RESEARCH AND DEVELOPMENT

PROJECT REPORT

Evaluation of ARMOUR-Zen against downy mildew in lettuce.

**Trial ID: ENA1312**

**Prepared For:**

Duane Ewing / Ewing & Associates

**Prepared by:**



Summer/2013

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ABSTRACT

*Objective:* Evaluate Efficacy of ARMOUR-Zen against Downy Mildew (*Bremia lactucae*) in lettuce.

*Product(s) Tested:* Armour-Zen

*Crop:*  Lettuce – Sun Devil

*Location:* San Luis Obispo, CA - Pacific Ag Research Edna Valley Farm

*Project Duration:* July 25 – September 30, 2013

*Key Findings:*

* No phytotoxicity and vigor ratings were normal
* Overall more lesions per head on the untreated check numerically, fewest on the inorganic standard (Reason)
* Numerically, a dose response can be seen in Armour-Zen treatments with plants receiving higher application rates having fewer downy mildew lesions
* No significant difference in percent control of severity between Armour-Zen and Serenade ASO treatments at 6 evaluations
* Percent control of the AUDPC for Downy Mildew severity was best on the inorganic standard treatment (Reason, 75% control), followed by the organic standard Serenade ASO + Regalia (35% control)
* Did not see normal dose response based on AUDPC values for three rates of Armour-Zen, where the 2 qt/100 gal treatment has significantly less downy mildew control than the 1 and 4 qt/100 gal rates
* No significant differences in the yield weights or gross returns

*Narrative*:

This trial was carried out to test the efficacy of three rates of Armour-Zen (1, 2 or 4 qt/100 gal) against downy mildew (*Bremia lactucae*) in lettuce grown in California’s Central Coast region. Included in the trial were a Reason treatment (inorganic grower standard), Serenade ASO + Regalia (organic standard), and an untreated check. All applications included Nu Film P at 0.25% v/v.

Downy Mildew lesions were counted per head and on average there was a dose response for cumulative lesion counts for Armour-Zen treatments with higher application rates corresponding to fewer lesions. Only the Reason treated plants had the least severity of infection statistically, but Armour-Zen did not perform as well as the organic standard treatment (Serenade and Regalia in rotation) in controlling infection.

Overall, yields were not significantly different between treatments and gross returns were not significantly improved by any one treatment.

MATERIALS AND METHODS

*Treatments:*

Applications were carried out on a 7-day interval on the following dates: August 13 (A), August 20 (B), August 27 (C), September 4 (D), and September 11 (E), 2013.

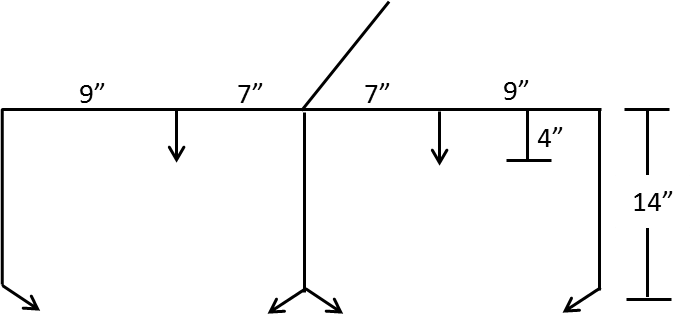
1. Untreated Check
2. ARMOUR-Zen 1 qt/100 gal (ABCDE) + Nu Film P 0.25 %v/v (ABCDE)
3. ARMOUR-Zen 2 qt/100 gal (ABCDE) + Nu Film P 0.25 %v/v (ABCDE)
4. ARMOUR-Zen 4 qt/100 gal (ABCDE) + Nu Film P 0.25 %v/v (ABCDE)
5. Serenade ASO 4 qt/a (ACE) + Regalia 1 qt/a (BD) + Nu Film P 0.25 %v/v (ABCDE)
6. Reason 7 fl oz/a (ABCDE) + Nu Film P 0.25 %v/v (ABCDE)

*Experimental Unit:*

Each plot was 17.3’ long by 3.33’ (one row) wide in Clay Loam soil where lettuce was planted at a density of 26,162 plants/acre, spaced 12” apart (2 rows per bed). Treatments were applied in a randomized block design, replicated four times. Downy mildew disease severity in the field was sufficient for robust analysis.

*Application:*

A backpack CO2 manual sprayer was used, with an operating pressure of 50 psi. The application was done through a 32” wide spray boom with six full cone T5 nozzles with 0.5 orifices. A diagram representing the spray boom follows:



*Evaluations:*

Assessments for number of lesions per head and severity of infection were carried out weekly. Outermost leaves touching the soil were not included, but all other leaves were. Severity is an estimation of percent leaf surface covered by downy mildew and downy mildew damage. Phytotoxicity was rated, but not observed.

Final yield data was collected at two harvests, September 20 and 30. Calculated yields and gross returns were based on a carton size of approximately 50 pounds, and a return of $12.50 per carton according to market standards for the area (thepacker.com).

All calculations were carried out in ARM software (Gylling Data Management, 2013). Statistics were analyzed using ANOVA mean comparison with Student-Newman-Keul’s test, α=0.05. Bartlett’s test for homogeneity of variances was used to determine the need for data transformations.

RESULTS

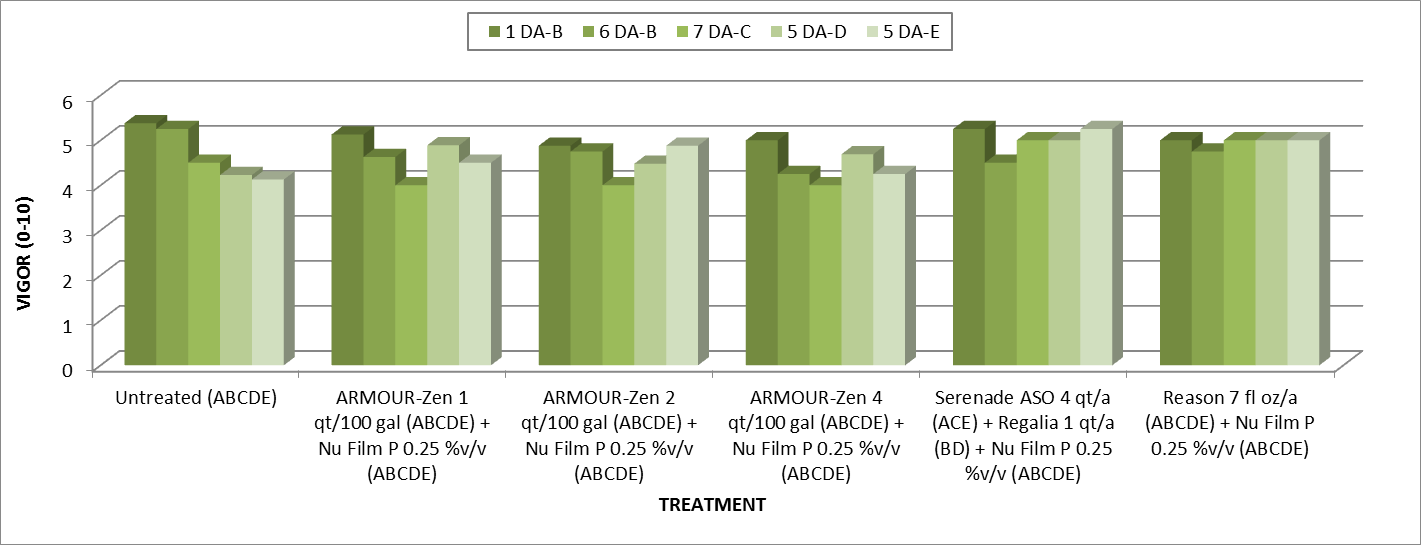
**Table 1. Phytotoxicity.** Average crop injury per treatment on a 0-100% scale.



RESULTS

**Table 2. Crop Vigor.** Relative vigor ratings for treated plants based on an average rating of 5 for the inorganic standard treatment (Reason 7 fl oz/a).



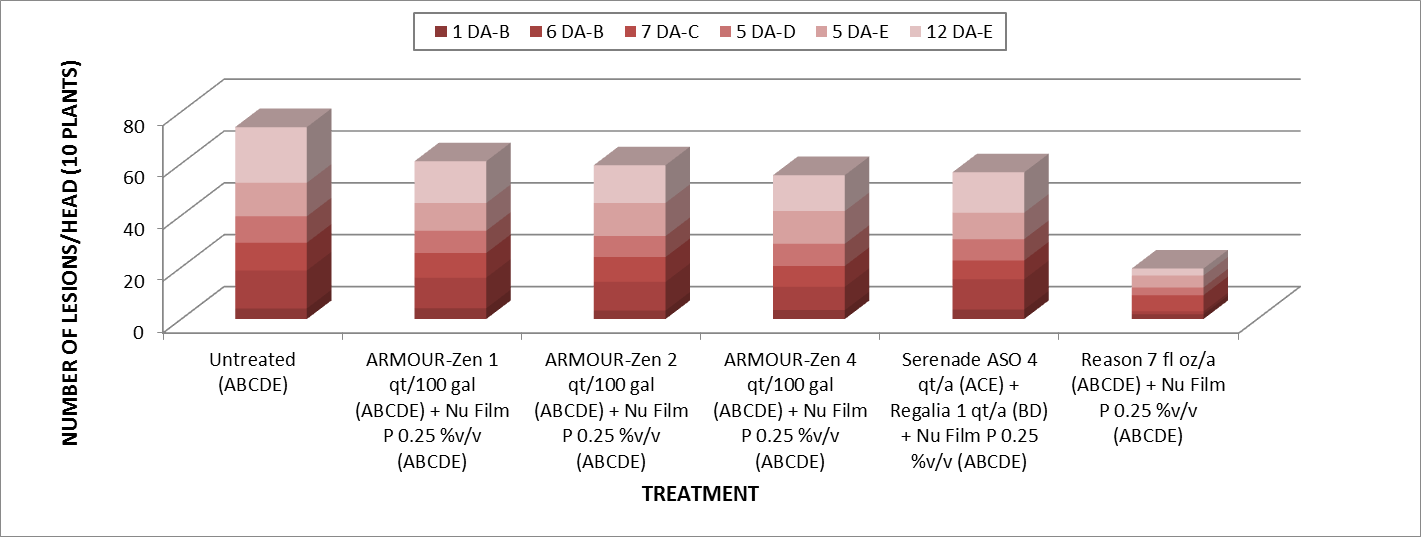


**Graph 2. Crop Vigor.** Relative vigor ratings for treated plants based on an average rating of 5 for the inorganic standard treatment (Reason 7 fl oz/a).

RESULTS

**Table 3. Lesions/Head.** Average number of lesions counted per 10 heads, starting at 1 day post second application, until 12 days after final application.



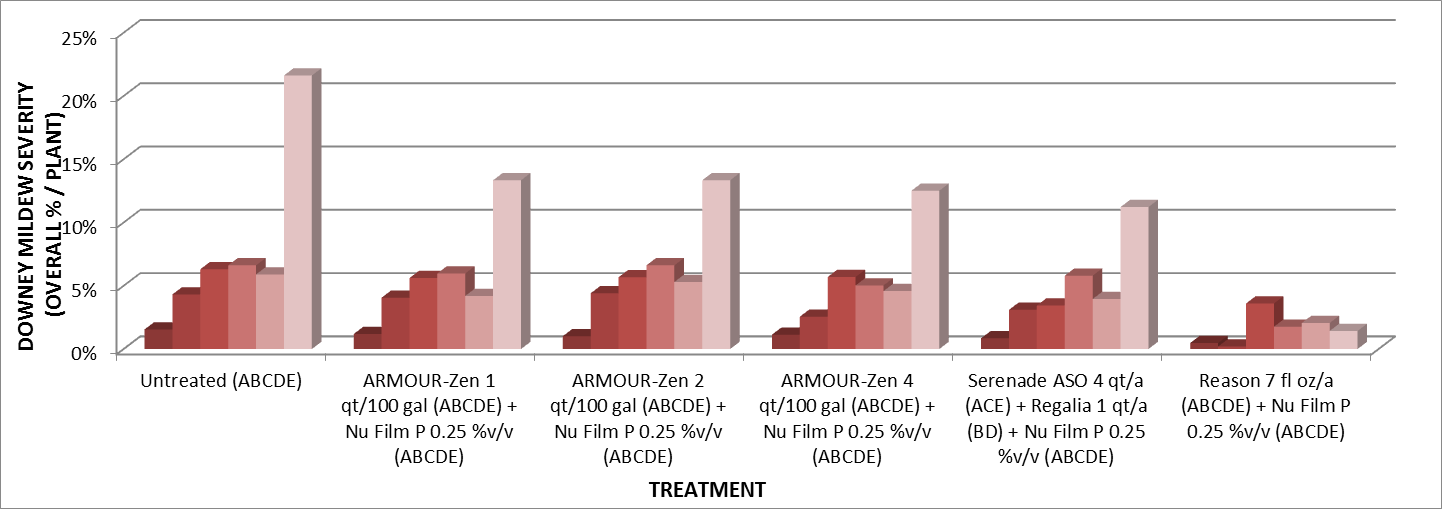


**Graph 3. Lesions/Head.** Average number of lesions counted per 10 heads, starting at 1 day post second application, until 12 days after final application.

RESULTS

**Table 4. Downy Mildew Severity.** Percentage of total plant infected by disease symptoms (0-100% scale).



****

**Graph 4. Downy Mildew Severity.** Percentage of total plant infected by disease symptoms (0-100% scale).

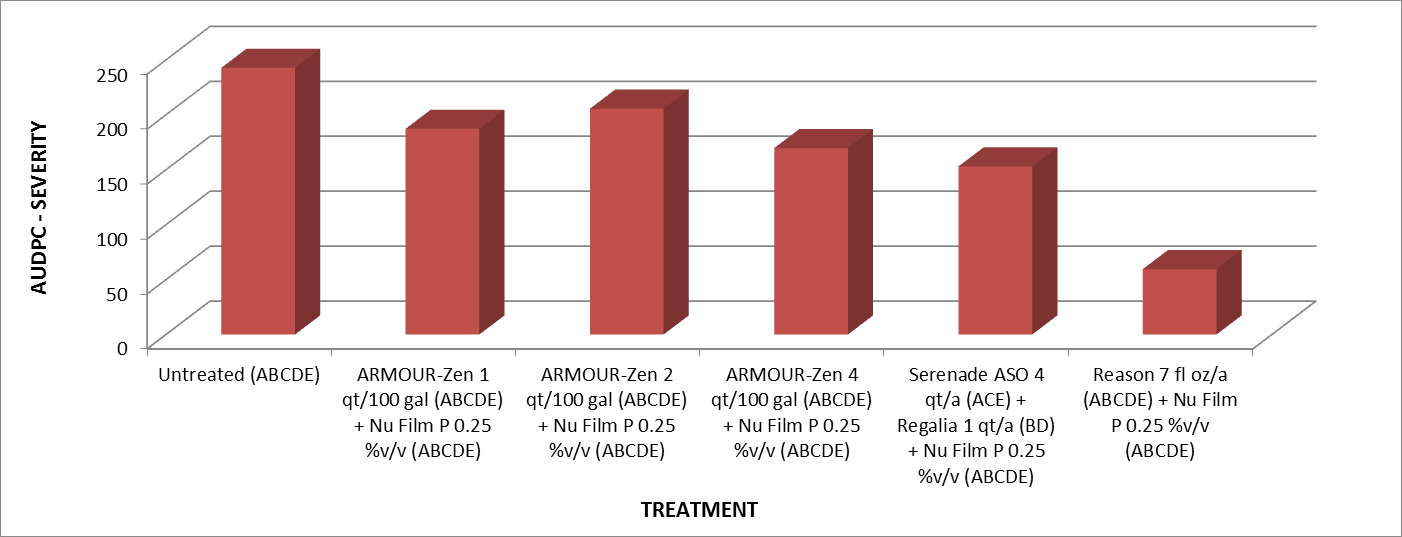
RESULTS

**Table 5. AUDPC.** Area under the disease progress curve, which represents overall severity of downy mildew infestation from 1DAB to 12DAE.



Note: AUDPC calculates the average disease intensity 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 intensity between two adjacent time points.



**Graph 5. AUDPC.** Area under the disease progress curve, which represents overall severity of downy mildew infestation from 1DAB to 12DAE.

RESULTS

**Table 6. Percent Control.** Percent of downy mildew control per treatment, from 1DAB to 12DAE.

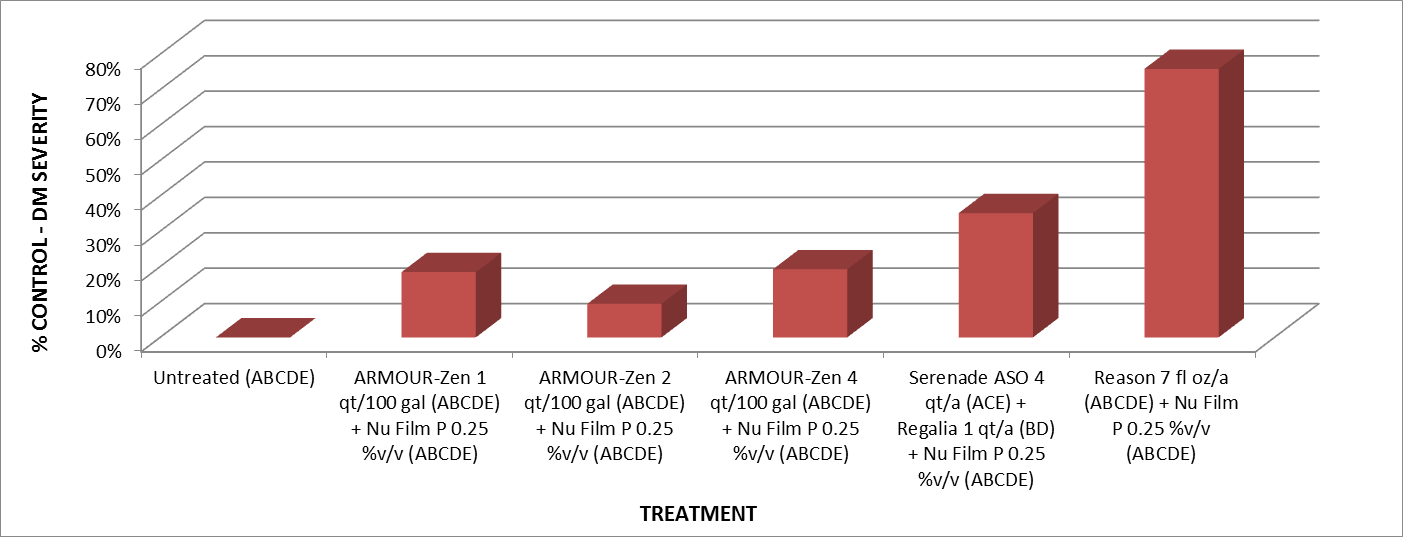


Note: This percent control expresses the severity of Fungal Disease infection in treated plots, compared to plants in the

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

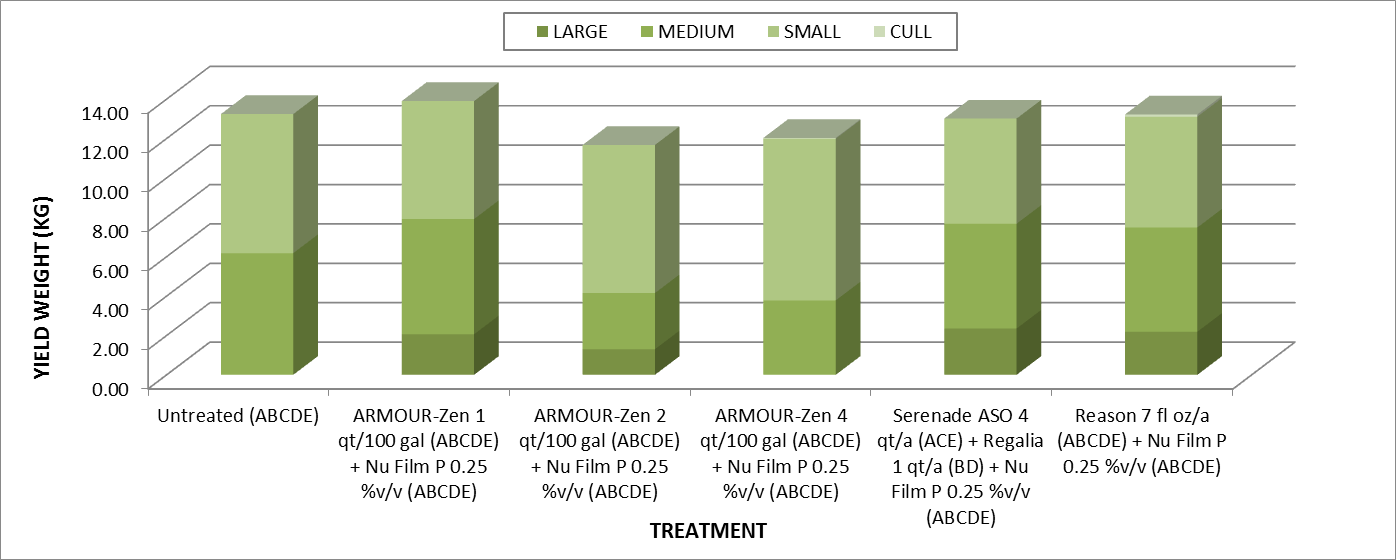


**Graph 6. Percent Control.** Percent of downy mildew control per treatment, from 1DAB to 12DAE.

RESULTS

**Table 7. Yield Weight (kg).** Total yield weight for large, medium, small and unmarketable heads of lettuce for two harvests (September 20 and 30).



