RESEARCH AND DEVELOPMENT

PROJECT REPORT

Efficacy of Armour-Zen for Control of *Leveillula taurica* (Powdery Mildew)

in Tomato

**Trial ID:**

ENA1313

Huasna Valley Farm, Arroyo Grande, CA

**Prepared for:**

Duane Ewing / Ewing & Associates

**Prepared by:**



Summer-Fall 2013

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ABSTRACT

Objective: Evaluate efficacy of Armour-Zen against powdery mildew on tomato in the Central Coast of California.

Product(s) Tested: Armour-Zen

Crop: Tomato

Location: Arroyo Grande, CA – Huasna Valley Farm, Pacific Ag Research

Duration of Project: May – September 2013

Findings:

* No crop injury and good vigor was recorded
* No significant difference in pest severity and AUDPC
* No significant difference in AUDPC, numerically highest in the UTC though
* No significant difference in yields or gross returns

Narrative:

This study was conducted to evaluate the efficacy of Armour-Zen against *Leveillula taurica* (Powdery Mildew) in Tomato. Treatments included a standard grower application of Serenade ASO plus Regalia and an untreated check. Applications were made weekly for five weeks. Vigor was normal and no phytotoxic effects were recorded.

Heavy powdery mildew pressure was reported by 1 DA-D in the untreated check plots. In small plot research it is difficult to compare later assessments to commercial data, so disease severity ratings and percent control calculations are truncated accordingly.

Pest severity was lower in the treated plots after application D, but was not statistically different at any other time. SAUDPC, calculated from 3 DA-A to 7 DA-D was slightly higher in the untreated check. Percent powdery mildew control was significantly better in the treated plots with a slight numerical advantage in the Serenade ASO-treated plots.

Overall yields were not significantly different between plots and gross returns did not prove one product was superior over another.

MATERIALS AND METHODS

*Treatments:*

This study consisted of five treatments applied on August 2 (A), August 9 (B), August 16 (C), August 23 (D) and August 30 (E), 2013.

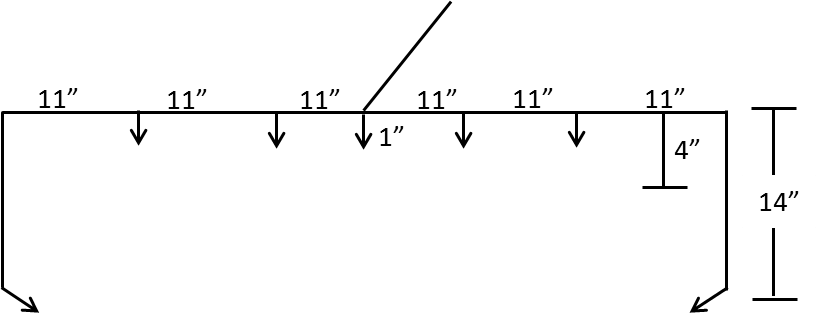
1. Untreated Check
2. ARMOUR-Zen 1 qt/100 gal (A-E) + Nu Film P 0.25% v/v
3. ARMOUR-Zen 2 qt/100 gal (A-E) + Nu Film P 0.25% v/v
4. ARMOUR-Zen 4 qt/100 gal (A-E) + Nu Film P 0.25% v/v
5. Serenade ASO 4 qt/a (ACE) + Regalia 1 qt/a (BD) + Nu Film P 0.25% v/v (A-E)

*Experimental Unit:*

Quali T 21 fresh market tomato seedlings were mechanically transplanted on May 22nd in clay loam soil at the Pacific Ag Research farm in Arroyo Grande, CA. Plots were 3.33 ft wide (one rows) and 21 feet long for a total trial area of 2240 ft2 in a field where plants were spaced 18 in apart for a crop density of 4356 plants/acre. Each treatment was replicated four times in a randomized block design.

*Application Equipment:*

Seventy-five gallons per acre of treatment applications were sprayed using a CO2 backpack sprayer with boom incorporating seven full cone TG 1 nozzles, operating at a pressure of 50 PSI. The hand-held boom used was 66”-wide and the spray was applied from 7-8” away from foliage.

**

*Evaluations:*

Ratings for crop vigor (0-10 scale, relative to the grower standard treatment) and phytotoxicity (percent damage) were taken six times at approximately weekly intervals. Powdery mildew severity was rated on a percentage scale, with the proportion of the plant infested recorded.

Harvests were carried out August 6, August 12, August 20, August 26 and September 9th. Weights and counts of marketable and unmarketable fruit were recorded.

Statistics were analyzed using ANOVA mean comparison with LSD test and α=0.05. All calculations were carried out in ARM9 software (Gylling Data Management).

RESULTS

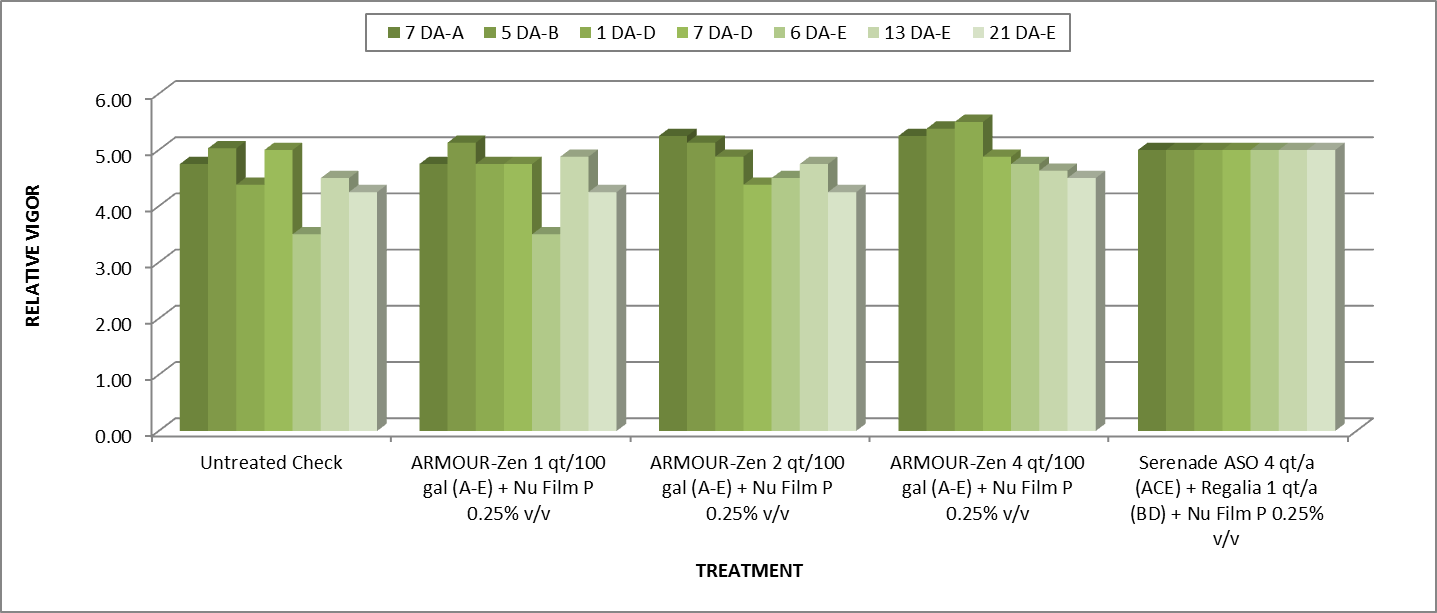
**Table 1**. **Phytotoxicity**. Crop injury rating (0-100%).



RESULTS

**Table 2**. **Relative Vigor**. Vigor rating (0-10 scale) where Serenade + Regalia treatment is standardized to 5. Other treatments are rated as relative (better or worse) than the organic grower standard.



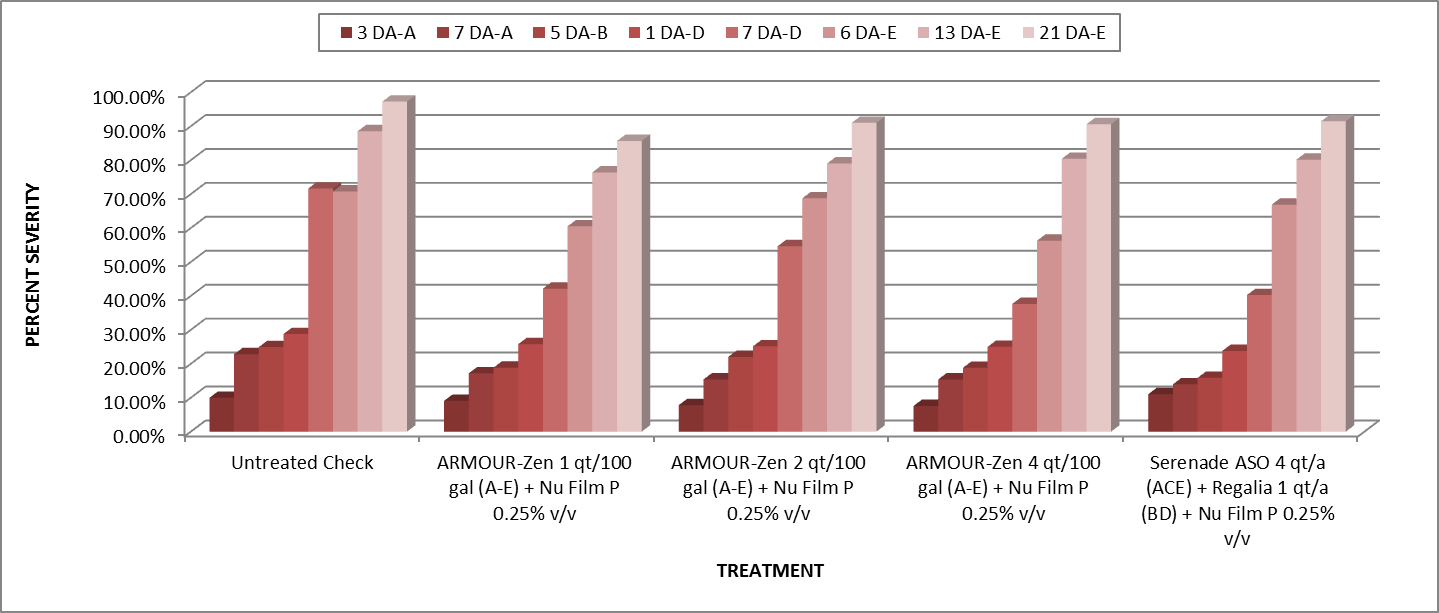


**Graph 2**. **Relative Vigor**. Vigor rating (0-10 scale) where Serenade + Regalia treatment is standardized to 5. Other treatments are rated as relative (better or worse) than the organic grower standard.

RESULTS

**Table 3**. **Pest Severity**. Observed incidence of powdery mildew disease symptoms on tomato (0-100%).





**Graph 3**. **Pest Severity**. Observed incidence of powdery mildew disease symptoms on tomato (0-100%).

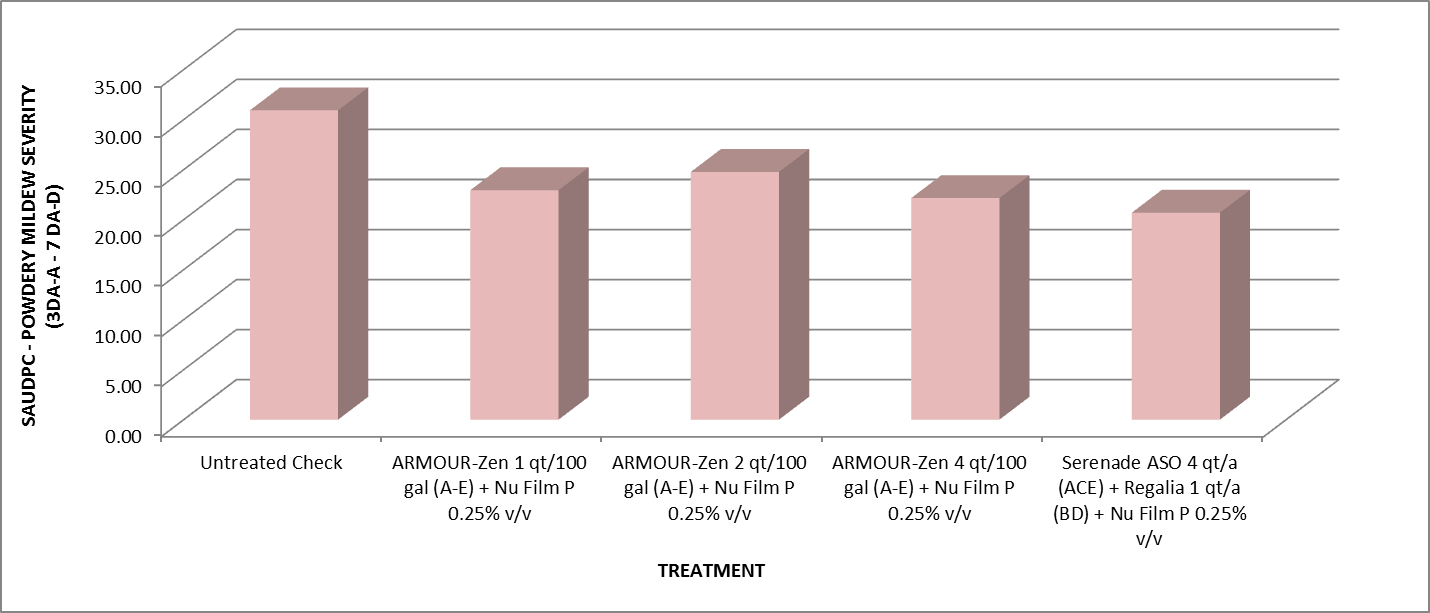
RESULTS

**Table 4.** **Powdery Mildew SAUDPC.** Standardized Area Under the Disease Progress Curve for powdery mildew severity from 3DA-A – 7DA-D.



AUDPC calculates the average disease severity between each pair of adjacent time points. It is calculated by determining the average distance in rise of disease intensity for each evaluation date and adding them together by treatment.

Where y = severity, t=time, N=average disease severity between two adjacent time points



**Chart 4.** **Powdery Mildew SAUDPC.** Standardized Area Under the Disease Progress Curve for powdery mildew severity from 3DA-A – 7DA-D.

RESULTS

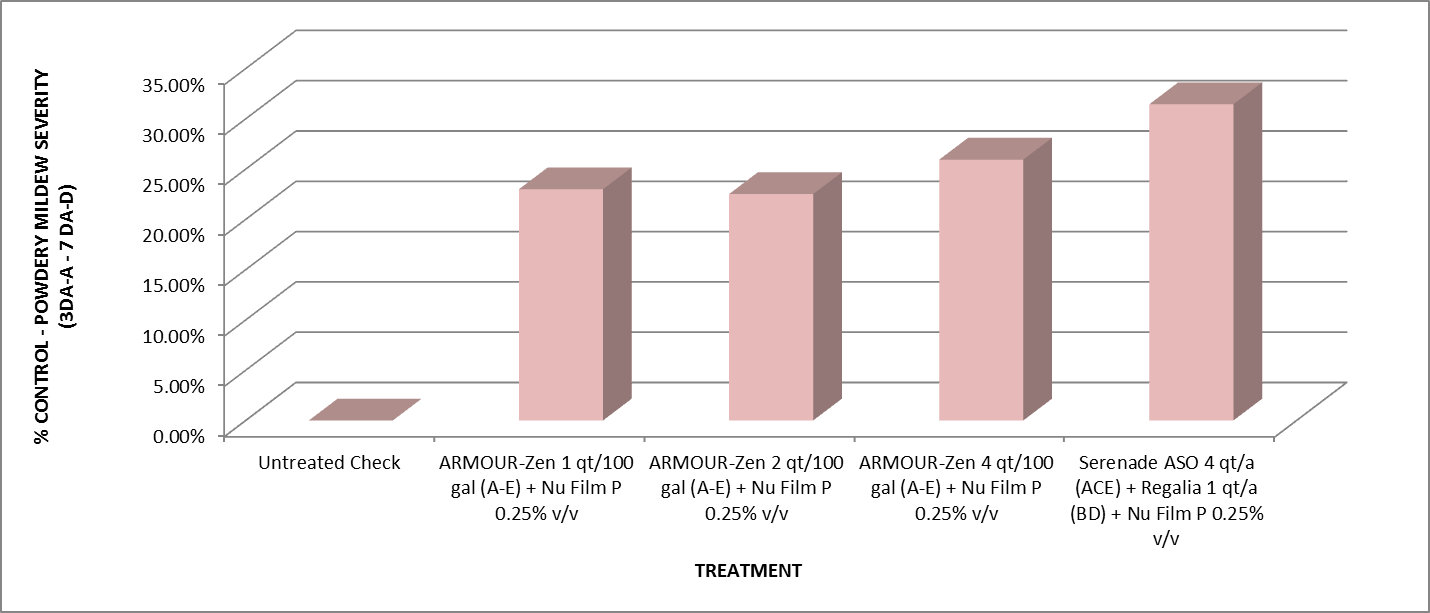
**Table 5.**  **Powdery Mildew % Control**. Percent control of powdery mildew severity on tomato, rated from SAUDPC from 3DA-A – 7DA-D.



Note: This percent control expresses the severity of Fungal Disease infection in treated plots, compared to plants in the untreated check. It was calculated using the Abbott formula.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Corrected % = (1 - | |  | | --- | | n in T after treatment | | http://www.ehabsoft.com/ldpline/line.gif | | n in Co after treatment | | ) \* 100 |

Where: n = disease pressure, T = treated, Co = control

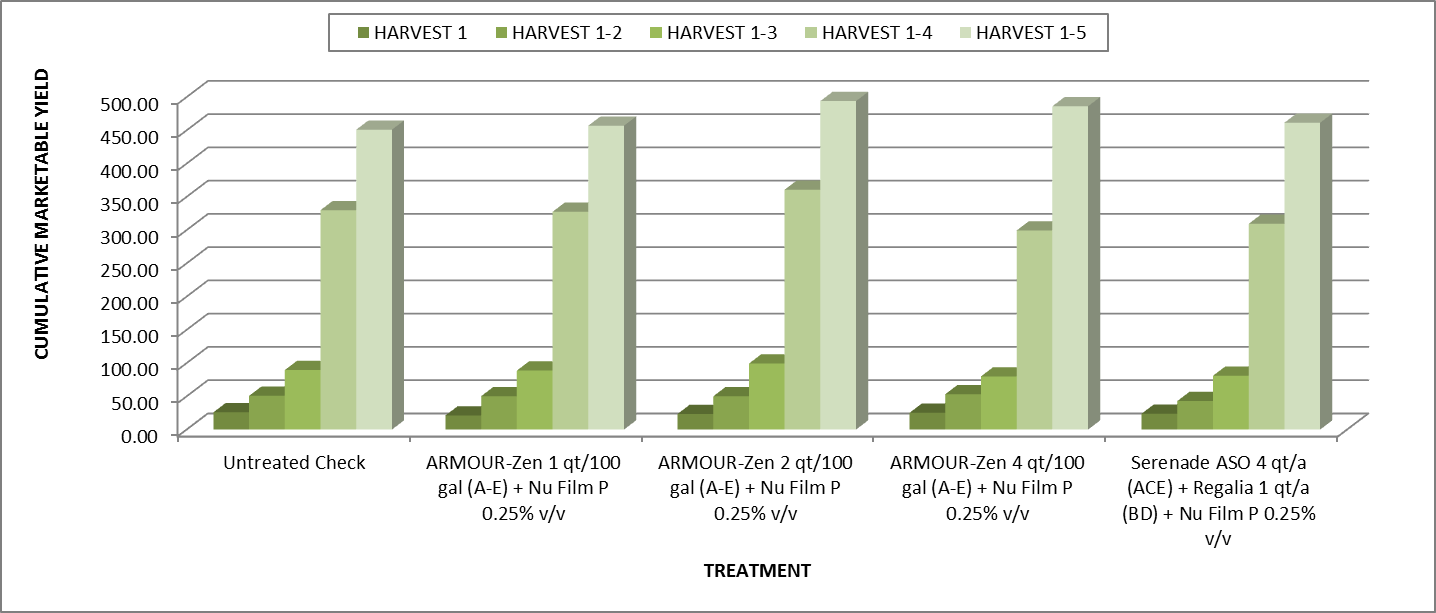


**Graph 5.**  **Powdery Mildew % Control**. Percent control of powdery mildew severity on tomato, rated from SAUDPC from 3DA-A – 7DA-D.

