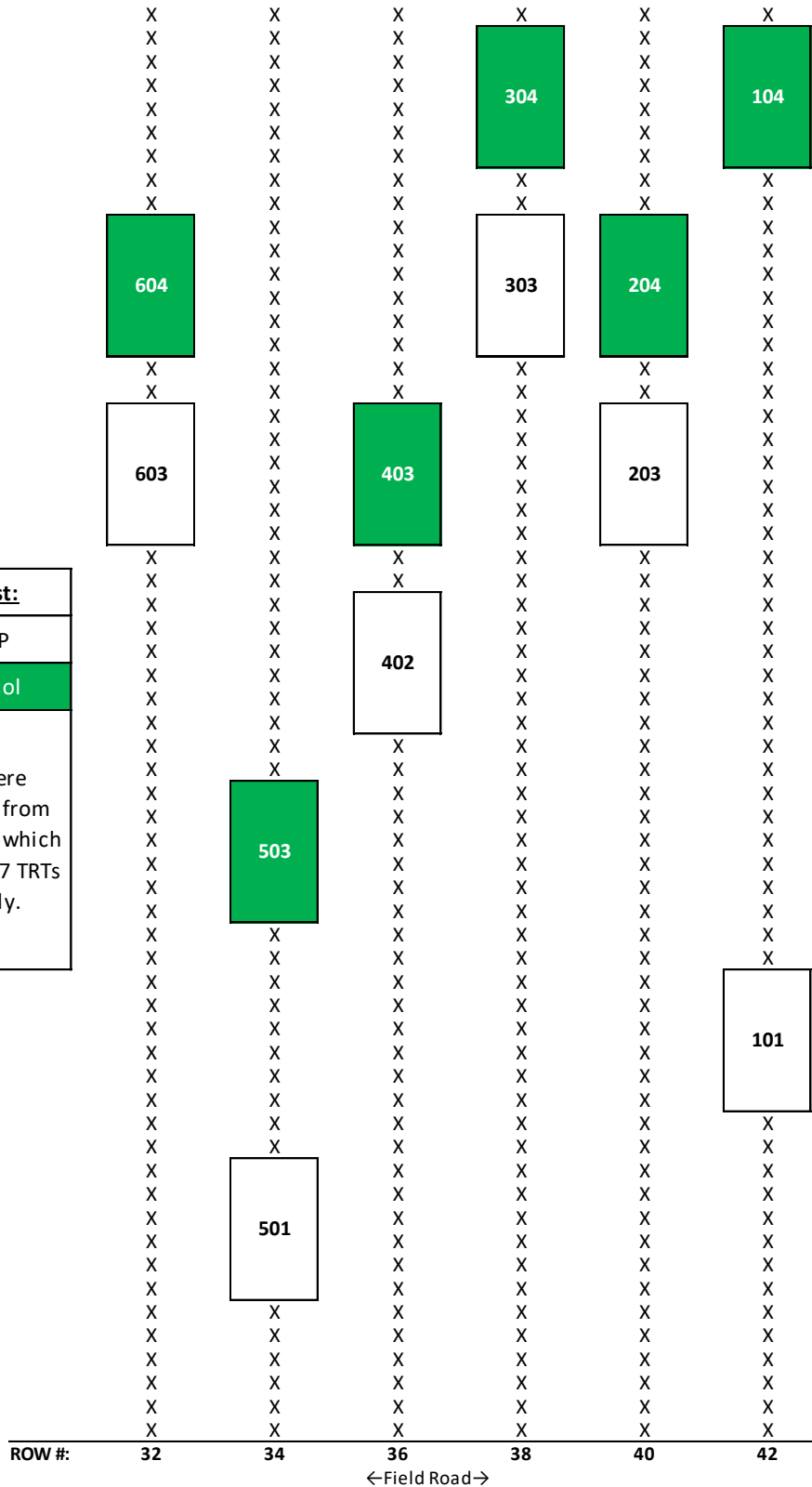
Plot Map

Almond Fertility

Olam KG Ranch Block S2 (26), Madera

TRT List:
1: GSP
2: Seasol

TRTs were Captured from 2020 Trial which Contained 7 TRTs initially.



Trial Notes:
Almond Variety: Nonpareil
Rootstock: Nemaguard
Planting Date: 2011
Spacing: In/Row: 18'
B/w Rows: 21'
Irrigation: Dual Line Drip
Trial Design Notes: Plot are 6 Trees. Inner 4 trees are to be utilized for all evaluation metrics throughout season including any sampling done in-house or via a third party individual. Outside 2 trees are to be utilized as applied borders and there are (exception plot 603 -> 604) 2 Tree buffers between plots. At Harvest 2 or 4 trees may be utilized for Yield dependent upon Nut load of On Map X: indicates a Buffer Tree or At Field Edge Border Trees Not utilized in the trial.