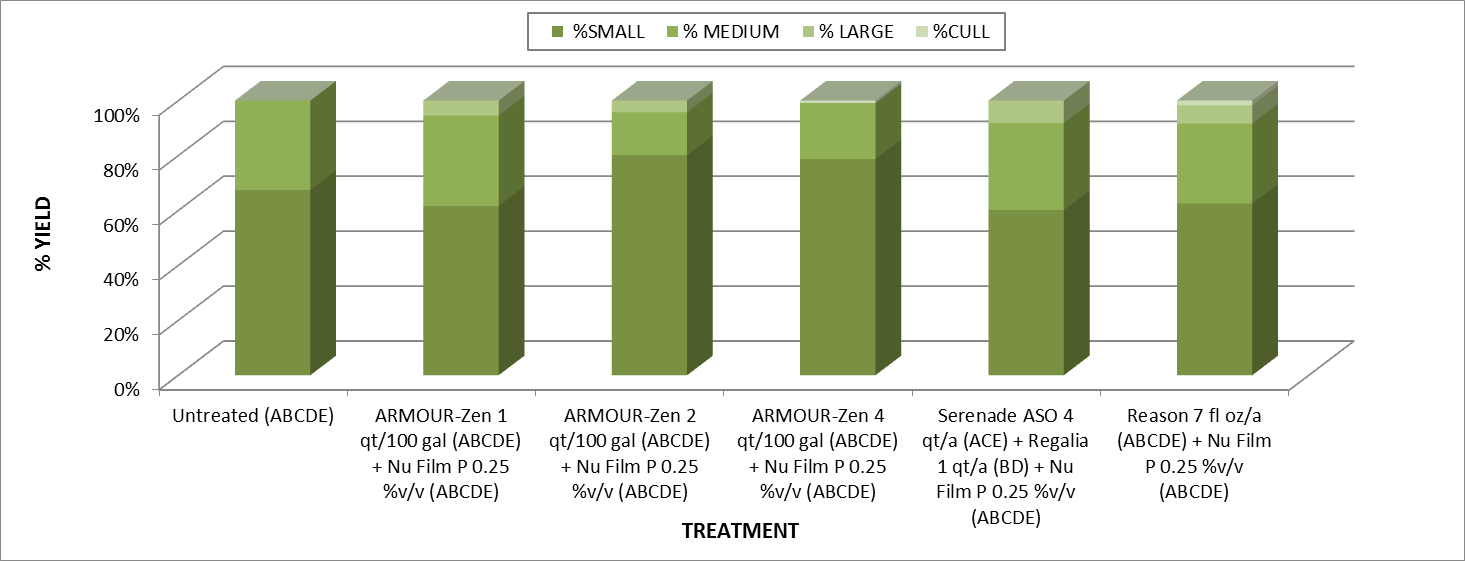


**Graph 7. Yield Weight (kg).** Total yield weight for large, medium, small and unmarketable heads of lettuce for two harvests (September 20 and 30).

RESULTS

**Table 8. Percent Yield.** Percent of total yield at two harvests for large, medium, small and unmarketable heads of lettuce.



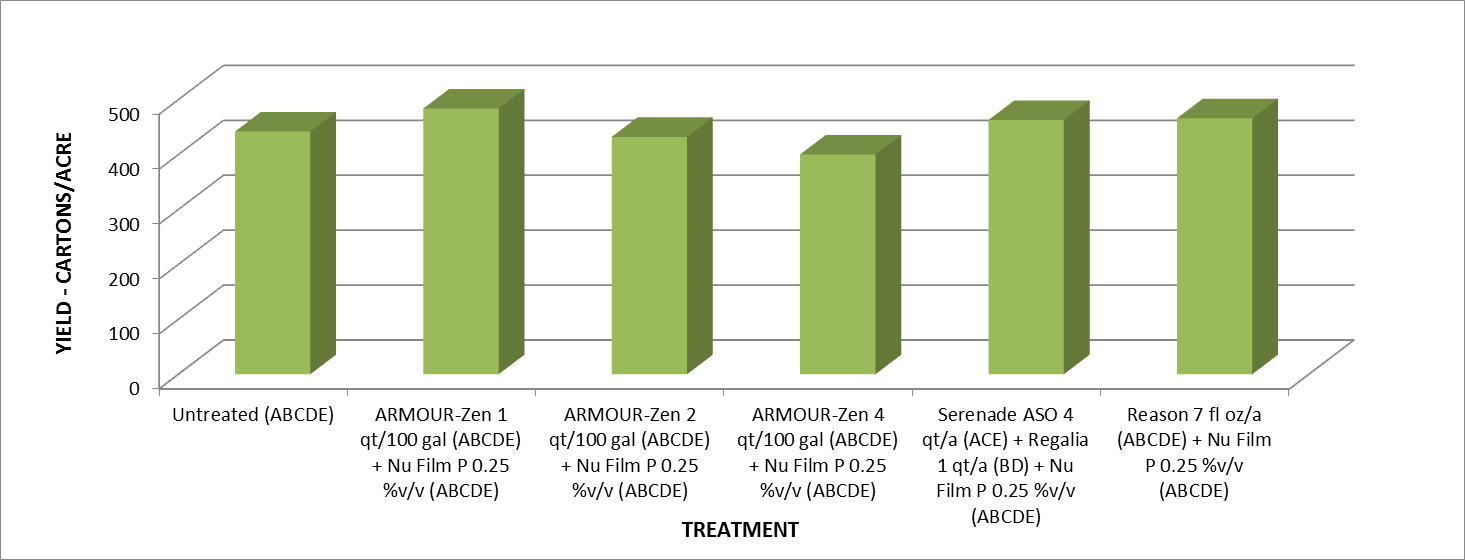


**Graph 8. Percent Yield.** Percent of total yield at two harvests for large, medium, small and unmarketable heads of lettuce.

RESULTS

**Table 9. Cartons/Acre.** Yield of marketable heads of lettuce in 50-pound cartons.



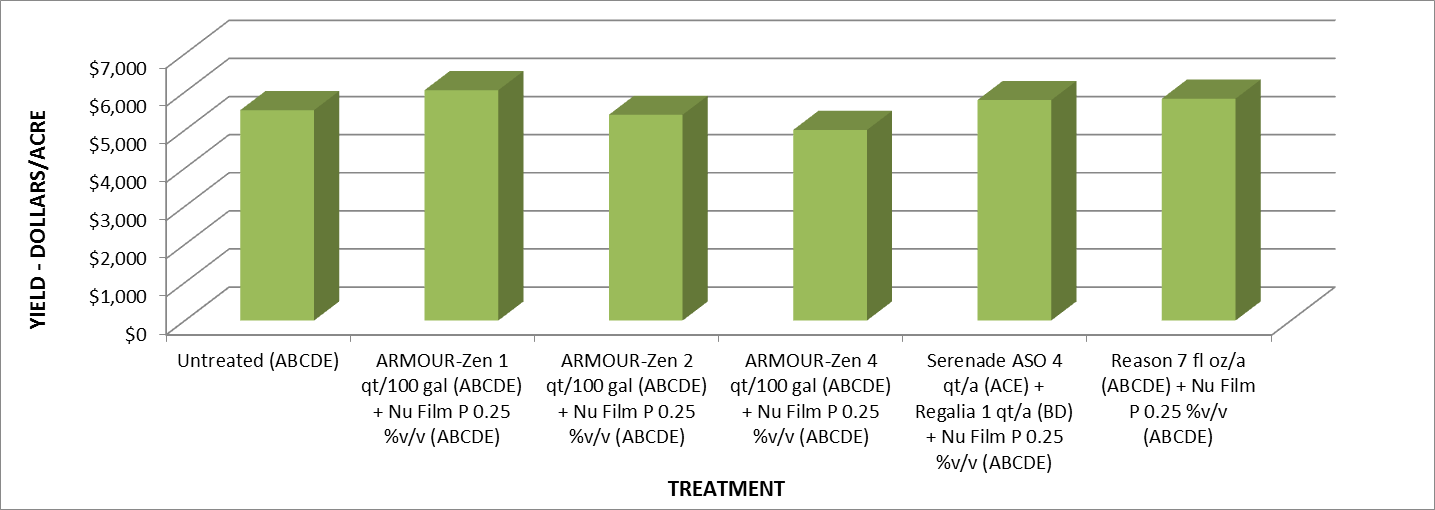


**Graph 9. Cartons/Acre.** Yield of marketable heads of lettuce in 50-pound cartons per acre.

RESULTS

**Table 10. Gross Returns.** Average gross return, in dollars per acre, of marketable lettuce at an approximate rate of $12.50 per fifty-pound carton according to local returns for the summer 2013 season (thepacker.com).





**Graph 10. Gross Returns.** Average gross return, in dollars per acre, of marketable lettuce at an approximate rate of $12.50 per fifty-pound carton according to local returns for the summer 2013 season (thepacker.com).

TREATMENT INFORMATION

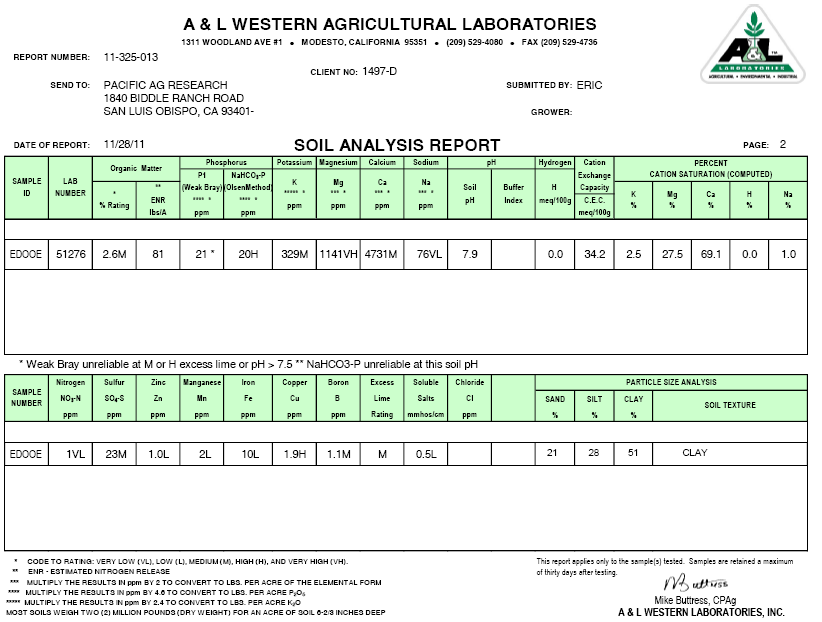


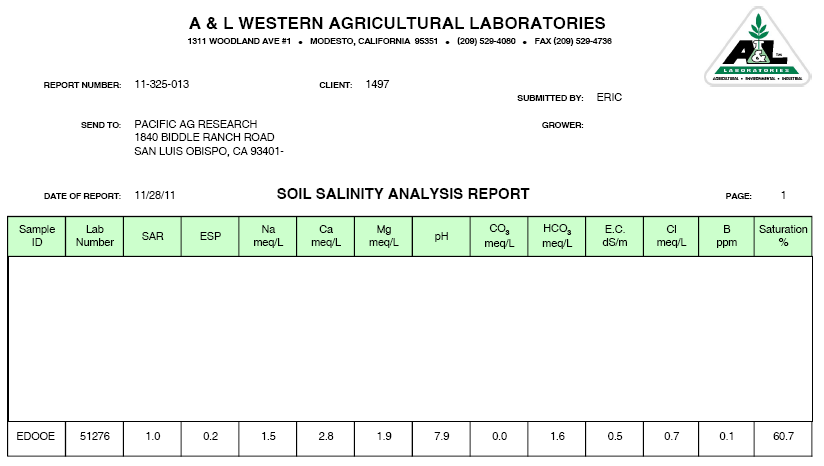
PLOT MAP



APPENDIX A: SOIL ANALYSIS

EDNA – BLOCK E





APPENDIX B: DAILY METEROLOGICAL SUMMARY

SAN LUIS OBISPO, CA

ON-SITE WEATHER STATION

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Date** | **Precip (in)** | **Cumulative Rainfall** | **Max (F°)** | **Min (F°)** | **Mean (F°)** | **Rel Hum%** |
| 1-Jul-13 | 0.00 | 0.11 | 88.8 | 56.2 | 70.0 | 64 |
| 2-Jul-13 | 0.00 | 0.11 | 95.0 | 59.7 | 73.0 | 62 |
| 3-Jul-13 | 0.00 | 0.11 | 84.7 | 54.0 | 68.4 | 65 |
| 4-Jul-13 | 0.00 | 0.11 | 82.4 | 55.8 | 67.5 | 69 |
| 5-Jul-13 | 0.00 | 0.11 | 76.0 | 57.0 | 64.0 | 73 |
| 6-Jul-13 | 0.00 | 0.11 | 77.0 | 55.2 | 63.2 | 69 |
| 7-Jul-13 | 0.00 | 0.11 | 80.3 | 54.8 | 64.1 | 67 |
| 8-Jul-13 | 0.00 | 0.11 | 84.5 | 55.2 | 67.0 | 64 |
| 9-Jul-13 | 0.00 | 0.11 | 85.9 | 54.4 | 65.6 | 67 |
| 10-Jul-13 | 0.00 | 0.11 | 80.7 | 54.2 | 63.2 | 72 |
| 11-Jul-13 | 0.00 | 0.11 | 84.1 | 54.8 | 65.8 | 68 |
| 12-Jul-13 | 0.01 | 0.12 | 81.3 | 54.0 | 64.5 | 69 |
| 13-Jul-13 | 0.00 | 0.12 | 85.1 | 53.1 | 63.6 | 70 |
| 14-Jul-13 | 0.00 | 0.12 | 82.1 | 52.9 | 63.0 | 68 |
| 15-Jul-13 | 0.00 | 0.12 | 72.9 | 53.5 | 61.0 | 69 |
| 16-Jul-13 | 0.00 | 0.12 | 74.1 | 54.8 | 62.2 | 66 |
| 17-Jul-13 | 0.00 | 0.12 | 77.0 | 55.0 | 63.4 | 68 |
| 18-Jul-13 | 0.00 | 0.12 | 74.7 | 53.6 | 61.3 | 71 |
| 19-Jul-13 | 0.00 | 0.12 | 76.4 | 52.3 | 61.3 | 70 |
| 20-Jul-13 | 0.00 | 0.12 | 79.5 | 53.3 | 63.5 | 67 |
| 21-Jul-13 | 0.00 | 0.12 | 80.5 | 53.8 | 66.3 | 67 |
| 22-Jul-13 | 0.00 | 0.12 | 81.9 | 59.7 | 67.2 | 70 |
| 23-Jul-13 | 0.00 | 0.12 | 82.3 | 58.9 | 67.5 | 70 |
| 24-Jul-13 | 0.00 | 0.12 | 78.6 | 56.8 | 64.5 | 73 |
| 25-Jul-13 | 0.00 | 0.12 | 79.5 | 55.8 | 64.2 | 71 |
| 26-Jul-13 | 0.00 | 0.12 | 78.6 | 55.4 | 63.1 | 73 |
| 27-Jul-13 | 0.00 | 0.12 | 77.4 | 55.2 | 63.3 | 71 |
| 28-Jul-13 | 0.00 | 0.12 | 74.9 | 55.8 | 63.3 | 71 |
| 29-Jul-13 | 0.00 | 0.12 | 73.3 | 56.0 | 62.5 | 73 |
| 30-Jul-13 | 0.00 | 0.12 | 72.7 | 55.8 | 62.8 | 70 |
| 31-Jul-13 | 0.00 | 0.12 | 73.5 | 52.3 | 61.9 | 71 |
| 1-Aug-13 | 0.00 | 0.12 | 77.0 | 45.2 | 60.3 | 67 |
| 2-Aug-13 | 0.00 | 0.12 | 75.1 | 44.4 | 59.1 | 71 |
| 3-Aug-13 | 0.00 | 0.12 | 75.4 | 53.8 | 61.1 | 71 |
| 4-Aug-13 | 0.00 | 0.12 | 77.6 | 54.2 | 62.5 | 68 |
| 5-Aug-13 | 0.00 | 0.12 | 77.2 | 53.8 | 61.5 | 71 |
| 6-Aug-13 | 0.00 | 0.12 | 73.7 | 54.2 | 60.2 | 73 |
| 7-Aug-13 | 0.00 | 0.12 | 73.1 | 54.0 | 60.8 | 72 |
| 8-Aug-13 | 0.00 | 0.12 | 72.3 | 55.8 | 62.2 | 71 |
| 9-Aug-13 | 0.00 | 0.12 | 77.2 | 56.6 | 63.2 | 68 |
| 10-Aug-13 | 0.00 | 0.12 | 78.4 | 56.4 | 63.7 | 71 |
| 11-Aug-13 | 0.00 | 0.12 | 79.1 | 55.0 | 61.7 | 75 |
| 12-Aug-13 | 0.00 | 0.12 | 76.8 | 54.6 | 61.8 | 74 |
| 13-Aug-13 | 0.00 | 0.12 | 81.1 | 50.9 | 63.4 | 69 |
| 14-Aug-13 | 0.00 | 0.12 | 85.3 | 47.2 | 64.3 | 62 |
| 15-Aug-13 | 0.00 | 0.12 | 87.8 | 49.4 | 66.8 | 63 |
| 16-Aug-13 | 0.00 | 0.12 | 88.4 | 51.3 | 66.3 | 66 |
| 17-Aug-13 | 0.00 | 0.12 | 82.4 | 56.0 | 65.9 | 68 |
| **Date** | **Precip (in)** | **Cumulative Rainfall** | **Max (F°)** | **Min (F°)** | **Mean (F°)** | **Rel Hum%** |
| 18-Aug-13 | 0.00 | 0.12 | 81.1 | 56.0 | 64.3 | 72 |
| 19-Aug-13 | 0.00 | 0.12 | 79.3 | 54.6 | 63.8 | 72 |
| 20-Aug-13 | 0.00 | 0.12 | 79.7 | 50.3 | 63.4 | 71 |
| 21-Aug-13 | 0.00 | 0.12 | 82.3 | 46.8 | 62.8 | 66 |
| 22-Aug-13 | 0.00 | 0.12 | 77.2 | 46.4 | 62.2 | 64 |
| 23-Aug-13 | 0.00 | 0.12 | 76.6 | 55.6 | 63.2 | 72 |
| 24-Aug-13 | 0.00 | 0.12 | 84.3 | 54.0 | 64.8 | 70 |
| 25-Aug-13 | 0.00 | 0.12 | 81.5 | 52.7 | 63.9 | 75 |
| 26-Aug-13 | 0.00 | 0.12 | 78.8 | 52.5 | 64.6 | 73 |
| 27-Aug-13 | 0.00 | 0.12 | 81.9 | 50.9 | 63.6 | 73 |
| 28-Aug-13 | 0.00 | 0.12 | 82.4 | 55.0 | 64.9 | 72 |
| 29-Aug-13 | 0.00 | 0.12 | 82.1 | 56.8 | 65.8 | 71 |
| 30-Aug-13 | 0.00 | 0.12 | 95.4 | 54.4 | 74.5 | 57 |
| 31-Aug-13 | 0.00 | 0.12 | 90.3 | 61.4 | 75.5 | 55 |
| 1-Sep-13 | 0.00 | 0.12 | 87.8 | 62.6 | 74.4 | 61 |
| 2-Sep-13 | 0.00 | 0.12 | 90.1 | 60.3 | 71.4 | 66 |
| 3-Sep-13 | 0.00 | 0.12 | 85.7 | 58.7 | 71.3 | 60 |
| 4-Sep-13 | 0.00 | 0.12 | 83.5 | 54.2 | 66.8 | 64 |
| 5-Sep-13 | 0.00 | 0.12 | 84.9 | 52.7 | 66.1 | 64 |
| 6-Sep-13 | 0.00 | 0.12 | 90.3 | 52.7 | 69.3 | 58 |
| 7-Sep-13 | 0.00 | 0.12 | 88.4 | 46.2 | 65.1 | 64 |
| 8-Sep-13 | 0.00 | 0.12 | 81.1 | 56.2 | 64.0 | 73 |
| 9-Sep-13 | 0.00 | 0.12 | 82.1 | 54.8 | 63.2 | 75 |
| 10-Sep-13 | 0.00 | 0.12 | 73.5 | 51.5 | 62.1 | 75 |
| 11-Sep-13 | 0.00 | 0.12 | 76.2 | 50.5 | 62.0 | 75 |
| 12-Sep-13 | 0.00 | 0.12 | 77.2 | 47.4 | 62.4 | 73 |
| 13-Sep-13 | 0.00 | 0.12 | 81.5 | 56.8 | 64.3 | 73 |
| 14-Sep-13 | 0.00 | 0.12 | 77.6 | 52.5 | 62.6 | 71 |
| 15-Sep-13 | 0.00 | 0.12 | 84.9 | 48.4 | 62.7 | 67 |
| 16-Sep-13 | 0.00 | 0.12 | 81.9 | 47.8 | 62.7 | 68 |
| 17-Sep-13 | 0.00 | 0.12 | 77.8 | 55.2 | 63.3 | 66 |
| 18-Sep-13 | 0.00 | 0.12 | 89.2 | 48.4 | 64.7 | 59 |
| 19-Sep-13 | 0.00 | 0.12 | 86.4 | 50.7 | 66.6 | 54 |
| 20-Sep-13 | 0.00 | 0.12 | 76.4 | 49.4 | 61.5 | 73 |
| 21-Sep-13 | 0.01 | 0.13 | 72.1 | 57.2 | 63.2 | 78 |
| 22-Sep-13 | 0.00 | 0.13 | 78.0 | 52.1 | 62.0 | 65 |
| 23-Sep-13 | 0.00 | 0.13 | 96.0 | 53.8 | 72.7 | 40 |
| 24-Sep-13 | 0.00 | 0.13 | 87.4 | 48.0 | 63.6 | 55 |
| 25-Sep-13 | 0.00 | 0.13 | 70.6 | 45.0 | 59.3 | 56 |
| 26-Sep-13 | 0.00 | 0.13 | 72.9 | 43.4 | 58.0 | 55 |
| 27-Sep-13 | 0.00 | 0.13 | 83.7 | 38.0 | 59.3 | 45 |
| 28-Sep-13 | 0.00 | 0.13 | 91.1 | 39.7 | 62.8 | 35 |
| 29-Sep-13 | 0.00 | 0.13 | 85.5 | 41.1 | 61.5 | 45 |
| 30-Sep-13 | 0.00 | 0.13 | 83.7 | 43.2 | 61.4 | 65 |
| 1-Oct-13 | 0.00 | 0.13 | 76.6 | 49.2 | 61.2 | 69 |
| 2-Oct-13 | 0.00 | 0.13 | 76.6 | 44.0 | 57.5 | 66 |
| 3-Oct-13 | 0.00 | 0.13 | 78.6 | 38.4 | 57.1 | 53 |
| 4-Oct-13 | 0.00 | 0.13 | 82.7 | 43.2 | 63.1 | 32 |
| **Date** | **Precip (in)** | **Cumulative Rainfall** | **Max (F°)** | **Min (F°)** | **Mean (F°)** | **Rel Hum%** |
| 5-Oct-13 | 0.00 | 0.13 | 92.9 | 46.4 | 66.6 | 24 |
| 6-Oct-13 | 0.00 | 0.13 | 92.5 | 38.4 | 63.5 | 26 |
| 7-Oct-13 | 0.00 | 0.13 | 78.8 | 43.6 | 58.6 | 49 |
| 8-Oct-13 | 0.00 | 0.13 | 68.6 | 50.9 | 56.9 | 69 |
| 9-Oct-13 | 0.00 | 0.13 | 59.9 | 41.1 | 53.3 | 67 |
| 10-Oct-13 | 0.00 | 0.13 | 68.0 | 36.7 | 53.6 | 67 |
| 11-Oct-13 | 0.00 | 0.13 | 71.6 | 41.5 | 55.3 | 64 |
| 12-Oct-13 | 0.00 | 0.13 | 70.4 | 46.8 | 56.5 | 71 |
| 13-Oct-13 | 0.00 | 0.13 | 71.7 | 43.2 | 54.8 | 71 |
| 14-Oct-13 | 0.00 | 0.13 | 87.2 | 42.1 | 60.6 | 52 |
| 15-Oct-13 | 0.00 | 0.13 | 89.0 | 44.6 | 63.5 | 38 |

