Insecticide Trial Results – Alfalfa Weevil

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Alfalfa & Wheat Expo

Crete, Nebraska
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Introduction

Major challenge for alfalfa weevil management: lack of alternative modes of action!

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Introduction

Major challenge for alfalfa weevil management: **lack of alternative modes of action!**

- Group 3A: Pyrethroids types I, and II
- Group 22A: Indoxacarb
- In some states, group 5: Spinosad
- Group 1B: Chlorpyrifos - not an option anymore, but other OP's are available

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Susceptibility to Lambda-Cyhalothrin®

University of Arizona (2020)

- **Field populations from 14 locations in seven states:** Arizona, California, Montana, New Mexico, Oklahoma, Texas, and Utah.

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Susceptibility to Lambda-Cyhalothrin®

University of Arizona (2020)

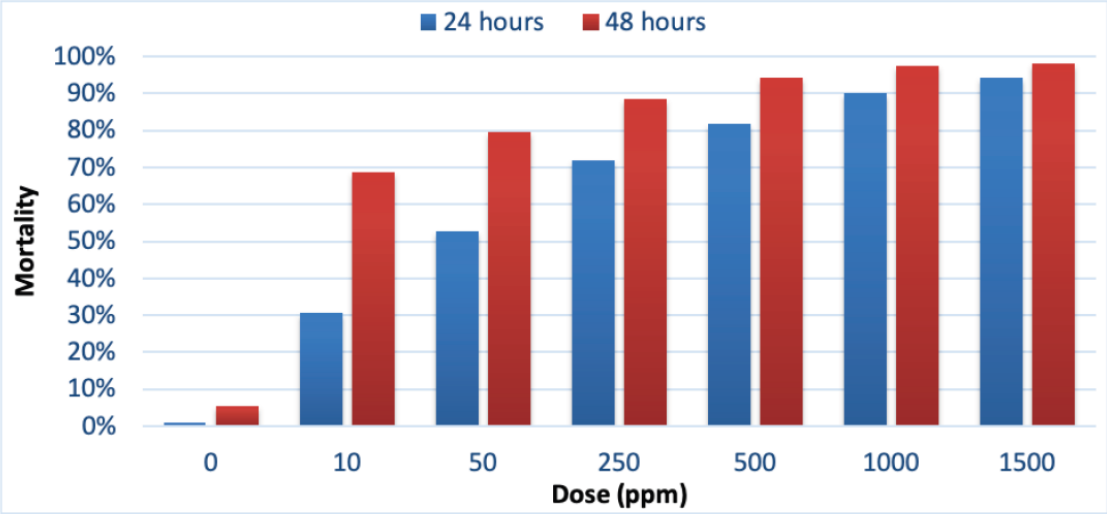

Fig. 4. Average percentage mortality of AW larvae in response to different concentrations of lambda-cyhalothrin at 24 and 48 hours after treatment in 2019.

- For all locations, the average mortality at 48 hours was greater than 80% for doses of 50 ppm or greater.
- **Conclusion:** No resistance has developed yet in those locations

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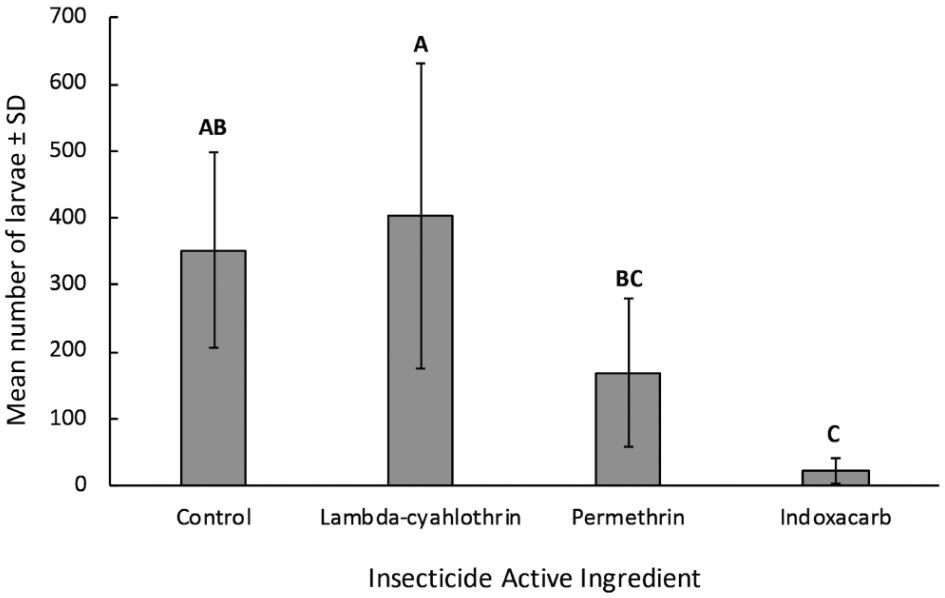
Susceptibility to Lambda-Cyhalothrin®

