Section III.
Field Crop Pests (Includes: Cereals and Vegetables)

THRIPS CONTROL ON DRY BULB ONIONS

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Project Description

In the following experiments, field plots of onion (var. Tamara) were established at the WSU Othello Research Farm and grown using rill irrigation and standard grower practices for agronomic and pest management inputs excluding thrips treatments. Plots were established in a random complete block design with four replications. In each instance, plots are 7.5 feet wide

and 30 feet long. Efficacy was evaluated by counting the number immature and adult thrips per plant on 10 individual plants per plot in the field. All data for each sample date was analyzed by ANOVA and treatments compared to non-treated controls in pairwise *t*-tests.

Objective 1: Conduct field efficacy trials for thrips control with candidate insecticide compounds and evaluate season long control programs.

New chemistries were evaluated for efficacy against thrips. The products were applied via C02 propelled back pack sprayer and evaluated post application to determine efficacy and residual activity for thrips control.

Figure 1a depicts data from the first week of the trial evaluating sequential applications of currently labeled products. The first week following the initiation of the experiment, the only treatment that controlled thrips significantly better than the untreated check was Warrior, a synthetic pyrethroid. This product is often used in commercial production, and previous experiments have shown its efficacy to be good early in the growing season, but it often loses efficacy as the growing season progresses.

Figure 1b depicts data from the fourth week of the same trial, at which point in the trial all treatments are controlling thrips better than the untreated check. None of the treatments provided significantly different control from the untreated check in weeks two and three. Figure 1c shows the final thrips count for the different sequential treatments on the left panel, and an average plot count for each treatment on the right panel. The final thrips (Fig. 1c) count panel shows that the lowest numbers of thrips were found on the treatment of AzaDirect + Radiant tank mix and the treatment that rotated Radiant and Movento from week to week. The average plot counts over the season (Fig. 1c) indicate that all of the sequential applications evaluated were providing significantly better overall control than were untreated plots. Yields were measured, but no differences were detected among treatments.

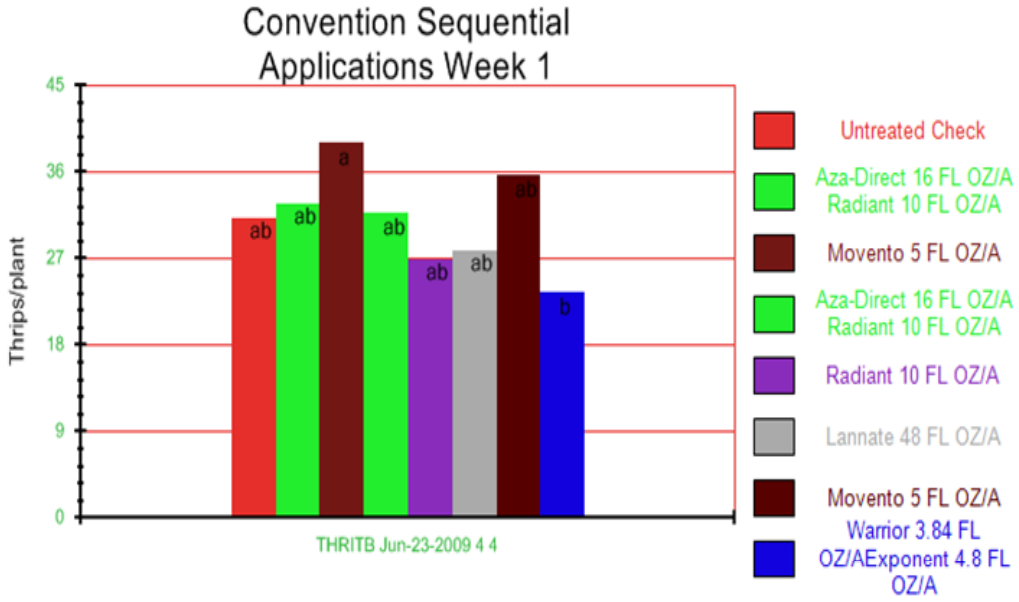

Figure 1a. Thrips per plant versus chemical treatments.