APPENDIX C: DATA SUMMARIES

Jan-13-2014 (ENA1312 DM Lettuce) Assessment Data Summary Page 1 of 15

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | | BREMLA | BREMLA | BREMLA | BREMLA | BREMLA |
| Pest Scientific Name | | | | | | Bremia lactucae | Bremia lactucae | Bremia lactucae | Bremia lactucae | Bremia lactucae |
| Pest Name | | | | | | Downy mildew o> | Downy mildew o> | Downy mildew o> | Downy mildew o> | Downy mildew o> |
| Crop Code | | | | | | LACSA | LACSA | LACSA | LACSA | LACSA |
| BBCH Scale | | | | | | BVNH | BVNH | BVNH | BVNH | BVNH |
| Crop Scientific Name | | | | | | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa |
| Crop Name | | | | | | Lettuce | Lettuce | Lettuce | Lettuce | Lettuce |
| Crop Variety | | | | | | Sun Devil | Sun Devil | Sun Devil | Sun Devil | Sun Devil |
| Description | | | | | | PHYTOXICITY | PHYTOXICITY | PHYTOXICITY | PHYTOXICITY | VIGOR |
| Part Rated | | | | | | PLANT C | PLANT C | PLANT C | PLANT C | PLANT C |
| Rating Date | | | | | | Aug-21-2013 | Aug-26-2013 | Sep-9-2013 | Sep-16-2013 | Aug-21-2013 |
| Rating Type | | | | | | PHYGEN | PHYGEN | PHYGEN | PHYGEN | VIGOR |
| Rating Unit | | | | | | % | % | % | % | 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 |
| Crop Stage Scale | | | | | | DESC | DESC | DESC | DESC | DESC |
| Footnote Number | | | | | |  |  |  |  |  |
| SE Group No. | | | | | | 2 | 1 | 3 | 4 | 5 |
| Days After First/Last Applic. | | | | | | 8 1 | 13 6 | 27 5 | 34 5 | 8 1 |
| Trt-Eval Interval | | | | | | 1 DA-B | 6 DA-B | 5 DA-D | 5 DA-E | 1 DA-B |
| Plant-Eval Interval | | | | | | 27 DP-1 | 32 DP-1 | 46 DP-1 | 53 DP-1 | 27 DP-1 |
| ARM Action Codes | | | | | |  |  |  |  |  |
| Number of Decimals | | | | | | 0 | 0 | 0 | 0 | 1 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 1 | 2 | 3 | 4 | 5 |
| 1 | Untreated |  |  | ABCDE | 106 | 0 | 0 | 0 | 0 | 7.0 |
|  |  |  |  |  | 202 | 0 | 0 | 0 | 0 | 5.5 |
|  |  |  |  |  | 304 | 0 | 0 | 0 | 0 | 5.0 |
|  |  |  |  |  | 401 | 0 | 0 | 0 | 0 | 4.0 |
| Mean = | | | | | | 0 | 0 | 0 | 0 | 5.4 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 103 | 0 | 0 | 0 | 0 | 5.5 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 0 | 0 | 0 | 0 | 5.5 |
|  |  |  |  |  | 301 | 0 | 0 | 0 | 0 | 5.0 |
|  |  |  |  |  | 403 | 0 | 0 | 0 | 0 | 4.5 |
| Mean = | | | | | | 0 | 0 | 0 | 0 | 5.1 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 101 | 0 | 0 | 0 | 0 | 5.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 0 | 0 | 0 | 0 | 5.5 |
|  |  |  |  |  | 306 | 0 | 0 | 0 | 0 | 4.0 |
|  |  |  |  |  | 404 | 0 | 0 | 0 | 0 | 5.0 |
| Mean = | | | | | | 0 | 0 | 0 | 0 | 4.9 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 104 | 0 | 0 | 0 | 0 | 5.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 201 | 0 | 0 | 0 | 0 | 5.5 |
|  |  |  |  |  | 303 | 0 | 0 | 0 | 0 | 4.5 |
|  |  |  |  |  | 406 | 0 | 0 | 0 | 0 | 5.0 |
| Mean = | | | | | | 0 | 0 | 0 | 0 | 5.0 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 102 | 0 | 0 | 0 | 0 | 6.0 |
|  | Regalia | 1 | qt/a | BD | 206 | 0 | 0 | 0 | 0 | 5.5 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 302 | 0 | 0 | 0 | 0 | 5.0 |
|  |  |  |  |  | 405 | 0 | 0 | 0 | 0 | 4.5 |
| Mean = | | | | | | 0 | 0 | 0 | 0 | 5.3 |
| 6 | Reason | 7 | fl oz/a | ABCDE | 105 | 0 | 0 | 0 | 0 | 5.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 0 | 0 | 0 | 0 | 5.0 |
|  |  |  |  |  | 305 | 0 | 0 | 0 | 0 | 5.0 |
|  |  |  |  |  | 402 | 0 | 0 | 0 | 0 | 5.0 |
| Mean = | | | | | | 0 | 0 | 0 | 0 | 5.0 |

Jan-13-2014 (ENA1312 DM Lettuce) Assessment Data Summary Page 2 of 15

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | | BREMLA | BREMLA | BREMLA | BREMLA | BREMLA |
| Pest Scientific Name | | | | | | Bremia lactucae | Bremia lactucae | Bremia lactucae | Bremia lactucae | Bremia lactucae |
| Pest Name | | | | | | Downy mildew o> | Downy mildew o> | Downy mildew o> | Downy mildew o> | Downy mildew o> |
| Crop Code | | | | | | LACSA | LACSA | LACSA | LACSA | LACSA |
| BBCH Scale | | | | | | BVNH | BVNH | BVNH | BVNH | BVNH |
| Crop Scientific Name | | | | | | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa |
| Crop Name | | | | | | Lettuce | Lettuce | Lettuce | Lettuce | Lettuce |
| Crop Variety | | | | | | Sun Devil | Sun Devil | Sun Devil | Sun Devil | Sun Devil |
| Description | | | | | | VIGOR | VIGOR | VIGOR | VIGOR | DM LESIONS |
| Part Rated | | | | | | PLANT C | PLANT C | PLANT C | PLANT C | PLANT C |
| Rating Date | | | | | | Aug-26-2013 | Sep-3-2013 | Sep-9-2013 | Sep-16-2013 | Aug-21-2013 |
| Rating Type | | | | | | VIGOR | VIGOR | VIGOR | VIGOR | LESION |
| Rating Unit | | | | | | 0-10 | 0-10 | 0-10 | 0-10 | 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 | 10 PLANT |
| Number of Subsamples | | | | | | 1 | 1 | 1 | 1 | 10 |
| Crop Stage Scale | | | | | | DESC | DESC | DESC | DESC | DESC |
| Footnote Number | | | | | |  |  |  |  |  |
| SE Group No. | | | | | | 6 | 7 | 8 | 9 | 26 |
| Days After First/Last Applic. | | | | | | 13 6 | 21 7 | 27 5 | 34 5 | 8 1 |
| Trt-Eval Interval | | | | | | 6 DA-B | 7 DA-C | 5 DA-D | 5 DA-E | 1 DA-B |
| Plant-Eval Interval | | | | | | 32 DP-1 | 40 DP-1 | 46 DP-1 | 53 DP-1 | 27 DP-1 |
| ARM Action Codes | | | | | |  |  | AL |  |  |
| Number of Decimals | | | | | | 1 | 1 | 1 | 1 | 1 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 6 | 7 | 8 | 9 | 10 |
| 1 | Untreated |  |  | ABCDE | 106 | 5.0 | 5.0 | 4.0 | 4.0 | 3.4 |
|  |  |  |  |  | 202 | 6.0 | 4.0 | 5.0 | 5.0 | 1.9 |
|  |  |  |  |  | 304 | 5.0 | 5.0 | 4.0 | 3.5 | 5.2 |
|  |  |  |  |  | 401 | 5.0 | 4.0 | 4.0 | 4.0 | 6.0 |
| Mean = | | | | | | 5.3 | 4.5 | 4.2t | 4.1 | 4.1 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 103 | 5.0 | 4.0 | 4.0 | 5.0 | 4.3 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 6.5 | 5.0 | 7.0 | 5.0 | 4.8 |
|  |  |  |  |  | 301 | 4.0 | 3.0 | 5.0 | 4.0 | 4.7 |
|  |  |  |  |  | 403 | 3.0 | 4.0 | 4.0 | 4.0 | 2.9 |
| Mean = | | | | | | 4.6 | 4.0 | 4.9t | 4.5 | 4.2 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 101 | 4.0 | 3.0 | 5.0 | 5.0 | 2.7 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 6.0 | 4.0 | 5.0 | 5.0 | 2.1 |
|  |  |  |  |  | 306 | 4.0 | 4.0 | 4.0 | 4.5 | 3.2 |
|  |  |  |  |  | 404 | 5.0 | 5.0 | 4.0 | 5.0 | 5.1 |
| Mean = | | | | | | 4.8 | 4.0 | 4.5t | 4.9 | 3.3 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 104 | 3.0 | 4.0 | 4.0 | 4.0 | 2.2 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 201 | 6.0 | 4.0 | 6.0 | 5.0 | 4.2 |
|  |  |  |  |  | 303 | 4.0 | 4.0 | 4.0 | 3.0 | 5.2 |
|  |  |  |  |  | 406 | 4.0 | 4.0 | 5.0 | 5.0 | 2.2 |
| Mean = | | | | | | 4.3 | 4.0 | 4.7t | 4.3 | 3.5 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 102 | 4.0 | 5.0 | 5.0 | 5.0 | 5.1 |
|  | Regalia | 1 | qt/a | BD | 206 | 4.0 | 5.0 | 5.0 | 5.0 | 3.2 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 302 | 5.0 | 5.0 | 5.0 | 6.0 | 3.4 |
|  |  |  |  |  | 405 | 5.0 | 5.0 | 5.0 | 5.0 | 3.0 |
| Mean = | | | | | | 4.5 | 5.0 | 5.0t | 5.3 | 3.7 |
| 6 | Reason | 7 | fl oz/a | ABCDE | 105 | 5.0 | 5.0 | 5.0 | 5.0 | 1.5 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 5.0 | 5.0 | 5.0 | 5.0 | 1.6 |
|  |  |  |  |  | 305 | 5.0 | 5.0 | 5.0 | 5.0 | 1.9 |
|  |  |  |  |  | 402 | 4.0 | 5.0 | 5.0 | 5.0 | 2.5 |
| Mean = | | | | | | 4.8 | 5.0 | 5.0t | 5.0 | 1.9 |

Jan-13-2014 (ENA1312 DM Lettuce) Assessment Data Summary Page 3 of 15

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | | BREMLA | BREMLA | BREMLA | BREMLA | BREMLA |
| Pest Scientific Name | | | | | | Bremia lactucae | Bremia lactucae | Bremia lactucae | Bremia lactucae | Bremia lactucae |
| Pest Name | | | | | | Downy mildew o> | Downy mildew o> | Downy mildew o> | Downy mildew o> | Downy mildew o> |
| Crop Code | | | | | | LACSA | LACSA | LACSA | LACSA | LACSA |
| BBCH Scale | | | | | | BVNH | BVNH | BVNH | BVNH | BVNH |
| Crop Scientific Name | | | | | | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa |
| Crop Name | | | | | | Lettuce | Lettuce | Lettuce | Lettuce | Lettuce |
| Crop Variety | | | | | | Sun Devil | Sun Devil | Sun Devil | Sun Devil | Sun Devil |
| Description | | | | | | DM LESIONS | DM LESIONS | DM LESIONS | DM LESIONS | DM LESIONS |
| Part Rated | | | | | | PLANT C | PLANT C | PLANT C | PLAHEA C | PLAHEA C |
| Rating Date | | | | | | Aug-26-2013 | Sep-3-2013 | Sep-9-2013 | Sep-16-2013 | Sep-23-2013 |
| Rating Type | | | | | | LESION | LESION | LESION | LESION | LESION |
| Rating Unit | | | | | | NUMBER | NUMBER | NUMBER | NUMBER | NUMBER |
| 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 |
| Crop Stage Scale | | | | | | DESC | DESC | DESC | DESC | DESC |
| Footnote Number | | | | | |  |  |  |  | 1 |
| SE Group No. | | | | | | 27 | 28 | 29 | 30 | 31 |
| Days After First/Last Applic. | | | | | | 13 6 | 21 7 | 27 5 | 34 5 | 41 12 |
| Trt-Eval Interval | | | | | | 6 DA-B | 7 DA-C | 5 DA-D | 5 DA-E | 12 DA-E |
| Plant-Eval Interval | | | | | | 32 DP-1 | 40 DP-1 | 46 DP-1 | 53 DP-1 | 60 DP-1 |
| ARM Action Codes | | | | | |  |  | AL |  | AL |
| Number of Decimals | | | | | | 1 | 1 | 1 | 1 | 1 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 11 | 12 | 13 | 14 | 15 |
| 1 | Untreated |  |  | ABCDE | 106 | 16.1 | 6.6 | 11.3 | 11.6 | 21.5 |
|  |  |  |  |  | 202 | 30.0 | 14.4 | 8.1 | 15.2 | 21.5 |
|  |  |  |  |  | 304 | 3.7 | 8.2 | 6.5 | 7.5 | 11.1 |
|  |  |  |  |  | 401 | 8.8 | 13.6 | 17.5 | 17.5 | 40.5 |
| Mean = | | | | | | 14.7 | 10.7 | 10.2t | 13.0 | 21.5t |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 103 | 22.8 | 7.5 | 8.1 | 11.3 | 17.5 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 15.0 | 7.0 | 9.3 | 10.1 | 15.4 |
|  |  |  |  |  | 301 | 3.8 | 14.2 | 7.0 | 7.7 | 9.1 |
|  |  |  |  |  | 403 | 5.6 | 9.3 | 10.3 | 13.6 | 27.1 |
| Mean = | | | | | | 11.8 | 9.5 | 8.6t | 10.7 | 16.1t |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 101 | 14.7 | 9.9 | 9.6 | 13.8 | 9.5 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 15.2 | 7.9 | 7.3 | 10.7 | 9.6 |
|  |  |  |  |  | 306 | 4.2 | 8.0 | 6.4 | 12.5 | 12.1 |
|  |  |  |  |  | 404 | 10.2 | 12.4 | 9.6 | 14.2 | 38.8 |
| Mean = | | | | | | 11.1 | 9.6 | 8.1t | 12.8 | 14.5t |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 104 | 17.1 | 8.1 | 8.6 | 8.1 | 9.3 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 201 | 7.9 | 10.2 | 6.4 | 10.7 | 11.8 |
|  |  |  |  |  | 303 | 4.5 | 7.3 | 8.2 | 17.0 | 8.5 |
|  |  |  |  |  | 406 | 6.5 | 6.6 | 11.6 | 14.7 | 37.7 |
| Mean = | | | | | | 9.0 | 8.1 | 8.5t | 12.6 | 13.8t |
| 5 | Serenade ASO | 4 | qt/a | ACE | 102 | 14.8 | 9.2 | 9.7 | 6.0 | 15.9 |
|  | Regalia | 1 | qt/a | BD | 206 | 23.8 | 4.8 | 6.4 | 8.4 | 11.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 302 | 4.3 | 10.8 | 7.9 | 14.0 | 10.4 |
|  |  |  |  |  | 405 | 3.8 | 4.2 | 9.3 | 12.4 | 31.4 |
| Mean = | | | | | | 11.7 | 7.3 | 8.2t | 10.2 | 15.6t |
| 6 | Reason | 7 | fl oz/a | ABCDE | 105 | 0.5 | 4.5 | 5.1 | 6.0 | 4.9 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 2.5 | 5.8 | 3.1 | 8.0 | 2.3 |
|  |  |  |  |  | 305 | 0.2 | 4.8 | 2.3 | 2.2 | 2.9 |
|  |  |  |  |  | 402 | 1.2 | 9.9 | 2.0 | 2.1 | 1.5 |
| Mean = | | | | | | 1.1 | 6.3 | 3.0t | 4.6 | 2.7t |