Montana State University (2021)

- **Laboratory bioassays and a field trial results:** larvae from southern Big Horn County were highly resistant to lambda-cyhalothrin
- Lambda-cyhalothrin applied at the highest label rate had no effect on the number of larvae 13d after treatment
- **Indications of cross-resistance to Zeta-cypermethrin**



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Susceptibility to Lambda-Cyhalothrin®

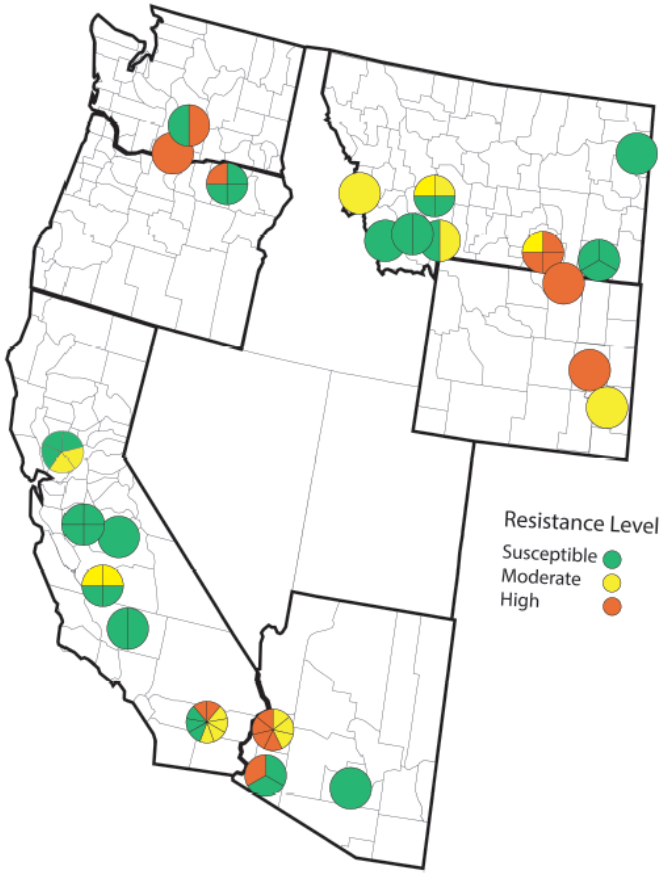

Fig. 1. Lambda-cyhalothrin resistance level categories for 71 commercial alfalfa field sites located in six western states: Arizona, California, Montana, Oregon, Washington and Wyoming. Pie charts represent location samples within a county (listed in Table 2). Each section of a pie chart represents a single alfalfa field site that has been categorized as highly resistant (LC50 >1.0 µg/cm²), moderately resistant (LC50 0.30–1.0 µg/cm²) or susceptible (LC50 value <0.30 µg/cm²). For context, the label rate for lambda-cyhalothrin is 0.22–0.34 µg/cm².