7 Rows to Eastern Edge of Block →

APPENDIX A: DAILY METEOROLOGICAL SUMMARY

FIREBAUGH #7
MADERA, CA
26.0 MILES

CIMIS - Firebaugh #7

Date	Precip (In)	Cumul. Precip (In)	High Temp (F)	Low Temp (F)	Mean Temp (F)	Low RH (%)	High RH (%)	Mean RH (%)	Mean Dew Point (F)	Avg Wind Speed (Mph)	Avg Soil Temp (F)
2/1/2021	0.00	0.00	70.50	48.10	56.90	39.00	95.00	65.00	45.20	3.60	49.40
2/2/2021	0.01	0.01	60.80	42.10	51.40	66.00	100.00	84.00	46.90	2.80	49.00
2/3/2021	0.00	0.01	58.90	39.50	49.40	50.00	99.00	76.00	42.10	3.50	48.60
2/4/2021	0.00	0.01	57.00	39.30	47.60	46.00	90.00	68.00	37.60	3.30	46.70
2/5/2021	0.00	0.01	62.30	34.90	48.00	41.00	88.00	66.00	37.10	2.20	45.70
2/6/2021	0.00	0.01	64.40	35.50	49.80	42.00	93.00	67.00	39.40	2.30	45.80
2/7/2021	0.00	0.01	64.90	35.80	49.90	46.00	92.00	71.00	40.80	2.10	46.20
2/8/2021	0.00	0.01	64.90	36.60	51.20	51.00	93.00	75.00	43.40	2.10	47.10
2/9/2021	0.00	0.01	64.80	49.20	55.90	49.00	89.00	71.00	46.80	2.60	50.30
2/10/2021	0.00	0.01	67.00	44.80	55.50	47.00	89.00	69.00	45.70	2.60	51.00
2/11/2021	0.04	0.05	64.30	44.20	54.60	59.00	94.00	79.00	48.30	2.30	51.10
2/12/2021	0.02	0.07	62.00	46.50	53.70	53.00	95.00	74.00	45.50	3.60	52.20
2/13/2021	0.00	0.07	65.70	43.60	54.20	42.00	94.00	65.00	42.70	3.70	51.50
2/14/2021	0.00	0.07	61.20	41.60	51.50	41.00	77.00	61.00	38.50	3.00	50.50
2/15/2021	0.00	0.07	63.00	49.30	54.90	63.00	82.00	73.00	46.40	3.40	52.60
2/16/2021	0.00	0.07	61.60	40.70	50.50	47.00	95.00	68.00	40.50	3.70	51.60
2/17/2021	0.00	0.07	62.70	47.20	55.70	24.00	89.00	33.00	27.30	6.50	51.20
2/18/2021	0.00	0.07	64.00	35.10	49.40	29.00	67.00	47.00	30.20	2.20	50.10
2/19/2021	0.00	0.07	69.60	37.80	53.90	35.00	90.00	60.00	40.20	2.60	51.70
2/20/2021	0.00	0.07	60.80	44.60	51.90	44.00	86.00	60.00	38.60	5.00	53.00
2/21/2021	0.00	0.07	62.40	38.70	50.10	36.00	78.00	55.00	34.40	3.30	52.00
2/22/2021	0.00	0.07	66.90	36.20	51.80	37.00	79.00	56.00	36.70	2.50	52.50
2/23/2021	0.00	0.07	69.00	40.60	54.30	37.00	79.00	55.00	38.60	2.90	52.90
2/24/2021	0.00	0.07	68.20	44.00	56.40	19.00	50.00	31.00	26.20	5.50	53.00
2/25/2021	0.00	0.07	64.60	39.70	51.40	24.00	52.00	35.00	25.00	3.90	53.30
2/26/2021	0.00	0.07	67.50	31.90	50.60	28.00	66.00	47.00	31.00	2.70	52.90
2/27/2021	0.00	0.07	65.30	42.20	53.20	22.00	83.00	40.00	29.70	6.10	53.30
2/28/2021	0.00	0.07	64.80	38.20	50.30	27.00	63.00	46.00	30.40	2.60	53.20
3/1/2021	0.00	0.07	76.10	34.80	54.90	11.00	67.00	29.00	23.20	3.70	53.20
3/2/2021	0.00	0.07	70.80	35.60	54.90	26.00	58.00	41.00	31.50	2.70	54.30
3/3/2021	0.00	0.07	67.30	41.90	54.50	29.00	68.00	49.00	35.90	2.70	54.90
3/4/2021	0.00	0.07	69.40	35.20	52.20	27.00	88.00	52.00	34.90	2.60	54.30
3/5/2021	0.00	0.07	70.20	38.60	54.40	39.00	79.00	59.00	40.50	2.90	55.20
3/6/2021	0.00	0.07	63.80	46.10	53.30	31.00	90.00	61.00	40.20	4.20	55.30
3/7/2021	0.00	0.07	65.70	36.70	51.50	26.00	90.00	53.00	35.10	3.10	53.80
3/8/2021	0.00	0.07	63.20	36.70	50.00	35.00	79.00	53.00	33.80	3.00	53.60
3/9/2021	0.09	0.16	63.30	39.80	50.80	35.00	88.00	59.00	37.20	3.50	53.60
3/10/2021	0.68	0.84	54.60	39.10	45.90	66.00	100.00	89.00	42.90	3.00	52.80
3/11/2021	0.00	0.84	54.10	35.00	44.90	58.00	100.00	83.00	40.10	2.50	50.70
3/12/2021	0.00	0.84	62.00	41.30	51.10	45.00	94.00	71.00	42.00	2.20	53.30
3/13/2021	0.00	0.84	66.10	36.50	50.90	43.00	94.00	67.00	40.50	3.00	54.20
3/14/2021	0.03	0.87	59.20	36.40	49.90	54.00	97.00	73.00	41.50	2.60	54.10