RESULTS

**Table 6.**  **Cumulative Marketable Yield**. Yield count of marketable tomatoes from five harvests.



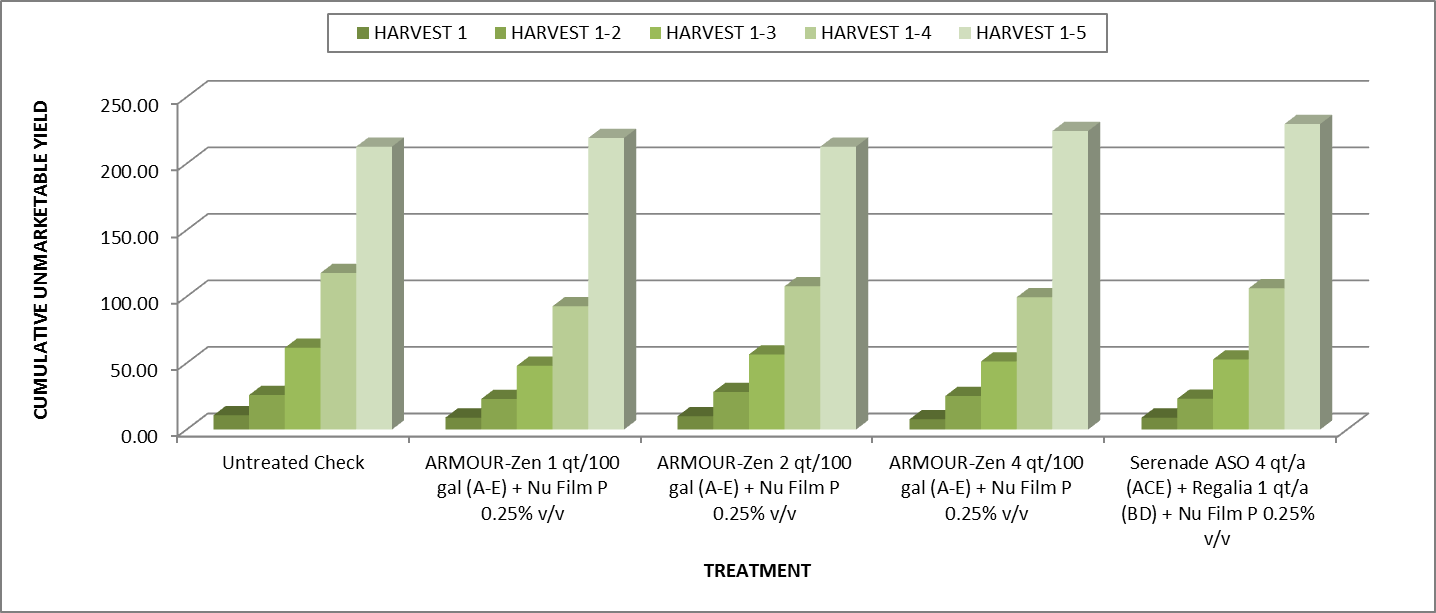


**Graph 6.**  **Cumulative Marketable Yield**. Yield count of marketable tomatoes from five harvests.

RESULTS

**Table 7.**  **Cumulative Unmarketable Yield**. Yield count of unmarketable tomatoes (blemished, damaged) from five harvests



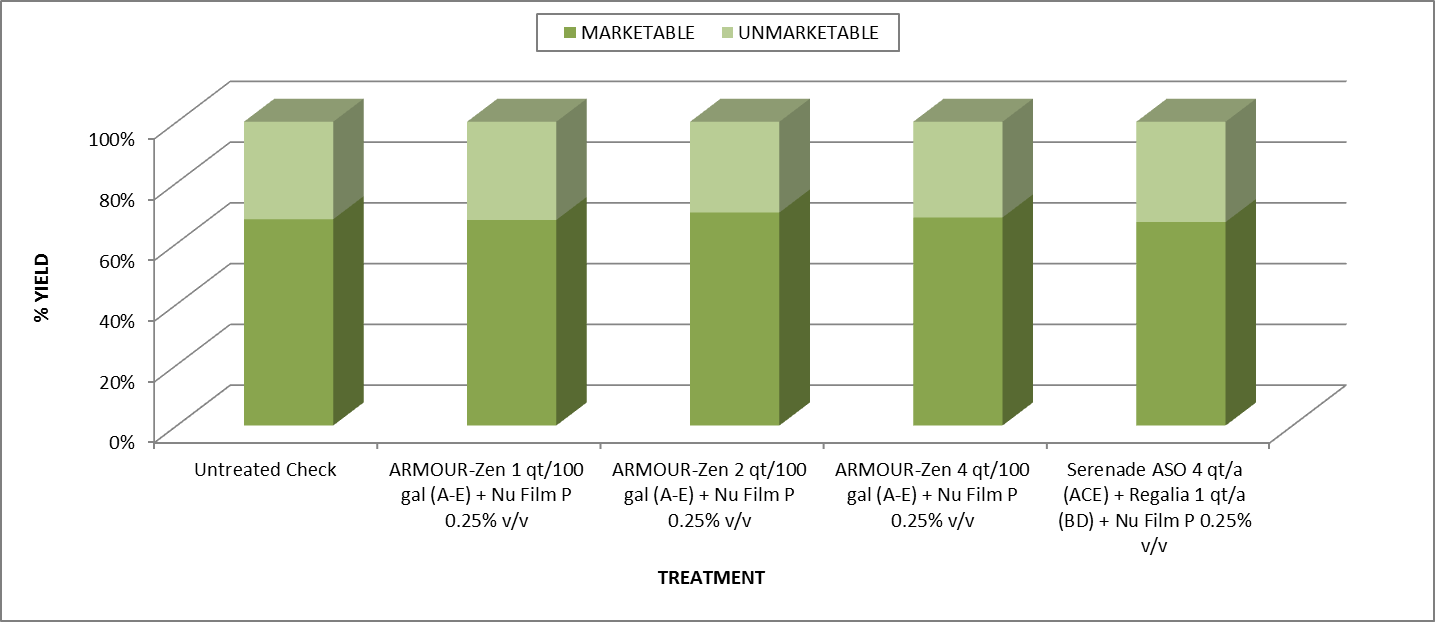


**Graph 7.**  **Cumulative Unmarketable Yield**. Yield count of unmarketable tomatoes (blemished, damaged) from five harvests

RESULTS

**Table 8.**  **Percent Yield**. Percentage of total yield with marketable or unmarketable traits.



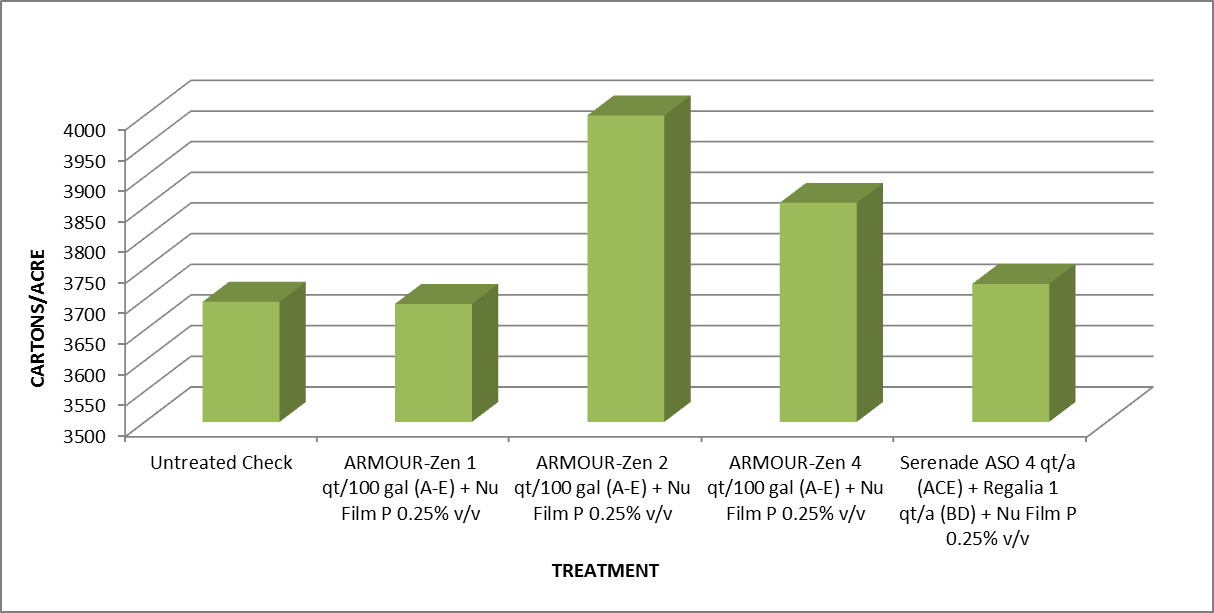


**Graph 8.**  **Percent Yield**. Percentage of total yield with marketable or unmarketable traits.

RESULTS

**Table 9.**  **Cartons/Acre**. Yield of marketable 25-pound cartons/acre.



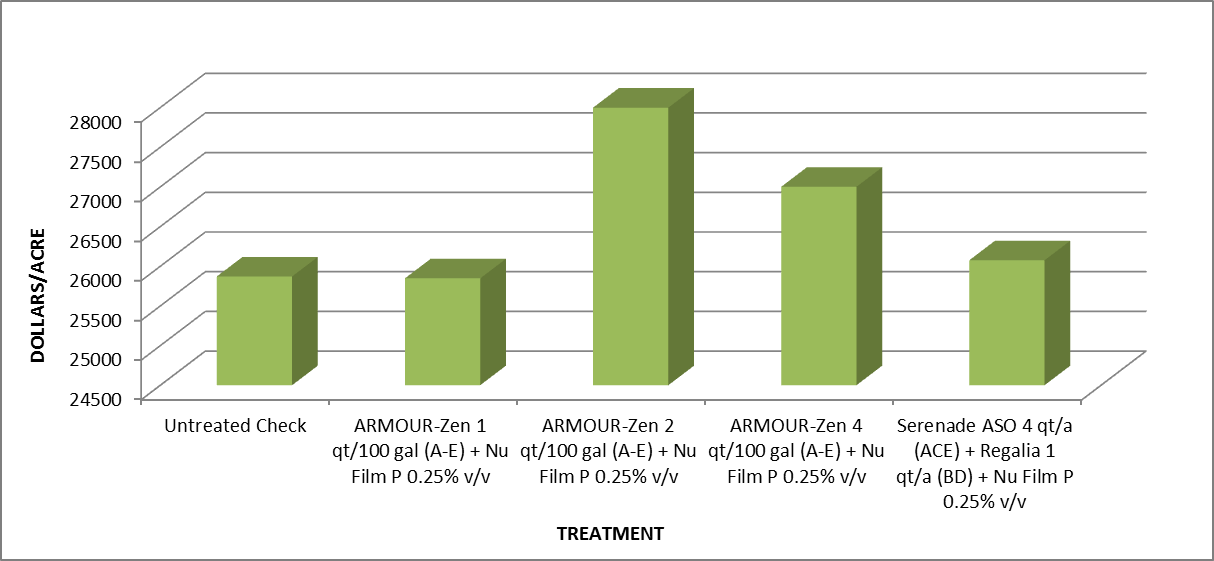


**Graph 9.**  **Cartons/Acre**. Yield of marketable 25-pound cartons/acre.

RESULTS

**Table 10.**  **Gross Returns**. Gross returns – in dollars per acre – from marketable tomatoes packed into 25-pound cartons with an approximate market value of $17.95/carton according to fall commodity prices for the Santa Maria, CA area from thepacker.com.





**Graph 10.**  **Gross Returns**. Gross returns – in dollars per acre – from marketable tomatoes packed into 25-pound cartons with an approximate market value of $17.95/carton according to fall commodity prices for the Santa Maria, CA area from thepacker.com.

CROP INFORMATION SHEET

|  |  |  |  |
| --- | --- | --- | --- |
| Principal Investigator: | Aaron Formella | Location: | Huasna B-3 |
|  |  |  |  |
| Study Director: | Duane Ewing | Grower: | Pacific Ag Research |
|  |  |  |  |
| Crop: | Tomato | Date/Duration: | May 22 - September 24, 2013 |
|  |  |  |  |
| Cultivar: | Q21 | Planting Date: | 5/22/2013 |
|  |  |  |  |
| Test Products: | Armour-Zen | Planting Method: | Mechanical transplant |
|  |  |  |  |
| Pest Species: | *Leveillula taurica* | Harvest Method: | hand |
|  | Powdery Mildew |  |  |
|  | Effect of Armour-Zen on powdery mildew on tomato | Adjuvants: | Nu Film P |
|  |  |  |
| Objective: | Application Method: | Backpack CO2 |
|  |  |  |
|  |  | Calibration Method: | Time Volume |
| Plot Dimensions: | 3.33' x 21' |  |  |
|  |  | Nozzle Type: | Tee Jet TG-1 x 7 |
| Experiment Size: | 2240 ft2 |  |  |
|  |  | Nozzle Height: | 7"-8" |
| Planting Density: | 4356 Plants/acre |  |  |
|  |  | Operating Pressure: | 50 PSI |
| Row Spacing: | 80" (2 rows) |  |  |
|  |  | Spray Boom Width: | 66" |
| Soil Type: | Clay loam |  |  |
|  |  | Dilution: | 75 GPA |
| Plant Spacing: | 18" |  |  |
|  |  | Irrigation Method: | Drip |
| No. Treatments/Reps: | 8 Treatments / 4 Reps |  |  |
|  |  | Application Dates: | 8/2, 8/9, 8/16, 8/23, 8/30 |
| Statistical Design: | RCB |  |  |
|  |  |  |  |
| No. Applications: | 5 | Evaluation Dates: | 8/5, 8/9, 8/14, 8/4, 8/30, 9/5 |
|  |  |  | 9/12, 9/20 |
| Appl. Frequency: | 7 Days |  |  |

TREATMENT LIST



PLOT MAP



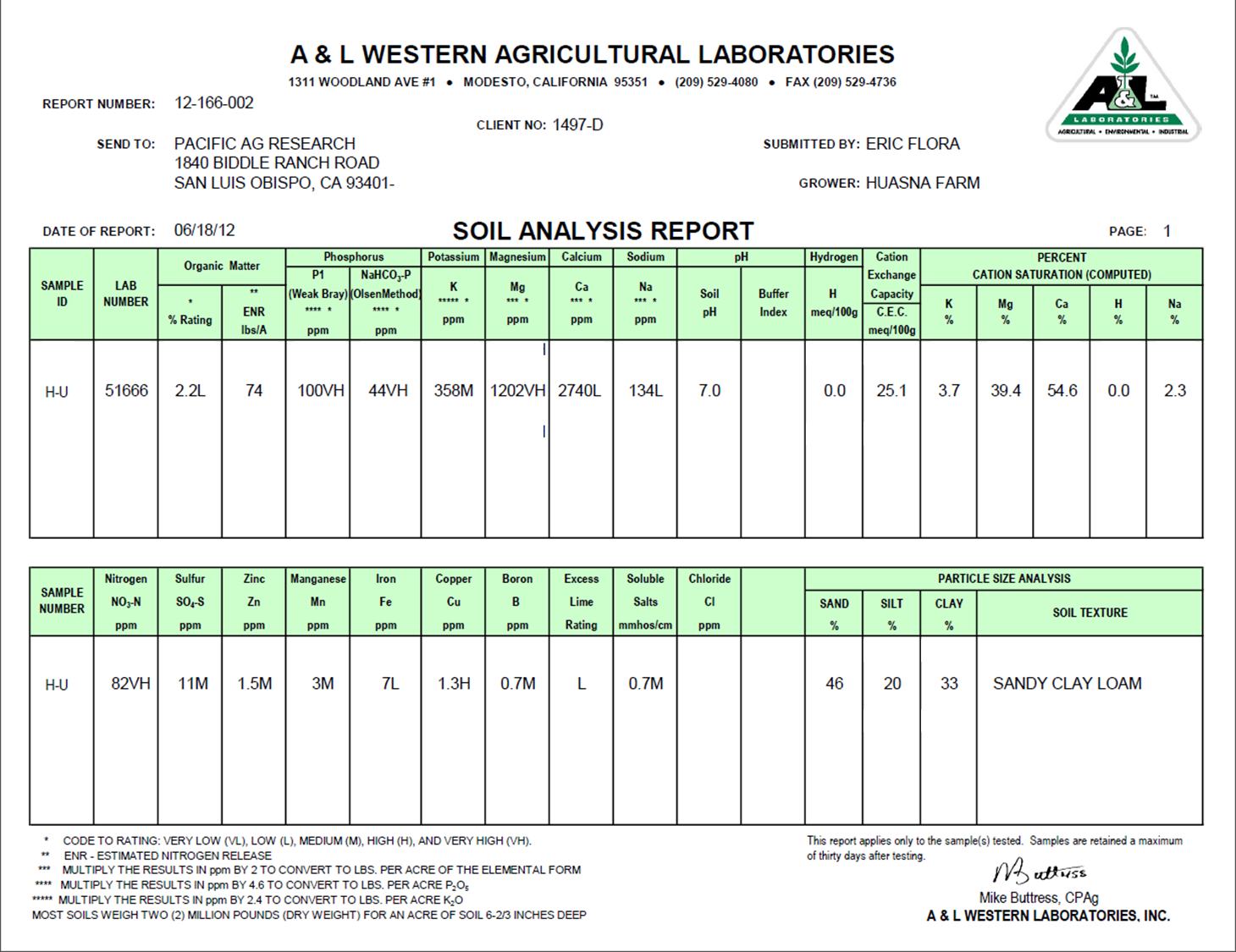
APPENDIX A: DAILY METEROLOGICAL SUMMARY:

ARROYO GRANDE, CA

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Precip (in)** | **Cumulative Rainfall (in)** | **Avg Soil Temp (°F)** | **Max Air Temp (°F)** | **Min Air Temp (°F)** | **Avg Air Temp (°F)** | **Avg Rel Hum (%)** |
| **7/15/2013** | 0.03 | 0.03 | 66.70 | 65.70 | 51.30 | 56.80 | 82 |
| **7/16/2013** | 0.02 | 0.05 | 66.70 | 66.50 | 52.40 | 58.50 | 78 |
| **7/17/2013** | 0.02 | 0.07 | 66.70 | 65.80 | 51.80 | 57.80 | 83 |
| **7/18/2013** | 0.03 | 0.10 | 66.70 | 67.10 | 52.10 | 57.50 | 83 |
| **7/19/2013** | 0.02 | 0.12 | 66.70 | 63.20 | 52.00 | 55.70 | 86 |
| **7/20/2013** | 0.01 | 0.13 | 66.50 | 63.10 | 52.10 | 56.10 | 86 |
| **7/21/2013** | 0.02 | 0.15 | 66.70 | 66.50 | 52.90 | 59.00 | 84 |
| **7/22/2013** | 0.02 | 0.17 | 67.30 | 69.50 | 57.20 | 61.50 | 85 |
| **7/23/2013** | 0.02 | 0.19 | 67.50 | 66.10 | 55.70 | 59.70 | 89 |
| **7/24/2013** | 0.01 | 0.20 | 67.30 | 64.80 | 54.10 | 57.60 | 91 |
| **7/25/2013** | 0.01 | 0.21 | 67.10 | 63.60 | 54.80 | 57.80 | 89 |
| **7/26/2013** | 0.00 | 0.21 | 66.90 | 62.80 | 54.60 | 57.60 | 89 |
| **7/27/2013** | 0.01 | 0.22 | 66.90 | 64.10 | 54.00 | 57.60 | 88 |
| **7/28/2013** | 0.02 | 0.24 | 66.90 | 64.20 | 54.60 | 58.00 | 87 |
| **7/29/2013** | 0.03 | 0.27 | 66.90 | 65.90 | 55.00 | 58.70 | 87 |
| **7/30/2013** | 0.02 | 0.29 | 66.90 | 64.30 | 52.00 | 58.50 | 85 |
| **7/31/2013** | 0.02 | 0.31 | 66.50 | 63.20 | 51.20 | 56.60 | 87 |
| **8/1/2013** | 0.01 | 0.32 | 66.30 | 69.50 | 50.90 | 59.00 | 79 |
| **8/2/2013** | 0.02 | 0.34 | 66.30 | 61.80 | 50.90 | 55.90 | 87 |
| **8/3/2013** | 0.02 | 0.36 | 66.10 | 63.60 | 52.50 | 55.90 | 87 |
| **8/4/2013** | 0.00 | 0.36 | 66.20 | 62.50 | 51.30 | 55.90 | 87 |
| **8/5/2013** | 0.00 | 0.36 | 65.90 | 60.80 | 52.50 | 55.30 | 90 |
| **8/6/2013** | 0.01 | 0.37 | 65.80 | 62.60 | 52.10 | 56.00 | 88 |
| **8/7/2013** | 0.03 | 0.40 | 65.80 | 65.90 | 52.80 | 57.50 | 84 |
| **8/8/2013** | 0.00 | 0.40 | 66.10 | 66.00 | 53.90 | 58.60 | 83 |
| **8/9/2013** | 0.02 | 0.42 | 66.30 | 64.30 | 54.60 | 58.40 | 82 |
| **8/10/2013** | 0.01 | 0.43 | 66.20 | 63.10 | 54.00 | 58.00 | 87 |
| **8/11/2013** | 0.02 | 0.45 | 66.00 | 63.60 | 53.80 | 57.10 | 89 |
| **8/12/2013** | 0.02 | 0.47 | 66.00 | 63.70 | 53.50 | 56.80 | 89 |
| **8/13/2013** | 0.00 | 0.47 | 66.00 | 62.50 | 52.50 | 55.90 | 91 |
| **8/14/2013** | 0.04 | 0.51 | 66.00 | 64.50 | 51.70 | 56.60 | 89 |
| **8/15/2013** | 0.01 | 0.52 | 66.10 | 68.10 | 50.20 | 58.00 | 85 |
| **8/16/2013** | 0.03 | 0.55 | 66.40 | 67.70 | 52.90 | 57.90 | 89 |
| **8/17/2013** | 0.01 | 0.56 | 66.40 | 62.90 | 53.30 | 57.10 | 93 |
| **8/18/2013** | 0.02 | 0.58 | 66.50 | 67.00 | 54.20 | 57.60 | 91 |
| **8/19/2013** | 0.01 | 0.59 | 66.50 | 65.30 | 53.50 | 57.70 | 91 |
| **8/20/2013** | 0.02 | 0.61 | 66.60 | 66.00 | 52.10 | 58.70 | 86 |
| **8/21/2013** | 0.00 | 0.61 | 66.30 | 68.70 | 50.70 | 58.70 | 83 |
| **8/22/2013** | 0.04 | 0.65 | 66.30 | 71.90 | 50.70 | 60.90 | 75 |
| **8/23/2013** | 0.03 | 0.68 | 66.30 | 67.80 | 50.50 | 58.40 | 85 |
| **Date** | **Precip (in)** | **Cumulative Rainfall (in)** | **Avg Soil Temp (°F)** | **Max Air Temp (°F)** | **Min Air Temp (°F)** | **Avg Air Temp (°F)** | **Avg Rel Hum (%)** |
| **8/24/2013** | 0.02 | 0.70 | 66.50 | 67.70 | 54.70 | 59.50 | 87 |
| **8/25/2013** | 0.02 | 0.72 | 66.70 | 68.10 | 54.90 | 59.80 | 89 |
| **8/26/2013** | 0.03 | 0.75 | 67.00 | 66.50 | 56.10 | 60.00 | 89 |
| **8/27/2013** | 0.00 | 0.75 | 66.90 | 63.80 | 54.30 | 57.70 | 93 |
| **8/28/2013** | 0.02 | 0.77 | 66.80 | 66.00 | 54.70 | 58.40 | 91 |
| **8/29/2013** | 0.02 | 0.79 | 66.90 | 71.70 | 55.20 | 60.20 | 87 |
| **8/30/2013** | 0.02 | 0.81 | 67.20 | 74.40 | 54.00 | 62.70 | 79 |
| **8/31/2013** | 0.02 | 0.83 | 67.60 | 78.90 | 58.40 | 66.90 | 70 |
| **9/1/2013** | 0.01 | 0.84 | 68.00 | 75.70 | 59.00 | 65.70 | 75 |
| **9/2/2013** | 0.02 | 0.86 | 68.00 | 71.70 | 57.90 | 63.60 | 84 |
| **9/3/2013** | 0.02 | 0.88 | 68.20 | 79.70 | 57.30 | 65.50 | 70 |
| **9/4/2013** | 0.02 | 0.90 | 67.90 | 70.40 | 54.80 | 61.80 | 81 |
| **9/5/2013** | 0.02 | 0.92 | 67.80 | 70.70 | 55.90 | 61.60 | 81 |
| **9/6/2013** | 0.02 | 0.94 | 67.30 | 68.10 | 53.20 | 59.50 | 83 |
| **9/7/2013** | 0.02 | 0.96 | 66.90 | 66.90 | 51.80 | 58.00 | 91 |
| **9/8/2013** | 0.02 | 0.98 | 67.00 | 64.20 | 54.90 | 57.50 | 93 |
| **9/9/2013** | 0.01 | 0.99 | 66.80 | 64.10 | 54.10 | 57.70 | 94 |
| **9/10/2013** | 0.00 | 0.99 | 66.70 | 68.00 | 54.90 | 60.00 | 88 |
| **9/11/2013** | 0.03 | 1.02 | 66.90 | 67.80 | 52.50 | 59.80 | 88 |
| **9/12/2013** | 0.03 | 1.05 | 66.50 | 68.70 | 50.60 | 59.00 | 88 |
| **9/13/2013** | 0.02 | 1.07 | 66.60 | 69.20 | 54.00 | 59.40 | 88 |
| **9/14/2013** | 0.02 | 1.09 | 66.50 | 69.50 | 53.40 | 58.60 | 85 |
| **9/15/2013** | 0.02 | 1.11 | 66.10 | 66.00 | 52.10 | 58.50 | 86 |
| **9/16/2013** | 0.02 | 1.13 | 66.00 | 63.40 | 52.50 | 56.90 | 94 |
| **9/17/2013** | 0.00 | 1.13 | 66.10 | 70.60 | 53.70 | 60.30 | 77 |
| **9/18/2013** | 0.02 | 1.15 | 65.60 | 81.40 | 49.30 | 62.30 | 63 |
| **9/19/2013** | 0.02 | 1.17 | 65.40 | 71.10 | 50.90 | 58.70 | 76 |
| **9/20/2013** | 0.01 | 1.18 | 65.40 | 67.80 | 53.10 | 58.70 | 87 |
| **9/21/2013** | 0.00 | 1.18 | 65.80 | 68.00 | 54.80 | 60.70 | 89 |
| **9/22/2013** | 0.02 | 1.20 | 65.40 | 69.80 | 52.10 | 61.00 | 69 |
| **9/23/2013** | 0.02 | 1.22 | 65.50 | 82.40 | 55.40 | 68.80 | 46 |
| **9/24/2013** | 0.02 | 1.24 | 65.40 | 75.20 | 52.40 | 61.20 | 69 |
| **9/25/2013** | 0.02 | 1.26 | 64.70 | 69.00 | 49.10 | 57.80 | 69 |
| **9/26/2013** | 0.01 | 1.27 | 63.80 | 66.20 | 47.30 | 55.30 | 71 |
| **9/27/2013** | 0.02 | 1.29 | 63.30 | 75.80 | 44.70 | 60.40 | 47 |
| **9/28/2013** | 0.02 | 1.31 | 63.20 | 78.10 | 50.70 | 61.90 | 46 |
| **9/29/2013** | 0.00 | 1.31 | 63.10 | 71.10 | 47.60 | 59.30 | 64 |
| **9/30/2013** | 0.03 | 1.34 | 63.40 | 76.70 | 49.00 | 60.70 | 75 |
| **10/1/2013** | 0.03 | 1.37 | 63.70 | 69.00 | 50.80 | 57.90 | 82 |
| **10/2/2013** | 0.01 | 1.38 | 63.50 | 63.00 | 47.80 | 54.10 | 89 |
| **Date** | **Precip (in)** | **Cumulative Rainfall (in)** | **Avg Soil Temp (°F)** | **Max Air Temp (°F)** | **Min Air Temp (°F)** | **Avg Air Temp (°F)** | **Avg Rel Hum (%)** |
| **10/3/2013** | 0.02 | 1.40 | 62.90 | 70.90 | 44.10 | 57.40 | 62 |
| **10/4/2013** | 0.01 | 1.41 | 62.70 | 71.60 | 51.20 | 62.00 | 50 |
| **10/5/2013** | 0.01 | 1.42 | 62.70 | 83.90 | 53.90 | 66.80 | 27 |
| **10/6/2013** | 0.00 | 1.42 | 62.40 | 87.70 | 50.50 | 65.60 | 27 |
| **10/7/2013** | 0.00 | 1.42 | 62.20 | 62.00 | 47.10 | 55.60 | 73 |
| **10/8/2013** | 0.02 | 1.44 | 62.40 | 59.00 | 49.20 | 54.00 | 82 |

APPENDIX B: SOIL CHARACTERISTICS

HUASNA FARM – BLOCK B



APPENDIX C: DATA SUMMARIES

6Feb14 (ENA1313$ PM Tomato) Assessment Data Summary Page 1 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | | D Disease | D Disease | D Disease | D Disease |
| Pest Code | | | | | | LEVETA | LEVETA | LEVETA | LEVETA |
| Pest Scientific Name | | | | | | Leveillula tau> | Leveillula tau> | Leveillula tau> | Leveillula tau> |
| Pest Name | | | | | | Powdery mildew> | Powdery mildew> | Powdery mildew> | Powdery mildew> |
| Crop Code | | | | | | LYPES | LYPES | LYPES | LYPES |
| BBCH Scale | | | | | | BVSO | BVSO | BVSO | BVSO |
| Crop Scientific Name | | | | | | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> |
| Crop Name | | | | | | Tomato | Tomato | Tomato | Tomato |
| Crop Variety | | | | | |  |  |  |  |
| Description | | | | | | PHYTOTOXICITY | PHYTOTOXICITY | PHYTOTOXICITY | PHYTOTOXICITY |
| Part Rated | | | | | | PLANT C | PLANT C | PLANT C | PLANT C |
| Rating Date | | | | | | 9Aug13 | 14Aug13 | 24Aug13 | 30Aug13 |
| Rating Type | | | | | | PHYGEN | PHYGEN | PHYGEN | PHYGEN |
| Rating Unit | | | | | | percent | percent | percent | percent |
| Sample Size, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Collection Basis, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Number of Subsamples | | | | | | 1 | 1 | 1 | 1 |
| Days After First/Last Applic. | | | | | | 7 7 | 12 5 | 22 1 | 28 7 |
| Trt-Eval Interval | | | | | | 7 DA-A | 5 DA-B | 1 DA-D | 7 DA-D |
| Plant-Eval Interval | | | | | | 79 DP-1 | 84 DP-1 | 94 DP-1 | 100 DP-1 |
| ARM Action Codes | | | | | |  |  |  |  |
| Number of Decimals | | | | | | 2 | 2 | 2 | 2 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 1 | 2 | 3 | 4 |
| 1 | Untreated Check |  |  | ABCDE | 106 | 0.00 | 0.00 | 0.00 | 0.00 |
|  |  |  |  |  | 201 | 0.00 | 0.00 | 0.00 | 0.00 |
|  |  |  |  |  | 307 | 0.00 | 0.00 | 0.00 | 0.00 |
|  |  |  |  |  | 405 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mean = | | | | | | 0.00 | 0.00 | 0.00 | 0.00 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 101 | 0.00 | 0.00 | 0.00 | 0.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 0.00 | 0.00 | 0.00 | 0.00 |
|  |  |  |  |  | 306 | 0.00 | 0.00 | 0.00 | 0.00 |
|  |  |  |  |  | 407 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mean = | | | | | | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 108 | 0.00 | 0.00 | 0.00 | 0.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 0.00 | 0.00 | 0.00 | 0.00 |
|  |  |  |  |  | 305 | 0.00 | 0.00 | 0.00 | 0.00 |
|  |  |  |  |  | 406 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mean = | | | | | | 0.00 | 0.00 | 0.00 | 0.00 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 102 | 0.00 | 0.00 | 0.00 | 0.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 0.00 | 0.00 | 0.00 | 0.00 |
|  |  |  |  |  | 301 | 0.00 | 0.00 | 0.00 | 0.00 |
|  |  |  |  |  | 402 | 0.00 | 0.10 | 0.00 | 0.00 |
| Mean = | | | | | | 0.00 | 0.03 | 0.00 | 0.00 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 107 | 0.00 | 0.00 | 0.00 | 0.00 |
|  | Regalia | 1 | qt/a | BD | 207 | 0.00 | 0.00 | 0.00 | 0.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 303 | 0.00 | 0.00 | 0.00 | 0.00 |
|  |  |  |  |  | 401 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mean = | | | | | | 0.00 | 0.00 | 0.00 | 0.00 |

6Feb14 (ENA1313$ PM Tomato) Assessment Data Summary Page 2 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | | D Disease | D Disease | D Disease | D Disease |
| Pest Code | | | | | | LEVETA | LEVETA | LEVETA | LEVETA |
| Pest Scientific Name | | | | | | Leveillula tau> | Leveillula tau> | Leveillula tau> | Leveillula tau> |
| Pest Name | | | | | | Powdery mildew> | Powdery mildew> | Powdery mildew> | Powdery mildew> |
| Crop Code | | | | | | LYPES | LYPES | LYPES | LYPES |
| BBCH Scale | | | | | | BVSO | BVSO | BVSO | BVSO |
| Crop Scientific Name | | | | | | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> |
| Crop Name | | | | | | Tomato | Tomato | Tomato | Tomato |
| Crop Variety | | | | | |  |  |  |  |
| Description | | | | | | PHYTOTOXICITY | PHYTOTOXICITY | VIGOR | VIGOR |
| Part Rated | | | | | | PLANT C | PLANT C | PLANT C | PLANT C |
| Rating Date | | | | | | 5Sep13 | 20Sep13 | 9Aug13 | 14Aug13 |
| Rating Type | | | | | | PHYGEN | PHYGEN | VIGOR | VIGOR |
| Rating Unit | | | | | | percent | percent | 0-10 | 0-10 |
| Sample Size, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Collection Basis, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Number of Subsamples | | | | | | 1 | 1 | 1 | 1 |
| Days After First/Last Applic. | | | | | | 34 6 | 49 21 | 7 7 | 12 5 |
| Trt-Eval Interval | | | | | | 6 DA-E | 21 DA-E | 7 DA-A | 5 DA-B |
| Plant-Eval Interval | | | | | | 106 DP-1 | 121 DP-1 | 79 DP-1 | 84 DP-1 |
| ARM Action Codes | | | | | |  |  |  |  |
| Number of Decimals | | | | | | 2 | 2 | 2 | 2 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 5 | 6 | 7 | 8 |
| 1 | Untreated Check |  |  | ABCDE | 106 | 0.00 | 0.00 | 5.00 | 5.00 |
|  |  |  |  |  | 201 | 0.00 | 0.00 | 4.00 | 5.00 |
|  |  |  |  |  | 307 | 0.00 | 0.00 | 5.00 | 5.13\* |
|  |  |  |  |  | 405 | 0.00 | 0.00 | 5.00 | 5.00 |
| Mean = | | | | | | 0.00 | 0.00 | 4.75 | 5.03 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 101 | 0.00 | 0.00 | 5.00 | 5.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 0.00 | 0.00 | 4.00 | 5.50 |
|  |  |  |  |  | 306 | 0.00 | 0.00 | 4.00 | 5.00 |
|  |  |  |  |  | 407 | 0.00 | 0.00 | 6.00 | 5.00 |
| Mean = | | | | | | 0.00 | 0.00 | 4.75 | 5.13 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 108 | 0.00 | 0.00 | 5.00 | 5.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 0.00 | 0.00 | 5.00 | 5.00 |
|  |  |  |  |  | 305 | 0.00 | 0.00 | 5.00 | 5.50 |
|  |  |  |  |  | 406 | 0.00 | 0.00 | 6.00 | 5.00 |
| Mean = | | | | | | 0.00 | 0.00 | 5.25 | 5.13 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 102 | 0.00 | 0.00 | 5.00 | 5.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 0.00 | 0.00 | 5.00 | 6.00 |
|  |  |  |  |  | 301 | 0.00 | 0.00 | 5.00 | 5.50 |
|  |  |  |  |  | 402 | 0.00 | 0.00 | 6.00 | 5.00 |
| Mean = | | | | | | 0.00 | 0.00 | 5.25 | 5.38 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 107 | 0.00 | 0.00 | 5.00 | 5.00 |
|  | Regalia | 1 | qt/a | BD | 207 | 0.00 | 0.00 | 5.00 | 5.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 303 | 0.00 | 0.00 | 5.00 | 5.00 |
|  |  |  |  |  | 401 | 0.00 | 0.00 | 5.00 | 5.00 |
| Mean = | | | | | | 0.00 | 0.00 | 5.00 | 5.00 |

6Feb14 (ENA1313$ PM Tomato) Assessment Data Summary Page 3 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | | D Disease | D Disease | D Disease | D Disease | D Disease |
| Pest Code | | | | | | LEVETA | LEVETA | LEVETA | LEVETA | LEVETA |
| Pest Scientific Name | | | | | | Leveillula tau> | Leveillula tau> | Leveillula tau> | Leveillula tau> | Leveillula tau> |
| Pest Name | | | | | | Powdery mildew> | Powdery mildew> | Powdery mildew> | Powdery mildew> | Powdery mildew> |
| Crop Code | | | | | | LYPES | LYPES | LYPES | LYPES | LYPES |
| BBCH Scale | | | | | | BVSO | BVSO | BVSO | BVSO | BVSO |
| Crop Scientific Name | | | | | | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> |
| Crop Name | | | | | | Tomato | Tomato | Tomato | Tomato | Tomato |
| Crop Variety | | | | | |  |  |  |  |  |
| Description | | | | | | VIGOR | VIGOR | VIGOR | VIGOR | VIGOR |
| Part Rated | | | | | | PLANT C | PLANT C | PLANT C | PLANT C | PLANT C |
| Rating Date | | | | | | 24Aug13 | 30Aug13 | 5Sep13 | 12Sep13 | 20Sep13 |
| Rating Type | | | | | | VIGOR | VIGOR | VIGOR | VIGOR | VIGOR |
| Rating Unit | | | | | | 0-10 | 0-10 | 0-10 | 0-10 | 0-10 |
| Sample Size, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Collection Basis, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Number of Subsamples | | | | | | 1 | 1 | 1 | 1 | 1 |
| Days After First/Last Applic. | | | | | | 22 1 | 28 7 | 34 6 | 41 13 | 49 21 |
| Trt-Eval Interval | | | | | | 1 DA-D | 7 DA-D | 6 DA-E | 13 DA-E | 21 DA-E |
| Plant-Eval Interval | | | | | | 94 DP-1 | 100 DP-1 | 106 DP-1 | 113 DP-1 | 121 DP-1 |
| ARM Action Codes | | | | | |  |  |  |  |  |
| Number of Decimals | | | | | | 2 | 2 | 2 | 2 | 2 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 9 | 10 | 11 | 12 | 13 |
| 1 | Untreated Check |  |  | ABCDE | 106 | 4.00 | 5.00 | 5.00 | 4.50 | 4.00 |
|  |  |  |  |  | 201 | 5.00 | 5.00 | 5.00 | 4.50 | 4.00 |
|  |  |  |  |  | 307 | 5.00 | 5.50 | 2.00 | 4.50 | 6.00 |
|  |  |  |  |  | 405 | 3.50 | 4.50 | 2.00 | 4.50 | 3.00 |
| Mean = | | | | | | 4.38 | 5.00 | 3.50 | 4.50 | 4.25 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 101 | 4.50 | 4.50 | 5.00 | 5.00 | 6.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 4.50 | 4.00 | 4.00 | 5.00 | 4.00 |
|  |  |  |  |  | 306 | 5.00 | 5.00 | 2.00 | 4.50 | 5.00 |
|  |  |  |  |  | 407 | 5.00 | 5.50 | 3.00 | 5.00 | 2.00 |
| Mean = | | | | | | 4.75 | 4.75 | 3.50 | 4.88 | 4.25 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 108 | 5.50 | 4.50 | 5.00 | 5.00 | 5.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 4.50 | 3.50 | 6.00 | 4.50 | 3.00 |
|  |  |  |  |  | 305 | 6.00 | 4.50 | 4.00 | 5.00 | 6.00 |
|  |  |  |  |  | 406 | 3.50 | 5.00 | 3.00 | 4.50 | 3.00 |
| Mean = | | | | | | 4.88 | 4.38 | 4.50 | 4.75 | 4.25 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 102 | 4.00 | 5.00 | 5.00 | 5.00 | 6.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 7.00 | 4.00 | 7.00 | 3.50 | 3.00 |
|  |  |  |  |  | 301 | 6.00 | 5.50 | 4.00 | 5.00 | 5.00 |
|  |  |  |  |  | 402 | 5.00 | 5.00 | 3.00 | 5.00 | 4.00 |
| Mean = | | | | | | 5.50 | 4.88 | 4.75 | 4.63 | 4.50 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 107 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 |
|  | Regalia | 1 | qt/a | BD | 207 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 303 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 |
|  |  |  |  |  | 401 | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 |
| Mean = | | | | | | 5.00 | 5.00 | 5.00 | 5.00 | 5.00 |

6Feb14 (ENA1313$ PM Tomato) Assessment Data Summary Page 4 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | | D Disease | D Disease | D Disease | D Disease | D Disease |
| Pest Code | | | | | | LEVETA | LEVETA | LEVETA | LEVETA | LEVETA |
| Pest Scientific Name | | | | | | Leveillula tau> | Leveillula tau> | Leveillula tau> | Leveillula tau> | Leveillula tau> |
| Pest Name | | | | | | Powdery mildew> | Powdery mildew> | Powdery mildew> | Powdery mildew> | Powdery mildew> |
| Crop Code | | | | | | LYPES | LYPES | LYPES | LYPES | LYPES |
| BBCH Scale | | | | | | BVSO | BVSO | BVSO | BVSO | BVSO |
| Crop Scientific Name | | | | | | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> |
| Crop Name | | | | | | Tomato | Tomato | Tomato | Tomato | Tomato |
| Crop Variety | | | | | |  |  |  |  |  |
| Description | | | | | | SEVERITY\_PM | SEVERITY\_PM | SEVERITY\_PM | SEVERITY\_PM | SEVERITY\_PM |
| Part Rated | | | | | | PLANT C | PLANT C | PLANT C | PLANT C | PLANT C |
| Rating Date | | | | | | 5Aug13 | 9Aug13 | 14Aug13 | 24Aug13 | 30Aug13 |
| Rating Type | | | | | | PESSEV | PESSEV | PESSEV | PESSEV | PESSEV |
| Rating Unit | | | | | | % | % | % | % | % |
| Sample Size, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Collection Basis, Unit | | | | | | 10 PLANT | 10 PLANT | 10 PLANT | 10 PLANT | 10 PLANT |
| Number of Subsamples | | | | | | 10 | 10 | 10 | 10 | 10 |
| Days After First/Last Applic. | | | | | | 3 3 | 7 7 | 12 5 | 22 1 | 28 7 |
| Trt-Eval Interval | | | | | | 3 DA-A | 7 DA-A | 5 DA-B | 1 DA-D | 7 DA-D |
| Plant-Eval Interval | | | | | | 75 DP-1 | 79 DP-1 | 84 DP-1 | 94 DP-1 | 100 DP-1 |
| ARM Action Codes | | | | | |  |  | AL | AL |  |
| Number of Decimals | | | | | | 2 | 2 | 2 | 2 | 2 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 14 | 15 | 16 | 17 | 18 |
| 1 | Untreated Check |  |  | ABCDE | 106 | 6.77 | 23.50 | 14.50 | 23.50 | 60.00 |
|  |  |  |  |  | 201 | 8.86 | 8.25 | 20.00 | 24.00 | 59.50 |
|  |  |  |  |  | 307 | 14.50 | 31.50 | 36.50 | 31.00 | 84.00 |
|  |  |  |  |  | 405 | 9.75 | 28.00 | 36.00 | 39.00 | 83.00 |
| Mean = | | | | | | 9.97 | 22.81 | 22.71t | 27.71t | 71.63 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 101 | 6.00 | 11.75 | 15.00 | 25.50 | 25.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 8.10 | 14.00 | 23.00 | 25.00 | 43.00 |
|  |  |  |  |  | 306 | 12.25 | 21.00 | 21.50 | 32.00 | 81.00 |
|  |  |  |  |  | 407 | 10.00 | 22.00 | 17.00 | 21.60 | 19.50 |
| Mean = | | | | | | 9.09 | 17.19 | 17.81t | 24.80t | 42.13 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 108 | 6.75 | 8.25 | 21.50 | 19.50 | 38.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 11.00 | 22.00 | 24.50 | 32.00 | 64.50 |
|  |  |  |  |  | 305 | 5.60 | 10.25 | 24.75 | 25.50 | 50.00 |
|  |  |  |  |  | 406 | 7.90 | 21.00 | 18.00 | 25.00 | 66.00 |
| Mean = | | | | | | 7.81 | 15.38 | 18.90t | 24.18t | 54.63 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 102 | 4.40 | 11.00 | 17.00 | 29.50 | 18.50 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 9.60 | 12.00 | 20.00 | 22.00 | 33.00 |
|  |  |  |  |  | 301 | 10.25 | 19.00 | 36.00 | 23.50 | 62.50 |
|  |  |  |  |  | 402 | 6.00 | 19.50 | 10.00 | 25.50 | 36.50 |
| Mean = | | | | | | 7.56 | 15.38 | 17.93t | 23.97t | 37.63 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 107 | 10.85 | 14.25 | 16.00 | 20.00 | 21.50 |
|  | Regalia | 1 | qt/a | BD | 207 | 7.25 | 9.75 | 15.50 | 22.00 | 34.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 303 | 14.25 | 15.50 | 13.75 | 28.50 | 44.00 |
|  |  |  |  |  | 401 | 11.75 | 16.25 | 18.50 | 25.50 | 61.50 |
| Mean = | | | | | | 11.03 | 13.94 | 14.84t | 22.60t | 40.25 |