Montana State University and UC Davis (2022)

- **Tested:** Alfalfa weevil samples from 71 commercial fields located in Arizona, California, Montana, Oregon, Washington, and Wyoming
- **17 field sites representing all six states were highly resistant to lambda-cyhalothrin**

Journal of Economic Entomology, 115(6), 2022, 2029–2040

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Susceptibility to Lambda-Cyhalothrin®

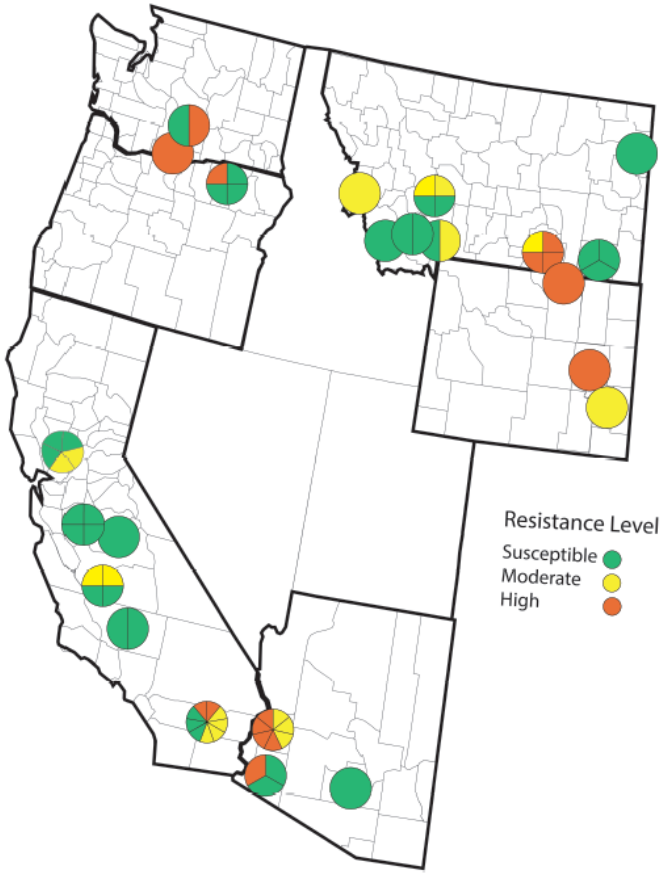

Fig. 1. Lambda-cyhalothrin resistance level categories for 71 commercial alfalfa field sites located in six western states: Arizona, California, Montana, Oregon, Washington and Wyoming. Pie charts represent location samples within a county (listed in Table 2). Each section of a pie chart represents a single alfalfa field site that has been categorized as highly resistant (LC50 >1.0 µg/cm²), moderately resistant (LC50 0.30–1.0 µg/cm²) or susceptible (LC50 value <0.30 µg/cm²). For context, the label rate for lambda-cyhalothrin is 0.22–0.34 µg/cm².

Montana State University and UC Davis (2022)

- Results also indicated presence of **cross-resistance between lambda-cyhalothrin and zeta-cypermethrin** and variable and/or limited potential **cross-resistance to permethrin**

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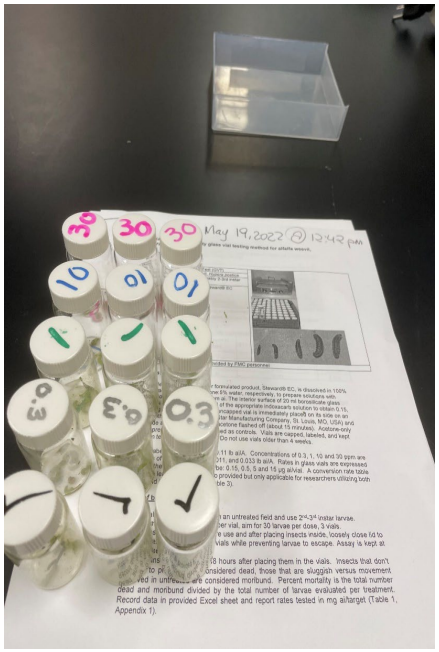
Indoxacarb vs Alfalfa Weevil Larvae

University of Nebraska, Lincoln (2022)