CIMIS - Firebaugh #7

Date	Precip (In)	Cumul. Precip (In)	High Temp (F)	Low Temp (F)	Mean Temp (F)	Low RH (%)	High RH (%)	Mean RH (%)	Mean Dew Point (F)	Avg Wind Speed (Mph)	Avg Soil Temp (F)
3/15/2021	0.16	1.03	56.70	39.10	45.80	46.00	92.00	76.00	38.60	4.40	53.30
3/16/2021	0.00	1.03	60.80	33.80	46.90	44.00	93.00	69.00	37.20	2.50	51.90
3/17/2021	0.00	1.03	63.40	36.00	50.90	49.00	98.00	73.00	42.50	2.30	53.30
3/18/2021	0.02	1.05	71.80	48.80	58.10	38.00	94.00	72.00	49.10	2.90	56.40
3/19/2021	0.15	1.20	58.60	49.90	55.00	91.00	100.00	96.00	53.90	2.60	57.00
3/20/2021	0.00	1.20	62.70	38.90	51.20	36.00	96.00	62.00	38.80	3.70	56.30
3/21/2021	0.00	1.20	66.60	39.90	52.30	27.00	91.00	54.00	36.30	4.10	55.80
3/22/2021	0.00	1.20	66.10	38.00	53.20	42.00	87.00	62.00	40.40	3.40	56.40
3/23/2021	0.00	1.20	67.40	47.80	56.30	25.00	74.00	44.00	34.60	7.40	57.30
3/24/2021	0.00	1.20	69.40	35.90	54.40	21.00	64.00	38.00	29.20	2.60	57.10
3/25/2021	0.00	1.20	66.00	40.00	53.40	46.00	74.00	59.00	39.30	3.30	57.10
3/26/2021	0.00	1.20	70.70	38.30	54.80	24.00	88.00	48.00	35.40	3.60	57.20
3/27/2021	0.00	1.20	77.40	39.80	59.10	22.00	68.00	41.00	35.50	3.00	59.00
3/28/2021	0.00	1.20	82.00	43.10	63.30	20.00	73.00	40.00	38.70	2.60	61.20
3/29/2021	0.00	1.20	79.10	49.00	63.30	23.00	67.00	40.00	38.70	4.10	62.40
3/30/2021	0.00	1.20	74.50	48.10	60.80	20.00	47.00	29.00	28.80	4.80	62.20
3/31/2021	0.00	1.20	85.00	40.20	63.30	17.00	64.00	36.00	35.70	2.80	62.50
4/1/2021	0.00	1.20	87.50	47.60	67.50	13.00	66.00	33.00	37.20	2.50	64.50
4/2/2021	0.00	1.20	86.10	52.40	67.90	18.00	59.00	32.00	37.10	3.50	65.40
4/3/2021	0.00	1.20	75.70	47.10	59.40	37.00	88.00	59.00	45.00	4.80	65.20
4/4/2021	0.00	1.20	72.60	42.70	57.30	42.00	92.00	64.00	45.10	3.40	64.60
4/5/2021	0.00	1.20	71.90	45.00	57.40	38.00	89.00	61.00	44.10	4.30	64.50
4/6/2021	0.00	1.20	77.80	42.40	60.60	30.00	94.00	57.00	45.20	2.90	64.80
4/7/2021	0.00	1.20	78.80	49.20	62.50	19.00	81.00	49.00	43.30	4.20	65.80
4/8/2021	0.00	1.20	78.00	43.10	60.30	24.00	87.00	48.00	40.30	4.50	64.90
4/9/2021	0.01	1.21	79.50	43.50	61.10	21.00	73.00	43.00	38.30	3.80	65.00
4/10/2021	0.00	1.21	78.50	43.50	60.30	32.00	85.00	52.00	42.80	4.30	63.30
4/11/2021	0.02	1.23	80.60	44.30	62.40	26.00	72.00	48.00	42.60	3.40	63.40
4/12/2021	0.00	1.23	82.40	47.00	64.50	24.00	76.00	43.00	41.60	3.30	63.30
4/13/2021	0.00	1.23	74.00	42.40	59.80	26.00	84.00	47.00	39.40	4.30	63.50
4/14/2021	0.00	1.23	72.40	37.60	56.30	25.00	85.00	49.00	37.60	3.10	62.90
4/15/2021	0.00	1.23	76.90	41.80	60.40	20.00	77.00	40.00	36.00	3.00	64.10
4/16/2021	0.01	1.24	79.20	44.90	62.80	24.00	68.00	40.00	38.30	3.40	64.20
4/17/2021	0.00	1.24	82.00	49.20	64.60	19.00	73.00	41.00	40.20	3.80	63.80
4/18/2021	0.00	1.24	87.50	45.60	68.30	12.00	64.00	29.00	34.80	3.40	65.30
4/19/2021	0.00	1.24	88.90	45.40	69.20	14.00	55.00	30.00	36.50	3.10	66.90
4/20/2021	0.00	1.24	82.20	47.70	62.50	20.00	74.00	46.00	41.20	3.90	67.50
4/21/2021	0.00	1.24	77.20	46.60	61.00	34.00	76.00	53.00	43.70	3.00	66.90
4/22/2021	0.02	1.26	77.40	45.30	60.60	35.00	91.00	58.00	45.60	3.90	67.00
4/23/2021	0.03	1.29	76.50	45.60	60.30	35.00	92.00	58.00	45.30	3.80	64.60
4/24/2021	0.00	1.29	74.30	46.80	60.40	19.00	86.00	47.00	40.00	4.70	64.70
4/25/2021	0.04	1.33	64.30	51.50	57.60	53.00	88.00	66.00	46.10	3.60	63.70