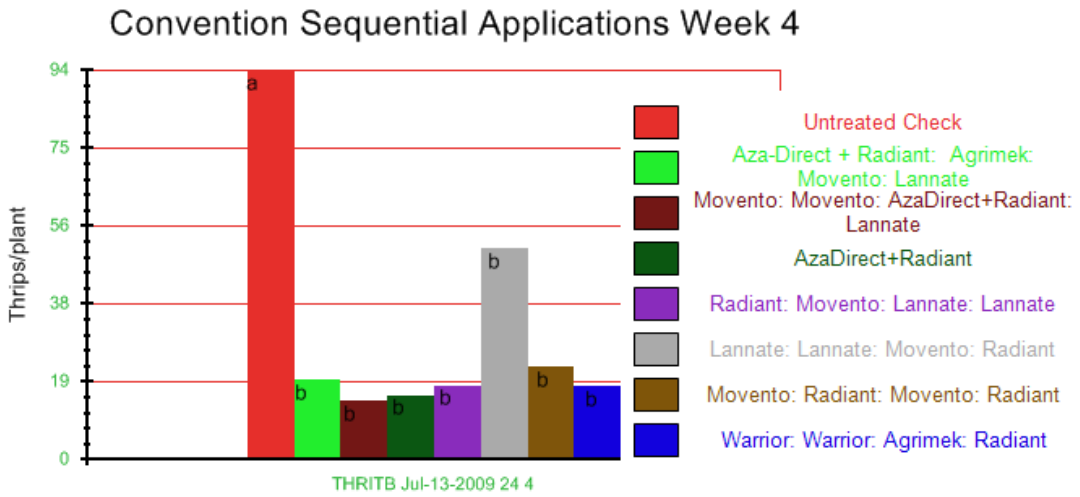

Figure 1b. Thrips per plant versus chemical treatments. Weekly applications were made; the first application is listed first, and subsequent applications for each treatment are listed in order of application. A + symbol indicates a tank mix.

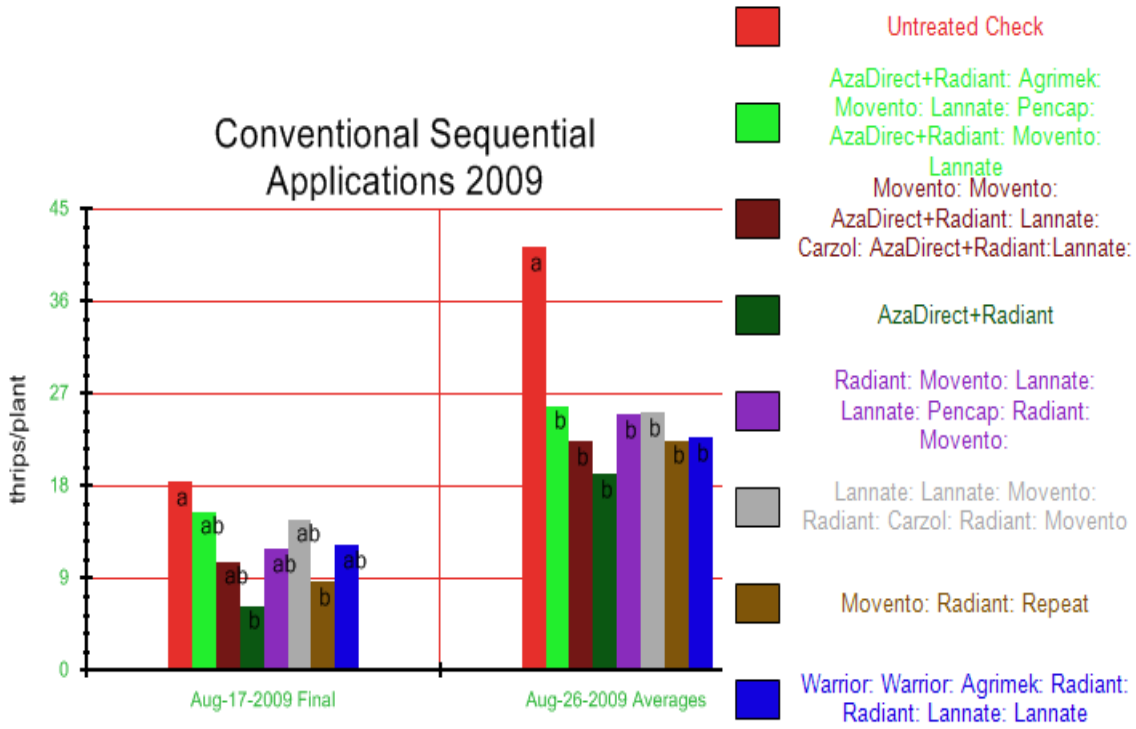

Figure 1c. Thrips per plant versus chemical treatments. Weekly applications were made; the first application is listed first, and subsequent applications for each treatment are listed in order of application. A + symbol indicates a tank mix.