- Alfalfa weevil larvae were collected on May 16 at Hickman, Lancaster County
- The vials were pre-treated with Steward EC (ai. Indoxacarb)
- The concentration tested were 0.3, 1, 10, and 30 ppm. The equivalent rates for those concentrations are **0.0033, 0.011, 0.033, and 0.11 lb ai/A**
- Percent mortality was recorded after 48 hours of exposure
- 30 larvae were tested in each replication



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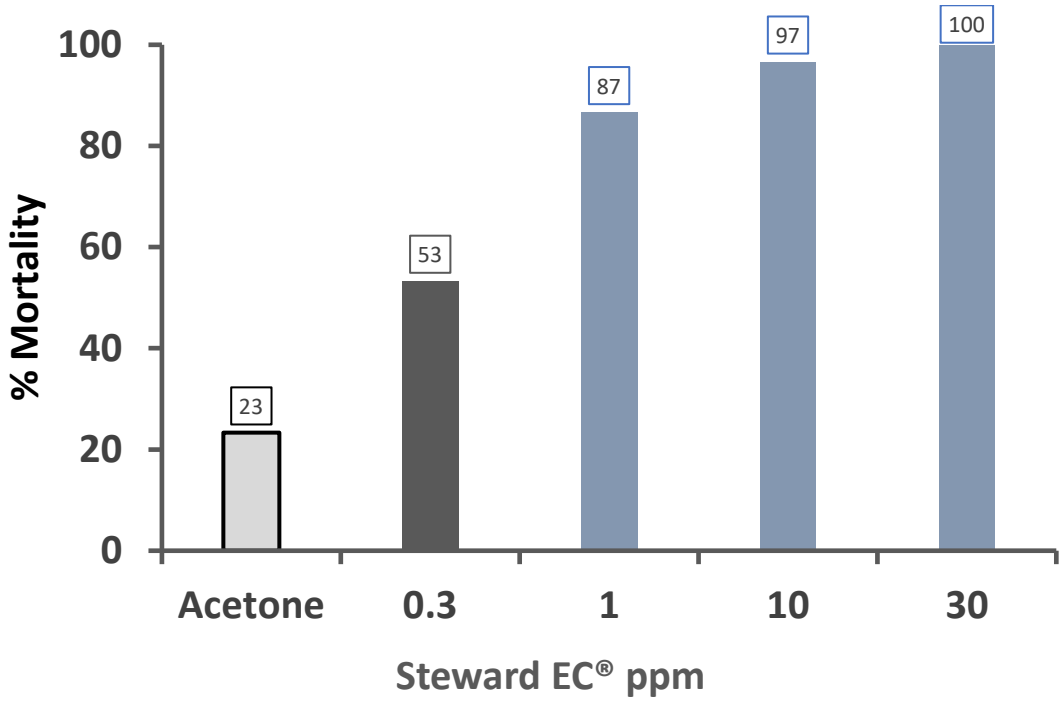
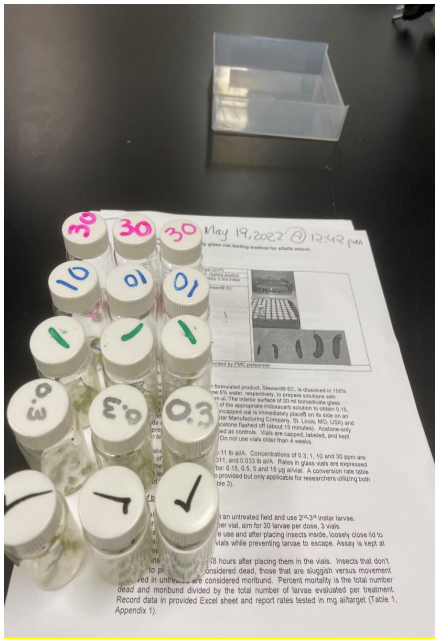
Indoxacarb vs Alfalfa Weevil Larvae

University of Nebraska, Lincoln (2022)





LC50 = 0.39 ppm

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Insecticide trials: Alfalfa Weevil Larvae

University of Nebraska, Lincoln (2023)

Pre-assessment was performed in 5 untreated adjacent plots with 10 sweep net collections in each plot.