CIMIS - Firebaugh #7

Date	Precip (In)	Cumul. Precip (In)	High Temp (F)	Low Temp (F)	Mean Temp (F)	Low RH (%)	High RH (%)	Mean RH (%)	Mean Dew Point (F)	Avg Wind Speed (Mph)	Avg Soil Temp (F)
4/26/2021	0.00	1.33	68.10	43.60	56.30	29.00	88.00	54.00	40.10	3.80	63.70
4/27/2021	0.00	1.33	75.80	38.30	59.60	23.00	81.00	43.00	37.40	4.10	63.10
4/28/2021	0.00	1.33	83.40	45.00	64.80	18.00	70.00	36.00	37.10	3.50	64.30
4/29/2021	0.00	1.33	90.60	49.70	71.60	18.00	62.00	33.00	41.10	2.70	67.10
4/30/2021	0.00	1.33	91.20	54.70	73.60	22.00	65.00	36.00	45.30	3.70	69.50
5/1/2021	0.00	1.33	85.40	54.40	67.80	28.00	65.00	43.00	44.70	4.90	69.40
5/2/2021	0.00	1.33	83.00	50.40	67.90	17.00	80.00	39.00	42.00	5.80	67.60
5/3/2021	0.00	1.33	86.70	52.60	72.10	12.00	55.00	28.00	37.50	5.00	67.80
5/4/2021	0.00	1.33	91.00	48.50	72.60	21.00	74.00	39.00	46.10	3.70	67.30
5/5/2021	0.04	1.37	95.30	52.90	76.20	23.00	79.00	37.00	47.80	2.90	69.40
5/6/2021	0.00	1.37	88.30	56.90	71.80	20.00	66.00	38.00	44.70	4.90	69.30
5/7/2021	0.00	1.37	79.80	51.20	66.30	30.00	69.00	45.00	44.50	4.40	68.10
5/8/2021	0.00	1.37	84.80	51.90	69.50	14.00	65.00	28.00	35.20	5.20	68.30
5/9/2021	0.00	1.37	86.40	59.40	72.90	19.00	43.00	30.00	39.50	5.00	69.20
5/10/2021	0.00	1.37	89.80	53.20	73.50	17.00	59.00	31.00	40.70	4.40	70.40
5/11/2021	0.00	1.37	93.90	53.10	75.30	12.00	59.00	27.00	39.50	2.80	71.70
5/12/2021	0.00	1.37	94.90	54.10	76.20	16.00	60.00	31.00	43.40	3.10	69.70
5/13/2021	0.02	1.39	92.80	57.40	74.20	11.00	66.00	34.00	44.20	4.00	70.60
5/14/2021	0.00	1.39	88.20	54.70	70.60	23.00	73.00	42.00	46.20	4.00	70.80
5/15/2021	0.00	1.39	72.50	50.40	62.60	43.00	78.00	56.00	46.60	4.30	70.10
5/16/2021	0.00	1.39	80.20	49.70	65.10	39.00	85.00	56.00	49.10	3.20	70.30
5/17/2021	0.00	1.39	81.40	52.00	66.10	33.00	80.00	52.00	47.90	4.50	70.70
5/18/2021	0.00	1.39	86.70	51.30	69.30	25.00	75.00	38.00	42.90	4.40	70.00
5/19/2021	0.00	1.39	79.50	52.10	65.40	22.00	42.00	31.00	33.70	5.10	69.50
5/20/2021	0.00	1.39	71.90	45.40	60.20	16.00	55.00	31.00	29.50	5.30	67.60
5/21/2021	0.00	1.39	72.80	51.30	62.40	23.00	51.00	34.00	33.80	5.20	67.20
5/22/2021	0.00	1.39	77.00	43.70	61.80	26.00	75.00	42.00	38.70	3.40	67.10
5/23/2021	0.00	1.39	79.20	45.80	64.50	27.00	72.00	46.00	43.10	3.50	67.60
5/24/2021	0.00	1.39	88.20	49.20	71.20	23.00	70.00	38.00	44.60	3.00	69.70
5/25/2021	0.00	1.39	86.40	55.90	71.50	18.00	68.00	38.00	44.90	4.10	69.10
5/26/2021	0.00	1.39	88.30	49.20	71.00	19.00	67.00	36.00	43.10	3.60	69.50
5/27/2021	0.00	1.39	88.50	51.40	71.00	15.00	70.00	35.00	42.30	3.90	70.10
5/28/2021	0.02	1.41	88.90	55.90	72.40	26.00	79.00	46.00	50.60	3.40	71.70
5/29/2021	0.00	1.41	86.40	55.00	70.10	28.00	76.00	48.00	49.30	4.90	71.80
5/30/2021	0.00	1.41	92.20	55.30	73.60	30.00	77.00	49.00	53.20	3.50	72.20
5/31/2021	0.00	1.41	101.30	62.80	83.30	19.00	61.00	33.00	51.60	2.90	74.60
6/1/2021	0.00	1.41	101.90	64.50	83.30	19.00	59.00	35.00	52.40	3.20	76.10
6/2/2021	0.00	1.41	100.40	64.40	82.00	17.00	55.00	34.00	50.90	3.70	76.60
6/3/2021	0.00	1.41	97.60	62.30	79.90	25.00	68.00	42.00	54.50	3.30	76.80
6/4/2021	0.00	1.41	96.70	61.50	80.80	23.00	54.00	34.00	50.10	3.70	77.20
6/5/2021	0.00	1.41	93.90	59.00	77.00	21.00	57.00	35.00	47.50	3.30	76.80
6/6/2021	0.00	1.41	89.20	56.90	73.90	22.00	70.00	39.00	47.50	3.80	75.30