6Feb14 (ENA1313$ PM Tomato) Assessment Data Summary Page 5 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | | D Disease | D Disease | D Disease |  |  |
| Pest Code | | | | | | LEVETA | LEVETA | LEVETA |  |  |
| Pest Scientific Name | | | | | | Leveillula tau> | Leveillula tau> | Leveillula tau> |  |  |
| Pest Name | | | | | | Powdery mildew> | Powdery mildew> | Powdery mildew> |  |  |
| Crop Code | | | | | | LYPES | LYPES | LYPES | LYPES | LYPES |
| BBCH Scale | | | | | | BVSO | BVSO | BVSO | BVSO | BVSO |
| Crop Scientific Name | | | | | | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> |
| Crop Name | | | | | | Tomato | Tomato | Tomato | Tomato | Tomato |
| Crop Variety | | | | | |  |  |  |  |  |
| Description | | | | | | SEVERITY\_PM1 | SEVERITY\_PM2 | SEVERITY\_PM3 | Marketable # | Marketable wei> |
| Part Rated | | | | | | PLANT C | PLANT C | PLANT C | FRUMAR C | FRUMAR C |
| Rating Date | | | | | | 5Sep13 | 12Sep13 | 20Sep13 | 6Aug13 | 6Aug13 |
| Rating Type | | | | | | PESSEV | PESSEV | PESSEV | YIELD | WEIGHT |
| Rating Unit | | | | | | % | % | % | NUMBER | KG |
| Sample Size, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Collection Basis, Unit | | | | | | 10 PLANT | 10 PLANT | 10 PLANT | 1 PLOT | 1 PLOT |
| Number of Subsamples | | | | | | 10 | 10 | 10 | 1 | 1 |
| Days After First/Last Applic. | | | | | | 34 6 | 41 13 | 49 21 | 4 4 | 4 4 |
| Trt-Eval Interval | | | | | | 6 DA-E | 13 DA-E | 21 DA-E | 4 DA-A | 4 DA-A |
| Plant-Eval Interval | | | | | | 106 DP-1 | 113 DP-1 | 121 DP-1 | 76 DP-1 | 76 DP-1 |
| ARM Action Codes | | | | | |  |  | AA | AL |  |
| Number of Decimals | | | | | | 2 | 2 | 2 | 2 | 2 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 19 | 20 | 21 | 22 | 23 |
| 1 | Untreated Check |  |  | ABCDE | 106 | 65.50 | 90.50 | 99.30 | 8.00 | 1.10 |
|  |  |  |  |  | 201 | 59.00 | 84.00 | 94.60 | 4.00 | 0.50 |
|  |  |  |  |  | 307 | 71.50 | 87.50 | 95.30 | 1.00 | 0.10 |
|  |  |  |  |  | 405 | 87.00 | 92.00 | 98.30 | 10.00 | 1.10 |
| Mean = | | | | | | 70.75 | 88.50 | 98.82t | 4.61t | 0.70 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 101 | 33.50 | 65.50 | 79.00 | 1.00 | 0.20 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 75.00 | 64.00 | 54.00 | 5.00 | 0.60 |
|  |  |  |  |  | 306 | 73.50 | 88.00 | 94.90 | 10.00 | 1.40 |
|  |  |  |  |  | 407 | 60.00 | 88.00 | 98.90 | 4.00 | 0.50 |
| Mean = | | | | | | 60.50 | 76.38 | 89.67t | 4.07t | 0.68 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 108 | 51.00 | 68.00 | 93.40 | 4.00 | 0.50 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 88.00 | 87.00 | 91.40 | 6.00 | 0.80 |
|  |  |  |  |  | 305 | 57.50 | 75.50 | 74.00 | 3.00 | 0.50 |
|  |  |  |  |  | 406 | 78.50 | 85.50 | 98.40 | 4.00 | 0.50 |
| Mean = | | | | | | 68.75 | 79.00 | 95.04t | 4.14t | 0.58 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 102 | 38.00 | 66.50 | 85.00 | 5.00 | 0.60 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 56.00 | 88.00 | 94.33 | 1.00 | 0.10 |
|  |  |  |  |  | 301 | 57.50 | 83.50 | 90.40 | 3.00 | 0.50 |
|  |  |  |  |  | 402 | 73.50 | 83.50 | 91.50 | 2.00 | 0.30 |
| Mean = | | | | | | 56.25 | 80.38 | 93.87t | 2.46t | 0.38 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 107 | 52.00 | 87.50 | 91.80 | 2.00 | 0.20 |
|  | Regalia | 1 | qt/a | BD | 207 | 62.00 | 69.50 | 80.40 | 2.00 | 0.20 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 303 | 85.00 | 75.50 | 96.00 | 13.00 | 1.70 |
|  |  |  |  |  | 401 | 68.50 | 88.00 | 94.50 | 7.00 | 1.00 |
| Mean = | | | | | | 66.88 | 80.13 | 95.29t | 4.63t | 0.78 |

6Feb14 (ENA1313$ PM Tomato) Assessment Data Summary Page 6 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | |  |  |  |  |  |
| Pest Code | | | | | |  |  |  |  |  |
| Pest Scientific Name | | | | | |  |  |  |  |  |
| Pest Name | | | | | |  |  |  |  |  |
| Crop Code | | | | | | LYPES | LYPES | LYPES | LYPES | LYPES |
| BBCH Scale | | | | | | BVSO | BVSO | BVSO | BVSO | BVSO |
| Crop Scientific Name | | | | | | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> |
| Crop Name | | | | | | Tomato | Tomato | Tomato | Tomato | Tomato |
| Crop Variety | | | | | |  |  |  |  |  |
| Description | | | | | | Unmarketable # | Unmarketable w> | Marketable # | Marketable wei> | Unmarketable # |
| Part Rated | | | | | | FRUUNM C | FRUUNM C | FRUMAR C | FRUMAR C | FRUUNM C |
| Rating Date | | | | | | 6Aug13 | 6Aug13 | 12Aug13 | 12Aug13 | 12Aug13 |
| Rating Type | | | | | | YIELD | WEIUNM | YIELD | WEIGHT | YIELD |
| Rating Unit | | | | | | NUMBER | KG | NUMBER | KG | NUMBER |
| Sample Size, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Collection Basis, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Number of Subsamples | | | | | | 1 | 1 | 1 | 1 | 1 |
| Days After First/Last Applic. | | | | | | 4 4 | 4 4 | 10 3 | 10 3 | 10 3 |
| Trt-Eval Interval | | | | | | 4 DA-A | 4 DA-A | 3 DA-B | 3 DA-B | 3 DA-B |
| Plant-Eval Interval | | | | | | 76 DP-1 | 76 DP-1 | 82 DP-1 | 82 DP-1 | 82 DP-1 |
| ARM Action Codes | | | | | |  |  |  |  |  |
| Number of Decimals | | | | | | 2 | 2 | 2 | 2 | 2 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 24 | 25 | 26 | 27 | 28 |
| 1 | Untreated Check |  |  | ABCDE | 106 | 0.00 | 0.00 | 23.00 | 3.10 | 9.00 |
|  |  |  |  |  | 201 | 2.00 | 0.10 | 18.00 | 2.80 | 11.00 |
|  |  |  |  |  | 307 | 2.00 | 0.50 | 17.00 | 2.20 | 4.00 |
|  |  |  |  |  | 405 | 6.00 | 0.60 | 23.00 | 2.70 | 9.00 |
| Mean = | | | | | | 2.50 | 0.30 | 20.25 | 2.70 | 8.25 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 101 | 0.00 | 0.00 | 12.00 | 1.60 | 7.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 2.00 | 0.20 | 19.00 | 2.60 | 7.00 |
|  |  |  |  |  | 306 | 4.00 | 0.60 | 19.00 | 2.50 | 5.00 |
|  |  |  |  |  | 407 | 6.00 | 0.60 | 15.00 | 2.00 | 5.00 |
| Mean = | | | | | | 3.00 | 0.35 | 16.25 | 2.18 | 6.00 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 108 | 0.00 | 0.00 | 11.00 | 1.60 | 5.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 9.00 | 0.90 | 26.00 | 3.60 | 5.00 |
|  |  |  |  |  | 305 | 2.00 | 0.10 | 11.00 | 1.60 | 5.00 |
|  |  |  |  |  | 406 | 6.00 | 0.40 | 29.00 | 3.30 | 8.00 |
| Mean = | | | | | | 4.25 | 0.35 | 19.25 | 2.53 | 5.75 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 102 | 1.00 | 0.10 | 25.00 | 3.50 | 6.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 3.00 | 0.40 | 15.00 | 2.20 | 8.00 |
|  |  |  |  |  | 301 | 4.00 | 0.30 | 17.00 | 2.10 | 3.00 |
|  |  |  |  |  | 402 | 2.00 | 0.10 | 33.00 | 4.40 | 4.00 |
| Mean = | | | | | | 2.50 | 0.23 | 22.50 | 3.05 | 5.25 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 107 | 0.00 | 0.00 | 11.00 | 1.60 | 7.00 |
|  | Regalia | 1 | qt/a | BD | 207 | 1.00 | 0.10 | 22.00 | 2.80 | 11.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 303 | 3.00 | 0.40 | 19.00 | 2.50 | 5.00 |
|  |  |  |  |  | 401 | 6.00 | 0.50 | 20.00 | 2.90 | 3.00 |
| Mean = | | | | | | 2.50 | 0.25 | 18.00 | 2.45 | 6.50 |

6Feb14 (ENA1313$ PM Tomato) Assessment Data Summary Page 7 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | |  |  |  |  |  |
| Pest Code | | | | | |  |  |  |  |  |
| Pest Scientific Name | | | | | |  |  |  |  |  |
| Pest Name | | | | | |  |  |  |  |  |
| Crop Code | | | | | | LYPES | LYPES | LYPES | LYPES | LYPES |
| BBCH Scale | | | | | | BVSO | BVSO | BVSO | BVSO | BVSO |
| Crop Scientific Name | | | | | | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> |
| Crop Name | | | | | | Tomato | Tomato | Tomato | Tomato | Tomato |
| Crop Variety | | | | | |  |  |  |  |  |
| Description | | | | | | Unmarketable w> | Marketable # | Marketable wei> | Unmarketable # | Unmarketable w> |
| Part Rated | | | | | | FRUUNM C | FRUMAR C | FRUMAR C | FRUUNM C | FRUUNM C |
| Rating Date | | | | | | 12Aug13 | 20Aug13 | 20Aug13 | 20Aug13 | 20Aug13 |
| Rating Type | | | | | | WEIUNM | YIELD | WEIGHT | YIELD | WEIUNM |
| Rating Unit | | | | | | KG | NUMBER | KG | NUMBER | KG |
| Sample Size, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Collection Basis, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Number of Subsamples | | | | | | 1 | 1 | 1 | 1 | 1 |
| Days After First/Last Applic. | | | | | | 10 3 | 18 4 | 18 4 | 18 4 | 18 4 |
| Trt-Eval Interval | | | | | | 3 DA-B | 4 DA-C | 4 DA-C | 4 DA-C | 4 DA-C |
| Plant-Eval Interval | | | | | | 82 DP-1 | 90 DP-1 | 90 DP-1 | 90 DP-1 | 90 DP-1 |
| ARM Action Codes | | | | | |  |  |  |  |  |
| Number of Decimals | | | | | | 2 | 2 | 2 | 2 | 2 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 29 | 30 | 31 | 32 | 33 |
| 1 | Untreated Check |  |  | ABCDE | 106 | 1.30 | 37.00 | 5.20 | 21.00 | 3.00 |
|  |  |  |  |  | 201 | 1.40 | 35.00 | 4.80 | 17.00 | 2.40 |
|  |  |  |  |  | 307 | 0.60 | 2.00 | 3.10 | 12.00 | 1.70 |
|  |  |  |  |  | 405 | 1.10 | 25.00 | 3.50 | 11.00 | 1.50 |
| Mean = | | | | | | 1.10 | 24.75 | 4.15 | 15.25 | 2.15 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 101 | 0.90 | 36.00 | 5.10 | 17.00 | 2.40 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 0.70 | 20.00 | 2.70 | 12.00 | 1.70 |
|  |  |  |  |  | 306 | 0.70 | 39.00 | 5.40 | 12.00 | 1.70 |
|  |  |  |  |  | 407 | 0.40 | 21.00 | 3.00 | 15.00 | 2.00 |
| Mean = | | | | | | 0.68 | 29.00 | 4.05 | 14.00 | 1.95 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 108 | 0.50 | 39.00 | 5.40 | 19.00 | 2.60 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 0.80 | 19.00 | 2.60 | 16.00 | 2.30 |
|  |  |  |  |  | 305 | 0.40 | 27.00 | 3.80 | 20.00 | 2.80 |
|  |  |  |  |  | 406 | 0.60 | 21.00 | 2.90 | 18.00 | 2.60 |
| Mean = | | | | | | 0.58 | 26.50 | 3.68 | 18.25 | 2.58 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 102 | 0.50 | 33.00 | 4.60 | 17.00 | 2.40 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 0.90 | 21.00 | 3.00 | 19.00 | 2.60 |
|  |  |  |  |  | 301 | 0.40 | 21.00 | 3.00 | 13.00 | 1.90 |
|  |  |  |  |  | 402 | 0.50 | 37.00 | 5.20 | 21.00 | 2.90 |
| Mean = | | | | | | 0.58 | 28.00 | 3.95 | 17.50 | 2.45 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 107 | 0.80 | 17.00 | 2.40 | 10.00 | 1.40 |
|  | Regalia | 1 | qt/a | BD | 207 | 1.50 | 22.00 | 3.10 | 12.00 | 1.60 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 303 | 0.60 | 22.00 | 3.10 | 20.00 | 2.80 |
|  |  |  |  |  | 401 | 0.30 | 15.00 | 2.00 | 15.00 | 1.20 |
| Mean = | | | | | | 0.80 | 19.00 | 2.65 | 14.25 | 1.75 |

6Feb14 (ENA1313$ PM Tomato) Assessment Data Summary Page 8 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | |  |  |  |  |  |
| Pest Code | | | | | |  |  |  |  |  |
| Pest Scientific Name | | | | | |  |  |  |  |  |
| Pest Name | | | | | |  |  |  |  |  |
| Crop Code | | | | | | LYPES | LYPES | LYPES | LYPES | LYPES |
| BBCH Scale | | | | | | BVSO | BVSO | BVSO | BVSO | BVSO |
| Crop Scientific Name | | | | | | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> |
| Crop Name | | | | | | Tomato | Tomato | Tomato | Tomato | Tomato |
| Crop Variety | | | | | |  |  |  |  |  |
| Description | | | | | | Marketable # | Marketable wei> | Unmarketable # | Unmarketable w> | Marketable # |
| Part Rated | | | | | | FRUMAR C | FRUMAR C | FRUUNM C | FRUUNM C | FRUMAR C |
| Rating Date | | | | | | 26Aug13 | 26Aug13 | 26Aug13 | 26Aug13 | 9Sep13 |
| Rating Type | | | | | | YIELD | WEIGHT | YIELD | WEIUNM | YIELD |
| Rating Unit | | | | | | NUMBER | KG | NUMBER | KG | NUMBER |
| Sample Size, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Collection Basis, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Number of Subsamples | | | | | | 1 | 1 | 1 | 1 | 1 |
| Days After First/Last Applic. | | | | | | 24 3 | 24 3 | 24 3 | 24 3 | 38 10 |
| Trt-Eval Interval | | | | | | 3 DA-D | 3 DA-D | 3 DA-D | 3 DA-D | 10 DA-E |
| Plant-Eval Interval | | | | | | 96 DP-1 | 96 DP-1 | 96 DP-1 | 96 DP-1 | 110 DP-1 |
| ARM Action Codes | | | | | |  |  |  |  |  |
| Number of Decimals | | | | | | 2 | 2 | 2 | 2 | 2 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 34 | 35 | 36 | 37 | 38 |
| 1 | Untreated Check |  |  | ABCDE | 106 | 53.00 | 7.30 | 47.00 | 6.40 | 284.00 |
|  |  |  |  |  | 201 | 31.00 | 4.20 | 39.00 | 5.50 | 180.00 |
|  |  |  |  |  | 307 | 41.00 | 5.60 | 29.00 | 4.00 | 239.00 |
|  |  |  |  |  | 405 | 30.00 | 4.10 | 27.00 | 3.70 | 259.00 |
| Mean = | | | | | | 38.75 | 5.30 | 35.50 | 4.90 | 240.50 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 101 | 35.00 | 4.90 | 19.00 | 2.60 | 249.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 34.00 | 4.70 | 32.00 | 4.50 | 195.00 |
|  |  |  |  |  | 306 | 46.00 | 6.40 | 27.00 | 3.80 | 252.00 |
|  |  |  |  |  | 407 | 39.00 | 5.60 | 22.00 | 3.00 | 259.00 |
| Mean = | | | | | | 38.50 | 5.40 | 25.00 | 3.48 | 238.75 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 108 | 35.00 | 4.90 | 24.00 | 3.30 | 255.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 48.00 | 6.60 | 35.00 | 7.70 | 253.00 |
|  |  |  |  |  | 305 | 56.00 | 7.70 | 25.00 | 3.40 | 277.00 |
|  |  |  |  |  | 406 | 58.00 | 8.10 | 29.00 | 4.10 | 261.00 |
| Mean = | | | | | | 49.25 | 6.83 | 28.25 | 4.63 | 261.50 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 102 | 19.00 | 2.70 | 39.00 | 4.50 | 258.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 34.00 | 4.80 | 31.00 | 4.30 | 186.00 |
|  |  |  |  |  | 301 | 25.00 | 3.50 | 15.00 | 1.40 | 209.00 |
|  |  |  |  |  | 402 | 29.00 | 4.00 | 19.00 | 2.60 | 225.00 |
| Mean = | | | | | | 26.75 | 3.75 | 26.00 | 3.20 | 219.50 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 107 | 37.00 | 5.10 | 32.00 | 4.40 | 249.00 |
|  | Regalia | 1 | qt/a | BD | 207 | 38.00 | 5.20 | 24.00 | 3.30 | 207.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 303 | 56.00 | 7.70 | 38.00 | 5.30 | 195.00 |
|  |  |  |  |  | 401 | 21.00 | 2.90 | 24.00 | 3.40 | 263.00 |
| Mean = | | | | | | 38.00 | 5.23 | 29.50 | 4.10 | 228.50 |