Target pest	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Total Collected	Average	SE
Alfalfa weevil larvae	22	34	17	43	27	143	28.6	4.6
Alfalfa weevil adults	1	0	2	0	2	5	1	0.4

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Insecticide trial #1: Alfalfa Weevil Larvae

University of Nebraska, Lincoln (2023)

Treatments:

Imidan + Silencer = 0.05 lb & 8 floz/acre
Imidan = 1lb/acre
Silencer = 8 floz/acre
Steward = 3.84 floz/acre
Untreated

Assessments: before treatment, 7, 14, and 21 days after treatment

Samples: 10 sweep nets per plot

4 Reps per treatment

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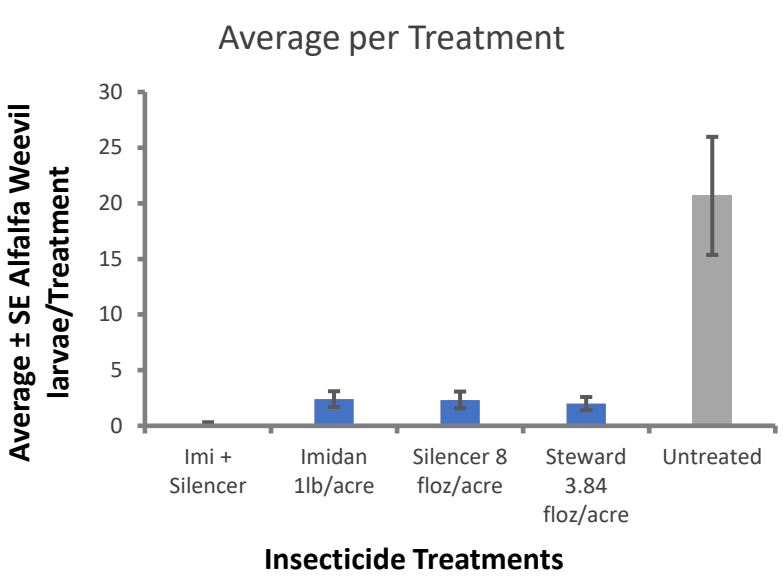
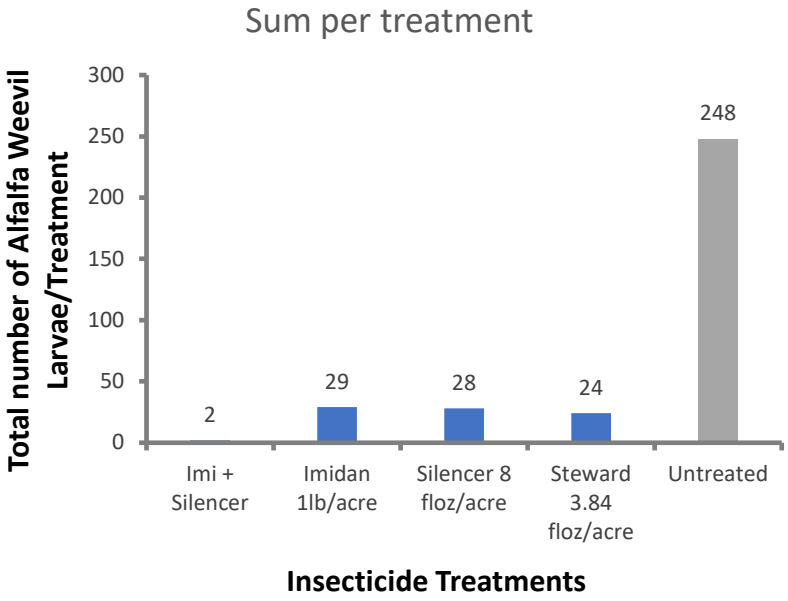
Insecticide trial #1: Alfalfa Weevil Larvae

University of Nebraska, Lincoln (2023)





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Insecticide trial #2: Alfalfa Weevil Larvae

University of Nebraska, Lincoln (2023)

Pre-assessment was performed in 5 untreated adjacent plots with 10 sweep net collections in each plot.