Figures 2a and 2b depict data from a trial evaluating weekly applications of products and some tank mixes. On July 13 (Fig. 2a) the three different rates of Carzol and the tank mix of AzaDirect and Radiant were the superior treatments in the trial. This same trend is realized in the plot averages (Fig. 2b). The tank mix of AzaDirect and Movento was also providing a significant level of control compared to the untreated check. The Movento, AzaDirect, AzaDirect + M-Pede,

and Nexter treatments did not provide a level of control that was significantly better than the untreated check plots (Figs. 2a and 2b). Yields were measured, but no differences were detected among treatments.

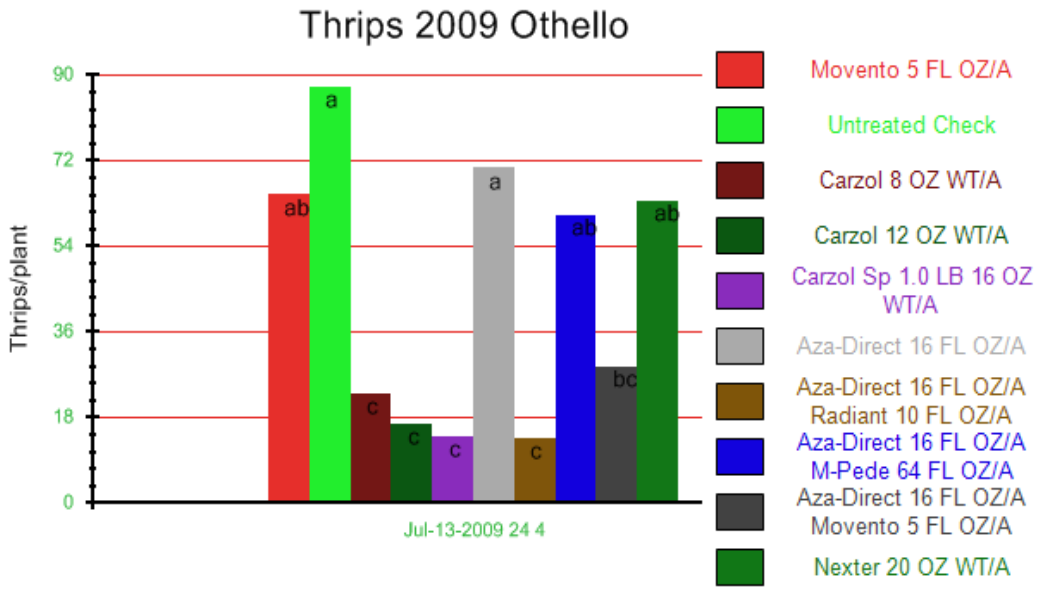

Figure 2a. Thrips per plant versus chemical treatments. Weekly applications were made of each product. A + symbol indicates a tank mix.