6Feb14 (ENA1313$ PM Tomato) Assessment Data Summary Page 9 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | |  |  |  |  |  |
| Pest Code | | | | | |  |  |  |  |  |
| Pest Scientific Name | | | | | |  |  |  |  |  |
| Pest Name | | | | | |  |  |  |  |  |
| Crop Code | | | | | | LYPES | LYPES | LYPES | LYPES | LYPES |
| BBCH Scale | | | | | | BVSO | BVSO | BVSO | BVSO | BVSO |
| Crop Scientific Name | | | | | | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> |
| Crop Name | | | | | | Tomato | Tomato | Tomato | Tomato | Tomato |
| Crop Variety | | | | | |  |  |  |  |  |
| Description | | | | | | Marketable wei> | Unmarketable # | Unmarketable w> | Marketable # | Marketable wei> |
| Part Rated | | | | | | FRUMAR C | FRUUNM C | FRUUNM C | FRUMAR C | FRUMAR C |
| Rating Date | | | | | | 9Sep13 | 9Sep13 | 9Sep13 | 24Sep13 | 24Sep13 |
| Rating Type | | | | | | WEIGHT | YIELD | WEIUNM | YIELD | WEIGHT |
| Rating Unit | | | | | | KG | NUMBER | KG | NUMBER | KG |
| Sample Size, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Collection Basis, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Number of Subsamples | | | | | | 1 | 1 | 1 | 1 | 1 |
| Days After First/Last Applic. | | | | | | 38 10 | 38 10 | 38 10 | 53 25 | 53 25 |
| Trt-Eval Interval | | | | | | 10 DA-E | 10 DA-E | 10 DA-E | 25 DA-E | 25 DA-E |
| Plant-Eval Interval | | | | | | 110 DP-1 | 110 DP-1 | 110 DP-1 | 125 DP-1 | 125 DP-1 |
| ARM Action Codes | | | | | |  |  |  |  |  |
| Number of Decimals | | | | | | 2 | 2 | 2 | 2 | 2 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 39 | 40 | 41 | 42 | 43 |
| 1 | Untreated Check |  |  | ABCDE | 106 | 34.10 | 51.00 | 6.20 | 109.00 | 10.90 |
|  |  |  |  |  | 201 | 21.60 | 54.00 | 6.50 | 148.00 | 14.80 |
|  |  |  |  |  | 307 | 28.70 | 47.00 | 5.70 | 145.00 | 14.50 |
|  |  |  |  |  | 405 | 31.10 | 73.00 | 8.70 | 82.00 | 8.20 |
| Mean = | | | | | | 28.88 | 56.25 | 6.78 | 121.00 | 12.10 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 101 | 29.80 | 52.00 | 6.30 | 192.00 | 19.20 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 23.30 | 60.00 | 7.20 | 155.00 | 15.50 |
|  |  |  |  |  | 306 | 30.10 | 37.00 | 4.40 | 61.00 | 6.10 |
|  |  |  |  |  | 407 | 30.90 | 30.00 | 3.60 | 110.00 | 11.00 |
| Mean = | | | | | | 28.53 | 44.75 | 5.38 | 129.50 | 12.95 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 108 | 31.20 | 53.00 | 6.30 | 211.00 | 21.10 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 30.40 | 67.00 | 8.10 | 140.00 | 14.00 |
|  |  |  |  |  | 305 | 32.60 | 44.00 | 5.30 | 124.00 | 12.40 |
|  |  |  |  |  | 406 | 31.10 | 41.00 | 4.90 | 58.00 | 5.80 |
| Mean = | | | | | | 31.33 | 51.25 | 6.15 | 133.25 | 13.33 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 102 | 31.10 | 54.00 | 6.50 | 244.00 | 24.40 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 22.30 | 76.00 | 9.10 | 165.00 | 16.50 |
|  |  |  |  |  | 301 | 25.00 | 32.00 | 3.80 | 185.00 | 18.50 |
|  |  |  |  |  | 402 | 27.10 | 31.00 | 3.70 | 153.00 | 15.30 |
| Mean = | | | | | | 26.38 | 48.25 | 5.78 | 186.75 | 18.68 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 107 | 29.90 | 57.00 | 6.90 | 221.00 | 22.10 |
|  | Regalia | 1 | qt/a | BD | 207 | 24.70 | 52.00 | 6.20 | 168.00 | 16.80 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 303 | 23.40 | 49.00 | 5.90 | 138.00 | 13.80 |
|  |  |  |  |  | 401 | 33.60 | 56.00 | 6.70 | 81.00 | 8.30 |
| Mean = | | | | | | 27.90 | 53.50 | 6.43 | 152.00 | 15.25 |

6Feb14 (ENA1313$ PM Tomato) Assessment Data Summary Page 10 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | |  |  |  |  |  |
| Pest Code | | | | | |  |  |  |  |  |
| Pest Scientific Name | | | | | |  |  |  |  |  |
| Pest Name | | | | | |  |  |  |  |  |
| Crop Code | | | | | | LYPES | LYPES | LYPES | LYPES | LYPES |
| BBCH Scale | | | | | | BVSO | BVSO | BVSO | BVSO | BVSO |
| Crop Scientific Name | | | | | | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> |
| Crop Name | | | | | | Tomato | Tomato | Tomato | Tomato | Tomato |
| Crop Variety | | | | | |  |  |  |  |  |
| Description | | | | | | Unmarketable # | Unmarketable w> | 1-2 Cuml Markt> | 1-3 Cuml Markt> | 1-4 Cuml Markt> |
| Part Rated | | | | | | FRUUNM C | FRUUNM C | FRUMAR C | FRUMAR C | FRUMAR C |
| Rating Date | | | | | | 24Sep13 | 24Sep13 | 12Aug13 | 12Aug13 | 12Aug13 |
| Rating Type | | | | | | YIELD | WEIUNM | YIELD | YIELD | YIELD |
| Rating Unit | | | | | | NUMBER | KG | NUMBER | NUMBER | NUMBER |
| Sample Size, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Collection Basis, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Number of Subsamples | | | | | | 1 | 1 | 1 | 1 | 1 |
| Days After First/Last Applic. | | | | | | 53 25 | 53 25 | 10 3 | 10 3 | 10 3 |
| Trt-Eval Interval | | | | | | 25 DA-E | 25 DA-E | 3 DA-B | 3 DA-B | 3 DA-B |
| Plant-Eval Interval | | | | | | 125 DP-1 | 125 DP-1 | 82 DP-1 | 82 DP-1 | 82 DP-1 |
| ARM Action Codes | | | | | |  |  | T1 | T2 | T3 |
| Number of Decimals | | | | | | 2 | 2 | 2 | 2 | 2 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 44 | 45 | 46 | 47 | 48 |
| 1 | Untreated Check |  |  | ABCDE | 106 | 68.00 | 3.40 | 31.00 | 68.00 | 121.00 |
|  |  |  |  |  | 201 | 124.00 | 6.20 | 22.00 | 57.00 | 88.00 |
|  |  |  |  |  | 307 | 126.00 | 6.30 | 18.00 | 20.00 | 61.00 |
|  |  |  |  |  | 405 | 62.00 | 3.10 | 33.00 | 58.00 | 88.00 |
| Mean = | | | | | | 95.00 | 4.75 | 26.00 | 50.75 | 89.50 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 101 | 140.00 | 7.00 | 13.00 | 49.00 | 84.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 156.00 | 7.80 | 24.00 | 44.00 | 78.00 |
|  |  |  |  |  | 306 | 100.00 | 5.00 | 29.00 | 68.00 | 114.00 |
|  |  |  |  |  | 407 | 110.00 | 5.50 | 19.00 | 40.00 | 79.00 |
| Mean = | | | | | | 126.50 | 6.33 | 21.25 | 50.25 | 88.75 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 108 | 134.00 | 6.70 | 15.00 | 54.00 | 89.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 124.00 | 6.20 | 32.00 | 51.00 | 99.00 |
|  |  |  |  |  | 305 | 112.00 | 5.60 | 14.00 | 41.00 | 97.00 |
|  |  |  |  |  | 406 | 50.00 | 2.50 | 33.00 | 54.00 | 112.00 |
| Mean = | | | | | | 105.00 | 5.25 | 23.50 | 50.00 | 99.25 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 102 | 140.00 | 7.00 | 30.00 | 63.00 | 82.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 142.00 | 7.10 | 16.00 | 37.00 | 71.00 |
|  |  |  |  |  | 301 | 120.00 | 6.00 | 20.00 | 41.00 | 66.00 |
|  |  |  |  |  | 402 | 98.00 | 4.90 | 35.00 | 72.00 | 101.00 |
| Mean = | | | | | | 125.00 | 6.25 | 25.25 | 53.25 | 80.00 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 107 | 162.00 | 8.10 | 13.00 | 30.00 | 67.00 |
|  | Regalia | 1 | qt/a | BD | 207 | 164.00 | 8.20 | 24.00 | 46.00 | 84.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 303 | 106.00 | 5.30 | 32.00 | 54.00 | 110.00 |
|  |  |  |  |  | 401 | 62.00 | 3.10 | 27.00 | 42.00 | 63.00 |
| Mean = | | | | | | 123.50 | 6.18 | 24.00 | 43.00 | 81.00 |

6Feb14 (ENA1313$ PM Tomato) Assessment Data Summary Page 11 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | |  |  |  |  |  |
| Pest Code | | | | | |  |  |  |  |  |
| Pest Scientific Name | | | | | |  |  |  |  |  |
| Pest Name | | | | | |  |  |  |  |  |
| Crop Code | | | | | | LYPES | LYPES | LYPES | LYPES | LYPES |
| BBCH Scale | | | | | | BVSO | BVSO | BVSO | BVSO | BVSO |
| Crop Scientific Name | | | | | | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> |
| Crop Name | | | | | | Tomato | Tomato | Tomato | Tomato | Tomato |
| Crop Variety | | | | | |  |  |  |  |  |
| Description | | | | | | 1-5 Cuml Markt> | 1-6 Cuml Markt> | 1-2 Cuml UnMar> | 1-3 Cuml UnMar> | 1-4 Cuml UnMar> |
| Part Rated | | | | | | FRUMAR C | FRUMAR C | FRUMAR C | FRUMAR C | FRUMAR C |
| Rating Date | | | | | | 12Aug13 | 12Aug13 | 12Aug13 | 12Aug13 | 12Aug13 |
| Rating Type | | | | | | YIELD | YIELD | YIELD | YIELD | YIELD |
| Rating Unit | | | | | | NUMBER | NUMBER | NUMBER | NUMBER | NUMBER |
| Sample Size, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Collection Basis, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Number of Subsamples | | | | | | 1 | 1 | 1 | 1 | 1 |
| Days After First/Last Applic. | | | | | | 10 3 | 10 3 | 10 3 | 10 3 | 10 3 |
| Trt-Eval Interval | | | | | | 3 DA-B | 3 DA-B | 3 DA-B | 3 DA-B | 3 DA-B |
| Plant-Eval Interval | | | | | | 82 DP-1 | 82 DP-1 | 82 DP-1 | 82 DP-1 | 82 DP-1 |
| ARM Action Codes | | | | | | T4 | T5 | T6 | T7 | T8 |
| Number of Decimals | | | | | | 2 | 2 | 2 | 2 | 2 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 49 | 50 | 51 | 52 | 53 |
| 1 | Untreated Check |  |  | ABCDE | 106 | 405.00 | 514.00 | 9.00 | 30.00 | 77.00 |
|  |  |  |  |  | 201 | 268.00 | 416.00 | 13.00 | 30.00 | 69.00 |
|  |  |  |  |  | 307 | 300.00 | 445.00 | 6.00 | 18.00 | 47.00 |
|  |  |  |  |  | 405 | 347.00 | 429.00 | 15.00 | 26.00 | 53.00 |
| Mean = | | | | | | 330.00 | 451.00 | 10.75 | 26.00 | 61.50 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 101 | 333.00 | 525.00 | 7.00 | 24.00 | 43.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 273.00 | 428.00 | 9.00 | 21.00 | 53.00 |
|  |  |  |  |  | 306 | 366.00 | 427.00 | 9.00 | 21.00 | 48.00 |
|  |  |  |  |  | 407 | 338.00 | 448.00 | 11.00 | 26.00 | 48.00 |
| Mean = | | | | | | 327.50 | 457.00 | 9.00 | 23.00 | 48.00 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 108 | 344.00 | 555.00 | 5.00 | 24.00 | 48.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 352.00 | 492.00 | 14.00 | 30.00 | 65.00 |
|  |  |  |  |  | 305 | 374.00 | 498.00 | 7.00 | 27.00 | 52.00 |
|  |  |  |  |  | 406 | 373.00 | 431.00 | 14.00 | 32.00 | 61.00 |
| Mean = | | | | | | 360.75 | 494.00 | 10.00 | 28.25 | 56.50 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 102 | 340.00 | 584.00 | 7.00 | 24.00 | 63.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 257.00 | 422.00 | 11.00 | 30.00 | 61.00 |
|  |  |  |  |  | 301 | 275.00 | 460.00 | 7.00 | 20.00 | 35.00 |
|  |  |  |  |  | 402 | 326.00 | 479.00 | 6.00 | 27.00 | 46.00 |
| Mean = | | | | | | 299.50 | 486.25 | 7.75 | 25.25 | 51.25 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 107 | 316.00 | 537.00 | 7.00 | 17.00 | 49.00 |
|  | Regalia | 1 | qt/a | BD | 207 | 291.00 | 459.00 | 12.00 | 24.00 | 48.00 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 303 | 305.00 | 443.00 | 8.00 | 28.00 | 66.00 |
|  |  |  |  |  | 401 | 326.00 | 407.00 | 9.00 | 24.00 | 48.00 |
| Mean = | | | | | | 309.50 | 461.50 | 9.00 | 23.25 | 52.75 |

6Feb14 (ENA1313$ PM Tomato) Assessment Data Summary Page 12 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | |  |  |  |  |  |
| Pest Code | | | | | |  |  |  |  |  |
| Pest Scientific Name | | | | | |  |  |  |  |  |
| Pest Name | | | | | |  |  |  |  |  |
| Crop Code | | | | | | LYPES | LYPES | LYPES | LYPES | LYPES |
| BBCH Scale | | | | | | BVSO | BVSO | BVSO | BVSO | BVSO |
| Crop Scientific Name | | | | | | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> |
| Crop Name | | | | | | Tomato | Tomato | Tomato | Tomato | Tomato |
| Crop Variety | | | | | |  |  |  |  |  |
| Description | | | | | | 1-5 Cuml UnMar> | 1-6 Cuml UnMar> | Total Market W> | Total UnMark W> | % Marketable |
| Part Rated | | | | | | FRUMAR C | FRUMAR C | FRUMAR C | FRUMAR C | HEASMA C |
| Rating Date | | | | | | 12Aug13 | 12Aug13 | 12Aug13 | 12Aug13 | 14Aug13 |
| Rating Type | | | | | | YIELD | YIELD | WEIGHT | WEIGHT | YIELD |
| Rating Unit | | | | | | NUMBER | NUMBER | kg | kg | NUMBER |
| Sample Size, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Collection Basis, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Number of Subsamples | | | | | | 1 | 1 | 1 | 1 | 1 |
| Days After First/Last Applic. | | | | | | 10 3 | 10 3 | 10 3 | 10 3 | 12 5 |
| Trt-Eval Interval | | | | | | 3 DA-B | 3 DA-B | 3 DA-B | 3 DA-B | 5 DA-D |
| Plant-Eval Interval | | | | | | 82 DP-1 | 82 DP-1 | 82 DP-1 | 82 DP-1 | 84 DP-1 |
| ARM Action Codes | | | | | | T9 | T10 | T13 | T14 | T11 |
| Number of Decimals | | | | | | 2 | 2 | 2 | 2 | 2 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 54 | 55 | 56 | 57 | 58 |
| 1 | Untreated Check |  |  | ABCDE | 106 | 128.00 | 196.00 | 61.70 | 20.30 | 72.39 |
|  |  |  |  |  | 201 | 123.00 | 247.00 | 48.70 | 22.10 | 62.75 |
|  |  |  |  |  | 307 | 94.00 | 220.00 | 54.20 | 18.80 | 66.92 |
|  |  |  |  |  | 405 | 126.00 | 188.00 | 50.70 | 18.70 | 69.53 |
| Mean = | | | | | | 117.75 | 212.75 | 53.83 | 19.98 | 67.90 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 101 | 95.00 | 235.00 | 60.80 | 19.20 | 69.08 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 113.00 | 269.00 | 49.40 | 22.10 | 61.41 |
|  |  |  |  |  | 306 | 85.00 | 185.00 | 51.90 | 16.20 | 69.77 |
|  |  |  |  |  | 407 | 78.00 | 188.00 | 53.00 | 15.10 | 70.44 |
| Mean = | | | | | | 92.75 | 219.25 | 53.78 | 18.15 | 67.67 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 108 | 101.00 | 235.00 | 64.70 | 19.40 | 70.25 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 132.00 | 256.00 | 58.00 | 26.00 | 65.78 |
|  |  |  |  |  | 305 | 96.00 | 208.00 | 58.60 | 17.60 | 70.54 |
|  |  |  |  |  | 406 | 102.00 | 152.00 | 51.70 | 15.10 | 73.93 |
| Mean = | | | | | | 107.75 | 212.75 | 58.25 | 19.53 | 70.12 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 102 | 117.00 | 257.00 | 66.90 | 21.00 | 69.44 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 137.00 | 279.00 | 48.90 | 24.40 | 60.20 |
|  |  |  |  |  | 301 | 67.00 | 187.00 | 52.60 | 13.80 | 71.10 |
|  |  |  |  |  | 402 | 77.00 | 175.00 | 56.30 | 14.70 | 73.24 |
| Mean = | | | | | | 99.50 | 224.50 | 56.18 | 18.48 | 68.49 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 107 | 106.00 | 268.00 | 61.30 | 21.60 | 66.71 |
|  | Regalia | 1 | qt/a | BD | 207 | 100.00 | 264.00 | 52.80 | 20.90 | 63.49 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 303 | 115.00 | 221.00 | 52.20 | 20.30 | 66.72 |
|  |  |  |  |  | 401 | 104.00 | 166.00 | 50.70 | 15.20 | 71.03 |
| Mean = | | | | | | 106.25 | 229.75 | 54.25 | 19.50 | 66.99 |

6Feb14 (ENA1313$ PM Tomato) Assessment Data Summary Page 13 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | |  |  |  |  |
| Pest Code | | | | | |  |  |  |  |
| Pest Scientific Name | | | | | |  |  |  |  |
| Pest Name | | | | | |  |  |  |  |
| Crop Code | | | | | | LYPES | LYPES | LYPES | LYPES |
| BBCH Scale | | | | | | BVSO | BVSO | BVSO | BVSO |
| Crop Scientific Name | | | | | | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> |
| Crop Name | | | | | | Tomato | Tomato | Tomato | Tomato |
| Crop Variety | | | | | |  |  | TOTAL | TOTAL |
| Description | | | | | | % UnMarketable | lb/ACRE | CARTONS/ACRE | $/ACRE |
| Part Rated | | | | | | HEASMA C | FRUMAR C | FRUMAR C | FRUMAR C |
| Rating Date | | | | | | 14Aug13 | 14Aug13 | 24Sep13 | 24Sep13 |
| Rating Type | | | | | | YIELD | YIELD | COMPRO | INCGRO |
| Rating Unit | | | | | | NUMBER | lb | NUMBER | DOLLAR |
| Sample Size, Unit | | | | | | 1 PLOT | 1 A | 1 ACRE | 1 ACRE |
| Collection Basis, Unit | | | | | | 1 PLOT | 25 A | 1 ACRE | 1 ACRE |
| Number of Subsamples | | | | | | 1 | 1 | 1 | 1 |
| Days After First/Last Applic. | | | | | | 12 5 | 12 5 | 53 25 | 53 25 |
| Trt-Eval Interval | | | | | | 5 DA-D | 10 DA-D | 139 DA-A | 139 DA-A |
| Plant-Eval Interval | | | | | | 84 DP-1 | 84 DP-1 | 125 DP-1 | 125 DP-1 |
| ARM Action Codes | | | | | | T12 | T16 | T17 | T15 |
| Number of Decimals | | | | | | 2 | 2 | 2 | 2 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 59 | 60 | 61 | 62 |
| 1 | Untreated Check |  |  | ABCDE | 106 | 27.61 | 84731.19 | 4236.56 | 29655.91 |
|  |  |  |  |  | 201 | 37.25 | 66878.59 | 3343.93 | 23407.51 |
|  |  |  |  |  | 307 | 33.08 | 74431.61 | 3721.58 | 26051.06 |
|  |  |  |  |  | 405 | 30.47 | 69625.14 | 3481.26 | 24368.80 |
| Mean = | | | | | | 32.10 | 73916.63 | 3695.83 | 25870.82 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 101 | 30.92 | 83495.24 | 4174.76 | 29223.33 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 38.59 | 67839.88 | 3391.99 | 23743.96 |
|  |  |  |  |  | 306 | 30.23 | 71273.07 | 3563.65 | 24945.57 |
|  |  |  |  |  | 407 | 29.56 | 72783.68 | 3639.18 | 25474.29 |
| Mean = | | | | | | 32.33 | 73847.97 | 3692.40 | 25846.79 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 108 | 29.75 | 88851.02 | 4442.55 | 31097.86 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 34.22 | 79650.06 | 3982.50 | 27877.52 |
|  |  |  |  |  | 305 | 29.46 | 80474.03 | 4023.70 | 28165.91 |
|  |  |  |  |  | 406 | 26.07 | 70998.42 | 3549.92 | 24849.45 |
| Mean = | | | | | | 29.88 | 79993.38 | 3999.67 | 27997.68 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 102 | 30.56 | 91872.23 | 4593.61 | 32155.28 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 39.80 | 67153.24 | 3357.66 | 23503.63 |
|  |  |  |  |  | 301 | 28.90 | 72234.37 | 3611.72 | 25282.03 |
|  |  |  |  |  | 402 | 26.76 | 77315.49 | 3865.77 | 27060.42 |
| Mean = | | | | | | 31.51 | 77143.83 | 3857.19 | 27000.34 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 107 | 33.29 | 84181.88 | 4209.09 | 29463.65 |
|  | Regalia | 1 | qt/a | BD | 207 | 36.51 | 72509.02 | 3625.45 | 25378.15 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 303 | 33.28 | 71685.05 | 3584.25 | 25089.77 |
|  |  |  |  |  | 401 | 28.97 | 69625.14 | 3481.26 | 24368.80 |
| Mean = | | | | | | 33.01 | 74500.27 | 3725.01 | 26075.10 |