Jan-13-2014 (ENA1312 DM Lettuce) Assessment Data Summary Page 4 of 15

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | | BREMLA | BREMLA | BREMLA | BREMLA | BREMLA |
| Pest Scientific Name | | | | | | Bremia lactucae | Bremia lactucae | Bremia lactucae | Bremia lactucae | Bremia lactucae |
| Pest Name | | | | | | Downy mildew o> | Downy mildew o> | Downy mildew o> | Downy mildew o> | Downy mildew o> |
| Crop Code | | | | | | LACSA | LACSA | LACSA | LACSA | LACSA |
| BBCH Scale | | | | | | BVNH | BVNH | BVNH | BVNH | BVNH |
| Crop Scientific Name | | | | | | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa |
| Crop Name | | | | | | Lettuce | Lettuce | Lettuce | Lettuce | Lettuce |
| Crop Variety | | | | | | Sun Devil | Sun Devil | Sun Devil | Sun Devil | Sun Devil |
| Description | | | | | | DM SEVERITY | DM SEVERITY | DM SEVERITY | DM SEVERITY | DM SEVERITY |
| Part Rated | | | | | | PLAHEA P | PLANT C | PLANT C | PLANT C | PLANT C |
| Rating Date | | | | | | Aug-21-2013 | Aug-26-2013 | Sep-3-2013 | Sep-9-2013 | Sep-16-2013 |
| 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 |
| Crop Stage Scale | | | | | | DESC | DESC | DESC | DESC | DESC |
| Footnote Number | | | | | |  |  |  |  |  |
| SE Group No. | | | | | | 32 | 33 | 34 | 35 | 36 |
| Days After First/Last Applic. | | | | | | 8 1 | 13 6 | 21 7 | 27 5 | 34 5 |
| Trt-Eval Interval | | | | | | 1 DA-B | 6 DA-B | 7 DA-C | 5 DA-D | 5 DA-E |
| Plant-Eval Interval | | | | | | 27 DP-1 | 32 DP-1 | 40 DP-1 | 46 DP-1 | 53 DP-1 |
| ARM Action Codes | | | | | |  | AL |  |  |  |
| Number of Decimals | | | | | | 2 | 1 | 1 | 1 | 1 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 16 | 17 | 18 | 19 | 20 |
| 1 | Untreated |  |  | ABCDE | 106 | 1.66 | 3.3 | 4.3 | 11.5 | 7.8 |
|  |  |  |  |  | 202 | 0.57 | 2.9 | 8.5 | 6.4 | 11.3 |
|  |  |  |  |  | 304 | 2.05 | 4.2 | 6.2 | 6.4 | 1.2 |
|  |  |  |  |  | 401 | 1.90 | 8.3 | 6.4 | 2.2 | 3.5 |
| Mean = | | | | | | 1.55 | 4.3t | 6.3 | 6.6 | 5.9 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 103 | 1.26 | 4.9 | 3.0 | 8.9 | 7.5 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 0.95 | 1.9 | 4.7 | 6.7 | 6.0 |
|  |  |  |  |  | 301 | 1.66 | 4.6 | 7.7 | 6.0 | 0.9 |
|  |  |  |  |  | 403 | 0.90 | 5.8 | 7.1 | 2.3 | 2.4 |
| Mean = | | | | | | 1.19 | 4.1t | 5.6 | 6.0 | 4.2 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 101 | 0.80 | 3.6 | 4.1 | 8.7 | 9.7 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 0.61 | 1.8 | 4.1 | 6.4 | 6.8 |
|  |  |  |  |  | 306 | 0.72 | 3.9 | 7.4 | 6.7 | 2.7 |
|  |  |  |  |  | 404 | 1.95 | 12.9 | 7.2 | 4.7 | 2.1 |
| Mean = | | | | | | 1.02 | 4.4t | 5.7 | 6.6 | 5.3 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 104 | 0.41 | 2.9 | 5.4 | 5.4 | 5.6 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 201 | 1.50 | 1.0 | 6.0 | 6.4 | 4.4 |
|  |  |  |  |  | 303 | 2.00 | 2.9 | 5.9 | 5.5 | 4.5 |
|  |  |  |  |  | 406 | 0.66 | 4.5 | 5.6 | 2.8 | 4.0 |
| Mean = | | | | | | 1.14 | 2.6t | 5.7 | 5.0 | 4.6 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 102 | 1.10 | 3.7 | 4.3 | 10.5 | 5.1 |
|  | Regalia | 1 | qt/a | BD | 206 | 0.41 | 4.0 | 2.5 | 5.2 | 4.9 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 302 | 0.95 | 3.8 | 5.0 | 6.2 | 3.0 |
|  |  |  |  |  | 405 | 0.95 | 1.6 | 2.0 | 1.3 | 2.9 |
| Mean = | | | | | | 0.85 | 3.1t | 3.4 | 5.8 | 4.0 |
| 6 | Reason | 7 | fl oz/a | ABCDE | 105 | 0.31 | 0.1 | 2.4 | 4.3 | 4.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 0.55 | 0.4 | 3.2 | 1.7 | 3.8 |
|  |  |  |  |  | 305 | 0.52 | 0.1 | 3.2 | 0.9 | 0.3 |
|  |  |  |  |  | 402 | 0.55 | 0.3 | 5.7 | 0.2 | 0.2 |
| Mean = | | | | | | 0.48 | 0.2t | 3.6 | 1.8 | 2.1 |

Jan-13-2014 (ENA1312 DM Lettuce) Assessment Data Summary Page 5 of 15

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | | BREMLA | BREMLA | BREMLA |  |  |
| Pest Scientific Name | | | | | | Bremia lactucae | Bremia lactucae | Bremia lactucae |  |  |
| Pest Name | | | | | | Downy mildew o> | Downy mildew o> | Downy mildew o> |  |  |
| Crop Code | | | | | | LACSA | LACSA | LACSA | LACSA | LACSA |
| BBCH Scale | | | | | | BVNH | BVNH | BVNH | BVNH | BVNH |
| Crop Scientific Name | | | | | | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa |
| Crop Name | | | | | | Lettuce | Lettuce | Lettuce | Lettuce | Lettuce |
| Crop Variety | | | | | | Sun Devil | Sun Devil | Sun Devil | Sun Devil | Sun Devil |
| Description | | | | | | DM SEVERITY | DM AUDPC | DM CONTROL | LARGE # | LARGE WEIGHT |
| Part Rated | | | | | | PLAHEA P | PLAHEA P | PLAHEA P | FRUMAR C | FRUMAR C |
| Rating Date | | | | | | Sep-23-2013 | Sep-23-2013 | Sep-23-2013 | Sep-20-2013 | Sep-20-2013 |
| Rating Type | | | | | | PESSEV | AUDPC | CONTRO | YIELD | WEIGHT |
| Rating Unit | | | | | | % | AUDPC | %UNCK | NUBER | 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 | 1 | 1 | 1 | 1 |
| Crop Stage Scale | | | | | | DESC | DESC | DESC |  |  |
| Footnote Number | | | | | | 1 |  |  |  |  |
| SE Group No. | | | | | | 37 | 39 | 40 | 10 | 11 |
| Days After First/Last Applic. | | | | | | 41 12 | 41 12 | 41 12 | 38 9 | 38 9 |
| Trt-Eval Interval | | | | | | 12 DA-E | 12 DA-E | 12 DA-E | 9 DA-E | 9 DA-E |
| Plant-Eval Interval | | | | | | 60 DP-1 | 60 DP-1 | 60 DP-1 | 57 DP-1 | 57 DP-1 |
| ARM Action Codes | | | | | | AS | T17 AUDPC | AA TAB[22] | AA | AL |
| Number of Decimals | | | | | | 1 | 0 | 1 | 1 | 1 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 21 | 22 | 23 | 24 | 25 |
| 1 | Untreated |  |  | ABCDE | 106 | 35.5 | 309 | 0.0 | 0.0 | 0.0 |
|  |  |  |  |  | 202 | 30.0 | 305 | 0.0 | 0.0 | 0.0 |
|  |  |  |  |  | 304 | 15.0 | 178 | 0.0 | 0.0 | 0.0 |
|  |  |  |  |  | 401 | 10.8 | 179 | 0.0 | 0.0 | 0.0 |
| Mean = | | | | | | 21.6t | 243 | 0.0t | 0.0t | 0.0t |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 103 | 19.5 | 234 | 24.0 | 2.0 | 2.4 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 18.8 | 199 | 34.8 | 2.0 | 2.2 |
|  |  |  |  |  | 301 | 11.2 | 173 | 2.8 | 2.0 | 4.0 |
|  |  |  |  |  | 403 | 6.3 | 143 | 20.1 | 0.0 | 0.0 |
| Mean = | | | | | | 13.3t | 187 | 18.4t | 1.1t | 1.7t |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 101 | 9.2 | 210 | 32.0 | 6.0 | 6.1 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 18.0 | 193 | 36.7 | 0.0 | 0.0 |
|  |  |  |  |  | 306 | 15.5 | 195 | 0.0 | 2.0 | 2.0 |
|  |  |  |  |  | 404 | 11.5 | 224 | 0.0 | 0.0 | 0.0 |
| Mean = | | | | | | 13.3t | 206 | 9.5t | 0.9t | 1.1t |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 104 | 12.5 | 175 | 43.4 | 0.0 | 0.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 201 | 13.0 | 170 | 44.4 | 0.0 | 0.0 |
|  |  |  |  |  | 303 | 13.5 | 179 | 0.0 | 0.0 | 0.0 |
|  |  |  |  |  | 406 | 11.1 | 155 | 13.0 | 0.0 | 0.0 |
| Mean = | | | | | | 12.5t | 170 | 19.3t | 0.0t | 0.0t |
| 5 | Serenade ASO | 4 | qt/a | ACE | 102 | 18.8 | 226 | 27.0 | 3.0 | 3.1 |
|  | Regalia | 1 | qt/a | BD | 206 | 10.0 | 147 | 51.8 | 0.0 | 0.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 302 | 8.9 | 154 | 13.5 | 4.0 | 4.3 |
|  |  |  |  |  | 405 | 8.5 | 85 | 52.5 | 0.0 | 0.0 |
| Mean = | | | | | | 11.2t | 153 | 35.1t | 0.9t | 1.2t |
| 6 | Reason | 7 | fl oz/a | ABCDE | 105 | 4.3 | 88 | 71.5 | 3.0 | 3.2 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 1.1 | 67 | 77.9 | 0.0 | 0.0 |
|  |  |  |  |  | 305 | 1.3 | 37 | 79.4 | 0.0 | 0.0 |
|  |  |  |  |  | 402 | 0.1 | 46 | 74.3 | 6.0 | 6.8 |
| Mean = | | | | | | 1.4t | 60 | 75.8t | 1.1t | 1.4t |

Jan-13-2014 (ENA1312 DM Lettuce) Assessment Data Summary Page 6 of 15

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | | LACSA | LACSA | LACSA | LACSA | LACSA |
| BBCH Scale | | | | | | BVNH | BVNH | BVNH | BVNH | BVNH |
| Crop Scientific Name | | | | | | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa |
| Crop Name | | | | | | Lettuce | Lettuce | Lettuce | Lettuce | Lettuce |
| Crop Variety | | | | | | Sun Devil | Sun Devil | Sun Devil | Sun Devil | Sun Devil |
| Description | | | | | | MEDIUM # | MEDIUM WEIGHT | SMALL # | SMALL WEIGHT | CULL # |
| Part Rated | | | | | | FRUMAR C | FRUMAR C | FRUMAR C | FRUMAR C | FRUMAR C |
| Rating Date | | | | | | Sep-20-2013 | Sep-20-2013 | Sep-20-2013 | Sep-20-2013 | Sep-20-2013 |
| Rating Type | | | | | | YIELD | WEIGHT | YIELD | WEIGHT | YIELD |
| Rating Unit | | | | | | NUBER | KG | NUBER | KG | NUBER |
| 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 |
| Crop Stage Scale | | | | | |  |  |  |  |  |
| Footnote Number | | | | | |  |  |  |  |  |
| SE Group No. | | | | | | 12 | 13 | 14 | 15 | 16 |
| Days After First/Last Applic. | | | | | | 38 9 | 38 9 | 38 9 | 38 9 | 38 9 |
| Trt-Eval Interval | | | | | | 9 DA-E | 9 DA-E | 9 DA-E | 9 DA-E | 9 DA-E |
| Plant-Eval Interval | | | | | | 57 DP-1 | 57 DP-1 | 57 DP-1 | 57 DP-1 | 57 DP-1 |
| ARM Action Codes | | | | | |  |  |  |  |  |
| Number of Decimals | | | | | | 1 | 1 | 1 | 1 | 1 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 26 | 27 | 28 | 29 | 30 |
| 1 | Untreated |  |  | ABCDE | 106 | 7.0 | 4.6 | 10.0 | 4.2 | 0.0 |
|  |  |  |  |  | 202 | 3.0 | 2.8 | 6.0 | 3.0 | 0.0 |
|  |  |  |  |  | 304 | 8.0 | 4.8 | 3.0 | 1.1 | 0.0 |
|  |  |  |  |  | 401 | 4.0 | 3.4 | 6.0 | 2.7 | 0.0 |
| Mean = | | | | | | 5.5 | 3.9 | 6.3 | 2.8 | 0.0 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 103 | 8.0 | 5.5 | 4.0 | 1.9 | 0.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 8.0 | 4.9 | 4.0 | 2.3 | 0.0 |
|  |  |  |  |  | 301 | 8.0 | 5.1 | 6.0 | 2.6 | 0.0 |
|  |  |  |  |  | 403 | 5.0 | 3.8 | 5.0 | 1.7 | 0.0 |
| Mean = | | | | | | 7.3 | 4.8 | 4.8 | 2.1 | 0.0 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 101 | 4.0 | 2.8 | 6.0 | 2.8 | 0.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 3.0 | 2.1 | 8.0 | 3.8 | 0.0 |
|  |  |  |  |  | 306 | 8.0 | 5.4 | 3.0 | 1.8 | 0.0 |
|  |  |  |  |  | 404 | 1.0 | 0.6 | 10.0 | 4.1 | 0.0 |
| Mean = | | | | | | 4.0 | 2.7 | 6.8 | 3.1 | 0.0 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 104 | 5.0 | 3.2 | 9.0 | 4.4 | 0.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 201 | 9.0 | 5.4 | 4.0 | 2.2 | 0.0 |
|  |  |  |  |  | 303 | 0.0 | 0.0 | 12.0 | 5.9 | 0.0 |
|  |  |  |  |  | 406 | 4.0 | 2.9 | 5.0 | 2.1 | 0.0 |
| Mean = | | | | | | 4.5 | 2.9 | 7.5 | 3.7 | 0.0 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 102 | 11.0 | 7.1 | 7.0 | 3.1 | 0.0 |
|  | Regalia | 1 | qt/a | BD | 206 | 8.0 | 4.5 | 0.0 | 0.0 | 0.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 302 | 4.0 | 3.0 | 6.0 | 2.4 | 0.0 |
|  |  |  |  |  | 405 | 5.0 | 2.9 | 8.0 | 2.8 | 0.0 |
| Mean = | | | | | | 7.0 | 4.4 | 5.3 | 2.1 | 0.0 |
| 6 | Reason | 7 | fl oz/a | ABCDE | 105 | 12.0 | 7.0 | 4.0 | 1.9 | 0.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 5.0 | 3.5 | 5.0 | 3.0 | 0.0 |
|  |  |  |  |  | 305 | 8.0 | 4.9 | 8.0 | 3.2 | 0.0 |
|  |  |  |  |  | 402 | 5.0 | 3.4 | 3.0 | 1.2 | 0.0 |
| Mean = | | | | | | 7.5 | 4.7 | 5.0 | 2.3 | 0.0 |

Jan-13-2014 (ENA1312 DM Lettuce) Assessment Data Summary Page 7 of 15

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | | LACSA | LACSA | LACSA | LACSA | LACSA |
| BBCH Scale | | | | | | BVNH | BVNH | BVNH | BVNH | BVNH |
| Crop Scientific Name | | | | | | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa |
| Crop Name | | | | | | Lettuce | Lettuce | Lettuce | Lettuce | Lettuce |
| Crop Variety | | | | | | Sun Devil | Sun Devil | Sun Devil | Sun Devil | Sun Devil |
| Description | | | | | | CULL WEIGHT | LARGE # | LARGE WEIGHT | MEDIUM # | MEDIUM WEIGHT |
| Part Rated | | | | | | FRUMAR C | FRUMAR C | FRUMAR C | FRUMAR C | FRUMAR C |
| Rating Date | | | | | | Sep-20-2013 | Sep-30-2013 | Sep-30-2013 | Sep-30-2013 | Sep-30-2013 |
| Rating Type | | | | | | WEIGHT | YIELD | WEIGHT | YIELD | WEIGHT |
| Rating Unit | | | | | | KG | NUBER | KG | NUBER | 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 |
| Crop Stage Scale | | | | | |  |  |  |  |  |
| Footnote Number | | | | | |  |  |  |  |  |
| SE Group No. | | | | | | 17 | 18 | 19 | 20 | 21 |
| Days After First/Last Applic. | | | | | | 38 9 | 48 19 | 48 19 | 48 19 | 48 19 |
| Trt-Eval Interval | | | | | | 9 DA-E | 19 DA-E | 19 DA-E | 19 DA-E | 19 DA-E |
| Plant-Eval Interval | | | | | | 57 DP-1 | 67 DP-1 | 67 DP-1 | 67 DP-1 | 67 DP-1 |
| ARM Action Codes | | | | | |  |  |  | AA | AA |
| Number of Decimals | | | | | | 1 | 1 | 1 | 1 | 1 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 31 | 32 | 33 | 34 | 35 |
| 1 | Untreated |  |  | ABCDE | 106 | 0.0 | 0.0 | 0.0 | 6.0 | 3.2 |
|  |  |  |  |  | 202 | 0.0 | 0.0 | 0.0 | 3.0 | 1.6 |
|  |  |  |  |  | 304 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
|  |  |  |  |  | 401 | 0.0 | 0.0 | 0.0 | 9.0 | 4.4 |
| Mean = | | | | | | 0.0 | 0.0 | 0.0 | 3.3t | 1.6t |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 103 | 0.0 | 2.0 | 2.1 | 2.0 | 1.4 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 0.0 | 0.0 | 0.0 | 3.0 | 1.7 |
|  |  |  |  |  | 301 | 0.0 | 0.0 | 0.0 | 2.0 | 1.0 |
|  |  |  |  |  | 403 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Mean = | | | | | | 0.0 | 0.5 | 0.5 | 1.3t | 0.8t |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 101 | 0.0 | 2.0 | 2.2 | 1.0 | 0.5 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
|  |  |  |  |  | 306 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
|  |  |  |  |  | 404 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Mean = | | | | | | 0.0 | 0.5 | 0.6 | 0.1t | 0.0t |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 104 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 201 | 0.0 | 0.0 | 0.0 | 1.0 | 0.7 |
|  |  |  |  |  | 303 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
|  |  |  |  |  | 406 | 0.0 | 0.0 | 0.0 | 6.0 | 3.0 |
| Mean = | | | | | | 0.0 | 0.0 | 0.0 | 0.8t | 0.4t |
| 5 | Serenade ASO | 4 | qt/a | ACE | 102 | 0.0 | 3.0 | 3.2 | 2.0 | 1.3 |
|  | Regalia | 1 | qt/a | BD | 206 | 0.0 | 2.0 | 2.3 | 3.0 | 1.6 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 302 | 0.0 | 0.0 | 0.0 | 2.0 | 0.9 |
|  |  |  |  |  | 405 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Mean = | | | | | | 0.0 | 1.3 | 1.4 | 1.3t | 0.7t |
| 6 | Reason | 7 | fl oz/a | ABCDE | 105 | 0.0 | 0.0 | 0.0 | 1.0 | 0.5 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 0.0 | 2.0 | 2.2 | 0.0 | 0.0 |
|  |  |  |  |  | 305 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
|  |  |  |  |  | 402 | 0.0 | 0.0 | 0.0 | 4.0 | 1.8 |
| Mean = | | | | | | 0.0 | 0.5 | 0.5 | 0.6t | 0.3t |

Jan-13-2014 (ENA1312 DM Lettuce) Assessment Data Summary Page 8 of 15

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | | LACSA | LACSA | LACSA | LACSA | LACSA |
| BBCH Scale | | | | | | BVNH | BVNH | BVNH | BVNH | BVNH |
| Crop Scientific Name | | | | | | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa |
| Crop Name | | | | | | Lettuce | Lettuce | Lettuce | Lettuce | Lettuce |
| Crop Variety | | | | | | Sun Devil | Sun Devil | Sun Devil | Sun Devil | Sun Devil |
| Description | | | | | | SMALL # | SMALL WEIGHT | CULL # | CULL WEIGHT | TOTAL LARGE # |
| Part Rated | | | | | | FRUMAR C | FRUMAR C | FRUMAR C | FRUMAR C | FRUMAR C |
| Rating Date | | | | | | Sep-30-2013 | Sep-30-2013 | Sep-30-2013 | Sep-30-2013 | Sep-30-2013 |
| Rating Type | | | | | | YIELD | WEIGHT | YIELD | WEIGHT | YIELD |
| Rating Unit | | | | | | NUBER | KG | NUBER | KG | NUBER |
| 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 |
| Crop Stage Scale | | | | | |  |  |  |  |  |
| Footnote Number | | | | | |  |  |  |  |  |
| SE Group No. | | | | | | 22 | 23 | 24 | 25 | 44 |
| Days After First/Last Applic. | | | | | | 48 19 | 48 19 | 48 19 | 48 19 | 48 19 |
| Trt-Eval Interval | | | | | | 19 DA-E | 19 DA-E | 19 DA-E | 19 DA-E | 19 DA-E |
| Plant-Eval Interval | | | | | | 67 DP-1 | 67 DP-1 | 67 DP-1 | 67 DP-1 | 67 DP-1 |
| ARM Action Codes | | | | | |  |  |  |  | AL T1 |
| Number of Decimals | | | | | | 1 | 1 | 1 | 1 | 1 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 36 | 37 | 38 | 39 | 40 |
| 1 | Untreated |  |  | ABCDE | 106 | 9.0 | 2.5 | 0.0 | 0.0 | 0.0 |
|  |  |  |  |  | 202 | 18.0 | 6.8 | 0.0 | 0.0 | 0.0 |
|  |  |  |  |  | 304 | 18.0 | 4.4 | 0.0 | 0.0 | 0.0 |
|  |  |  |  |  | 401 | 12.0 | 3.5 | 0.0 | 0.0 | 0.0 |
| Mean = | | | | | | 14.3 | 4.3 | 0.0 | 0.0 | 0.0t |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 103 | 9.0 | 3.6 | 0.0 | 0.0 | 4.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 8.0 | 2.6 | 0.0 | 0.0 | 2.0 |
|  |  |  |  |  | 301 | 15.0 | 3.9 | 0.0 | 0.0 | 2.0 |
|  |  |  |  |  | 403 | 18.0 | 5.4 | 0.0 | 0.0 | 0.0 |
| Mean = | | | | | | 12.5 | 3.9 | 0.0 | 0.0 | 1.6t |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 101 | 11.0 | 3.7 | 0.0 | 0.0 | 8.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 17.0 | 5.0 | 0.0 | 0.0 | 0.0 |
|  |  |  |  |  | 306 | 15.0 | 4.5 | 0.0 | 0.0 | 2.0 |
|  |  |  |  |  | 404 | 16.0 | 4.4 | 0.0 | 0.0 | 0.0 |
| Mean = | | | | | | 14.8 | 4.4 | 0.0 | 0.0 | 1.3t |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 104 | 12.0 | 3.9 | 1.0 | 0.2 | 0.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 201 | 20.0 | 6.8 | 0.0 | 0.0 | 0.0 |
|  |  |  |  |  | 303 | 14.0 | 3.4 | 0.0 | 0.0 | 0.0 |
|  |  |  |  |  | 406 | 15.0 | 4.2 | 0.0 | 0.0 | 0.0 |
| Mean = | | | | | | 15.3 | 4.6 | 0.3 | 0.0 | 0.0t |
| 5 | Serenade ASO | 4 | qt/a | ACE | 102 | 4.0 | 1.4 | 0.0 | 0.0 | 6.0 |
|  | Regalia | 1 | qt/a | BD | 206 | 14.0 | 3.1 | 0.0 | 0.0 | 2.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 302 | 10.0 | 2.6 | 0.0 | 0.0 | 4.0 |
|  |  |  |  |  | 405 | 18.0 | 5.9 | 0.0 | 0.0 | 0.0 |
| Mean = | | | | | | 11.5 | 3.3 | 0.0 | 0.0 | 2.2t |
| 6 | Reason | 7 | fl oz/a | ABCDE | 105 | 9.0 | 2.7 | 1.0 | 0.3 | 3.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 14.0 | 3.9 | 0.0 | 0.0 | 2.0 |
|  |  |  |  |  | 305 | 14.0 | 3.9 | 1.0 | 0.1 | 0.0 |
|  |  |  |  |  | 402 | 17.0 | 2.7 | 0.0 | 0.0 | 6.0 |
| Mean = | | | | | | 13.5 | 3.3 | 0.5 | 0.1 | 2.0t |