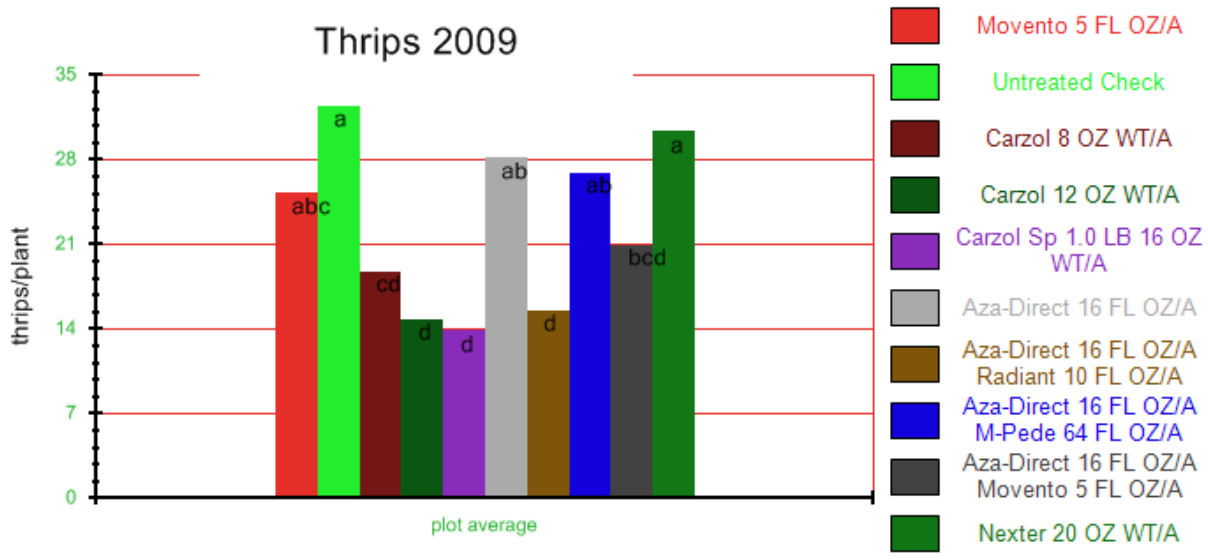

Figure 2b. Thrips per plant versus chemical treatments. Weekly applications were made of each product. A + symbol indicates a tank mix.

Figure 3 illustrates the summary data for a trial that evaluated sequential applications of organic products for thrips control in onions. The data indicates that the sequence of Entrust +Trilogy, Entrust + Trilogy, AzaDirect + Entrust, AzaDirect + Entrust, AzaDirect + Entrust was the best treatment in the trial. The treatment sequence of Pyganic, Trilogy, Trilogy, Entrust, Entrust provided a level of control no better than the untreated check. The other two treatment sequences provided a moderate level of control. It seems as if the sequences where tank mixes were used were more successful with the organic products.

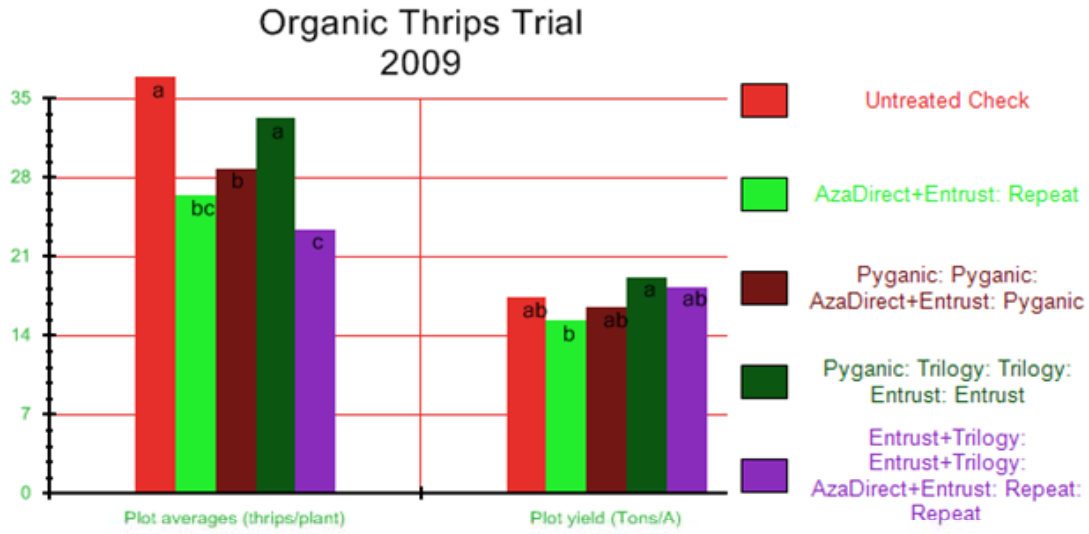

Figure 3. Thrips per plant versus chemical treatments. Weekly applications were made; the first application is listed first, and subsequent applications for each treatment are listed in order of application. A + symbol indicates a tank mix.

Objective 2: Determine the species consistency of thrips populations infesting onions in Washington State.