6Feb14 (ENA1313$ PM Tomato) Assessment Data Summary Page 14 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | | D Disease | D Disease | D Disease | D Disease |
| Pest Code | | | | | | LEVETA | LEVETA | LEVETA | LEVETA |
| Pest Scientific Name | | | | | | Leveillula tau> | Leveillula tau> | Leveillula tau> | Leveillula tau> |
| Pest Name | | | | | | Powdery mildew> | Powdery mildew> | Powdery mildew> | Powdery mildew> |
| Crop Code | | | | | | LYPES | LYPES | LYPES | LYPES |
| BBCH Scale | | | | | | BVSO | BVSO | BVSO | BVSO |
| Crop Scientific Name | | | | | | Solanum lycope> | Solanum lycope> | Solanum lycope> | Solanum lycope> |
| Crop Name | | | | | | Tomato | Tomato | Tomato | Tomato |
| Crop Variety | | | | | |  |  |  |  |
| Description | | | | | | AUDPC SEVERITY | % CONTROL SEVE> | SEVERITY\_PM | SEVERITY\_PM |
| Part Rated | | | | | | PLANT C | PLANT C | PLANT C | PLANT C |
| Rating Date | | | | | | 20Sep13 | 20Sep13 |  |  |
| Rating Type | | | | | |  | CONTRO | SAUDPC | CONTRO |
| Rating Unit | | | | | | AUDPC | %UNCK | % | %UNCK |
| Sample Size, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Collection Basis, Unit | | | | | | 10 PLANT | 10 PLANT | 10 PLANT | 10 PLANT |
| Number of Subsamples | | | | | | 1 | 1 | 10 | 1 |
| Days After First/Last Applic. | | | | | | 49 21 | 49 21 |  |  |
| Trt-Eval Interval | | | | | | 21 DA-E | 21 DA-E |  |  |
| Plant-Eval Interval | | | | | | 121 DP-1 | 121 DP-1 |  |  |
| ARM Action Codes | | | | | | T18 SAUDPC | TAB[63] | T20 SAUDPC | TAB[65] |
| Number of Decimals | | | | | | 2 | 2 |  |  |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 63 | 64 | 65 | 66 |
| 1 | Untreated Check |  |  | ABCDE | 106 | 49.52 | 0.00 | 23.84160 | 0.0000000 |
|  |  |  |  |  | 201 | 46.65 | 0.00 | 23.01380 | 0.0000000 |
|  |  |  |  |  | 307 | 58.67 | 0.00 | 37.78000 | 0.0000000 |
|  |  |  |  |  | 405 | 62.48 | 0.00 | 39.06000 | 0.0000000 |
| Mean = | | | | | | 54.33 | 0.00 | 30.92385 | 0.0000000 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 101 | 33.83 | 31.67 | 18.25500 | 23.4321543 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 41.16 | 11.77 | 23.22800 | -1.0000001 |
|  |  |  |  |  | 306 | 55.21 | 5.90 | 31.17000 | 17.4960307 |
|  |  |  |  |  | 407 | 43.08 | 31.05 | 19.11200 | 51.0701551 |
| Mean = | | | | | | 43.32 | 20.10 | 22.94125 | 22.7495850 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 108 | 39.37 | 20.49 | 19.27500 | 19.1539169 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 55.17 | -18.00 | 30.17000 | -31.0000031 |
|  |  |  |  |  | 305 | 43.11 | 26.52 | 23.87800 | 36.7972537 |
|  |  |  |  |  | 406 | 51.88 | 16.97 | 25.73200 | 34.1218674 |
| Mean = | | | | | | 47.38 | 11.50 | 24.76375 | 14.7682587 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 102 | 35.19 | 28.94 | 19.09200 | 19.9214840 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 43.45 | 6.86 | 19.92800 | 13.4084783 |
|  |  |  |  |  | 301 | 50.01 | 14.75 | 30.06000 | 20.4340940 |
|  |  |  |  |  | 402 | 44.95 | 28.06 | 19.53000 | 50.0000050 |
| Mean = | | | | | | 43.40 | 19.65 | 22.15250 | 25.9410153 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 107 | 40.35 | 18.50 | 17.21300 | 27.8026668 |
|  | Regalia | 1 | qt/a | BD | 207 | 39.14 | 16.09 | 18.10500 | 21.3298121 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 303 | 47.74 | 18.62 | 22.45500 | 40.5637941 |
|  |  |  |  |  | 401 | 49.82 | 20.27 | 24.95500 | 36.1111136 |
| Mean = | | | | | | 44.26 | 18.37 | 20.68200 | 31.4518466 |

6Feb14 (ENA1313$ PM Tomato) Assessment Data Summary Page 15 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

Pest Type

D, Disease, G-BYRD7, G-DisStg = Disease, such as a fungus, bacteria, or virus

Pest Code

LEVETA, Leveillula taurica, = US

Crop Code

LYPES, BVSO, Solanum lycopersicum, = US

Part Rated

PLANT = plant

FRUMAR = fruit - marketable

FRUUNM = fruit - unmarketable

HEASMA = head - small

C = Crop is Part Rated

Rating Type

PHYGEN = phytotoxicity - general / injury

VIGOR = vigor

PESSEV = pest severity

YIELD = yield

WEIGHT = weight

WEIUNM = weight unmarketable

COMPRO = commercial product, general

INCGRO = income - gross / value

CONTRO = control / burndown or knockdown

SAUDPC = Standardized AUDPC (average AUDPC per day)

Rating Unit

0-10 = 0-10 index/scale

% = percent

NUMBER = number

KG = kilogram

lb = pound

DOLLAR = dollar

AUDPC = area under disease process curve

%UNCK = percent of untreated check

PLOT = total plot

A = acre

PLOT = total plot

PLANT = plant/plant biomass/shrub

A = acre

Plant-Eval Interval

79 DP-1 = 1 LYPES 22May13

84 DP-1 = 1 LYPES 22May13

94 DP-1 = 1 LYPES 22May13

100 DP-1 = 1 LYPES 22May13

106 DP-1 = 1 LYPES 22May13

121 DP-1 = 1 LYPES 22May13

113 DP-1 = 1 LYPES 22May13

75 DP-1 = 1 LYPES 22May13

76 DP-1 = 1 LYPES 22May13

82 DP-1 = 1 LYPES 22May13

90 DP-1 = 1 LYPES 22May13

96 DP-1 = 1 LYPES 22May13

110 DP-1 = 1 LYPES 22May13

125 DP-1 = 1 LYPES 22May13

ARM Action Codes

AL = Automatic log transformation of X+1

AA = Automatic arcsine square root % transformation

T1 = [C22]+[C26]

T2 = [C30]+[C46]

T3 = [C34]+[C47]

T4 = [C38]+[C48]

T5 = [C42]+[C49]

T6 = [C24]+[C28]

T7 = [C51]+[C32]

T8 = [C52]+[C36]

T9 = [C40]+[C53]

T10 = [C44]+[C54]

T13 = [C23]+[C27]+[C31]+[C35]+[C39]+[C43]

T14 = [C25]+[C29]+[C33]+[C37]+[C41]+[C45]

T11 = ([C50]/([C55]+[C50]))\*100

T12 = ([C55]/([C50]+[C55]))\*100

T16 = ([C56]\*2.20462)/0.0016053719

T17 = [60]/20

T15 = [C61]\*7

T18 = &@SAUDPC(@MATCH(EPT=LEVETA,EDT=PESSEV,ERU=%))

6Feb14 (ENA1313$ PM Tomato) Assessment Data Summary Page 16 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

TAB[63] = Abbott (% of Untreated)[63]

T20 = &@SAUDPC(@MATCH(EPT=LEVETA,ECE=SEVERITY\_PM,EDT=PESSEV,ERU=%))

TAB[65] = Abbott (% of Untreated)[65]

6Feb14 (ENA1313$ PM Tomato) AOV Means Table Page 1 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | D Disease | | D Disease | | D Disease | | D Disease | | D Disease | |
| Pest Code | | | | | LEVETA | | LEVETA | | LEVETA | | LEVETA | | LEVETA | |
| Pest Scientific Name | | | | | Leveillula tau> | | Leveillula tau> | | Leveillula tau> | | Leveillula tau> | | Leveillula tau> | |
| Pest Name | | | | | Powdery mildew> | | Powdery mildew> | | Powdery mildew> | | Powdery mildew> | | Powdery mildew> | |
| Crop Code | | | | | LYPES | | LYPES | | LYPES | | LYPES | | LYPES | |
| BBCH Scale | | | | | BVSO | | BVSO | | BVSO | | BVSO | | BVSO | |
| Crop Scientific Name | | | | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | |
| Crop Name | | | | | Tomato | | Tomato | | Tomato | | Tomato | | Tomato | |
| Crop Variety | | | | |  | |  | |  | |  | |  | |
| Description | | | | | PHYTOTOXICITY | | PHYTOTOXICITY | | PHYTOTOXICITY | | PHYTOTOXICITY | | PHYTOTOXICITY | |
| Part Rated | | | | | PLANT C | | PLANT C | | PLANT C | | PLANT C | | PLANT C | |
| Rating Date | | | | | 9Aug13 | | 14Aug13 | | 24Aug13 | | 30Aug13 | | 5Sep13 | |
| Rating Type | | | | | PHYGEN | | PHYGEN | | PHYGEN | | PHYGEN | | PHYGEN | |
| Rating Unit | | | | | percent | | percent | | percent | | percent | | percent | |
| Sample Size, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Collection Basis, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Number of Subsamples | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Days After First/Last Applic. | | | | | 7 7 | | 12 5 | | 22 1 | | 28 7 | | 34 6 | |
| Trt-Eval Interval | | | | | 7 DA-A | | 5 DA-B | | 1 DA-D | | 7 DA-D | | 6 DA-E | |
| Plant-Eval Interval | | | | | 79 DP-1 | | 84 DP-1 | | 94 DP-1 | | 100 DP-1 | | 106 DP-1 | |
| ARM Action Codes | | | | |  | |  | |  | |  | |  | |
| Number of Decimals | | | | | 2 | | 2 | | 2 | | 2 | | 2 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 1 | | 2 | | 3 | | 4 | | 5 | |
| 1 | Untreated Check |  |  | ABCDE | 0.00 | a | 0.00 | a | 0.00 | a | 0.00 | a | 0.00 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 0.00 | a | 0.00 | a | 0.00 | a | 0.00 | a | 0.00 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 0.00 | a | 0.00 | a | 0.00 | a | 0.00 | a | 0.00 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 0.00 | a | 0.03 | a | 0.00 | a | 0.00 | a | 0.00 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 0.00 | a | 0.00 | a | 0.00 | a | 0.00 | a | 0.00 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 0.000 | | 0.034 | | 0.000 | | 0.000 | | 0.000 | |
| Standard Deviation | | | | | 0.000 | | 0.022 | | 0.000 | | 0.000 | | 0.000 | |
| CV | | | | | 0.0 | | 447.21 | | 0.0 | | 0.0 | | 0.0 | |
| Bartlett's X2 | | | | | 0.0 | | 0.0 | | 0.0 | | 0.0 | | 0.0 | |
| P(Bartlett's X2) | | | | | . | | . | | . | | . | | . | |
| Skewness | | | | | . | | 4.4721\* | | . | | . | | . | |
| Kurtosis | | | | | . | | 20.0\* | | . | | . | | . | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 0.000 | | 1.000 | | 0.000 | | 0.000 | | 0.000 | |
| Replicate Prob(F) | | | | | 1.0000 | | 0.4262 | | 1.0000 | | 1.0000 | | 1.0000 | |
| Treatment F | | | | | 0.000 | | 1.000 | | 0.000 | | 0.000 | | 0.000 | |
| Treatment Prob(F) | | | | | 1.0000 | | 0.4449 | | 1.0000 | | 1.0000 | | 1.0000 | |

Means followed by same letter do not significantly differ (P=.05, LSD)

t=Mean descriptions are reported in transformed data units, and are not de-transformed.

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Missing data estimates are included in columns:Yates=8

6Feb14 (ENA1313$ PM Tomato) AOV Means Table Page 2 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | D Disease | | D Disease | | D Disease | | D Disease | | D Disease | |
| Pest Code | | | | | LEVETA | | LEVETA | | LEVETA | | LEVETA | | LEVETA | |
| Pest Scientific Name | | | | | Leveillula tau> | | Leveillula tau> | | Leveillula tau> | | Leveillula tau> | | Leveillula tau> | |
| Pest Name | | | | | Powdery mildew> | | Powdery mildew> | | Powdery mildew> | | Powdery mildew> | | Powdery mildew> | |
| Crop Code | | | | | LYPES | | LYPES | | LYPES | | LYPES | | LYPES | |
| BBCH Scale | | | | | BVSO | | BVSO | | BVSO | | BVSO | | BVSO | |
| Crop Scientific Name | | | | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | |
| Crop Name | | | | | Tomato | | Tomato | | Tomato | | Tomato | | Tomato | |
| Crop Variety | | | | |  | |  | |  | |  | |  | |
| Description | | | | | PHYTOTOXICITY | | VIGOR | | VIGOR | | VIGOR | | VIGOR | |
| Part Rated | | | | | PLANT C | | PLANT C | | PLANT C | | PLANT C | | PLANT C | |
| Rating Date | | | | | 20Sep13 | | 9Aug13 | | 14Aug13 | | 24Aug13 | | 30Aug13 | |
| Rating Type | | | | | PHYGEN | | VIGOR | | VIGOR | | VIGOR | | VIGOR | |
| Rating Unit | | | | | percent | | 0-10 | | 0-10 | | 0-10 | | 0-10 | |
| Sample Size, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Collection Basis, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Number of Subsamples | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Days After First/Last Applic. | | | | | 49 21 | | 7 7 | | 12 5 | | 22 1 | | 28 7 | |
| Trt-Eval Interval | | | | | 21 DA-E | | 7 DA-A | | 5 DA-B | | 1 DA-D | | 7 DA-D | |
| Plant-Eval Interval | | | | | 121 DP-1 | | 79 DP-1 | | 84 DP-1 | | 94 DP-1 | | 100 DP-1 | |
| ARM Action Codes | | | | |  | |  | |  | |  | |  | |
| Number of Decimals | | | | | 2 | | 2 | | 2 | | 2 | | 2 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 6 | | 7 | | 8 | | 9 | | 10 | |
| 1 | Untreated Check |  |  | ABCDE | 0.00 | a | 4.75 | a | 5.03 | a | 4.38 | a | 5.00 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 0.00 | a | 4.75 | a | 5.13 | a | 4.75 | a | 4.75 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 0.00 | a | 5.25 | a | 5.13 | a | 4.88 | a | 4.38 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 0.00 | a | 5.25 | a | 5.38 | a | 5.50 | a | 4.88 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 0.00 | a | 5.00 | a | 5.00 | a | 5.00 | a | 5.00 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 0.000 | | 0.660 | | 0.397 | | 1.196 | | 0.663 | |
| Standard Deviation | | | | | 0.000 | | 0.428 | | 0.255 | | 0.776 | | 0.431 | |
| CV | | | | | 0.0 | | 8.56 | | 4.97 | | 15.84 | | 8.97 | |
| Bartlett's X2 | | | | | 0.0 | | 2.06 | | 1.724 | | 5.141 | | 0.691 | |
| P(Bartlett's X2) | | | | | . | | 0.56 | | 0.422 | | 0.162 | | 0.875 | |
| Skewness | | | | | . | | 0.0 | | 2.1575\* | | 0.5003 | | -0.9067 | |
| Kurtosis | | | | | . | | 0.8072 | | 4.2533\* | | 1.1164 | | 0.7468 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 0.000 | | 5.091 | | 1.837 | | 1.882 | | 3.416 | |
| Replicate Prob(F) | | | | | 1.0000 | | 0.0168 | | 0.1987 | | 0.1864 | | 0.0529 | |
| Treatment F | | | | | 0.000 | | 1.364 | | 1.333 | | 1.111 | | 1.449 | |
| Treatment Prob(F) | | | | | 1.0000 | | 0.3036 | | 0.3180 | | 0.3960 | | 0.2776 | |

6Feb14 (ENA1313$ PM Tomato) AOV Means Table Page 3 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | D Disease | | D Disease | | D Disease | | D Disease | | D Disease | |
| Pest Code | | | | | LEVETA | | LEVETA | | LEVETA | | LEVETA | | LEVETA | |
| Pest Scientific Name | | | | | Leveillula tau> | | Leveillula tau> | | Leveillula tau> | | Leveillula tau> | | Leveillula tau> | |
| Pest Name | | | | | Powdery mildew> | | Powdery mildew> | | Powdery mildew> | | Powdery mildew> | | Powdery mildew> | |
| Crop Code | | | | | LYPES | | LYPES | | LYPES | | LYPES | | LYPES | |
| BBCH Scale | | | | | BVSO | | BVSO | | BVSO | | BVSO | | BVSO | |
| Crop Scientific Name | | | | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | |
| Crop Name | | | | | Tomato | | Tomato | | Tomato | | Tomato | | Tomato | |
| Crop Variety | | | | |  | |  | |  | |  | |  | |
| Description | | | | | VIGOR | | VIGOR | | VIGOR | | SEVERITY\_PM | | SEVERITY\_PM | |
| Part Rated | | | | | PLANT C | | PLANT C | | PLANT C | | PLANT C | | PLANT C | |
| Rating Date | | | | | 5Sep13 | | 12Sep13 | | 20Sep13 | | 5Aug13 | | 9Aug13 | |
| Rating Type | | | | | VIGOR | | VIGOR | | VIGOR | | PESSEV | | PESSEV | |
| Rating Unit | | | | | 0-10 | | 0-10 | | 0-10 | | % | | % | |
| Sample Size, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Collection Basis, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 10 PLANT | | 10 PLANT | |
| Number of Subsamples | | | | | 1 | | 1 | | 1 | | 10 | | 10 | |
| Days After First/Last Applic. | | | | | 34 6 | | 41 13 | | 49 21 | | 3 3 | | 7 7 | |
| Trt-Eval Interval | | | | | 6 DA-E | | 13 DA-E | | 21 DA-E | | 3 DA-A | | 7 DA-A | |
| Plant-Eval Interval | | | | | 106 DP-1 | | 113 DP-1 | | 121 DP-1 | | 75 DP-1 | | 79 DP-1 | |
| ARM Action Codes | | | | |  | |  | |  | |  | |  | |
| Number of Decimals | | | | | 2 | | 2 | | 2 | | 2 | | 2 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 11 | | 12 | | 13 | | 14 | | 15 | |
| 1 | Untreated Check |  |  | ABCDE | 3.50 | a | 4.50 | a | 4.25 | a | 9.97 | a | 22.81 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 3.50 | a | 4.88 | a | 4.25 | a | 9.09 | a | 17.19 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 4.50 | a | 4.75 | a | 4.25 | a | 7.81 | a | 15.38 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 4.75 | a | 4.63 | a | 4.50 | a | 7.56 | a | 15.38 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 5.00 | a | 5.00 | a | 5.00 | a | 11.03 | a | 13.94 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 1.349 | | 0.576 | | 1.427 | | 3.714 | | 8.687 | |
| Standard Deviation | | | | | 0.876 | | 0.374 | | 0.926 | | 2.410 | | 5.638 | |
| CV | | | | | 20.6 | | 7.87 | | 20.82 | | 26.51 | | 33.29 | |
| Bartlett's X2 | | | | | 0.45 | | 4.255 | | 0.343 | | 0.33 | | 4.66 | |
| P(Bartlett's X2) | | | | | 0.93 | | 0.119 | | 0.952 | | 0.988 | | 0.324 | |
| Skewness | | | | | -0.2294 | | -1.9913\* | | -0.3879 | | 0.3129 | | 0.5407 | |
| Kurtosis | | | | | -0.4042 | | 5.1356\* | | -0.7528 | | -0.5935 | | -0.378 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 8.065 | | 1.075 | | 5.806 | | 2.805 | | 2.617 | |
| Replicate Prob(F) | | | | | 0.0033 | | 0.3966 | | 0.0109 | | 0.0850 | | 0.0991 | |
| Treatment F | | | | | 2.609 | | 1.119 | | 0.495 | | 1.460 | | 1.525 | |
| Treatment Prob(F) | | | | | 0.0888 | | 0.3924 | | 0.7398 | | 0.2744 | | 0.2568 | |

6Feb14 (ENA1313$ PM Tomato) AOV Means Table Page 4 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | D Disease | | D Disease | | D Disease | | D Disease | | D Disease | |
| Pest Code | | | | | LEVETA | | LEVETA | | LEVETA | | LEVETA | | LEVETA | |
| Pest Scientific Name | | | | | Leveillula tau> | | Leveillula tau> | | Leveillula tau> | | Leveillula tau> | | Leveillula tau> | |
| Pest Name | | | | | Powdery mildew> | | Powdery mildew> | | Powdery mildew> | | Powdery mildew> | | Powdery mildew> | |
| Crop Code | | | | | LYPES | | LYPES | | LYPES | | LYPES | | LYPES | |
| BBCH Scale | | | | | BVSO | | BVSO | | BVSO | | BVSO | | BVSO | |
| Crop Scientific Name | | | | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | |
| Crop Name | | | | | Tomato | | Tomato | | Tomato | | Tomato | | Tomato | |
| Crop Variety | | | | |  | |  | |  | |  | |  | |
| Description | | | | | SEVERITY\_PM | | SEVERITY\_PM | | SEVERITY\_PM | | SEVERITY\_PM1 | | SEVERITY\_PM2 | |
| Part Rated | | | | | PLANT C | | PLANT C | | PLANT C | | PLANT C | | PLANT C | |
| Rating Date | | | | | 14Aug13 | | 24Aug13 | | 30Aug13 | | 5Sep13 | | 12Sep13 | |
| Rating Type | | | | | PESSEV | | PESSEV | | PESSEV | | PESSEV | | PESSEV | |
| Rating Unit | | | | | % | | % | | % | | % | | % | |
| Sample Size, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Collection Basis, Unit | | | | | 10 PLANT | | 10 PLANT | | 10 PLANT | | 10 PLANT | | 10 PLANT | |
| Number of Subsamples | | | | | 10 | | 10 | | 10 | | 10 | | 10 | |
| Days After First/Last Applic. | | | | | 12 5 | | 22 1 | | 28 7 | | 34 6 | | 41 13 | |
| Trt-Eval Interval | | | | | 5 DA-B | | 1 DA-D | | 7 DA-D | | 6 DA-E | | 13 DA-E | |
| Plant-Eval Interval | | | | | 84 DP-1 | | 94 DP-1 | | 100 DP-1 | | 106 DP-1 | | 113 DP-1 | |
| ARM Action Codes | | | | | AL | | AL | |  | |  | |  | |
| Number of Decimals | | | | | 2 | | 2 | | 2 | | 2 | | 2 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 16 | | 17 | | 18 | | 19 | | 20 | |
| 1 | Untreated Check |  |  | ABCDE | 22.71 | a | 27.71 | a | 71.63 | a | 70.75 | a | 88.50 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 17.81 | a | 24.80 | a | 42.13 | b | 60.50 | a | 76.38 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 18.90 | a | 24.18 | a | 54.63 | ab | 68.75 | a | 79.00 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 17.93 | a | 23.97 | a | 37.63 | b | 56.25 | a | 80.38 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 14.84 | a | 22.60 | a | 40.25 | b | 66.88 | a | 80.13 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 0.222t | | 0.124t | | 22.851 | | 18.479 | | 13.731 | |
| Standard Deviation | | | | | 0.144t | | 0.081t | | 14.831 | | 11.993 | | 8.912 | |
| CV | | | | | 11.22 | | 5.73 | | 30.11 | | 18.56 | | 11.02 | |
| Bartlett's X2 | | | | | 5.441 | | 1.496 | | 2.134 | | 0.759 | | 3.883 | |
| P(Bartlett's X2) | | | | | 0.245 | | 0.827 | | 0.711 | | 0.944 | | 0.422 | |
| Skewness | | | | | 0.3961 | | 0.4743 | | 0.1519 | | -0.302 | | -0.7544 | |
| Kurtosis | | | | | -0.1412 | | 0.2892 | | -1.071 | | -0.2078 | | -1.0562 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 0.728 | | 1.223 | | 3.987 | | 4.469 | | 1.622 | |
| Replicate Prob(F) | | | | | 0.5549 | | 0.3440 | | 0.0349 | | 0.0251 | | 0.2362 | |
| Treatment F | | | | | 0.756 | | 0.599 | | 3.621 | | 1.020 | | 1.042 | |
| Treatment Prob(F) | | | | | 0.5732 | | 0.6701 | | 0.0370 | | 0.4356 | | 0.4259 | |