CIMIS - Firebaugh #7

Date	Precip (In)	Cumul. Precip (In)	High Temp (F)	Low Temp (F)	Mean Temp (F)	Low RH (%)	High RH (%)	Mean RH (%)	Mean Dew Point (F)	Avg Wind Speed (Mph)	Avg Soil Temp (F)
6/7/2021	0.00	1.41	83.90	53.40	68.20	20.00	67.00	38.00	41.80	4.50	73.60
6/8/2021	0.00	1.41	77.50	49.20	63.90	28.00	71.00	43.00	40.90	4.60	72.10
6/9/2021	0.00	1.41	76.50	48.80	62.40	27.00	74.00	43.00	39.80	4.70	71.60
6/10/2021	0.00	1.41	78.70	43.90	63.40	16.00	80.00	39.00	37.70	4.10	70.30
6/11/2021	0.00	1.41	83.20	48.80	67.40	18.00	63.00	35.00	38.60	4.10	70.80
6/12/2021	0.00	1.41	90.30	56.20	73.90	34.00	69.00	51.00	54.80	3.60	72.70
6/13/2021	0.00	1.41	92.50	62.70	76.80	33.00	77.00	50.00	57.00	4.50	74.10
6/14/2021	0.00	1.41	88.70	60.20	74.60	37.00	85.00	54.00	56.90	4.70	75.10
6/15/2021	0.00	1.41	89.90	66.30	80.50	11.00	63.00	20.00	36.10	5.00	75.50
6/16/2021	0.00	1.41	93.20	57.70	77.30	20.00	50.00	30.00	43.70	3.50	73.70
6/17/2021	0.00	1.41	102.00	62.30	83.00	15.00	42.00	29.00	47.70	3.10	75.60
6/18/2021	0.00	1.41	106.10	67.20	88.00	17.00	45.00	27.00	50.00	3.00	78.20
6/19/2021	0.00	1.41	105.10	70.90	87.20	19.00	43.00	27.00	48.80	3.50	79.90
6/20/2021	0.00	1.41	103.40	65.50	83.90	17.00	48.00	29.00	48.00	3.40	78.40
6/21/2021	0.00	1.41	97.20	61.40	77.40	24.00	68.00	42.00	52.60	4.10	77.90
6/22/2021	0.00	1.41	91.20	56.10	72.60	35.00	89.00	56.00	55.80	3.80	77.40
6/23/2021	0.00	1.41	89.80	58.20	72.60	33.00	84.00	54.00	55.20	4.00	78.00
6/24/2021	0.00	1.41	88.50	58.00	72.50	35.00	79.00	54.00	55.00	4.10	76.80
6/25/2021	0.00	1.41	92.50	58.60	75.50	31.00	79.00	49.00	55.20	3.40	76.40
6/26/2021	0.00	1.41	96.90	63.60	80.60	31.00	70.00	47.00	58.30	3.20	77.80
6/27/2021	0.00	1.41	100.50	68.50	83.80	30.00	65.00	43.00	59.00	3.60	80.10
6/28/2021	0.00	1.41	95.70	64.60	80.60	25.00	70.00	44.00	56.90	4.10	80.80
6/29/2021	0.00	1.41	99.60	64.20	82.90	24.00	66.00	42.00	57.20	3.00	81.70
6/30/2021	0.00	1.41	96.80	69.00	81.60	30.00	67.00	46.00	58.70	3.90	83.40
7/1/2021	0.00	1.41	95.50	63.80	78.80	26.00	74.00	48.00	57.20	3.60	81.50
7/2/2021	0.00	1.41	96.20	63.70	79.50	30.00	76.00	48.00	58.10	3.80	80.30
7/3/2021	0.00	1.41	96.60	64.90	78.60	30.00	72.00	48.00	57.20	3.90	80.30
7/4/2021	0.00	1.41	95.20	62.90	78.00	27.00	67.00	44.00	54.30	3.90	80.10
7/5/2021	0.00	1.41	95.20	61.60	77.30	26.00	72.00	45.00	54.30	4.00	79.90
7/6/2021	0.00	1.41	93.20	60.50	76.90	32.00	76.00	47.00	55.20	4.10	79.60
7/7/2021	0.00	1.41	95.00	58.00	77.20	22.00	66.00	41.00	51.30	3.60	78.80
7/8/2021	0.00	1.41	101.20	63.50	82.60	20.00	61.00	36.00	53.30	3.00	79.80
7/9/2021	0.00	1.41	105.90	71.80	89.50	19.00	47.00	30.00	54.30	2.80	82.10
7/10/2021	0.00	1.41	107.10	65.10	90.60	19.00	57.00	29.00	53.90	3.20	82.80
7/11/2021	0.00	1.41	107.50	69.00	89.60	17.00	49.00	28.00	52.10	3.70	82.40
7/12/2021	0.00	1.41	100.20	70.90	88.60	26.00	59.00	35.00	57.20	4.20	81.70
7/13/2021	0.00	1.41	96.00	60.80	75.50	26.00	72.00	48.00	54.70	3.80	79.20
7/14/2021	0.00	1.41	93.90	55.90	74.00	33.00	89.00	53.00	55.60	3.50	74.30
7/15/2021	0.00	1.41	93.80	58.50	75.60	26.00	77.00	46.00	53.20	3.70	75.90
7/16/2021	0.00	1.41	92.90	56.50	74.30	26.00	83.00	45.00	51.80	3.20	76.40
7/17/2021	0.00	1.41	97.20	58.50	79.50	22.00	79.00	40.00	53.30	2.80	77.20
7/18/2021	0.00	1.41	98.90	62.50	82.50	25.00	73.00	38.00	54.10	2.60	78.10