Jan-13-2014 (ENA1312 DM Lettuce) Assessment Data Summary Page 9 of 15

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | | LACSA | LACSA | LACSA | LACSA |
| BBCH Scale | | | | | | BVNH | BVNH | BVNH | BVNH |
| Crop Scientific Name | | | | | | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa |
| Crop Name | | | | | | Lettuce | Lettuce | Lettuce | Lettuce |
| Crop Variety | | | | | | Sun Devil | Sun Devil | Sun Devil | Sun Devil |
| Description | | | | | | TOTAL LARGE WE> | TOTAL MEDIUM # | TOTAL MEDIUM W> | TOTAL SMALL # |
| Part Rated | | | | | | FRUMAR C | FRUMAR C | FRUMAR C | FRUMAR C |
| Rating Date | | | | | | Sep-30-2013 | Sep-30-2013 | Sep-30-2013 | Sep-30-2013 |
| Rating Type | | | | | | WEIGHT | YIELD | WEIGHT | YIELD |
| Rating Unit | | | | | | KG | NUBER | KG | NUBER |
| 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 |
| Crop Stage Scale | | | | | |  |  |  |  |
| Footnote Number | | | | | |  |  |  |  |
| SE Group No. | | | | | | 45 | 46 | 47 | 48 |
| Days After First/Last Applic. | | | | | | 48 19 | 48 19 | 48 19 | 48 19 |
| Trt-Eval Interval | | | | | | 19 DA-E | 19 DA-E | 19 DA-E | 19 DA-E |
| Plant-Eval Interval | | | | | | 67 DP-1 | 67 DP-1 | 67 DP-1 | 67 DP-1 |
| ARM Action Codes | | | | | | AL T2 | T3 | T4 | T5 |
| Number of Decimals | | | | | | 1 | 1 | 1 | 1 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 41 | 42 | 43 | 44 |
| 1 | Untreated |  |  | ABCDE | 106 | 0.0 | 13.0 | 7.8 | 19.0 |
|  |  |  |  |  | 202 | 0.0 | 6.0 | 4.4 | 24.0 |
|  |  |  |  |  | 304 | 0.0 | 8.0 | 4.8 | 21.0 |
|  |  |  |  |  | 401 | 0.0 | 13.0 | 7.8 | 18.0 |
| Mean = | | | | | | 0.0t | 10.0 | 6.2 | 20.5 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 103 | 4.5 | 10.0 | 6.9 | 13.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 2.2 | 11.0 | 6.6 | 12.0 |
|  |  |  |  |  | 301 | 4.0 | 10.0 | 6.1 | 21.0 |
|  |  |  |  |  | 403 | 0.0 | 5.0 | 3.8 | 23.0 |
| Mean = | | | | | | 2.1t | 9.0 | 5.8 | 17.3 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 101 | 8.3 | 5.0 | 3.3 | 17.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 0.0 | 3.0 | 2.1 | 25.0 |
|  |  |  |  |  | 306 | 2.0 | 8.0 | 5.4 | 18.0 |
|  |  |  |  |  | 404 | 0.0 | 1.0 | 0.6 | 26.0 |
| Mean = | | | | | | 1.3t | 4.3 | 2.9 | 21.5 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 104 | 0.0 | 5.0 | 3.2 | 21.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 201 | 0.0 | 10.0 | 6.1 | 24.0 |
|  |  |  |  |  | 303 | 0.0 | 0.0 | 0.0 | 26.0 |
|  |  |  |  |  | 406 | 0.0 | 10.0 | 5.9 | 20.0 |
| Mean = | | | | | | 0.0t | 6.3 | 3.8 | 22.8 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 102 | 6.3 | 13.0 | 8.4 | 11.0 |
|  | Regalia | 1 | qt/a | BD | 206 | 2.3 | 11.0 | 6.1 | 14.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 302 | 4.3 | 6.0 | 3.9 | 16.0 |
|  |  |  |  |  | 405 | 0.0 | 5.0 | 2.9 | 26.0 |
| Mean = | | | | | | 2.3t | 8.8 | 5.3 | 16.8 |
| 6 | Reason | 7 | fl oz/a | ABCDE | 105 | 3.2 | 13.0 | 7.5 | 13.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 2.2 | 5.0 | 3.5 | 19.0 |
|  |  |  |  |  | 305 | 0.0 | 8.0 | 4.9 | 22.0 |
|  |  |  |  |  | 402 | 6.8 | 9.0 | 5.2 | 20.0 |
| Mean = | | | | | | 2.2t | 8.8 | 5.3 | 18.5 |

Jan-13-2014 (ENA1312 DM Lettuce) Assessment Data Summary Page 10 of 15

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | | LACSA | LACSA | LACSA | LACSA |
| BBCH Scale | | | | | | BVNH | BVNH | BVNH | BVNH |
| Crop Scientific Name | | | | | | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa |
| Crop Name | | | | | | Lettuce | Lettuce | Lettuce | Lettuce |
| Crop Variety | | | | | | Sun Devil | Sun Devil | Sun Devil | Sun Devil |
| Description | | | | | | TOTAL SMALL WE> | TOTAL CULL # | TOTAL CULL WEI> | TOTAL NUMBER H> |
| Part Rated | | | | | | FRUMAR C | FRUUNM C | FRUUNM C | HEAMAR C |
| Rating Date | | | | | | Sep-30-2013 | Sep-30-2013 | Sep-30-2013 | Sep-30-2013 |
| Rating Type | | | | | | WEIGHT | YIELD | WEIGHT | COUNT |
| Rating Unit | | | | | | KG | NUBER | KG | NUMBER |
| 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 |
| Crop Stage Scale | | | | | |  |  |  |  |
| Footnote Number | | | | | |  |  |  |  |
| SE Group No. | | | | | | 49 | 50 | 51 | 52 |
| Days After First/Last Applic. | | | | | | 48 19 | 48 19 | 48 19 | 48 19 |
| Trt-Eval Interval | | | | | | 19 DA-E | 19 DA-E | 19 DA-E | 19 DA-E |
| Plant-Eval Interval | | | | | | 67 DP-1 | 67 DP-1 | 67 DP-1 | 67 DP-1 |
| ARM Action Codes | | | | | | T6 | T7 | T8 | T9 |
| Number of Decimals | | | | | | 1 | 1 | 1 | 1 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 45 | 46 | 47 | 48 |
| 1 | Untreated |  |  | ABCDE | 106 | 6.7 | 0.0 | 0.0 | 32.0 |
|  |  |  |  |  | 202 | 9.8 | 0.0 | 0.0 | 30.0 |
|  |  |  |  |  | 304 | 5.5 | 0.0 | 0.0 | 29.0 |
|  |  |  |  |  | 401 | 6.2 | 0.0 | 0.0 | 31.0 |
| Mean = | | | | | | 7.1 | 0.0 | 0.0 | 30.5 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 103 | 5.5 | 0.0 | 0.0 | 27.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 4.9 | 0.0 | 0.0 | 25.0 |
|  |  |  |  |  | 301 | 6.5 | 0.0 | 0.0 | 33.0 |
|  |  |  |  |  | 403 | 7.1 | 0.0 | 0.0 | 28.0 |
| Mean = | | | | | | 6.0 | 0.0 | 0.0 | 28.3 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 101 | 6.5 | 0.0 | 0.0 | 30.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 8.8 | 0.0 | 0.0 | 28.0 |
|  |  |  |  |  | 306 | 6.3 | 0.0 | 0.0 | 28.0 |
|  |  |  |  |  | 404 | 8.5 | 0.0 | 0.0 | 27.0 |
| Mean = | | | | | | 7.5 | 0.0 | 0.0 | 28.3 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 104 | 8.3 | 1.0 | 0.2 | 27.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 201 | 9.0 | 0.0 | 0.0 | 34.0 |
|  |  |  |  |  | 303 | 9.3 | 0.0 | 0.0 | 26.0 |
|  |  |  |  |  | 406 | 6.3 | 0.0 | 0.0 | 30.0 |
| Mean = | | | | | | 8.2 | 0.3 | 0.0 | 29.3 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 102 | 4.5 | 0.0 | 0.0 | 30.0 |
|  | Regalia | 1 | qt/a | BD | 206 | 3.1 | 0.0 | 0.0 | 27.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 302 | 5.0 | 0.0 | 0.0 | 26.0 |
|  |  |  |  |  | 405 | 8.7 | 0.0 | 0.0 | 31.0 |
| Mean = | | | | | | 5.3 | 0.0 | 0.0 | 28.5 |
| 6 | Reason | 7 | fl oz/a | ABCDE | 105 | 4.6 | 1.0 | 0.3 | 30.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 6.9 | 0.0 | 0.0 | 26.0 |
|  |  |  |  |  | 305 | 7.1 | 1.0 | 0.1 | 31.0 |
|  |  |  |  |  | 402 | 3.9 | 0.0 | 0.0 | 35.0 |
| Mean = | | | | | | 5.6 | 0.5 | 0.1 | 30.5 |

Jan-13-2014 (ENA1312 DM Lettuce) Assessment Data Summary Page 11 of 15

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | | LACSA | LACSA | LACSA | LACSA | LACSA |
| BBCH Scale | | | | | | BVNH | BVNH | BVNH | BVNH | BVNH |
| Crop Scientific Name | | | | | | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa |
| Crop Name | | | | | | Lettuce | Lettuce | Lettuce | Lettuce | Lettuce |
| Crop Variety | | | | | | Sun Devil | Sun Devil | Sun Devil | Sun Devil | Sun Devil |
| Description | | | | | | % SMALL HEAD | % MED HEAD | % LRG HEAD | % CULL HEAD | TOTAL YIELD-LB |
| Part Rated | | | | | | HEASMA C | HEAMED C | HEALAR C | HEAROT C | HEAMAR C |
| Rating Date | | | | | | Sep-30-2013 | Sep-30-2013 | Sep-30-2013 | Sep-30-2013 | Sep-30-2013 |
| Rating Type | | | | | | YIELD | YIELD | YIELD | YIELD | WEIGHT |
| Rating Unit | | | | | | % | % | % | % | 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 |
| Crop Stage Scale | | | | | |  |  |  |  |  |
| Footnote Number | | | | | |  |  |  |  |  |
| SE Group No. | | | | | | 53 | 54 | 55 | 56 | 65 |
| Days After First/Last Applic. | | | | | | 48 19 | 48 19 | 48 19 | 48 19 | 48 19 |
| Trt-Eval Interval | | | | | | 19 DA-E | 19 DA-E | 19 DA-E | 19 DA-E | 19 DA-E |
| Plant-Eval Interval | | | | | | 67 DP-1 | 67 DP-1 | 67 DP-1 | 67 DP-1 | 67 DP-1 |
| ARM Action Codes | | | | | | T10 | T11 | AA T12 | T13 | T14 |
| Number of Decimals | | | | | | 1 | 1 | 1 | 1 | 1 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 49 | 50 | 51 | 52 | 53 |
| 1 | Untreated |  |  | ABCDE | 106 | 59.4 | 40.6 | 0.0 | 0.0 | 14.5 |
|  |  |  |  |  | 202 | 80.0 | 20.0 | 0.0 | 0.0 | 14.2 |
|  |  |  |  |  | 304 | 72.4 | 27.6 | 0.0 | 0.0 | 10.3 |
|  |  |  |  |  | 401 | 58.1 | 41.9 | 0.0 | 0.0 | 14.0 |
| Mean = | | | | | | 67.5 | 32.5 | 0.0t | 0.0 | 13.2 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 103 | 48.1 | 37.0 | 14.8 | 0.0 | 16.8 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 48.0 | 44.0 | 8.0 | 0.0 | 13.7 |
|  |  |  |  |  | 301 | 63.6 | 30.3 | 6.1 | 0.0 | 16.6 |
|  |  |  |  |  | 403 | 82.1 | 17.9 | 0.0 | 0.0 | 10.9 |
| Mean = | | | | | | 60.5 | 32.3 | 5.3t | 0.0 | 14.5 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 101 | 56.7 | 16.7 | 26.7 | 0.0 | 18.1 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 89.3 | 10.7 | 0.0 | 0.0 | 10.9 |
|  |  |  |  |  | 306 | 64.3 | 28.6 | 7.1 | 0.0 | 13.7 |
|  |  |  |  |  | 404 | 96.3 | 3.7 | 0.0 | 0.0 | 9.1 |
| Mean = | | | | | | 76.6 | 14.9 | 4.1t | 0.0 | 12.9 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 104 | 77.8 | 18.5 | 0.0 | 3.7 | 11.5 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 201 | 70.6 | 29.4 | 0.0 | 0.0 | 15.0 |
|  |  |  |  |  | 303 | 100.0 | 0.0 | 0.0 | 0.0 | 9.3 |
|  |  |  |  |  | 406 | 66.7 | 33.3 | 0.0 | 0.0 | 12.2 |
| Mean = | | | | | | 78.8 | 20.3 | 0.0t | 0.9 | 12.0 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 102 | 36.7 | 43.3 | 20.0 | 0.0 | 19.2 |
|  | Regalia | 1 | qt/a | BD | 206 | 51.9 | 40.7 | 7.4 | 0.0 | 11.5 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 302 | 61.5 | 23.1 | 15.4 | 0.0 | 13.2 |
|  |  |  |  |  | 405 | 83.9 | 16.1 | 0.0 | 0.0 | 11.6 |
| Mean = | | | | | | 58.5 | 30.8 | 7.9t | 0.0 | 13.9 |
| 6 | Reason | 7 | fl oz/a | ABCDE | 105 | 43.3 | 43.3 | 10.0 | 3.3 | 15.3 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 73.1 | 19.2 | 7.7 | 0.0 | 12.6 |
|  |  |  |  |  | 305 | 71.0 | 25.8 | 0.0 | 3.2 | 12.0 |
|  |  |  |  |  | 402 | 57.1 | 25.7 | 17.1 | 0.0 | 16.0 |
| Mean = | | | | | | 61.1 | 28.5 | 6.5t | 1.6 | 14.0 |

Jan-13-2014 (ENA1312 DM Lettuce) Assessment Data Summary Page 12 of 15

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | |  |  | BREMLA | BREMLA | BREMLA |
| Pest Scientific Name | | | | | |  |  | Bremia lactucae | Bremia lactucae | Bremia lactucae |
| Pest Name | | | | | |  |  | Downy mildew o> | Downy mildew o> | Downy mildew o> |
| Crop Code | | | | | | LACSA | LACSA | LACSA | LACSA | LACSA |
| BBCH Scale | | | | | | BVNH | BVNH | BVNH | BVNH | BVNH |
| Crop Scientific Name | | | | | | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa | Lactuca sativa |
| Crop Name | | | | | | Lettuce | Lettuce | Lettuce | Lettuce | Lettuce |
| Crop Variety | | | | | | Sun Devil | Sun Devil | Sun Devil | Sun Devil | Sun Devil |
| Description | | | | | | CARTON/ACRE | $/ACRE | DM SEVERITY | DM SEVERITY | DM SEVERITY |
| Part Rated | | | | | | HEAMAR C | HEAD C | PLAHEA P | PLANT C | PLANT C |
| Rating Date | | | | | | Sep-30-2013 | Sep-30-2013 | Aug-21-2013 | Aug-26-2013 | Sep-3-2013 |
| Rating Type | | | | | | COMPRO | INCGRO | PESINC | PESINC | PESINC |
| Rating Unit | | | | | | NUMBER | DOLLAR | % | % | % |
| Sample Size, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT | 1 PLOT |
| Collection Basis, Unit | | | | | | 1 PLOT | 1 ACRE | 10 PLANT | 10 PLANT | 10 PLANT |
| Number of Subsamples | | | | | | 1 | 1 | 1 | 1 | 1 |
| Crop Stage Scale | | | | | |  |  | DESC | DESC | DESC |
| Footnote Number | | | | | |  |  |  |  |  |
| SE Group No. | | | | | | 66 | 67 | 58 | 59 | 60 |
| Days After First/Last Applic. | | | | | | 48 19 | 48 19 | 8 1 | 13 6 | 21 7 |
| Trt-Eval Interval | | | | | | 19 DA-E | 19 DA-E | 1 DA-B | 6 DA-B | 7 DA-C |
| Plant-Eval Interval | | | | | | 67 DP-1 | 67 DP-1 | 27 DP-1 | 32 DP-1 | 40 DP-1 |
| ARM Action Codes | | | | | | T15 | T16 | TIO[16] | AA TIO[17] | TIO[18] |
| Number of Decimals | | | | | | 0 | 0 | 1 | 1 | 1 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 54 | 55 | 56 | 57 | 58 |
| 1 | Untreated |  |  | ABCDE | 106 | 484 | 6048 | 60.0 | 100.0 | 100.0 |
|  |  |  |  |  | 202 | 473 | 5910 | 60.0 | 100.0 | 100.0 |
|  |  |  |  |  | 304 | 345 | 4313 | 90.0 | 90.0 | 100.0 |
|  |  |  |  |  | 401 | 465 | 5818 | 70.0 | 90.0 | 100.0 |
| Mean = | | | | | | 442 | 5522 | 70.0 | 97.4t | 100.0 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 103 | 560 | 6994 | 80.0 | 100.0 | 100.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 456 | 5706 | 50.0 | 90.0 | 100.0 |
|  |  |  |  |  | 301 | 555 | 6932 | 90.0 | 80.0 | 100.0 |
|  |  |  |  |  | 403 | 364 | 4554 | 40.0 | 90.0 | 100.0 |
| Mean = | | | | | | 484 | 6047 | 65.0 | 92.5t | 100.0 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 101 | 603 | 7541 | 50.0 | 90.0 | 90.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 365 | 4559 | 40.0 | 100.0 | 100.0 |
|  |  |  |  |  | 306 | 456 | 5697 | 70.0 | 90.0 | 100.0 |
|  |  |  |  |  | 404 | 304 | 3804 | 70.0 | 90.0 | 100.0 |
| Mean = | | | | | | 432 | 5400 | 57.5 | 94.3t | 97.5 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 104 | 384 | 4805 | 50.0 | 100.0 | 100.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 201 | 500 | 6256 | 55.6 | 100.0 | 100.0 |
|  |  |  |  |  | 303 | 310 | 3879 | 90.0 | 80.0 | 100.0 |
|  |  |  |  |  | 406 | 405 | 5067 | 50.0 | 100.0 | 100.0 |
| Mean = | | | | | | 400 | 5002 | 61.4 | 98.7t | 100.0 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 102 | 640 | 7995 | 70.0 | 100.0 | 100.0 |
|  | Regalia | 1 | qt/a | BD | 206 | 383 | 4792 | 60.0 | 100.0 | 100.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 302 | 440 | 5505 | 60.0 | 80.0 | 100.0 |
|  |  |  |  |  | 405 | 388 | 4846 | 50.0 | 90.0 | 90.0 |
| Mean = | | | | | | 463 | 5785 | 60.0 | 96.2t | 97.5 |
| 6 | Reason | 7 | fl oz/a | ABCDE | 105 | 511 | 6385 | 50.0 | 20.0 | 90.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 420 | 5255 | 30.0 | 60.0 | 100.0 |
|  |  |  |  |  | 305 | 399 | 4992 | 70.0 | 70.0 | 100.0 |
|  |  |  |  |  | 402 | 533 | 6657 | 50.0 | 50.0 | 100.0 |
| Mean = | | | | | | 466 | 5822 | 50.0 | 49.6t | 97.5 |