6Feb14 (ENA1313$ PM Tomato) AOV Means Table Page 5 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | D Disease | |  | |  | |  | |  | |
| Pest Code | | | | | LEVETA | |  | |  | |  | |  | |
| Pest Scientific Name | | | | | Leveillula tau> | |  | |  | |  | |  | |
| Pest Name | | | | | Powdery mildew> | |  | |  | |  | |  | |
| Crop Code | | | | | LYPES | | LYPES | | LYPES | | LYPES | | LYPES | |
| BBCH Scale | | | | | BVSO | | BVSO | | BVSO | | BVSO | | BVSO | |
| Crop Scientific Name | | | | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | |
| Crop Name | | | | | Tomato | | Tomato | | Tomato | | Tomato | | Tomato | |
| Crop Variety | | | | |  | |  | |  | |  | |  | |
| Description | | | | | SEVERITY\_PM3 | | Marketable # | | Marketable wei> | | Unmarketable # | | Unmarketable w> | |
| Part Rated | | | | | PLANT C | | FRUMAR C | | FRUMAR C | | FRUUNM C | | FRUUNM C | |
| Rating Date | | | | | 20Sep13 | | 6Aug13 | | 6Aug13 | | 6Aug13 | | 6Aug13 | |
| Rating Type | | | | | PESSEV | | YIELD | | WEIGHT | | YIELD | | WEIUNM | |
| Rating Unit | | | | | % | | NUMBER | | KG | | NUMBER | | KG | |
| Sample Size, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Collection Basis, Unit | | | | | 10 PLANT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Number of Subsamples | | | | | 10 | | 1 | | 1 | | 1 | | 1 | |
| Days After First/Last Applic. | | | | | 49 21 | | 4 4 | | 4 4 | | 4 4 | | 4 4 | |
| Trt-Eval Interval | | | | | 21 DA-E | | 4 DA-A | | 4 DA-A | | 4 DA-A | | 4 DA-A | |
| Plant-Eval Interval | | | | | 121 DP-1 | | 76 DP-1 | | 76 DP-1 | | 76 DP-1 | | 76 DP-1 | |
| ARM Action Codes | | | | | AA | | AL | |  | |  | |  | |
| Number of Decimals | | | | | 2 | | 2 | | 2 | | 2 | | 2 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 21 | | 22 | | 23 | | 24 | | 25 | |
| 1 | Untreated Check |  |  | ABCDE | 98.82 | a | 4.61 | a | 0.70 | a | 2.50 | a | 0.30 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 89.67 | a | 4.07 | a | 0.68 | a | 3.00 | a | 0.35 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 95.04 | a | 4.14 | a | 0.58 | a | 4.25 | a | 0.35 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 93.87 | a | 2.46 | a | 0.38 | a | 2.50 | a | 0.23 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 95.29 | a | 4.63 | a | 0.78 | a | 2.50 | a | 0.25 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 14.838t | | 0.449t | | 0.747 | | 3.133 | | 0.380 | |
| Standard Deviation | | | | | 9.630t | | 0.291t | | 0.485 | | 2.033 | | 0.246 | |
| CV | | | | | 12.5 | | 42.15 | | 78.16 | | 68.92 | | 83.49 | |
| Bartlett's X2 | | | | | 8.449 | | 4.046 | | 7.142 | | 3.096 | | 2.537 | |
| P(Bartlett's X2) | | | | | 0.076 | | 0.40 | | 0.129 | | 0.542 | | 0.638 | |
| Skewness | | | | | -1.5126\* | | 0.0145 | | 1.0115 | | 0.7654 | | 0.6032 | |
| Kurtosis | | | | | 2.5061\* | | -0.7793 | | 0.5418 | | -0.0471 | | -0.4758 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 1.229 | | 0.295 | | 0.670 | | 5.173 | | 2.909 | |
| Replicate Prob(F) | | | | | 0.3418 | | 0.8284 | | 0.5866 | | 0.0159 | | 0.0782 | |
| Treatment F | | | | | 0.871 | | 0.359 | | 0.407 | | 0.556 | | 0.214 | |
| Treatment Prob(F) | | | | | 0.5092 | | 0.8330 | | 0.8004 | | 0.6985 | | 0.9254 | |

6Feb14 (ENA1313$ PM Tomato) AOV Means Table Page 6 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | |  | |  | |  | |  | |  | |
| Pest Code | | | | |  | |  | |  | |  | |  | |
| Pest Scientific Name | | | | |  | |  | |  | |  | |  | |
| Pest Name | | | | |  | |  | |  | |  | |  | |
| Crop Code | | | | | LYPES | | LYPES | | LYPES | | LYPES | | LYPES | |
| BBCH Scale | | | | | BVSO | | BVSO | | BVSO | | BVSO | | BVSO | |
| Crop Scientific Name | | | | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | |
| Crop Name | | | | | Tomato | | Tomato | | Tomato | | Tomato | | Tomato | |
| Crop Variety | | | | |  | |  | |  | |  | |  | |
| Description | | | | | Marketable # | | Marketable wei> | | Unmarketable # | | Unmarketable w> | | Marketable # | |
| Part Rated | | | | | FRUMAR C | | FRUMAR C | | FRUUNM C | | FRUUNM C | | FRUMAR C | |
| Rating Date | | | | | 12Aug13 | | 12Aug13 | | 12Aug13 | | 12Aug13 | | 20Aug13 | |
| Rating Type | | | | | YIELD | | WEIGHT | | YIELD | | WEIUNM | | YIELD | |
| Rating Unit | | | | | NUMBER | | KG | | NUMBER | | KG | | NUMBER | |
| Sample Size, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Collection Basis, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Number of Subsamples | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Days After First/Last Applic. | | | | | 10 3 | | 10 3 | | 10 3 | | 10 3 | | 18 4 | |
| Trt-Eval Interval | | | | | 3 DA-B | | 3 DA-B | | 3 DA-B | | 3 DA-B | | 4 DA-C | |
| Plant-Eval Interval | | | | | 82 DP-1 | | 82 DP-1 | | 82 DP-1 | | 82 DP-1 | | 90 DP-1 | |
| ARM Action Codes | | | | |  | |  | |  | |  | |  | |
| Number of Decimals | | | | | 2 | | 2 | | 2 | | 2 | | 2 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 26 | | 27 | | 28 | | 29 | | 30 | |
| 1 | Untreated Check |  |  | ABCDE | 20.25 | a | 2.70 | a | 8.25 | a | 1.10 | a | 24.75 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 16.25 | a | 2.18 | a | 6.00 | a | 0.68 | b | 29.00 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 19.25 | a | 2.53 | a | 5.75 | a | 0.58 | b | 26.50 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 22.50 | a | 3.05 | a | 5.25 | a | 0.58 | b | 28.00 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 18.00 | a | 2.45 | a | 6.50 | a | 0.80 | ab | 19.00 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 9.158 | | 1.142 | | 2.974 | | 0.363 | | 15.554 | |
| Standard Deviation | | | | | 5.943 | | 0.741 | | 1.930 | | 0.235 | | 10.095 | |
| CV | | | | | 30.88 | | 28.73 | | 30.39 | | 31.6 | | 39.66 | |
| Bartlett's X2 | | | | | 5.162 | | 4.833 | | 3.979 | | 4.555 | | 5.167 | |
| P(Bartlett's X2) | | | | | 0.271 | | 0.305 | | 0.409 | | 0.336 | | 0.271 | |
| Skewness | | | | | 0.4947 | | 0.572 | | 0.566 | | 0.9368 | | -0.3148 | |
| Kurtosis | | | | | -0.076 | | 0.1896 | | -0.4808 | | 0.0169 | | 0.0858 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 1.806 | | 1.605 | | 3.808 | | 5.158 | | 1.076 | |
| Replicate Prob(F) | | | | | 0.1997 | | 0.2401 | | 0.0397 | | 0.0161 | | 0.3960 | |
| Treatment F | | | | | 0.626 | | 0.763 | | 1.430 | | 3.460 | | 0.611 | |
| Treatment Prob(F) | | | | | 0.6528 | | 0.5689 | | 0.2834 | | 0.0423 | | 0.6624 | |

6Feb14 (ENA1313$ PM Tomato) AOV Means Table Page 7 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | |  | |  | |  | |  | |  | |
| Pest Code | | | | |  | |  | |  | |  | |  | |
| Pest Scientific Name | | | | |  | |  | |  | |  | |  | |
| Pest Name | | | | |  | |  | |  | |  | |  | |
| Crop Code | | | | | LYPES | | LYPES | | LYPES | | LYPES | | LYPES | |
| BBCH Scale | | | | | BVSO | | BVSO | | BVSO | | BVSO | | BVSO | |
| Crop Scientific Name | | | | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | |
| Crop Name | | | | | Tomato | | Tomato | | Tomato | | Tomato | | Tomato | |
| Crop Variety | | | | |  | |  | |  | |  | |  | |
| Description | | | | | Marketable wei> | | Unmarketable # | | Unmarketable w> | | Marketable # | | Marketable wei> | |
| Part Rated | | | | | FRUMAR C | | FRUUNM C | | FRUUNM C | | FRUMAR C | | FRUMAR C | |
| Rating Date | | | | | 20Aug13 | | 20Aug13 | | 20Aug13 | | 26Aug13 | | 26Aug13 | |
| Rating Type | | | | | WEIGHT | | YIELD | | WEIUNM | | YIELD | | WEIGHT | |
| Rating Unit | | | | | KG | | NUMBER | | KG | | NUMBER | | KG | |
| Sample Size, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Collection Basis, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Number of Subsamples | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Days After First/Last Applic. | | | | | 18 4 | | 18 4 | | 18 4 | | 24 3 | | 24 3 | |
| Trt-Eval Interval | | | | | 4 DA-C | | 4 DA-C | | 4 DA-C | | 3 DA-D | | 3 DA-D | |
| Plant-Eval Interval | | | | | 90 DP-1 | | 90 DP-1 | | 90 DP-1 | | 96 DP-1 | | 96 DP-1 | |
| ARM Action Codes | | | | |  | |  | |  | |  | |  | |
| Number of Decimals | | | | | 2 | | 2 | | 2 | | 2 | | 2 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 31 | | 32 | | 33 | | 34 | | 35 | |
| 1 | Untreated Check |  |  | ABCDE | 4.15 | a | 15.25 | a | 2.15 | a | 38.75 | a | 5.30 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 4.05 | a | 14.00 | a | 1.95 | a | 38.50 | a | 5.40 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 3.68 | a | 18.25 | a | 2.58 | a | 49.25 | a | 6.83 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 3.95 | a | 17.50 | a | 2.45 | a | 26.75 | a | 3.75 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 2.65 | a | 14.25 | a | 1.75 | a | 38.00 | a | 5.23 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 1.605 | | 5.892 | | 0.852 | | 15.423 | | 2.148 | |
| Standard Deviation | | | | | 1.042 | | 3.824 | | 0.553 | | 10.010 | | 1.394 | |
| CV | | | | | 28.19 | | 24.13 | | 25.43 | | 26.17 | | 26.3 | |
| Bartlett's X2 | | | | | 2.277 | | 3.207 | | 4.987 | | 3.168 | | 3.028 | |
| P(Bartlett's X2) | | | | | 0.685 | | 0.524 | | 0.289 | | 0.53 | | 0.553 | |
| Skewness | | | | | 0.4089 | | -0.0946 | | -0.1865 | | 0.2681 | | 0.2693 | |
| Kurtosis | | | | | -1.4095 | | -1.3698 | | -1.3113 | | -0.7115 | | -0.7194 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 1.631 | | 0.177 | | 0.302 | | 0.975 | | 0.898 | |
| Replicate Prob(F) | | | | | 0.2342 | | 0.9102 | | 0.8231 | | 0.4368 | | 0.4706 | |
| Treatment F | | | | | 1.374 | | 1.014 | | 1.529 | | 2.531 | | 2.442 | |
| Treatment Prob(F) | | | | | 0.3003 | | 0.4386 | | 0.2557 | | 0.0953 | | 0.1037 | |

6Feb14 (ENA1313$ PM Tomato) AOV Means Table Page 8 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | |  | |  | |  | |  | |  | |
| Pest Code | | | | |  | |  | |  | |  | |  | |
| Pest Scientific Name | | | | |  | |  | |  | |  | |  | |
| Pest Name | | | | |  | |  | |  | |  | |  | |
| Crop Code | | | | | LYPES | | LYPES | | LYPES | | LYPES | | LYPES | |
| BBCH Scale | | | | | BVSO | | BVSO | | BVSO | | BVSO | | BVSO | |
| Crop Scientific Name | | | | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | |
| Crop Name | | | | | Tomato | | Tomato | | Tomato | | Tomato | | Tomato | |
| Crop Variety | | | | |  | |  | |  | |  | |  | |
| Description | | | | | Unmarketable # | | Unmarketable w> | | Marketable # | | Marketable wei> | | Unmarketable # | |
| Part Rated | | | | | FRUUNM C | | FRUUNM C | | FRUMAR C | | FRUMAR C | | FRUUNM C | |
| Rating Date | | | | | 26Aug13 | | 26Aug13 | | 9Sep13 | | 9Sep13 | | 9Sep13 | |
| Rating Type | | | | | YIELD | | WEIUNM | | YIELD | | WEIGHT | | YIELD | |
| Rating Unit | | | | | NUMBER | | KG | | NUMBER | | KG | | NUMBER | |
| Sample Size, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Collection Basis, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Number of Subsamples | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Days After First/Last Applic. | | | | | 24 3 | | 24 3 | | 38 10 | | 38 10 | | 38 10 | |
| Trt-Eval Interval | | | | | 3 DA-D | | 3 DA-D | | 10 DA-E | | 10 DA-E | | 10 DA-E | |
| Plant-Eval Interval | | | | | 96 DP-1 | | 96 DP-1 | | 110 DP-1 | | 110 DP-1 | | 110 DP-1 | |
| ARM Action Codes | | | | |  | |  | |  | |  | |  | |
| Number of Decimals | | | | | 2 | | 2 | | 2 | | 2 | | 2 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 36 | | 37 | | 38 | | 39 | | 40 | |
| 1 | Untreated Check |  |  | ABCDE | 35.50 | a | 4.90 | a | 240.50 | a | 28.88 | a | 56.25 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 25.00 | a | 3.48 | a | 238.75 | a | 28.53 | a | 44.75 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 28.25 | a | 4.63 | a | 261.50 | a | 31.33 | a | 51.25 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 26.00 | a | 3.20 | a | 219.50 | a | 26.38 | a | 48.25 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 29.50 | a | 4.10 | a | 228.50 | a | 27.90 | a | 53.50 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 11.712 | | 2.008 | | 33.374 | | 4.166 | | 17.938 | |
| Standard Deviation | | | | | 7.602 | | 1.304 | | 21.661 | | 2.704 | | 11.642 | |
| CV | | | | | 26.35 | | 32.11 | | 9.11 | | 9.45 | | 22.92 | |
| Bartlett's X2 | | | | | 2.349 | | 2.864 | | 4.222 | | 6.213 | | 6.316 | |
| P(Bartlett's X2) | | | | | 0.672 | | 0.581 | | 0.377 | | 0.184 | | 0.177 | |
| Skewness | | | | | 0.4438 | | 0.8071 | | -0.5887 | | -0.5506 | | 0.1428 | |
| Kurtosis | | | | | 0.0101 | | 1.514 | | -0.9449 | | -0.9987 | | -0.1728 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 1.392 | | 1.719 | | 6.512 | | 6.629 | | 2.827 | |
| Replicate Prob(F) | | | | | 0.2928 | | 0.2161 | | 0.0073 | | 0.0069 | | 0.0835 | |
| Treatment F | | | | | 1.176 | | 1.241 | | 2.113 | | 1.771 | | 0.592 | |
| Treatment Prob(F) | | | | | 0.3697 | | 0.3454 | | 0.1420 | | 0.1995 | | 0.6747 | |

6Feb14 (ENA1313$ PM Tomato) AOV Means Table Page 9 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | |  | |  | |  | |  | |  | |
| Pest Code | | | | |  | |  | |  | |  | |  | |
| Pest Scientific Name | | | | |  | |  | |  | |  | |  | |
| Pest Name | | | | |  | |  | |  | |  | |  | |
| Crop Code | | | | | LYPES | | LYPES | | LYPES | | LYPES | | LYPES | |
| BBCH Scale | | | | | BVSO | | BVSO | | BVSO | | BVSO | | BVSO | |
| Crop Scientific Name | | | | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | |
| Crop Name | | | | | Tomato | | Tomato | | Tomato | | Tomato | | Tomato | |
| Crop Variety | | | | |  | |  | |  | |  | |  | |
| Description | | | | | Unmarketable w> | | Marketable # | | Marketable wei> | | Unmarketable # | | Unmarketable w> | |
| Part Rated | | | | | FRUUNM C | | FRUMAR C | | FRUMAR C | | FRUUNM C | | FRUUNM C | |
| Rating Date | | | | | 9Sep13 | | 24Sep13 | | 24Sep13 | | 24Sep13 | | 24Sep13 | |
| Rating Type | | | | | WEIUNM | | YIELD | | WEIGHT | | YIELD | | WEIUNM | |
| Rating Unit | | | | | KG | | NUMBER | | KG | | NUMBER | | KG | |
| Sample Size, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Collection Basis, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Number of Subsamples | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Days After First/Last Applic. | | | | | 38 10 | | 53 25 | | 53 25 | | 53 25 | | 53 25 | |
| Trt-Eval Interval | | | | | 10 DA-E | | 25 DA-E | | 25 DA-E | | 25 DA-E | | 25 DA-E | |
| Plant-Eval Interval | | | | | 110 DP-1 | | 125 DP-1 | | 125 DP-1 | | 125 DP-1 | | 125 DP-1 | |
| ARM Action Codes | | | | |  | |  | |  | |  | |  | |
| Number of Decimals | | | | | 2 | | 2 | | 2 | | 2 | | 2 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 41 | | 42 | | 43 | | 44 | | 45 | |
| 1 | Untreated Check |  |  | ABCDE | 6.78 | a | 121.00 | a | 12.10 | a | 95.00 | a | 4.75 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 5.38 | a | 129.50 | a | 12.95 | a | 126.50 | a | 6.33 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 6.15 | a | 133.25 | a | 13.33 | a | 105.00 | a | 5.25 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 5.78 | a | 186.75 | a | 18.68 | a | 125.00 | a | 6.25 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 6.43 | a | 152.00 | a | 15.25 | a | 123.50 | a | 6.18 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 2.146 | | 52.090 | | 5.192 | | 35.390 | | 1.770 | |
| Standard Deviation | | | | | 1.393 | | 33.808 | | 3.370 | | 22.969 | | 1.148 | |
| CV | | | | | 22.83 | | 23.4 | | 23.3 | | 19.97 | | 19.97 | |
| Bartlett's X2 | | | | | 6.24 | | 1.64 | | 1.618 | | 2.321 | | 2.321 | |
| P(Bartlett's X2) | | | | | 0.182 | | 0.802 | | 0.805 | | 0.677 | | 0.677 | |
| Skewness | | | | | 0.0957 | | 0.0424 | | 0.0463 | | -0.5093 | | -0.5093 | |
| Kurtosis | | | | | -0.2238 | | -0.4855 | | -0.4756 | | -0.5491 | | -0.5491 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 2.888 | | 7.544 | | 7.539 | | 7.627 | | 7.627 | |
| Replicate Prob(F) | | | | | 0.0795 | | 0.0043 | | 0.0043 | | 0.0041 | | 0.0041 | |
| Treatment F | | | | | 0.616 | | 2.402 | | 2.425 | | 1.525 | | 1.525 | |
| Treatment Prob(F) | | | | | 0.6594 | | 0.1076 | | 0.1053 | | 0.2567 | | 0.2567 | |