CIMIS - Firebaugh #7

Date	Precip (In)	Cumul. Precip (In)	High Temp (F)	Low Temp (F)	Mean Temp (F)	Low RH (%)	High RH (%)	Mean RH (%)	Mean Dew Point (F)	Avg Wind Speed (Mph)	Avg Soil Temp (F)
7/19/2021	0.00	1.41	99.70	66.00	83.70	19.00	66.00	34.00	52.20	2.90	78.90
7/20/2021	0.00	1.41	99.40	66.10	82.10	14.00	56.00	31.00	48.80	3.70	79.40
7/21/2021	0.00	1.41	98.10	62.00	80.00	16.00	58.00	34.00	48.80	3.10	79.30
7/22/2021	0.00	1.41	97.70	60.70	79.70	17.00	65.00	36.00	50.40	3.30	78.80
7/23/2021	0.00	1.41	98.10	60.60	79.80	16.00	77.00	33.00	48.30	2.90	78.20
7/24/2021	0.00	1.41	98.90	60.10	81.60	21.00	58.00	34.00	50.10	3.20	78.00
7/25/2021	0.00	1.41	97.50	64.70	82.00	24.00	57.00	36.00	52.20	3.40	78.10
7/26/2021	0.00	1.41	94.70	66.30	79.90	22.00	46.00	32.00	47.10	3.00	77.40
7/27/2021	0.00	1.41	97.20	66.10	82.20	25.00	62.00	38.00	53.80	3.60	77.70
7/28/2021	0.00	1.41	99.60	63.50	83.20	26.00	78.00	42.00	57.40	3.20	78.70
7/29/2021	0.00	1.41	101.80	66.70	84.80	26.00	67.00	42.00	59.10	3.00	79.90
7/30/2021	0.00	1.41	103.00	72.40	86.30	25.00	55.00	40.00	59.10	3.40	80.40
7/31/2021	0.00	1.41	99.90	65.70	82.90	26.00	62.00	39.00	55.40	3.40	80.40
8/1/2021	0.00	1.41	98.90	63.00	80.10	25.00	68.00	40.00	53.40	3.50	79.30
8/2/2021	0.00	1.41	93.90	59.00	76.20	24.00	81.00	45.00	53.50	3.40	78.70
8/3/2021	0.00	1.41	99.10	64.30	80.20	22.00	68.00	39.00	52.90	3.10	79.20
8/4/2021	0.00	1.41	99.10	61.40	81.00	22.00	62.00	36.00	51.20	3.90	78.80
8/5/2021	0.00	1.41	92.30	58.40	75.50	31.00	77.00	49.00	54.70	3.80	77.40
8/6/2021	0.00	1.41	92.50	57.80	76.00	27.00	76.00	48.00	54.80	3.10	76.70
8/7/2021	0.00	1.41	96.40	61.10	79.40	25.00	63.00	40.00	53.00	2.60	76.80
8/8/2021	0.00	1.41	97.80	60.50	78.70	24.00	84.00	46.00	55.90	3.00	77.40
8/9/2021	0.00	1.41	97.30	62.60	79.20	26.00	78.00	43.00	54.70	2.90	77.80
8/10/2021	0.00	1.41	98.80	60.10	81.10	24.00	63.00	38.00	53.20	2.90	77.90
8/11/2021	0.00	1.41	101.60	63.90	81.10	24.00	84.00	44.00	57.20	3.30	78.50
8/12/2021	0.00	1.41	98.00	63.90	82.20	28.00	78.00	44.00	57.80	3.20	77.70
8/13/2021	0.00	1.41	96.70	67.40	81.90	29.00	54.00	41.00	55.70	3.20	78.10
8/14/2021	0.00	1.41	98.90	66.60	82.60	28.00	60.00	42.00	57.10	2.60	78.40
8/15/2021	0.00	1.41	97.70	66.30	83.30	35.00	68.00	47.00	61.00	2.60	79.30
8/16/2021	0.00	1.41	97.50	70.90	83.50	26.00	67.00	46.00	60.30	2.60	79.60
8/17/2021	0.00	1.41	95.20	60.40	79.30	23.00	71.00	40.00	53.00	3.40	78.70
8/18/2021	0.00	1.41	82.80	54.20	69.80	32.00	83.00	51.00	51.00	3.40	75.80
8/19/2021	0.00	1.41	84.50	59.60	70.50	37.00	79.00	58.00	55.10	2.30	74.40
8/20/2021	0.00	1.41	87.90	57.60	72.40	37.00	78.00	55.00	55.20	2.70	74.60
8/21/2021	0.00	1.41	83.00	57.90	68.90	46.00	91.00	65.00	56.70	4.40	74.50
8/22/2021	0.00	1.41	87.00	55.60	70.10	24.00	92.00	53.00	52.30	3.10	73.80
8/23/2021	0.00	1.41	89.80	59.40	73.30	32.00	72.00	49.00	53.20	3.30	74.10
8/24/2021	0.00	1.41	89.30	59.50	73.30	37.00	78.00	55.00	56.20	3.70	74.40
8/25/2021	0.00	1.41	90.10	59.10	73.50	34.00	81.00	55.00	56.20	3.10	74.70
8/26/2021	0.00	1.41	92.70	69.70	83.10	24.00	83.00	30.00	48.80	3.30	75.70
8/27/2021	0.00	1.41	96.50	58.60	78.00	25.00	60.00	39.00	51.10	2.60	74.60
8/28/2021	0.00	1.41	99.70	60.10	80.70	21.00	60.00	37.00	51.80	2.40	75.30
8/29/2021	0.00	1.41	99.60	62.60	81.80	23.00	57.00	37.00	52.80	2.80	75.90