Jan-13-2014 (ENA1312 DM Lettuce) Assessment Data Summary Page 13 of 15

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | | BREMLA | BREMLA | BREMLA |
| Pest Scientific Name | | | | | | Bremia lactucae | Bremia lactucae | Bremia lactucae |
| Pest Name | | | | | | Downy mildew o> | Downy mildew o> | Downy mildew o> |
| Crop Code | | | | | | LACSA | LACSA | LACSA |
| BBCH Scale | | | | | | BVNH | BVNH | BVNH |
| Crop Scientific Name | | | | | | Lactuca sativa | Lactuca sativa | Lactuca sativa |
| Crop Name | | | | | | Lettuce | Lettuce | Lettuce |
| Crop Variety | | | | | | Sun Devil | Sun Devil | Sun Devil |
| Description | | | | | | DM SEVERITY | DM SEVERITY | DM SEVERITY |
| Part Rated | | | | | | PLANT C | PLANT C | PLAHEA P |
| Rating Date | | | | | | Sep-9-2013 | Sep-16-2013 | Sep-23-2013 |
| Rating Type | | | | | | PESINC | PESINC | PESINC |
| Rating Unit | | | | | | % | % | % |
| Sample Size, Unit | | | | | | 1 PLOT | 1 PLOT | 1 PLOT |
| Collection Basis, Unit | | | | | | 10 PLANT | 10 PLANT | 10 PLANT |
| Number of Subsamples | | | | | | 1 | 1 | 1 |
| Crop Stage Scale | | | | | | DESC | DESC | DESC |
| Footnote Number | | | | | |  |  | 1 |
| SE Group No. | | | | | | 61 | 62 | 63 |
| Days After First/Last Applic. | | | | | | 27 5 | 34 5 | 41 12 |
| Trt-Eval Interval | | | | | | 5 DA-D | 5 DA-E | 12 DA-E |
| Plant-Eval Interval | | | | | | 46 DP-1 | 53 DP-1 | 60 DP-1 |
| ARM Action Codes | | | | | | TIO[19] | TIO[20] | TIO[21] |
| Number of Decimals | | | | | | 1 | 1 | 1 |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |
| No. | Name | Rate | Unit | Code | Plot | 59 | 60 | 61 |
| 1 | Untreated |  |  | ABCDE | 106 | 100.0 | 100.0 | 100.0 |
|  |  |  |  |  | 202 | 100.0 | 100.0 | 100.0 |
|  |  |  |  |  | 304 | 100.0 | 100.0 | 100.0 |
|  |  |  |  |  | 401 | 100.0 | 100.0 | 100.0 |
| Mean = | | | | | | 100.0 | 100.0 | 100.0 |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 103 | 100.0 | 100.0 | 100.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 205 | 100.0 | 100.0 | 100.0 |
|  |  |  |  |  | 301 | 100.0 | 100.0 | 100.0 |
|  |  |  |  |  | 403 | 100.0 | 100.0 | 100.0 |
| Mean = | | | | | | 100.0 | 100.0 | 100.0 |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 101 | 100.0 | 100.0 | 100.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 204 | 100.0 | 100.0 | 100.0 |
|  |  |  |  |  | 306 | 100.0 | 100.0 | 100.0 |
|  |  |  |  |  | 404 | 90.0 | 100.0 | 100.0 |
| Mean = | | | | | | 97.5 | 100.0 | 100.0 |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 104 | 100.0 | 100.0 | 100.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 201 | 100.0 | 100.0 | 100.0 |
|  |  |  |  |  | 303 | 100.0 | 100.0 | 100.0 |
|  |  |  |  |  | 406 | 100.0 | 100.0 | 100.0 |
| Mean = | | | | | | 100.0 | 100.0 | 100.0 |
| 5 | Serenade ASO | 4 | qt/a | ACE | 102 | 100.0 | 100.0 | 100.0 |
|  | Regalia | 1 | qt/a | BD | 206 | 90.0 | 100.0 | 100.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 302 | 100.0 | 100.0 | 100.0 |
|  |  |  |  |  | 405 | 90.0 | 100.0 | 100.0 |
| Mean = | | | | | | 95.0 | 100.0 | 100.0 |
| 6 | Reason | 7 | fl oz/a | ABCDE | 105 | 100.0 | 100.0 | 100.0 |
|  | Nu Film P | 0.25 | % v/v | ABCDE | 203 | 100.0 | 100.0 | 88.9 |
|  |  |  |  |  | 305 | 90.0 | 80.0 | 88.9 |
|  |  |  |  |  | 402 | 70.0 | 80.0 | 60.0 |
| Mean = | | | | | | 90.0 | 90.0 | 84.4 |

Jan-13-2014 (ENA1312 DM Lettuce) Assessment Data Summary Page 14 of 15

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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

BREMLA, Bremia lactucae, = US

Crop Code

LACSA, BVNH, Lactuca sativa, = US

Part Rated

PLANT = plant

PLAHEA = plant - headed

FRUMAR = fruit - marketable

FRUUNM = fruit - unmarketable

HEAMAR = head - marketable

HEASMA = head - small

HEAMED = head - medium

HEALAR = head - large

HEAROT = head - rotten

HEAD = head

C = Crop is Part Rated

P = Pest is Part Rated

Rating Type

PHYGEN = phytotoxicity - general / injury

VIGOR = vigor

LESION = lesion

PESSEV = pest severity

AUDPC = area under disease progress curve

CONTRO = control / burndown or knockdown

YIELD = yield

WEIGHT = weight

COUNT = count

COMPRO = commercial product, general

INCGRO = income - gross / value

PESINC = pest incidence

Rating Unit

% = percent

0-10 = 0-10 index/scale

NUMBER = number

AUDPC = area under disease process curve

%UNCK = percent of untreated check

KG = kilogram

DOLLAR = dollar

PLOT = total plot

PLOT = total plot

PLANT = plant/plant biomass/shrub

Crop Stage Scale

DESC = descriptive growth stages

Plant-Eval Interval

27 DP-1 = 1 LACSA Jul-25-2013

32 DP-1 = 1 LACSA Jul-25-2013

46 DP-1 = 1 LACSA Jul-25-2013

53 DP-1 = 1 LACSA Jul-25-2013

40 DP-1 = 1 LACSA Jul-25-2013

60 DP-1 = 1 LACSA Jul-25-2013

57 DP-1 = 1 LACSA Jul-25-2013

67 DP-1 = 1 LACSA Jul-25-2013

ARM Action Codes

AL = Automatic log transformation of X+1

AS = Automatic square root transformation of X+0.5

AA = Automatic arcsine square root % transformation

T17 = &@AUDPC(@MATCH(EPT=BREMLA,EDT=PESSEV,ERU=%))

TAB[22] = Arcsine square root percent([23])

T1 = LOG([40]+ 1)

T2 = LOG([41]+ 1)

T3 = [C26]+[C34]

T4 = [C27]+[C35]

T5 = [C28]+[C36]

T6 = [C29]+[C37]

T7 = [C30]+[C38]

T8 = [C31]+[C39]

T9 = [C40]+[C42]+[C44]+[C46]

T10 = 100\*(([C44]/[C48]))

T11 = 100\*(([C42]/[C48]))

T12 = Arcsine square root percent([51])

T13 = 100\*(([C46]/[C48]))

Jan-13-2014 (ENA1312 DM Lettuce) Assessment Data Summary Page 15 of 15

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

T14 = [C25]+[C27]+[C29]+[C33]+[C35]+[C37]

T15 = (([C53]\*2.2)/50)/0.001318698347

T16 = [C54]\*12.5

TIO[16] = % Incidence (&0 = none)[16]

TIO[17] = Arcsine square root percent([57])

TIO[18] = % Incidence (&0 = none)[18]

TIO[19] = % Incidence (&0 = none)[19]

TIO[20] = % Incidence (&0 = none)[20]

TIO[21] = % Incidence (&0 = none)[21]

Footnote 1: Blank plots indicate harvested plants (i.e if only 8 samples, only 8 heads are remaining in plot.)

Jan-13-2014 (ENA1312 DM Lettuce) AOV Means Table Page 1 of 14

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | BREMLA | | BREMLA | | BREMLA | | BREMLA | | BREMLA | |
| Pest Scientific Name | | | | | Bremia lactucae | | Bremia lactucae | | Bremia lactucae | | Bremia lactucae | | Bremia lactucae | |
| Pest Name | | | | | Downy mildew o> | | Downy mildew o> | | Downy mildew o> | | Downy mildew o> | | Downy mildew o> | |
| Crop Code | | | | | LACSA | | LACSA | | LACSA | | LACSA | | LACSA | |
| BBCH Scale | | | | | BVNH | | BVNH | | BVNH | | BVNH | | BVNH | |
| Crop Scientific Name | | | | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | |
| Crop Name | | | | | Lettuce | | Lettuce | | Lettuce | | Lettuce | | Lettuce | |
| Crop Variety | | | | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | |
| Description | | | | | PHYTOXICITY | | PHYTOXICITY | | PHYTOXICITY | | PHYTOXICITY | | VIGOR | |
| Part Rated | | | | | PLANT C | | PLANT C | | PLANT C | | PLANT C | | PLANT C | |
| Rating Date | | | | | Aug-21-2013 | | Aug-26-2013 | | Sep-9-2013 | | Sep-16-2013 | | Aug-21-2013 | |
| Rating Type | | | | | PHYGEN | | PHYGEN | | PHYGEN | | PHYGEN | | VIGOR | |
| Rating Unit | | | | | % | | % | | % | | % | | 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 | |
| Crop Stage Scale | | | | | DESC | | DESC | | DESC | | DESC | | DESC | |
| Footnote Number | | | | |  | |  | |  | |  | |  | |
| SE Group No. | | | | | 2 | | 1 | | 3 | | 4 | | 5 | |
| Days After First/Last Applic. | | | | | 8 1 | | 13 6 | | 27 5 | | 34 5 | | 8 1 | |
| Trt-Eval Interval | | | | | 1 DA-B | | 6 DA-B | | 5 DA-D | | 5 DA-E | | 1 DA-B | |
| Plant-Eval Interval | | | | | 27 DP-1 | | 32 DP-1 | | 46 DP-1 | | 53 DP-1 | | 27 DP-1 | |
| ARM Action Codes | | | | |  | |  | |  | |  | |  | |
| Number of Decimals | | | | | 0 | | 0 | | 0 | | 0 | | 1 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 1 | | 2 | | 3 | | 4 | | 5 | |
| 1 | Untreated |  |  | ABCDE | 0 | a | 0 | a | 0 | a | 0 | a | 5.4 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 0 | a | 0 | a | 0 | a | 0 | a | 5.1 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 0 | a | 0 | a | 0 | a | 0 | a | 4.9 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 0 | a | 0 | a | 0 | a | 0 | a | 5.0 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 0 | a | 0 | a | 0 | a | 0 | a | 5.3 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 6 | Reason | 7 | fl oz/a | ABCDE | 0 | a | 0 | a | 0 | a | 0 | a | 5.0 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 0.0 | | 0.0 | | 0.0 | | 0.0 | | 0.82 | |
| Standard Deviation | | | | | 0.0 | | 0.0 | | 0.0 | | 0.0 | | 0.54 | |
| CV | | | | | 0.0 | | 0.0 | | 0.0 | | 0.0 | | 10.67 | |
| Bartlett's X2 | | | | | 0.0 | | 0.0 | | 0.0 | | 0.0 | | 4.6 | |
| P(Bartlett's X2) | | | | | . | | . | | . | | . | | 0.331 | |
| Skewness | | | | | . | | . | | . | | . | | 0.881 | |
| Kurtosis | | | | | . | | . | | . | | . | | 2.8793\* | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 0.000 | | 0.000 | | 0.000 | | 0.000 | | 4.344 | |
| Replicate Prob(F) | | | | | 1.0000 | | 1.0000 | | 1.0000 | | 1.0000 | | 0.0216 | |
| Treatment F | | | | | 0.000 | | 0.000 | | 0.000 | | 0.000 | | 0.457 | |
| Treatment Prob(F) | | | | | 1.0000 | | 1.0000 | | 1.0000 | | 1.0000 | | 0.8022 | |

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.

Jan-13-2014 (ENA1312 DM Lettuce) AOV Means Table Page 2 of 14

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | BREMLA | | BREMLA | | BREMLA | | BREMLA | | BREMLA | |
| Pest Scientific Name | | | | | Bremia lactucae | | Bremia lactucae | | Bremia lactucae | | Bremia lactucae | | Bremia lactucae | |
| Pest Name | | | | | Downy mildew o> | | Downy mildew o> | | Downy mildew o> | | Downy mildew o> | | Downy mildew o> | |
| Crop Code | | | | | LACSA | | LACSA | | LACSA | | LACSA | | LACSA | |
| BBCH Scale | | | | | BVNH | | BVNH | | BVNH | | BVNH | | BVNH | |
| Crop Scientific Name | | | | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | |
| Crop Name | | | | | Lettuce | | Lettuce | | Lettuce | | Lettuce | | Lettuce | |
| Crop Variety | | | | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | |
| Description | | | | | VIGOR | | VIGOR | | VIGOR | | VIGOR | | DM LESIONS | |
| Part Rated | | | | | PLANT C | | PLANT C | | PLANT C | | PLANT C | | PLANT C | |
| Rating Date | | | | | Aug-26-2013 | | Sep-3-2013 | | Sep-9-2013 | | Sep-16-2013 | | Aug-21-2013 | |
| Rating Type | | | | | VIGOR | | VIGOR | | VIGOR | | VIGOR | | LESION | |
| Rating Unit | | | | | 0-10 | | 0-10 | | 0-10 | | 0-10 | | 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 | | 10 PLANT | |
| Number of Subsamples | | | | | 1 | | 1 | | 1 | | 1 | | 10 | |
| Crop Stage Scale | | | | | DESC | | DESC | | DESC | | DESC | | DESC | |
| Footnote Number | | | | |  | |  | |  | |  | |  | |
| SE Group No. | | | | | 6 | | 7 | | 8 | | 9 | | 26 | |
| Days After First/Last Applic. | | | | | 13 6 | | 21 7 | | 27 5 | | 34 5 | | 8 1 | |
| Trt-Eval Interval | | | | | 6 DA-B | | 7 DA-C | | 5 DA-D | | 5 DA-E | | 1 DA-B | |
| Plant-Eval Interval | | | | | 32 DP-1 | | 40 DP-1 | | 46 DP-1 | | 53 DP-1 | | 27 DP-1 | |
| ARM Action Codes | | | | |  | |  | | AL | |  | |  | |
| Number of Decimals | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 6 | | 7 | | 8 | | 9 | | 10 | |
| 1 | Untreated |  |  | ABCDE | 5.3 | a | 4.5 | ab | 4.2 | a | 4.1 | a | 4.1 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 4.6 | a | 4.0 | b | 4.9 | a | 4.5 | a | 4.2 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 4.8 | a | 4.0 | b | 4.5 | a | 4.9 | a | 3.3 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 4.3 | a | 4.0 | b | 4.7 | a | 4.3 | a | 3.5 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 4.5 | a | 5.0 | a | 5.0 | a | 5.3 | a | 3.7 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 6 | Reason | 7 | fl oz/a | ABCDE | 4.8 | a | 5.0 | a | 5.0 | a | 5.0 | a | 1.9 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 1.24 | | 0.86 | | 0.07t | | 0.83 | | 1.92 | |
| Standard Deviation | | | | | 0.82 | | 0.57 | | 0.05t | | 0.55 | | 1.27 | |
| CV | | | | | 17.55 | | 12.85 | | 5.98 | | 11.79 | | 37.16 | |
| Bartlett's X2 | | | | | 6.072 | | 0.418 | | 2.747 | | 4.366 | | 5.308 | |
| P(Bartlett's X2) | | | | | 0.299 | | 0.811 | | 0.432 | | 0.359 | | 0.379 | |
| Skewness | | | | | 0.053 | | -0.6834 | | 0.7139 | | -0.8106 | | 0.2927 | |
| Kurtosis | | | | | -0.2766 | | -0.4242 | | 0.9556 | | 0.8597 | | -1.2036 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 3.215 | | 0.172 | | 3.752 | | 1.468 | | 0.680 | |
| Replicate Prob(F) | | | | | 0.0531 | | 0.9134 | | 0.0342 | | 0.2632 | | 0.5778 | |
| Treatment F | | | | | 0.655 | | 3.000 | | 1.118 | | 2.615 | | 1.744 | |
| Treatment Prob(F) | | | | | 0.6623 | | 0.0450 | | 0.3925 | | 0.0682 | | 0.1854 | |

Jan-13-2014 (ENA1312 DM Lettuce) AOV Means Table Page 3 of 14

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | BREMLA | | BREMLA | | BREMLA | | BREMLA | | BREMLA | |
| Pest Scientific Name | | | | | Bremia lactucae | | Bremia lactucae | | Bremia lactucae | | Bremia lactucae | | Bremia lactucae | |
| Pest Name | | | | | Downy mildew o> | | Downy mildew o> | | Downy mildew o> | | Downy mildew o> | | Downy mildew o> | |
| Crop Code | | | | | LACSA | | LACSA | | LACSA | | LACSA | | LACSA | |
| BBCH Scale | | | | | BVNH | | BVNH | | BVNH | | BVNH | | BVNH | |
| Crop Scientific Name | | | | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | |
| Crop Name | | | | | Lettuce | | Lettuce | | Lettuce | | Lettuce | | Lettuce | |
| Crop Variety | | | | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | |
| Description | | | | | DM LESIONS | | DM LESIONS | | DM LESIONS | | DM LESIONS | | DM LESIONS | |
| Part Rated | | | | | PLANT C | | PLANT C | | PLANT C | | PLAHEA C | | PLAHEA C | |
| Rating Date | | | | | Aug-26-2013 | | Sep-3-2013 | | Sep-9-2013 | | Sep-16-2013 | | Sep-23-2013 | |
| Rating Type | | | | | LESION | | LESION | | LESION | | LESION | | LESION | |
| Rating Unit | | | | | NUMBER | | NUMBER | | NUMBER | | NUMBER | | NUMBER | |
| 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 | |
| Crop Stage Scale | | | | | DESC | | DESC | | DESC | | DESC | | DESC | |
| Footnote Number | | | | |  | |  | |  | |  | | 1 | |
| SE Group No. | | | | | 27 | | 28 | | 29 | | 30 | | 31 | |
| Days After First/Last Applic. | | | | | 13 6 | | 21 7 | | 27 5 | | 34 5 | | 41 12 | |
| Trt-Eval Interval | | | | | 6 DA-B | | 7 DA-C | | 5 DA-D | | 5 DA-E | | 12 DA-E | |
| Plant-Eval Interval | | | | | 32 DP-1 | | 40 DP-1 | | 46 DP-1 | | 53 DP-1 | | 60 DP-1 | |
| ARM Action Codes | | | | |  | |  | | AL | |  | | AL | |
| Number of Decimals | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 11 | | 12 | | 13 | | 14 | | 15 | |
| 1 | Untreated |  |  | ABCDE | 14.7 | a | 10.7 | a | 10.2 | a | 13.0 | a | 21.5 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 11.8 | a | 9.5 | a | 8.6 | a | 10.7 | a | 16.1 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 11.1 | a | 9.6 | a | 8.1 | a | 12.8 | a | 14.5 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 9.0 | a | 8.1 | a | 8.5 | a | 12.6 | a | 13.8 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 11.7 | a | 7.3 | a | 8.2 | a | 10.2 | a | 15.6 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 6 | Reason | 7 | fl oz/a | ABCDE | 1.1 | b | 6.3 | a | 3.0 | b | 4.6 | b | 2.7 | b |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 7.89 | | 4.59 | | 0.14t | | 5.03 | | 0.25t | |
| Standard Deviation | | | | | 5.24 | | 3.04 | | 0.09t | | 3.34 | | 0.16t | |
| CV | | | | | 52.97 | | 35.6 | | 9.84 | | 31.41 | | 14.67 | |
| Bartlett's X2 | | | | | 10.956 | | 2.721 | | 4.146 | | 3.176 | | 1.419 | |
| P(Bartlett's X2) | | | | | 0.052 | | 0.743 | | 0.529 | | 0.673 | | 0.922 | |
| Skewness | | | | | 0.8927 | | 0.5234 | | -1.0452\* | | -0.4109 | | -0.4711 | |
| Kurtosis | | | | | 0.0884 | | -0.3956 | | 1.5772 | | -0.326 | | 0.029 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 8.052 | | 0.346 | | 3.832 | | 0.858 | | 6.252 | |
| Replicate Prob(F) | | | | | 0.0020 | | 0.7922 | | 0.0321 | | 0.4842 | | 0.0058 | |
| Treatment F | | | | | 3.180 | | 1.188 | | 12.708 | | 3.649 | | 11.383 | |
| Treatment Prob(F) | | | | | 0.0373 | | 0.3610 | | 0.0001 | | 0.0233 | | 0.0001 | |