Target pest	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Total Collected	Average	SE
Alfalfa weevil larvae	22	34	17	43	27	143	28.6	4.6
Alfalfa weevil adults	1	0	2	0	2	5	1	0.4

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Insecticide trial #2: Alfalfa Weevil Larvae

University of Nebraska, Lincoln (2023)

Treatments:

Warrior II = 1.92 floz/acre

Untreated

Assessments: before treatment, 3, 7, and 14 days after treatment

Samples: 10 sweep nets per plot

4 Reps per treatment

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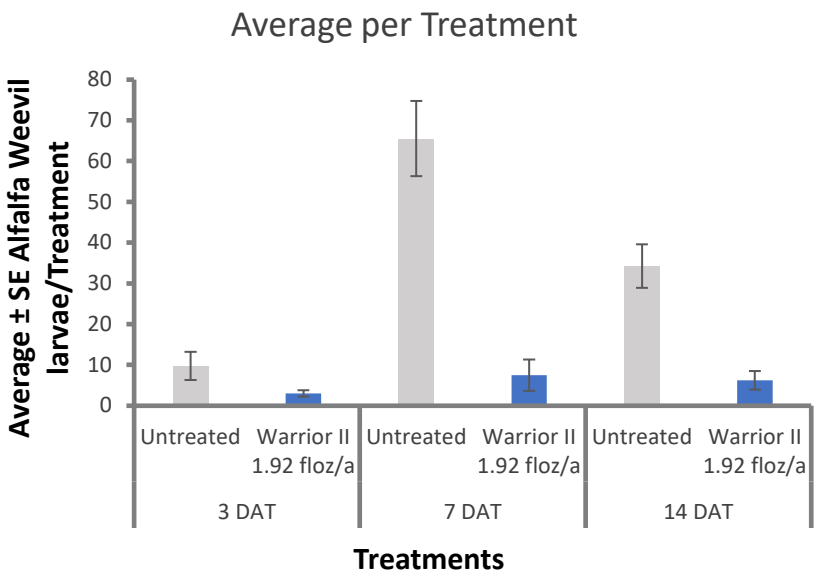
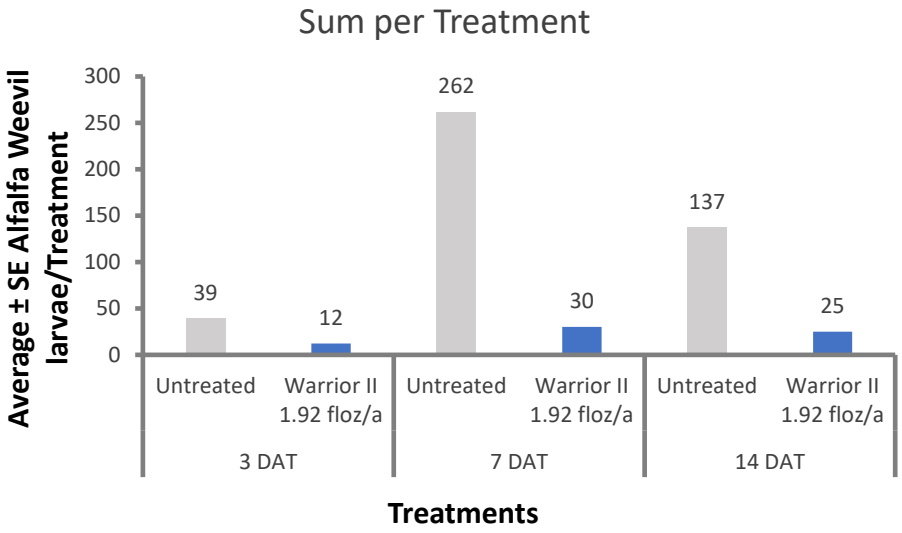
Insecticide trial #2: Alfalfa Weevil Larvae

University of Nebraska, Lincoln (2023)





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