CIMIS - Firebaugh #7

Date	Precip (In)	Cumul. Precip (In)	High Temp (F)	Low Temp (F)	Mean Temp (F)	Low RH (%)	High RH (%)	Mean RH (%)	Mean Dew Point (F)	Avg Wind Speed (Mph)	Avg Soil Temp (F)
8/30/2021	0.00	1.41	103.20	64.40	84.10	18.00	56.00	33.00	51.70	3.20	76.30
8/31/2021	0.00	1.41	97.10	55.90	76.30	16.00	70.00	38.00	49.00	3.40	75.60
9/1/2021	0.00	1.41	88.50	51.60	68.50	20.00	81.00	48.00	47.80	3.50	73.30
9/2/2021	0.00	1.41	85.00	50.70	66.80	30.00	95.00	56.00	50.60	3.10	71.70
9/3/2021	0.00	1.41	89.70	54.80	71.40	27.00	83.00	50.00	51.60	2.70	72.30
9/4/2021	0.00	1.41	93.70	55.80	76.60	21.00	77.00	39.00	50.20	2.70	73.20
9/5/2021	0.00	1.41	96.50	59.60	78.30	20.00	63.00	35.00	48.00	2.70	73.70
9/6/2021	0.00	1.41	99.30	59.10	80.50	19.00	50.00	30.00	46.50	2.70	74.10
9/7/2021	0.00	1.41	100.70	58.80	82.30	20.00	65.00	30.00	48.00	3.10	74.90
9/8/2021	0.00	1.41	101.40	64.90	82.90	20.00	48.00	35.00	52.70	3.20	75.10
9/9/2021	0.00	1.41	101.60	66.00	84.40	24.00	63.00	36.00	54.50	2.60	76.00
9/10/2021	0.00	1.41	93.70	68.10	79.80	27.00	57.00	41.00	54.00	3.70	76.20
9/11/2021	0.00	1.41	93.30	59.70	76.70	27.00	77.00	43.00	52.20	2.80	75.20
9/12/2021	0.00	1.41	95.80	58.30	77.70	23.00	68.00	39.00	50.60	2.80	74.80
9/13/2021	0.00	1.41	96.50	58.80	78.10	22.00	68.00	36.00	49.10	2.20	74.80
9/14/2021	0.00	1.41	97.20	60.20	78.60	20.00	58.00	35.00	48.50	2.50	74.90
9/15/2021	0.00	1.41	93.70	61.80	76.50	27.00	56.00	40.00	50.50	3.20	74.50
9/16/2021	0.00	1.41	88.60	56.40	69.50	27.00	82.00	53.00	51.60	3.60	73.60
9/17/2021	0.00	1.41	88.00	55.50	69.70	33.00	83.00	56.00	53.10	3.20	73.00
9/18/2021	0.00	1.41	83.00	52.60	67.40	34.00	93.00	59.00	52.70	4.10	71.90
9/19/2021	0.00	1.41	81.00	58.10	69.00	31.00	91.00	55.00	52.10	4.00	71.20
9/20/2021	0.00	1.41	85.60	54.40	70.30	27.00	75.00	43.00	46.90	2.90	70.60
9/21/2021	0.00	1.41	93.30	53.20	74.60	25.00	63.00	42.00	50.10	2.70	71.10
9/22/2021	0.00	1.41	96.80	60.40	78.40	23.00	63.00	39.00	51.50	2.90	72.40
9/23/2021	0.00	1.41	93.30	63.00	76.40	25.00	56.00	40.00	50.70	3.40	72.60
9/24/2021	0.00	1.41	95.30	58.60	76.40	23.00	59.00	40.00	50.10	2.00	72.60
9/25/2021	0.00	1.41	92.20	62.90	75.70	28.00	62.00	44.00	52.50	2.70	72.90
9/26/2021	0.00	1.41	83.30	57.10	68.70	34.00	86.00	57.00	52.90	3.10	71.70
9/27/2021	0.00	1.41	83.80	54.10	67.80	31.00	94.00	61.00	53.70	4.20	70.60
9/28/2021	0.00	1.41	76.80	54.20	65.80	22.00	78.00	43.00	42.80	5.40	69.40
9/29/2021	0.00	1.41	80.40	47.50	65.30	21.00	64.00	38.00	39.30	3.30	67.80
9/30/2021	0.00	1.41	85.60	48.90	67.50	22.00	60.00	38.00	40.90	2.30	68.10
10/1/2021	0.00	1.41	90.40	50.70	70.40	18.00	62.00	36.00	42.10	2.20	68.80
10/2/2021	0.09	1.50	90.90	51.20	71.60	20.00	68.00	38.00	44.40	2.70	69.10
10/3/2021	0.07	1.57	88.40	51.50	70.30	23.00	76.00	40.00	44.90	2.50	68.90
10/4/2021	0.06	1.63	89.90	53.10	69.90	21.00	60.00	40.00	44.20	2.30	68.50
10/5/2021	0.00	1.63	89.00	63.20	77.00	19.00	66.00	31.00	43.60	3.40	69.60
10/6/2021	0.05	1.68	79.30	55.30	67.00	30.00	82.00	54.00	50.00	3.20	68.00
10/7/2021	0.04	1.72	79.40	52.10	63.50	27.00	72.00	47.00	43.20	3.50	67.00
10/8/2021	0.00	1.72	71.10	51.50	59.90	28.00	73.00	52.00	42.10	3.00	66.20
10/9/2021	0.06	1.78	71.90	41.50	57.20	35.00	84.00	56.00	41.60	2.90	64.50
10/10/2021	0.04	1.82	78.50	44.70	61.20	28.00	70.00	45.00	39.80	2.70	64.00