Jan-13-2014 (ENA1312 DM Lettuce) AOV Means Table Page 4 of 14

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | BREMLA | | BREMLA | | BREMLA | | BREMLA | | BREMLA | |
| Pest Scientific Name | | | | | Bremia lactucae | | Bremia lactucae | | Bremia lactucae | | Bremia lactucae | | Bremia lactucae | |
| Pest Name | | | | | Downy mildew o> | | Downy mildew o> | | Downy mildew o> | | Downy mildew o> | | Downy mildew o> | |
| Crop Code | | | | | LACSA | | LACSA | | LACSA | | LACSA | | LACSA | |
| BBCH Scale | | | | | BVNH | | BVNH | | BVNH | | BVNH | | BVNH | |
| Crop Scientific Name | | | | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | |
| Crop Name | | | | | Lettuce | | Lettuce | | Lettuce | | Lettuce | | Lettuce | |
| Crop Variety | | | | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | |
| Description | | | | | DM SEVERITY | | DM SEVERITY | | DM SEVERITY | | DM SEVERITY | | DM SEVERITY | |
| Part Rated | | | | | PLAHEA P | | PLANT C | | PLANT C | | PLANT C | | PLANT C | |
| Rating Date | | | | | Aug-21-2013 | | Aug-26-2013 | | Sep-3-2013 | | Sep-9-2013 | | Sep-16-2013 | |
| 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 | |
| Crop Stage Scale | | | | | DESC | | DESC | | DESC | | DESC | | DESC | |
| Footnote Number | | | | |  | |  | |  | |  | |  | |
| SE Group No. | | | | | 32 | | 33 | | 34 | | 35 | | 36 | |
| Days After First/Last Applic. | | | | | 8 1 | | 13 6 | | 21 7 | | 27 5 | | 34 5 | |
| Trt-Eval Interval | | | | | 1 DA-B | | 6 DA-B | | 7 DA-C | | 5 DA-D | | 5 DA-E | |
| Plant-Eval Interval | | | | | 27 DP-1 | | 32 DP-1 | | 40 DP-1 | | 46 DP-1 | | 53 DP-1 | |
| ARM Action Codes | | | | |  | | AL | |  | |  | |  | |
| Number of Decimals | | | | | 2 | | 1 | | 1 | | 1 | | 1 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 16 | | 17 | | 18 | | 19 | | 20 | |
| 1 | Untreated |  |  | ABCDE | 1.55 | a | 4.3 | a | 6.3 | a | 6.6 | a | 5.9 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 1.19 | a | 4.1 | a | 5.6 | a | 6.0 | a | 4.2 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 1.02 | a | 4.4 | a | 5.7 | a | 6.6 | a | 5.3 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 1.14 | a | 2.6 | a | 5.7 | a | 5.0 | a | 4.6 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 0.85 | a | 3.1 | a | 3.4 | a | 5.8 | a | 4.0 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 6 | Reason | 7 | fl oz/a | ABCDE | 0.48 | a | 0.2 | b | 3.6 | a | 1.8 | b | 2.1 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 0.755 | | 0.24t | | 2.18 | | 2.01 | | 2.59 | |
| Standard Deviation | | | | | 0.501 | | 0.16t | | 1.45 | | 1.33 | | 1.72 | |
| CV | | | | | 48.2 | | 28.14 | | 28.64 | | 25.11 | | 39.75 | |
| Bartlett's X2 | | | | | 8.819 | | 6.388 | | 7.646 | | 4.483 | | 9.978 | |
| P(Bartlett's X2) | | | | | 0.116 | | 0.27 | | 0.177 | | 0.482 | | 0.076 | |
| Skewness | | | | | 0.6149 | | -0.4276 | | 0.0156 | | 0.1333 | | 0.7218 | |
| Kurtosis | | | | | -1.0291 | | 0.0015 | | -0.9151 | | -0.3075 | | 0.4212 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 1.421 | | 2.749 | | 2.376 | | 20.174 | | 11.493 | |
| Replicate Prob(F) | | | | | 0.2757 | | 0.0794 | | 0.1108 | | 0.0001 | | 0.0004 | |
| Treatment F | | | | | 2.025 | | 9.729 | | 2.833 | | 7.575 | | 2.376 | |
| Treatment Prob(F) | | | | | 0.1330 | | 0.0003 | | 0.0538 | | 0.0010 | | 0.0889 | |

Jan-13-2014 (ENA1312 DM Lettuce) AOV Means Table Page 5 of 14

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | BREMLA | | BREMLA | | BREMLA | |  | |  | |
| Pest Scientific Name | | | | | Bremia lactucae | | Bremia lactucae | | Bremia lactucae | |  | |  | |
| Pest Name | | | | | Downy mildew o> | | Downy mildew o> | | Downy mildew o> | |  | |  | |
| Crop Code | | | | | LACSA | | LACSA | | LACSA | | LACSA | | LACSA | |
| BBCH Scale | | | | | BVNH | | BVNH | | BVNH | | BVNH | | BVNH | |
| Crop Scientific Name | | | | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | |
| Crop Name | | | | | Lettuce | | Lettuce | | Lettuce | | Lettuce | | Lettuce | |
| Crop Variety | | | | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | |
| Description | | | | | DM SEVERITY | | DM AUDPC | | DM CONTROL | | LARGE # | | LARGE WEIGHT | |
| Part Rated | | | | | PLAHEA P | | PLAHEA P | | PLAHEA P | | FRUMAR C | | FRUMAR C | |
| Rating Date | | | | | Sep-23-2013 | | Sep-23-2013 | | Sep-23-2013 | | Sep-20-2013 | | Sep-20-2013 | |
| Rating Type | | | | | PESSEV | | AUDPC | | CONTRO | | YIELD | | WEIGHT | |
| Rating Unit | | | | | % | | AUDPC | | %UNCK | | NUBER | | 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 | | 1 | | 1 | | 1 | | 1 | |
| Crop Stage Scale | | | | | DESC | | DESC | | DESC | |  | |  | |
| Footnote Number | | | | | 1 | |  | |  | |  | |  | |
| SE Group No. | | | | | 37 | | 39 | | 40 | | 10 | | 11 | |
| Days After First/Last Applic. | | | | | 41 12 | | 41 12 | | 41 12 | | 38 9 | | 38 9 | |
| Trt-Eval Interval | | | | | 12 DA-E | | 12 DA-E | | 12 DA-E | | 9 DA-E | | 9 DA-E | |
| Plant-Eval Interval | | | | | 60 DP-1 | | 60 DP-1 | | 60 DP-1 | | 57 DP-1 | | 57 DP-1 | |
| ARM Action Codes | | | | | AS | | T17 AUDPC | | AA TAB[22] | | AA | | AL | |
| Number of Decimals | | | | | 1 | | 0 | | 1 | | 1 | | 1 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 21 | | 22 | | 23 | | 24 | | 25 | |
| 1 | Untreated |  |  | ABCDE | 21.6 | a | 243 | a | 0.0 | d | 0.0 | a | 0.0 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 13.3 | b | 187 | bc | 18.4 | bc | 1.1 | a | 1.7 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 13.3 | b | 206 | ab | 9.5 | c | 0.9 | a | 1.1 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 12.5 | b | 170 | bc | 19.3 | bc | 0.0 | a | 0.0 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 11.2 | b | 153 | c | 35.1 | b | 0.9 | a | 1.2 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 6 | Reason | 7 | fl oz/a | ABCDE | 1.4 | c | 60 | d | 75.8 | a | 1.1 | a | 1.4 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 0.89t | | 50.7 | | 16.27t | | 7.26t | | 0.46t | |
| Standard Deviation | | | | | 0.59t | | 33.7 | | 10.80t | | 4.82t | | 0.30t | |
| CV | | | | | 17.27 | | 19.85 | | 38.95 | | 125.23 | | 123.31 | |
| Bartlett's X2 | | | | | 9.468 | | 13.078 | | 9.309 | | 0.971 | | 0.462 | |
| P(Bartlett's X2) | | | | | 0.092 | | 0.023\* | | 0.054 | | 0.808 | | 0.927 | |
| Skewness | | | | | -0.2725 | | -0.0812 | | 0.0333 | | 0.8271 | | 0.7749 | |
| Kurtosis | | | | | 0.6425 | | 0.22 | | -1.2937 | | -0.9994 | | -1.194 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 4.845 | | 4.865 | | 4.461 | | 1.657 | | 1.665 | |
| Replicate Prob(F) | | | | | 0.0149 | | 0.0147 | | 0.0198 | | 0.2187 | | 0.2170 | |
| Treatment F | | | | | 13.673 | | 13.656 | | 13.901 | | 1.543 | | 1.638 | |
| Treatment Prob(F) | | | | | 0.0001 | | 0.0001 | | 0.0001 | | 0.2356 | | 0.2103 | |

Jan-13-2014 (ENA1312 DM Lettuce) AOV Means Table Page 6 of 14

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | LACSA | | LACSA | | LACSA | | LACSA | | LACSA | | LACSA | |
| BBCH Scale | | | | | BVNH | | BVNH | | BVNH | | BVNH | | BVNH | | BVNH | |
| Crop Scientific Name | | | | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | |
| Crop Name | | | | | Lettuce | | Lettuce | | Lettuce | | Lettuce | | Lettuce | | Lettuce | |
| Crop Variety | | | | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | |
| Description | | | | | MEDIUM # | | MEDIUM WEIGHT | | SMALL # | | SMALL WEIGHT | | CULL # | | CULL WEIGHT | |
| Part Rated | | | | | FRUMAR C | | FRUMAR C | | FRUMAR C | | FRUMAR C | | FRUMAR C | | FRUMAR C | |
| Rating Date | | | | | Sep-20-2013 | | Sep-20-2013 | | Sep-20-2013 | | Sep-20-2013 | | Sep-20-2013 | | Sep-20-2013 | |
| Rating Type | | | | | YIELD | | WEIGHT | | YIELD | | WEIGHT | | YIELD | | WEIGHT | |
| Rating Unit | | | | | NUBER | | KG | | NUBER | | KG | | NUBER | | KG | |
| Sample Size, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Collection Basis, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Number of Subsamples | | | | | 1 | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Crop Stage Scale | | | | |  | |  | |  | |  | |  | |  | |
| Footnote Number | | | | |  | |  | |  | |  | |  | |  | |
| SE Group No. | | | | | 12 | | 13 | | 14 | | 15 | | 16 | | 17 | |
| Days After First/Last Applic. | | | | | 38 9 | | 38 9 | | 38 9 | | 38 9 | | 38 9 | | 38 9 | |
| Trt-Eval Interval | | | | | 9 DA-E | | 9 DA-E | | 9 DA-E | | 9 DA-E | | 9 DA-E | | 9 DA-E | |
| Plant-Eval Interval | | | | | 57 DP-1 | | 57 DP-1 | | 57 DP-1 | | 57 DP-1 | | 57 DP-1 | | 57 DP-1 | |
| ARM Action Codes | | | | |  | |  | |  | |  | |  | |  | |
| Number of Decimals | | | | | 1 | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 26 | | 27 | | 28 | | 29 | | 30 | | 31 | |
| 1 | Untreated |  |  | ABCDE | 5.5 | a | 3.9 | a | 6.3 | a | 2.8 | a | 0.0 | a | 0.0 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 7.3 | a | 4.8 | a | 4.8 | a | 2.1 | a | 0.0 | a | 0.0 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 4.0 | a | 2.7 | a | 6.8 | a | 3.1 | a | 0.0 | a | 0.0 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 4.5 | a | 2.9 | a | 7.5 | a | 3.7 | a | 0.0 | a | 0.0 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 7.0 | a | 4.4 | a | 5.3 | a | 2.1 | a | 0.0 | a | 0.0 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |  |  |
| 6 | Reason | 7 | fl oz/a | ABCDE | 7.5 | a | 4.7 | a | 5.0 | a | 2.3 | a | 0.0 | a | 0.0 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 4.07 | | 2.35 | | 4.46 | | 1.97 | | 0.00 | | 0.00 | |
| Standard Deviation | | | | | 2.70 | | 1.56 | | 2.96 | | 1.31 | | 0.00 | | 0.00 | |
| CV | | | | | 45.37 | | 40.04 | | 49.98 | | 48.81 | | 0.0 | | 0.0 | |
| Bartlett's X2 | | | | | 2.299 | | 4.382 | | 4.646 | | 5.361 | | 0.0 | | 0.0 | |
| P(Bartlett's X2) | | | | | 0.806 | | 0.496 | | 0.461 | | 0.373 | | . | | . | |
| Skewness | | | | | 0.0333 | | -0.2695 | | 0.2485 | | 0.4427 | | . | | . | |
| Kurtosis | | | | | -0.2145 | | 0.3756 | | 0.179 | | 1.211 | | . | | . | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 2.013 | | 1.988 | | 0.642 | | 0.363 | | 0.000 | | 0.000 | |
| Replicate Prob(F) | | | | | 0.1555 | | 0.1591 | | 0.6000 | | 0.7809 | | 1.0000 | | 1.0000 | |
| Treatment F | | | | | 1.237 | | 1.362 | | 0.545 | | 0.912 | | 0.000 | | 0.000 | |
| Treatment Prob(F) | | | | | 0.3403 | | 0.2929 | | 0.7396 | | 0.4993 | | 1.0000 | | 1.0000 | |

Jan-13-2014 (ENA1312 DM Lettuce) AOV Means Table Page 7 of 14

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | LACSA | | LACSA | | LACSA | | LACSA | | LACSA | |
| BBCH Scale | | | | | BVNH | | BVNH | | BVNH | | BVNH | | BVNH | |
| Crop Scientific Name | | | | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | |
| Crop Name | | | | | Lettuce | | Lettuce | | Lettuce | | Lettuce | | Lettuce | |
| Crop Variety | | | | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | |
| Description | | | | | LARGE # | | LARGE WEIGHT | | MEDIUM # | | MEDIUM WEIGHT | | SMALL # | |
| Part Rated | | | | | FRUMAR C | | FRUMAR C | | FRUMAR C | | FRUMAR C | | FRUMAR C | |
| Rating Date | | | | | Sep-30-2013 | | Sep-30-2013 | | Sep-30-2013 | | Sep-30-2013 | | Sep-30-2013 | |
| Rating Type | | | | | YIELD | | WEIGHT | | YIELD | | WEIGHT | | YIELD | |
| Rating Unit | | | | | NUBER | | KG | | NUBER | | KG | | NUBER | |
| 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 | |
| Crop Stage Scale | | | | |  | |  | |  | |  | |  | |
| Footnote Number | | | | |  | |  | |  | |  | |  | |
| SE Group No. | | | | | 18 | | 19 | | 20 | | 21 | | 22 | |
| Days After First/Last Applic. | | | | | 48 19 | | 48 19 | | 48 19 | | 48 19 | | 48 19 | |
| Trt-Eval Interval | | | | | 19 DA-E | | 19 DA-E | | 19 DA-E | | 19 DA-E | | 19 DA-E | |
| Plant-Eval Interval | | | | | 67 DP-1 | | 67 DP-1 | | 67 DP-1 | | 67 DP-1 | | 67 DP-1 | |
| ARM Action Codes | | | | |  | |  | | AA | | AA | |  | |
| Number of Decimals | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 32 | | 33 | | 34 | | 35 | | 36 | |
| 1 | Untreated |  |  | ABCDE | 0.0 | a | 0.0 | a | 3.3 | a | 1.6 | a | 14.3 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 0.5 | a | 0.5 | a | 1.3 | a | 0.8 | a | 12.5 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 0.5 | a | 0.6 | a | 0.1 | a | 0.0 | a | 14.8 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 0.0 | a | 0.0 | a | 0.8 | a | 0.4 | a | 15.3 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 1.3 | a | 1.4 | a | 1.3 | a | 0.7 | a | 11.5 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 6 | Reason | 7 | fl oz/a | ABCDE | 0.5 | a | 0.5 | a | 0.6 | a | 0.3 | a | 13.5 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 1.23 | | 1.32 | | 8.39t | | 5.90t | | 4.70 | |
| Standard Deviation | | | | | 0.81 | | 0.88 | | 5.57t | | 3.92t | | 3.12 | |
| CV | | | | | 177.77 | | 177.36 | | 97.56 | | 94.75 | | 22.88 | |
| Bartlett's X2 | | | | | 0.776 | | 0.809 | | 2.912 | | 2.683 | | 2.345 | |
| P(Bartlett's X2) | | | | | 0.855 | | 0.847 | | 0.714 | | 0.749 | | 0.80 | |
| Skewness | | | | | 1.7161\* | | 1.6954\* | | 0.3969 | | 0.2971 | | -0.5601 | |
| Kurtosis | | | | | 1.4516 | | 1.3184 | | -0.9966 | | -1.2029 | | -0.1707 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 2.908 | | 2.870 | | 0.831 | | 0.929 | | 6.155 | |
| Replicate Prob(F) | | | | | 0.0691 | | 0.0714 | | 0.4973 | | 0.4510 | | 0.0061 | |
| Treatment F | | | | | 1.268 | | 1.293 | | 1.140 | | 1.203 | | 0.831 | |
| Treatment Prob(F) | | | | | 0.3280 | | 0.3181 | | 0.3821 | | 0.3547 | | 0.5475 | |

Jan-13-2014 (ENA1312 DM Lettuce) AOV Means Table Page 8 of 14

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | LACSA | | LACSA | | LACSA | | LACSA | | LACSA | |
| BBCH Scale | | | | | BVNH | | BVNH | | BVNH | | BVNH | | BVNH | |
| Crop Scientific Name | | | | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | |
| Crop Name | | | | | Lettuce | | Lettuce | | Lettuce | | Lettuce | | Lettuce | |
| Crop Variety | | | | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | |
| Description | | | | | SMALL WEIGHT | | CULL # | | CULL WEIGHT | | TOTAL LARGE # | | TOTAL LARGE WE> | |
| Part Rated | | | | | FRUMAR C | | FRUMAR C | | FRUMAR C | | FRUMAR C | | FRUMAR C | |
| Rating Date | | | | | Sep-30-2013 | | Sep-30-2013 | | Sep-30-2013 | | Sep-30-2013 | | Sep-30-2013 | |
| Rating Type | | | | | WEIGHT | | YIELD | | WEIGHT | | YIELD | | WEIGHT | |
| Rating Unit | | | | | KG | | NUBER | | KG | | NUBER | | 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 | |
| Crop Stage Scale | | | | |  | |  | |  | |  | |  | |
| Footnote Number | | | | |  | |  | |  | |  | |  | |
| SE Group No. | | | | | 23 | | 24 | | 25 | | 44 | | 45 | |
| Days After First/Last Applic. | | | | | 48 19 | | 48 19 | | 48 19 | | 48 19 | | 48 19 | |
| Trt-Eval Interval | | | | | 19 DA-E | | 19 DA-E | | 19 DA-E | | 19 DA-E | | 19 DA-E | |
| Plant-Eval Interval | | | | | 67 DP-1 | | 67 DP-1 | | 67 DP-1 | | 67 DP-1 | | 67 DP-1 | |
| ARM Action Codes | | | | |  | |  | |  | | AL T1 | | AL T2 | |
| Number of Decimals | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 37 | | 38 | | 39 | | 40 | | 41 | |
| 1 | Untreated |  |  | ABCDE | 4.3 | a | 0.0 | a | 0.0 | a | 0.0 | a | 0.0 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 3.9 | a | 0.0 | a | 0.0 | a | 1.6 | a | 2.1 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 4.4 | a | 0.0 | a | 0.0 | a | 1.3 | a | 1.3 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 4.6 | a | 0.3 | a | 0.0 | a | 0.0 | a | 0.0 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 3.3 | a | 0.0 | a | 0.0 | a | 2.2 | a | 2.3 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 6 | Reason | 7 | fl oz/a | ABCDE | 3.3 | a | 0.5 | a | 0.1 | a | 2.0 | a | 2.2 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 1.90 | | 0.44 | | 0.10 | | 0.43t | | 0.45t | |
| Standard Deviation | | | | | 1.26 | | 0.29 | | 0.07 | | 0.28t | | 0.30t | |
| CV | | | | | 31.83 | | 234.76 | | 257.35 | | 97.18 | | 96.52 | |
| Bartlett's X2 | | | | | 5.8 | | 0.06 | | 1.009 | | 0.546 | | 0.303 | |
| P(Bartlett's X2) | | | | | 0.326 | | 0.806 | | 0.315 | | 0.909 | | 0.96 | |
| Skewness | | | | | 0.5809 | | 2.4219\* | | 3.2907\* | | 0.5643 | | 0.4913 | |
| Kurtosis | | | | | 0.3016 | | 4.2103\* | | 11.1883\* | | -1.3053 | | -1.5026 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 2.203 | | 1.774 | | 2.115 | | 1.888 | | 1.723 | |
| Replicate Prob(F) | | | | | 0.1301 | | 0.1952 | | 0.1411 | | 0.1751 | | 0.2050 | |
| Treatment F | | | | | 0.806 | | 2.032 | | 1.893 | | 2.674 | | 2.718 | |
| Treatment Prob(F) | | | | | 0.5627 | | 0.1320 | | 0.1554 | | 0.0639 | | 0.0609 | |