6Feb14 (ENA1313$ PM Tomato) AOV Means Table Page 10 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | |  | |  | |  | |  | |  | |
| Pest Code | | | | |  | |  | |  | |  | |  | |
| Pest Scientific Name | | | | |  | |  | |  | |  | |  | |
| Pest Name | | | | |  | |  | |  | |  | |  | |
| Crop Code | | | | | LYPES | | LYPES | | LYPES | | LYPES | | LYPES | |
| BBCH Scale | | | | | BVSO | | BVSO | | BVSO | | BVSO | | BVSO | |
| Crop Scientific Name | | | | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | |
| Crop Name | | | | | Tomato | | Tomato | | Tomato | | Tomato | | Tomato | |
| Crop Variety | | | | |  | |  | |  | |  | |  | |
| Description | | | | | 1-2 Cuml Markt> | | 1-3 Cuml Markt> | | 1-4 Cuml Markt> | | 1-5 Cuml Markt> | | 1-6 Cuml Markt> | |
| Part Rated | | | | | FRUMAR C | | FRUMAR C | | FRUMAR C | | FRUMAR C | | FRUMAR C | |
| Rating Date | | | | | 12Aug13 | | 12Aug13 | | 12Aug13 | | 12Aug13 | | 12Aug13 | |
| Rating Type | | | | | YIELD | | YIELD | | YIELD | | YIELD | | YIELD | |
| Rating Unit | | | | | NUMBER | | NUMBER | | NUMBER | | NUMBER | | NUMBER | |
| Sample Size, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Collection Basis, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Number of Subsamples | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Days After First/Last Applic. | | | | | 10 3 | | 10 3 | | 10 3 | | 10 3 | | 10 3 | |
| Trt-Eval Interval | | | | | 3 DA-B | | 3 DA-B | | 3 DA-B | | 3 DA-B | | 3 DA-B | |
| Plant-Eval Interval | | | | | 82 DP-1 | | 82 DP-1 | | 82 DP-1 | | 82 DP-1 | | 82 DP-1 | |
| ARM Action Codes | | | | | T1 | | T2 | | T3 | | T4 | | T5 | |
| Number of Decimals | | | | | 2 | | 2 | | 2 | | 2 | | 2 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 46 | | 47 | | 48 | | 49 | | 50 | |
| 1 | Untreated Check |  |  | ABCDE | 26.00 | a | 50.75 | a | 89.50 | a | 330.00 | a | 451.00 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 21.25 | a | 50.25 | a | 88.75 | a | 327.50 | a | 457.00 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 23.50 | a | 50.00 | a | 99.25 | a | 360.75 | a | 494.00 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 25.25 | a | 53.25 | a | 80.00 | a | 299.50 | a | 486.25 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 24.00 | a | 43.00 | a | 81.00 | a | 309.50 | a | 461.50 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 12.762 | | 23.560 | | 31.293 | | 45.769 | | 37.420 | |
| Standard Deviation | | | | | 8.283 | | 15.291 | | 20.310 | | 29.705 | | 24.286 | |
| CV | | | | | 34.51 | | 30.92 | | 23.16 | | 9.13 | | 5.17 | |
| Bartlett's X2 | | | | | 0.63 | | 4.265 | | 2.44 | | 7.003 | | 0.754 | |
| P(Bartlett's X2) | | | | | 0.96 | | 0.371 | | 0.655 | | 0.136 | | 0.945 | |
| Skewness | | | | | -0.1054 | | -0.2405 | | 0.2644 | | -0.0159 | | 0.8197 | |
| Kurtosis | | | | | -1.5386 | | -0.0042 | | -0.8419 | | -0.5788 | | -0.3158 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 1.075 | | 0.377 | | 0.076 | | 4.069 | | 20.478 | |
| Replicate Prob(F) | | | | | 0.3965 | | 0.7712 | | 0.9715 | | 0.0330 | | 0.0001 | |
| Treatment F | | | | | 0.195 | | 0.251 | | 0.586 | | 2.492 | | 2.445 | |
| Treatment Prob(F) | | | | | 0.9363 | | 0.9036 | | 0.6786 | | 0.0989 | | 0.1033 | |

6Feb14 (ENA1313$ PM Tomato) AOV Means Table Page 11 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | |  | |  | |  | |  | |  | |
| Pest Code | | | | |  | |  | |  | |  | |  | |
| Pest Scientific Name | | | | |  | |  | |  | |  | |  | |
| Pest Name | | | | |  | |  | |  | |  | |  | |
| Crop Code | | | | | LYPES | | LYPES | | LYPES | | LYPES | | LYPES | |
| BBCH Scale | | | | | BVSO | | BVSO | | BVSO | | BVSO | | BVSO | |
| Crop Scientific Name | | | | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | |
| Crop Name | | | | | Tomato | | Tomato | | Tomato | | Tomato | | Tomato | |
| Crop Variety | | | | |  | |  | |  | |  | |  | |
| Description | | | | | 1-2 Cuml UnMar> | | 1-3 Cuml UnMar> | | 1-4 Cuml UnMar> | | 1-5 Cuml UnMar> | | 1-6 Cuml UnMar> | |
| Part Rated | | | | | FRUMAR C | | FRUMAR C | | FRUMAR C | | FRUMAR C | | FRUMAR C | |
| Rating Date | | | | | 12Aug13 | | 12Aug13 | | 12Aug13 | | 12Aug13 | | 12Aug13 | |
| Rating Type | | | | | YIELD | | YIELD | | YIELD | | YIELD | | YIELD | |
| Rating Unit | | | | | NUMBER | | NUMBER | | NUMBER | | NUMBER | | NUMBER | |
| Sample Size, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Collection Basis, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Number of Subsamples | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Days After First/Last Applic. | | | | | 10 3 | | 10 3 | | 10 3 | | 10 3 | | 10 3 | |
| Trt-Eval Interval | | | | | 3 DA-B | | 3 DA-B | | 3 DA-B | | 3 DA-B | | 3 DA-B | |
| Plant-Eval Interval | | | | | 82 DP-1 | | 82 DP-1 | | 82 DP-1 | | 82 DP-1 | | 82 DP-1 | |
| ARM Action Codes | | | | | T6 | | T7 | | T8 | | T9 | | T10 | |
| Number of Decimals | | | | | 2 | | 2 | | 2 | | 2 | | 2 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 51 | | 52 | | 53 | | 54 | | 55 | |
| 1 | Untreated Check |  |  | ABCDE | 10.75 | a | 26.00 | a | 61.50 | a | 117.75 | a | 212.75 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 9.00 | a | 23.00 | a | 48.00 | a | 92.75 | a | 219.25 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 10.00 | a | 28.25 | a | 56.50 | a | 107.75 | a | 212.75 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 7.75 | a | 25.25 | a | 51.25 | a | 99.50 | a | 224.50 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 9.00 | a | 23.25 | a | 52.75 | a | 106.25 | a | 229.75 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 3.482 | | 6.248 | | 15.927 | | 24.638 | | 31.164 | |
| Standard Deviation | | | | | 2.260 | | 4.055 | | 10.337 | | 15.991 | | 20.226 | |
| CV | | | | | 24.3 | | 16.12 | | 19.14 | | 15.26 | | 9.2 | |
| Bartlett's X2 | | | | | 4.255 | | 1.929 | | 4.183 | | 6.502 | | 1.214 | |
| P(Bartlett's X2) | | | | | 0.373 | | 0.749 | | 0.382 | | 0.165 | | 0.876 | |
| Skewness | | | | | 0.554 | | -0.2897 | | 0.5267 | | -0.1679 | | -0.0632 | |
| Kurtosis | | | | | -0.8915 | | -0.6864 | | -0.06 | | -0.6139 | | -1.3035 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 5.886 | | 1.438 | | 0.908 | | 3.376 | | 18.594 | |
| Replicate Prob(F) | | | | | 0.0104 | | 0.2803 | | 0.4658 | | 0.0545 | | 0.0001 | |
| Treatment F | | | | | 1.013 | | 1.130 | | 1.007 | | 1.376 | | 0.540 | |
| Treatment Prob(F) | | | | | 0.4389 | | 0.3882 | | 0.4416 | | 0.2997 | | 0.7097 | |

6Feb14 (ENA1313$ PM Tomato) AOV Means Table Page 12 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | |  | |  | |  | |  | |  | |
| Pest Code | | | | |  | |  | |  | |  | |  | |
| Pest Scientific Name | | | | |  | |  | |  | |  | |  | |
| Pest Name | | | | |  | |  | |  | |  | |  | |
| Crop Code | | | | | LYPES | | LYPES | | LYPES | | LYPES | | LYPES | |
| BBCH Scale | | | | | BVSO | | BVSO | | BVSO | | BVSO | | BVSO | |
| Crop Scientific Name | | | | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | |
| Crop Name | | | | | Tomato | | Tomato | | Tomato | | Tomato | | Tomato | |
| Crop Variety | | | | |  | |  | |  | |  | |  | |
| Description | | | | | Total Market W> | | Total UnMark W> | | % Marketable | | % UnMarketable | | lb/ACRE | |
| Part Rated | | | | | FRUMAR C | | FRUMAR C | | HEASMA C | | HEASMA C | | FRUMAR C | |
| Rating Date | | | | | 12Aug13 | | 12Aug13 | | 14Aug13 | | 14Aug13 | | 14Aug13 | |
| Rating Type | | | | | WEIGHT | | WEIGHT | | YIELD | | YIELD | | YIELD | |
| Rating Unit | | | | | kg | | kg | | NUMBER | | NUMBER | | lb | |
| Sample Size, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 A | |
| Collection Basis, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 25 A | |
| Number of Subsamples | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Days After First/Last Applic. | | | | | 10 3 | | 10 3 | | 12 5 | | 12 5 | | 12 5 | |
| Trt-Eval Interval | | | | | 3 DA-B | | 3 DA-B | | 5 DA-D | | 5 DA-D | | 10 DA-D | |
| Plant-Eval Interval | | | | | 82 DP-1 | | 82 DP-1 | | 84 DP-1 | | 84 DP-1 | | 84 DP-1 | |
| ARM Action Codes | | | | | T13 | | T14 | | T11 | | T12 | | T16 | |
| Number of Decimals | | | | | 2 | | 2 | | 2 | | 2 | | 2 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 56 | | 57 | | 58 | | 59 | | 60 | |
| 1 | Untreated Check |  |  | ABCDE | 53.83 | a | 19.98 | a | 67.90 | a | 32.10 | a | 73916.63 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 53.78 | a | 18.15 | a | 67.67 | a | 32.33 | a | 73847.97 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 58.25 | a | 19.53 | a | 70.12 | a | 29.88 | a | 79993.38 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 56.18 | a | 18.48 | a | 68.49 | a | 31.51 | a | 77143.83 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 54.25 | a | 19.50 | a | 66.99 | a | 33.01 | a | 74500.27 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 4.046 | | 3.059 | | 2.929 | | 2.929 | | 5556.101 | |
| Standard Deviation | | | | | 2.626 | | 1.985 | | 1.901 | | 1.901 | | 3606.018 | |
| CV | | | | | 4.75 | | 10.38 | | 2.79 | | 5.98 | | 4.75 | |
| Bartlett's X2 | | | | | 0.915 | | 3.772 | | 1.324 | | 1.324 | | 0.915 | |
| P(Bartlett's X2) | | | | | 0.922 | | 0.438 | | 0.857 | | 0.857 | | 0.922 | |
| Skewness | | | | | 0.7408 | | 0.1499 | | -0.663 | | 0.663 | | 0.7408 | |
| Kurtosis | | | | | -0.5554 | | -0.5827 | | -0.3863 | | -0.3863 | | -0.5554 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 20.406 | | 13.400 | | 20.449 | | 20.449 | | 20.406 | |
| Replicate Prob(F) | | | | | 0.0001 | | 0.0004 | | 0.0001 | | 0.0001 | | 0.0001 | |
| Treatment F | | | | | 2.184 | | 0.608 | | 1.557 | | 1.557 | | 2.184 | |
| Treatment Prob(F) | | | | | 0.1325 | | 0.6646 | | 0.2483 | | 0.2483 | | 0.1325 | |

6Feb14 (ENA1313$ PM Tomato) AOV Means Table Page 13 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | |  | |  | | D Disease | | D Disease | | D Disease | |
| Pest Code | | | | |  | |  | | LEVETA | | LEVETA | | LEVETA | |
| Pest Scientific Name | | | | |  | |  | | Leveillula tau> | | Leveillula tau> | | Leveillula tau> | |
| Pest Name | | | | |  | |  | | Powdery mildew> | | Powdery mildew> | | Powdery mildew> | |
| Crop Code | | | | | LYPES | | LYPES | | LYPES | | LYPES | | LYPES | |
| BBCH Scale | | | | | BVSO | | BVSO | | BVSO | | BVSO | | BVSO | |
| Crop Scientific Name | | | | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | | Solanum lycope> | |
| Crop Name | | | | | Tomato | | Tomato | | Tomato | | Tomato | | Tomato | |
| Crop Variety | | | | | TOTAL | | TOTAL | |  | |  | |  | |
| Description | | | | | CARTONS/ACRE | | $/ACRE | | AUDPC SEVERITY | | % CONTROL SEVE> | | SEVERITY\_PM | |
| Part Rated | | | | | FRUMAR C | | FRUMAR C | | PLANT C | | PLANT C | | PLANT C | |
| Rating Date | | | | | 24Sep13 | | 24Sep13 | | 20Sep13 | | 20Sep13 | |  | |
| Rating Type | | | | | COMPRO | | INCGRO | |  | | CONTRO | | SAUDPC | |
| Rating Unit | | | | | NUMBER | | DOLLAR | | AUDPC | | %UNCK | | % | |
| Sample Size, Unit | | | | | 1 ACRE | | 1 ACRE | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Collection Basis, Unit | | | | | 1 ACRE | | 1 ACRE | | 10 PLANT | | 10 PLANT | | 10 PLANT | |
| Number of Subsamples | | | | | 1 | | 1 | | 1 | | 1 | | 10 | |
| Days After First/Last Applic. | | | | | 53 25 | | 53 25 | | 49 21 | | 49 21 | |  | |
| Trt-Eval Interval | | | | | 139 DA-A | | 139 DA-A | | 21 DA-E | | 21 DA-E | |  | |
| Plant-Eval Interval | | | | | 125 DP-1 | | 125 DP-1 | | 121 DP-1 | | 121 DP-1 | |  | |
| ARM Action Codes | | | | | T17 | | T15 | | T18 SAUDPC | | TAB[63] | | T20 SAUDPC | |
| Number of Decimals | | | | | 2 | | 2 | | 2 | | 2 | |  | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 61 | | 62 | | 63 | | 64 | | 65 | |
| 1 | Untreated Check |  |  | ABCDE | 3695.83 | a | 25870.82 | a | 54.33 | a | 0.00 | a | 30.92385 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 3692.40 | a | 25846.79 | a | 43.32 | a | 20.10 | a | 22.94125 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 3999.67 | a | 27997.68 | a | 47.38 | a | 11.50 | a | 24.76375 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 3857.19 | a | 27000.34 | a | 43.40 | a | 19.65 | a | 22.15250 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 3725.01 | a | 26075.10 | a | 44.26 | a | 18.37 | a | 20.68200 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 277.805 | | 1944.636 | | 8.253 | | 15.406 | | 7.289198 | |
| Standard Deviation | | | | | 180.301 | | 1262.107 | | 5.356 | | 9.999 | | 4.730832 | |
| CV | | | | | 4.75 | | 4.75 | | 11.51 | | 71.81 | | 19.47 | |
| Bartlett's X2 | | | | | 0.915 | | 0.915 | | 0.818 | | 10.079 | | 2.377 | |
| P(Bartlett's X2) | | | | | 0.922 | | 0.922 | | 0.936 | | 0.018\* | | 0.667 | |
| Skewness | | | | | 0.7408 | | 0.7408 | | 0.3389 | | -0.6443 | | 1.129\* | |
| Kurtosis | | | | | -0.5554 | | -0.5554 | | -0.3846 | | 0.1744 | | 0.5746 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 20.406 | | 20.406 | | 4.889 | | 2.952 | | 3.674 | |
| Replicate Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.0191 | | 0.0756 | | 0.0437 | |
| Treatment F | | | | | 2.184 | | 2.184 | | 3.025 | | 2.905 | | 2.843 | |
| Treatment Prob(F) | | | | | 0.1325 | | 0.1325 | | 0.0612 | | 0.0679 | | 0.0718 | |

6Feb14 (ENA1313$ PM Tomato) AOV Means Table Page 14 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | | D Disease | |
| Pest Code | | | | | LEVETA | |
| Pest Scientific Name | | | | | Leveillula tau> | |
| Pest Name | | | | | Powdery mildew> | |
| Crop Code | | | | | LYPES | |
| BBCH Scale | | | | | BVSO | |
| Crop Scientific Name | | | | | Solanum lycope> | |
| Crop Name | | | | | Tomato | |
| Crop Variety | | | | |  | |
| Description | | | | | SEVERITY\_PM | |
| Part Rated | | | | | PLANT C | |
| Rating Date | | | | |  | |
| Rating Type | | | | | CONTRO | |
| Rating Unit | | | | | %UNCK | |
| Sample Size, Unit | | | | | 1 PLOT | |
| Collection Basis, Unit | | | | | 10 PLANT | |
| Number of Subsamples | | | | | 1 | |
| Days After First/Last Applic. | | | | |  | |
| Trt-Eval Interval | | | | |  | |
| Plant-Eval Interval | | | | |  | |
| ARM Action Codes | | | | | TAB[65] | |
| Number of Decimals | | | | |  | |
| Trt | Treatment |  | Rate | Appl |  |  |
| No. | Name | Rate | Unit | Code | 66 | |
| 1 | Untreated Check |  |  | ABCDE | 0.0000000 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 22.7495850 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 14.7682587 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 25.9410153 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 31.4518466 | a |
|  | Regalia | 1 | qt/a | BD |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |
| LSD (P=.05) | | | | | 21.95876854 | |
| Standard Deviation | | | | | 14.25167035 | |
| CV | | | | | 75.08 | |
| Bartlett's X2 | | | | | 4.163 | |
| P(Bartlett's X2) | | | | | 0.244 | |
| Skewness | | | | | -0.5121 | |
| Kurtosis | | | | | 0.502 | |
|  |  |  |  |  |  |  |
| Replicate F | | | | | 4.847 | |
| Replicate Prob(F) | | | | | 0.0196 | |
| Treatment F | | | | | 2.935 | |
| Treatment Prob(F) | | | | | 0.0662 | |

6Feb14 (ENA1313$ PM Tomato) AOV Means Table Page 15 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

Pest Type

D, Disease, G-BYRD7, G-DisStg = Disease, such as a fungus, bacteria, or virus

Pest Code

LEVETA, Leveillula taurica, = US

Crop Code

LYPES, BVSO, Solanum lycopersicum, = US

Part Rated

PLANT = plant

FRUMAR = fruit - marketable

FRUUNM = fruit - unmarketable

HEASMA = head - small

C = Crop is Part Rated

Rating Type

PHYGEN = phytotoxicity - general / injury

VIGOR = vigor

PESSEV = pest severity

YIELD = yield

WEIGHT = weight

WEIUNM = weight unmarketable

COMPRO = commercial product, general

INCGRO = income - gross / value

CONTRO = control / burndown or knockdown

SAUDPC = Standardized AUDPC (average AUDPC per day)

Rating Unit

0-10 = 0-10 index/scale

% = percent

NUMBER = number

KG = kilogram

lb = pound

DOLLAR = dollar

AUDPC = area under disease process curve

%UNCK = percent of untreated check

PLOT = total plot

A = acre

PLOT = total plot

PLANT = plant/plant biomass/shrub

A = acre

Plant-Eval Interval

79 DP-1 = 1 LYPES 22May13

84 DP-1 = 1 LYPES 22May13

94 DP-1 = 1 LYPES 22May13

100 DP-1 = 1 LYPES 22May13

106 DP-1 = 1 LYPES 22May13

121 DP-1 = 1 LYPES 22May13

113 DP-1 = 1 LYPES 22May13

75 DP-1 = 1 LYPES 22May13

76 DP-1 = 1 LYPES 22May13

82 DP-1 = 1 LYPES 22May13

90 DP-1 = 1 LYPES 22May13

96 DP-1 = 1 LYPES 22May13

110 DP-1 = 1 LYPES 22May13

125 DP-1 = 1 LYPES 22May13

ARM Action Codes

AL = Automatic log transformation of X+1

AA = Automatic arcsine square root % transformation

T1 = [C22]+[C26]

T2 = [C30]+[C46]

T3 = [C34]+[C47]

T4 = [C38]+[C48]

T5 = [C42]+[C49]

T6 = [C24]+[C28]

T7 = [C51]+[C32]

T8 = [C52]+[C36]

T9 = [C40]+[C53]

T10 = [C44]+[C54]

T13 = [C23]+[C27]+[C31]+[C35]+[C39]+[C43]

T14 = [C25]+[C29]+[C33]+[C37]+[C41]+[C45]

T11 = ([C50]/([C55]+[C50]))\*100

T12 = ([C55]/([C50]+[C55]))\*100

T16 = ([C56]\*2.20462)/0.0016053719

T17 = [60]/20

T15 = [C61]\*7

T18 = &@SAUDPC(@MATCH(EPT=LEVETA,EDT=PESSEV,ERU=%))

6Feb14 (ENA1313$ PM Tomato) AOV Means Table Page 16 of 16

**Pacific Agricultural Research**

**ENA1313: Efficacy of ARMOUR-Zen against powdery mildew on tomato**

Trial ID: ENA1313 Location: PAR Huasna, CA Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

TAB[63] = Abbott (% of Untreated)[63]

T20 = &@SAUDPC(@MATCH(EPT=LEVETA,ECE=SEVERITY\_PM,EDT=PESSEV,ERU=%))

TAB[65] = Abbott (% of Untreated)[65]