CIMIS - Firebaugh #7

Date	Precip (In)	Cumul. Precip (In)	High Temp (F)	Low Temp (F)	Mean Temp (F)	Low RH (%)	High RH (%)	Mean RH (%)	Mean Dew Point (F)	Avg Wind Speed (Mph)	Avg Soil Temp (F)
10/11/2021	0.04	1.86	67.70	50.50	60.10	21.00	73.00	33.00	31.10	9.00	62.30
10/12/2021	0.00	1.86	67.90	42.00	56.80	20.00	41.00	30.00	25.40	6.70	59.60
10/13/2021	0.00	1.86	74.30	38.20	56.70	16.00	62.00	34.00	28.60	2.90	59.40
10/14/2021	0.00	1.86	74.30	46.40	59.40	26.00	79.00	45.00	38.30	3.50	60.60
10/15/2021	0.00	1.86	82.20	42.10	61.60	18.00	64.00	38.00	35.80	2.60	61.20
10/16/2021	0.07	1.93	84.30	47.50	64.20	21.00	60.00	39.00	38.90	2.70	62.00
10/17/2021	0.06	1.99	83.20	44.80	62.40	14.00	64.00	38.00	36.70	4.70	61.70
10/18/2021	0.07	2.06	66.80	41.10	54.30	41.00	86.00	58.00	40.10	3.20	60.70
10/19/2021	0.00	2.06	70.50	38.60	55.50	31.00	80.00	50.00	37.30	3.30	59.20
10/20/2021	0.00	2.06	77.80	52.00	64.10	23.00	60.00	43.00	41.10	3.30	60.30
10/21/2021	0.00	2.06	82.20	57.80	67.80	27.00	86.00	52.00	49.50	2.30	62.80
10/22/2021	0.01	2.07	63.70	50.80	58.90	80.00	95.00	85.00	54.40	2.90	62.30
10/23/2021	0.00	2.07	70.50	51.90	60.90	38.00	86.00	59.00	46.40	2.30	62.30
10/24/2021	0.00	2.07	74.10	58.40	66.30	49.00	66.00	55.00	49.70	11.20	62.40
10/25/2021	0.73	2.80	66.70	49.90	58.40	52.00	100.00	82.00	53.00	3.60	62.50
10/26/2021	0.00	2.80	66.90	45.00	55.50	43.00	95.00	72.00	46.60	2.50	60.10
10/27/2021	0.00	2.80	70.40	46.50	59.00	59.00	97.00	79.00	52.50	2.30	59.90
10/28/2021	0.00	2.80	74.80	50.80	62.30	58.00	99.00	82.00	56.90	2.20	60.80
10/29/2021	0.00	2.80	75.70	50.40	62.60	62.00	99.00	84.00	57.60	1.90	61.30
10/30/2021	0.00	2.80	74.50	52.90	62.90	54.00	100.00	78.00	56.10	3.10	61.70
10/31/2021	0.00	2.80	69.60	52.80	59.80	56.00	89.00	73.00	51.10	2.40	61.70
11/1/2021	0.00	2.80	70.20	53.20	61.20	56.00	93.00	78.00	54.20	2.40	61.40

APPENDIX B: PHOTO SET



Photo 1: 02/19/21 (0 DA-B).
Application B: Pink Bud Pre-Bloom- Drip.



Photo 2: 03/05/21 (14 DA-B).
Application D: Petal Fall- Drip.



Photo 3: 03/22/21 (5 DA-E).
Application F: Two Weeks After Petal Fall- Drip.



Photo 5: 04/10/21 (19 DA-F).
Application H: Five Weeks After Petal Fall- Drip.