Jan-13-2014 (ENA1312 DM Lettuce) AOV Means Table Page 9 of 14

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | LACSA | | LACSA | | LACSA | | LACSA | | LACSA | |
| BBCH Scale | | | | | BVNH | | BVNH | | BVNH | | BVNH | | BVNH | |
| Crop Scientific Name | | | | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | |
| Crop Name | | | | | Lettuce | | Lettuce | | Lettuce | | Lettuce | | Lettuce | |
| Crop Variety | | | | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | |
| Description | | | | | TOTAL MEDIUM # | | TOTAL MEDIUM W> | | TOTAL SMALL # | | TOTAL SMALL WE> | | TOTAL CULL # | |
| Part Rated | | | | | FRUMAR C | | FRUMAR C | | FRUMAR C | | FRUMAR C | | FRUUNM C | |
| Rating Date | | | | | Sep-30-2013 | | Sep-30-2013 | | Sep-30-2013 | | Sep-30-2013 | | Sep-30-2013 | |
| Rating Type | | | | | YIELD | | WEIGHT | | YIELD | | WEIGHT | | YIELD | |
| Rating Unit | | | | | NUBER | | KG | | NUBER | | KG | | NUBER | |
| 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 | |
| Crop Stage Scale | | | | |  | |  | |  | |  | |  | |
| Footnote Number | | | | |  | |  | |  | |  | |  | |
| SE Group No. | | | | | 46 | | 47 | | 48 | | 49 | | 50 | |
| Days After First/Last Applic. | | | | | 48 19 | | 48 19 | | 48 19 | | 48 19 | | 48 19 | |
| Trt-Eval Interval | | | | | 19 DA-E | | 19 DA-E | | 19 DA-E | | 19 DA-E | | 19 DA-E | |
| Plant-Eval Interval | | | | | 67 DP-1 | | 67 DP-1 | | 67 DP-1 | | 67 DP-1 | | 67 DP-1 | |
| ARM Action Codes | | | | | T3 | | T4 | | T5 | | T6 | | T7 | |
| Number of Decimals | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 42 | | 43 | | 44 | | 45 | | 46 | |
| 1 | Untreated |  |  | ABCDE | 10.0 | a | 6.2 | a | 20.5 | a | 7.1 | a | 0.0 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 9.0 | a | 5.8 | a | 17.3 | a | 6.0 | a | 0.0 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 4.3 | a | 2.9 | a | 21.5 | a | 7.5 | a | 0.0 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 6.3 | a | 3.8 | a | 22.8 | a | 8.2 | a | 0.3 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 8.8 | a | 5.3 | a | 16.8 | a | 5.3 | a | 0.0 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 6 | Reason | 7 | fl oz/a | ABCDE | 8.8 | a | 5.3 | a | 18.5 | a | 5.6 | a | 0.5 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 5.47 | | 3.12 | | 5.95 | | 2.63 | | 0.44 | |
| Standard Deviation | | | | | 3.63 | | 2.07 | | 3.95 | | 1.75 | | 0.29 | |
| CV | | | | | 46.38 | | 42.4 | | 20.22 | | 26.35 | | 234.76 | |
| Bartlett's X2 | | | | | 1.137 | | 1.766 | | 3.413 | | 2.449 | | 0.06 | |
| P(Bartlett's X2) | | | | | 0.951 | | 0.88 | | 0.637 | | 0.784 | | 0.806 | |
| Skewness | | | | | -0.3399 | | -0.4764 | | -0.3073 | | 0.0229 | | 2.4219\* | |
| Kurtosis | | | | | -0.6192 | | -0.1797 | | -0.8887 | | -0.8048 | | 4.2103\* | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 0.884 | | 1.134 | | 2.971 | | 0.405 | | 1.774 | |
| Replicate Prob(F) | | | | | 0.4717 | | 0.3671 | | 0.0654 | | 0.7514 | | 0.1952 | |
| Treatment F | | | | | 1.399 | | 1.555 | | 1.495 | | 1.721 | | 2.032 | |
| Treatment Prob(F) | | | | | 0.2802 | | 0.2324 | | 0.2495 | | 0.1905 | | 0.1320 | |

Jan-13-2014 (ENA1312 DM Lettuce) AOV Means Table Page 10 of 14

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | LACSA | | LACSA | | LACSA | | LACSA | | LACSA | |
| BBCH Scale | | | | | BVNH | | BVNH | | BVNH | | BVNH | | BVNH | |
| Crop Scientific Name | | | | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | |
| Crop Name | | | | | Lettuce | | Lettuce | | Lettuce | | Lettuce | | Lettuce | |
| Crop Variety | | | | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | |
| Description | | | | | TOTAL CULL WEI> | | TOTAL NUMBER H> | | % SMALL HEAD | | % MED HEAD | | % LRG HEAD | |
| Part Rated | | | | | FRUUNM C | | HEAMAR C | | HEASMA C | | HEAMED C | | HEALAR C | |
| Rating Date | | | | | Sep-30-2013 | | Sep-30-2013 | | Sep-30-2013 | | Sep-30-2013 | | Sep-30-2013 | |
| Rating Type | | | | | WEIGHT | | COUNT | | YIELD | | YIELD | | YIELD | |
| Rating Unit | | | | | 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 | |
| Crop Stage Scale | | | | |  | |  | |  | |  | |  | |
| Footnote Number | | | | |  | |  | |  | |  | |  | |
| SE Group No. | | | | | 51 | | 52 | | 53 | | 54 | | 55 | |
| Days After First/Last Applic. | | | | | 48 19 | | 48 19 | | 48 19 | | 48 19 | | 48 19 | |
| Trt-Eval Interval | | | | | 19 DA-E | | 19 DA-E | | 19 DA-E | | 19 DA-E | | 19 DA-E | |
| Plant-Eval Interval | | | | | 67 DP-1 | | 67 DP-1 | | 67 DP-1 | | 67 DP-1 | | 67 DP-1 | |
| ARM Action Codes | | | | | T8 | | T9 | | T10 | | T11 | | AA T12 | |
| Number of Decimals | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 47 | | 48 | | 49 | | 50 | | 51 | |
| 1 | Untreated |  |  | ABCDE | 0.0 | a | 30.5 | a | 67.5 | a | 32.5 | a | 0.0 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 0.0 | a | 28.3 | a | 60.5 | a | 32.3 | a | 5.3 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 0.0 | a | 28.3 | a | 76.6 | a | 14.9 | a | 4.1 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 0.0 | a | 29.3 | a | 78.8 | a | 20.3 | a | 0.0 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 0.0 | a | 28.5 | a | 58.5 | a | 30.8 | a | 7.9 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 6 | Reason | 7 | fl oz/a | ABCDE | 0.1 | a | 30.5 | a | 61.1 | a | 28.5 | a | 6.5 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 0.10 | | 4.40 | | 21.63 | | 17.91 | | 13.49t | |
| Standard Deviation | | | | | 0.07 | | 2.92 | | 14.35 | | 11.89 | | 8.95t | |
| CV | | | | | 257.35 | | 10.01 | | 21.37 | | 44.75 | | 95.76 | |
| Bartlett's X2 | | | | | 1.009 | | 5.504 | | 1.329 | | 0.661 | | 0.646 | |
| P(Bartlett's X2) | | | | | 0.315 | | 0.357 | | 0.932 | | 0.985 | | 0.886 | |
| Skewness | | | | | 3.2907\* | | 0.4444 | | 0.2146 | | -0.3166 | | 0.5418 | |
| Kurtosis | | | | | 11.1883\* | | -0.4509 | | -0.41 | | -0.5401 | | -1.3308 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 2.115 | | 0.512 | | 2.494 | | 1.037 | | 2.003 | |
| Replicate Prob(F) | | | | | 0.1411 | | 0.6800 | | 0.0996 | | 0.4044 | | 0.1569 | |
| Treatment F | | | | | 1.893 | | 0.532 | | 1.478 | | 1.501 | | 2.738 | |
| Treatment Prob(F) | | | | | 0.1554 | | 0.7491 | | 0.2547 | | 0.2477 | | 0.0596 | |

Jan-13-2014 (ENA1312 DM Lettuce) AOV Means Table Page 11 of 14

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pest Type | | | | |  | |  | |  | |  | | D Disease | |
| Pest Code | | | | |  | |  | |  | |  | | BREMLA | |
| Pest Scientific Name | | | | |  | |  | |  | |  | | Bremia lactucae | |
| Pest Name | | | | |  | |  | |  | |  | | Downy mildew o> | |
| Crop Code | | | | | LACSA | | LACSA | | LACSA | | LACSA | | LACSA | |
| BBCH Scale | | | | | BVNH | | BVNH | | BVNH | | BVNH | | BVNH | |
| Crop Scientific Name | | | | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | |
| Crop Name | | | | | Lettuce | | Lettuce | | Lettuce | | Lettuce | | Lettuce | |
| Crop Variety | | | | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | |
| Description | | | | | % CULL HEAD | | TOTAL YIELD-LB | | CARTON/ACRE | | $/ACRE | | DM SEVERITY | |
| Part Rated | | | | | HEAROT C | | HEAMAR C | | HEAMAR C | | HEAD C | | PLAHEA P | |
| Rating Date | | | | | Sep-30-2013 | | Sep-30-2013 | | Sep-30-2013 | | Sep-30-2013 | | Aug-21-2013 | |
| Rating Type | | | | | YIELD | | WEIGHT | | COMPRO | | INCGRO | | PESINC | |
| Rating Unit | | | | | % | | KG | | NUMBER | | DOLLAR | | % | |
| Sample Size, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 PLOT | |
| Collection Basis, Unit | | | | | 1 PLOT | | 1 PLOT | | 1 PLOT | | 1 ACRE | | 10 PLANT | |
| Number of Subsamples | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Crop Stage Scale | | | | |  | |  | |  | |  | | DESC | |
| Footnote Number | | | | |  | |  | |  | |  | |  | |
| SE Group No. | | | | | 56 | | 65 | | 66 | | 67 | | 58 | |
| Days After First/Last Applic. | | | | | 48 19 | | 48 19 | | 48 19 | | 48 19 | | 8 1 | |
| Trt-Eval Interval | | | | | 19 DA-E | | 19 DA-E | | 19 DA-E | | 19 DA-E | | 1 DA-B | |
| Plant-Eval Interval | | | | | 67 DP-1 | | 67 DP-1 | | 67 DP-1 | | 67 DP-1 | | 27 DP-1 | |
| ARM Action Codes | | | | | T13 | | T14 | | T15 | | T16 | | TIO[16] | |
| Number of Decimals | | | | | 1 | | 1 | | 0 | | 0 | | 1 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 52 | | 53 | | 54 | | 55 | | 56 | |
| 1 | Untreated |  |  | ABCDE | 0.0 | a | 13.2 | a | 442 | a | 5522 | a | 70.0 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 0.0 | a | 14.5 | a | 484 | a | 6047 | a | 65.0 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 0.0 | a | 12.9 | a | 432 | a | 5400 | a | 57.5 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 0.9 | a | 12.0 | a | 400 | a | 5002 | a | 61.4 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 0.0 | a | 13.9 | a | 463 | a | 5785 | a | 60.0 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 6 | Reason | 7 | fl oz/a | ABCDE | 1.6 | a | 14.0 | a | 466 | a | 5822 | a | 50.0 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 1.53 | | 3.83 | | 127.9 | | 1598.7 | | 18.41 | |
| Standard Deviation | | | | | 1.01 | | 2.54 | | 84.9 | | 1061.0 | | 12.22 | |
| CV | | | | | 237.34 | | 18.96 | | 18.96 | | 18.96 | | 20.14 | |
| Bartlett's X2 | | | | | 0.001 | | 2.414 | | 2.414 | | 2.414 | | 3.003 | |
| P(Bartlett's X2) | | | | | 0.969 | | 0.789 | | 0.789 | | 0.789 | | 0.699 | |
| Skewness | | | | | 2.442\* | | 0.392 | | 0.392 | | 0.392 | | 0.3618 | |
| Kurtosis | | | | | 4.3659\* | | -0.4093 | | -0.4093 | | -0.4093 | | -0.3405 | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 1.812 | | 2.598 | | 2.599 | | 2.599 | | 6.364 | |
| Replicate Prob(F) | | | | | 0.1882 | | 0.0907 | | 0.0907 | | 0.0907 | | 0.0054 | |
| Treatment F | | | | | 1.902 | | 0.488 | | 0.488 | | 0.488 | | 1.237 | |
| Treatment Prob(F) | | | | | 0.1537 | | 0.7800 | | 0.7800 | | 0.7800 | | 0.3405 | |

Jan-13-2014 (ENA1312 DM Lettuce) AOV Means Table Page 12 of 14

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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 | | | | | BREMLA | | BREMLA | | BREMLA | | BREMLA | | BREMLA | |
| Pest Scientific Name | | | | | Bremia lactucae | | Bremia lactucae | | Bremia lactucae | | Bremia lactucae | | Bremia lactucae | |
| Pest Name | | | | | Downy mildew o> | | Downy mildew o> | | Downy mildew o> | | Downy mildew o> | | Downy mildew o> | |
| Crop Code | | | | | LACSA | | LACSA | | LACSA | | LACSA | | LACSA | |
| BBCH Scale | | | | | BVNH | | BVNH | | BVNH | | BVNH | | BVNH | |
| Crop Scientific Name | | | | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | | Lactuca sativa | |
| Crop Name | | | | | Lettuce | | Lettuce | | Lettuce | | Lettuce | | Lettuce | |
| Crop Variety | | | | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | | Sun Devil | |
| Description | | | | | DM SEVERITY | | DM SEVERITY | | DM SEVERITY | | DM SEVERITY | | DM SEVERITY | |
| Part Rated | | | | | PLANT C | | PLANT C | | PLANT C | | PLANT C | | PLAHEA P | |
| Rating Date | | | | | Aug-26-2013 | | Sep-3-2013 | | Sep-9-2013 | | Sep-16-2013 | | Sep-23-2013 | |
| Rating Type | | | | | PESINC | | PESINC | | PESINC | | PESINC | | PESINC | |
| 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 | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Crop Stage Scale | | | | | DESC | | DESC | | DESC | | DESC | | DESC | |
| Footnote Number | | | | |  | |  | |  | |  | | 1 | |
| SE Group No. | | | | | 59 | | 60 | | 61 | | 62 | | 63 | |
| Days After First/Last Applic. | | | | | 13 6 | | 21 7 | | 27 5 | | 34 5 | | 41 12 | |
| Trt-Eval Interval | | | | | 6 DA-B | | 7 DA-C | | 5 DA-D | | 5 DA-E | | 12 DA-E | |
| Plant-Eval Interval | | | | | 32 DP-1 | | 40 DP-1 | | 46 DP-1 | | 53 DP-1 | | 60 DP-1 | |
| ARM Action Codes | | | | | AA TIO[17] | | TIO[18] | | TIO[19] | | TIO[20] | | TIO[21] | |
| Number of Decimals | | | | | 1 | | 1 | | 1 | | 1 | | 1 | |
| Trt | Treatment |  | Rate | Appl |  |  |  |  |  |  |  |  |  |  |
| No. | Name | Rate | Unit | Code | 57 | | 58 | | 59 | | 60 | | 61 | |
| 1 | Untreated |  |  | ABCDE | 97.4 | a | 100.0 | a | 100.0 | a | 100.0 | a | 100.0 | a |
| 2 | ARMOUR-Zen | 1 | qt/100 gal | ABCDE | 92.5 | a | 100.0 | a | 100.0 | a | 100.0 | a | 100.0 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 3 | ARMOUR-Zen | 2 | qt/100 gal | ABCDE | 94.3 | a | 97.5 | a | 97.5 | a | 100.0 | a | 100.0 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 4 | ARMOUR-Zen | 4 | qt/100 gal | ABCDE | 98.7 | a | 100.0 | a | 100.0 | a | 100.0 | a | 100.0 | a |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 5 | Serenade ASO | 4 | qt/a | ACE | 96.2 | a | 97.5 | a | 95.0 | a | 100.0 | a | 100.0 | a |
|  | Regalia | 1 | qt/a | BD |  |  |  |  |  |  |  |  |  |  |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| 6 | Reason | 7 | fl oz/a | ABCDE | 49.6 | b | 97.5 | a | 90.0 | a | 90.0 | b | 84.4 | b |
|  | Nu Film P | 0.25 | % v/v | ABCDE |  |  |  |  |  |  |  |  |  |  |
| LSD (P=.05) | | | | | 16.19t | | 5.21 | | 8.95 | | 7.10 | | 10.53 | |
| Standard Deviation | | | | | 10.75t | | 3.46 | | 5.94 | | 4.71 | | 6.99 | |
| CV | | | | | 14.72 | | 3.5 | | 6.12 | | 4.79 | | 7.17 | |
| Bartlett's X2 | | | | | 0.584 | | 0.0 | | 3.84 | | 0.0 | | 0.0 | |
| P(Bartlett's X2) | | | | | 0.989 | | . | | 0.147 | | . | | . | |
| Skewness | | | | | -0.9362 | | -2.4219\* | | -3.0022\* | | -3.22\* | | -4.0231\* | |
| Kurtosis | | | | | 0.9358 | | 4.2103\* | | 10.2327\* | | 9.124\* | | 17.2711\* | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Replicate F | | | | | 2.373 | | 1.279 | | 2.323 | | 1.000 | | 1.000 | |
| Replicate Prob(F) | | | | | 0.1112 | | 0.3175 | | 0.1164 | | 0.4199 | | 0.4199 | |
| Treatment F | | | | | 6.987 | | 0.628 | | 1.819 | | 3.000 | | 3.303 | |
| Treatment Prob(F) | | | | | 0.0015 | | 0.6813 | | 0.1696 | | 0.0450 | | 0.0329 | |

Jan-13-2014 (ENA1312 DM Lettuce) AOV Means Table Page 13 of 14

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley 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

BREMLA, Bremia lactucae, = US

Crop Code

LACSA, BVNH, Lactuca sativa, = US

Part Rated

PLANT = plant

PLAHEA = plant - headed

FRUMAR = fruit - marketable

FRUUNM = fruit - unmarketable

HEAMAR = head - marketable

HEASMA = head - small

HEAMED = head - medium

HEALAR = head - large

HEAROT = head - rotten

HEAD = head

C = Crop is Part Rated

P = Pest is Part Rated

Rating Type

PHYGEN = phytotoxicity - general / injury

VIGOR = vigor

LESION = lesion

PESSEV = pest severity

AUDPC = area under disease progress curve

CONTRO = control / burndown or knockdown

YIELD = yield

WEIGHT = weight

COUNT = count

COMPRO = commercial product, general

INCGRO = income - gross / value

PESINC = pest incidence

Rating Unit

% = percent

0-10 = 0-10 index/scale

NUMBER = number

AUDPC = area under disease process curve

%UNCK = percent of untreated check

KG = kilogram

DOLLAR = dollar

PLOT = total plot

PLOT = total plot

PLANT = plant/plant biomass/shrub

Crop Stage Scale

DESC = descriptive growth stages

Plant-Eval Interval

27 DP-1 = 1 LACSA Jul-25-2013

32 DP-1 = 1 LACSA Jul-25-2013

46 DP-1 = 1 LACSA Jul-25-2013

53 DP-1 = 1 LACSA Jul-25-2013

40 DP-1 = 1 LACSA Jul-25-2013

60 DP-1 = 1 LACSA Jul-25-2013

57 DP-1 = 1 LACSA Jul-25-2013

67 DP-1 = 1 LACSA Jul-25-2013

ARM Action Codes

AL = Automatic log transformation of X+1

AS = Automatic square root transformation of X+0.5

AA = Automatic arcsine square root % transformation

T17 = &@AUDPC(@MATCH(EPT=BREMLA,EDT=PESSEV,ERU=%))

TAB[22] = Arcsine square root percent([23])

T1 = LOG([40]+ 1)

T2 = LOG([41]+ 1)

T3 = [C26]+[C34]

T4 = [C27]+[C35]

T5 = [C28]+[C36]

T6 = [C29]+[C37]

T7 = [C30]+[C38]

T8 = [C31]+[C39]

T9 = [C40]+[C42]+[C44]+[C46]

T10 = 100\*(([C44]/[C48]))

T11 = 100\*(([C42]/[C48]))

T12 = Arcsine square root percent([51])

T13 = 100\*(([C46]/[C48]))

Jan-13-2014 (ENA1312 DM Lettuce) AOV Means Table Page 14 of 14

**Pacific Agricultural Research**

**Efficacy of ARMOUR-Zen against downy mildew on lettuce**

Trial ID: ENA1312 Location: Edna Valley Trial Year: 2013

Protocol ID: Investigator: Eric Flora

Project ID: Study Director: Aaron Formella

Sponsor Contact: Duane Ewing

T14 = [C25]+[C27]+[C29]+[C33]+[C35]+[C37]

T15 = (([C53]\*2.2)/50)/0.001318698347

T16 = [C54]\*12.5

TIO[16] = % Incidence (&0 = none)[16]

TIO[17] = Arcsine square root percent([57])

TIO[18] = % Incidence (&0 = none)[18]

TIO[19] = % Incidence (&0 = none)[19]

TIO[20] = % Incidence (&0 = none)[20]

TIO[21] = % Incidence (&0 = none)[21]

Footnote 1: Blank plots indicate harvested plants (i.e if only 8 samples, only 8 heads are remaining in plot.)