Twenty onion plants were collected weekly from untreated check plots at the WSU Othello research station. The plants were taken back to the laboratory and dissected in order to collect the thrips on each plant. Samples were stored in alcohol and the ratio of onion thrips adults to western flower thrips adults present will be ascertained.

This objective of the project is still being worked on. The samples have been collected and preserved in alcohol and will be evaluated this winter. The specimens need to be slide mounted and keyed. The initial samples that have been evaluated were predominately onion thrips (*Thrips tabaci*).

Objective 3: Evaluate different water carrier gallonage rates and delivery pressures to determine the best method for applying insecticides for thrips control. Carzol, Radiant, and Lannate were used in rotation with one another to test gallonage and delivery pressure rates. Gallonages including 10, 20, 30, and 40 gallons per acre were evaluated for efficacy at various pressures. It has been assumed that the higher the pressure and gallonage, the better thrips control will be. Many growers are going away from applications with fixed wing aircraft and focusing on aerial

applications via helicopter in order to increase efficacy. It has been assumed that applications with ground rigs and through irrigation are much more efficacious than are aerial application.

For this objective, four different application water carrier rates (gallonage) and pressures were tested including: 10 gallons 15 psi, 20 gallons 50 psi, 30 gallons 30 psi, and 40 gallons 60 psi. Six applications were made to test the efficacy of the different application rates with products known to be efficacious at controlling thrips. Applications of the following sequence of products were made on a seven day interval: AzaDirect + Radiant, AzaDirect + Radiant, Carzol, Lannate, Lannate, Lannate. Figure 4a illustrates the data obtained after the first application for this trial. Contradictory to conventional wisdom, the lowest application rate and pressure provided the best level of thrips control. The 10 gallon 15 psi rate was expected to have the lowest level of control. The other treatments had equal levels of thrips suppression. Subsequent applications (Fig. 4b) show that the gallonage and pressure application rates did not really have a different impact on thrips control. All treatments provided a level of control that was significantly better than the untreated check, but did not differ from one another. These results were quite surprising, and in my opinion warrant further work to investigate if this trend is valid.

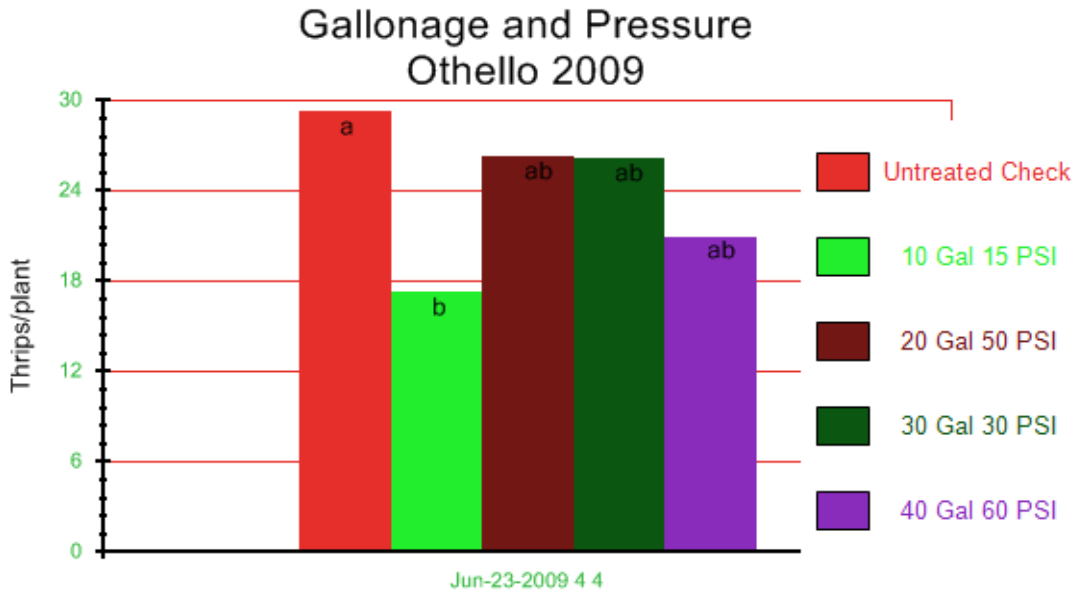

Figure 4a.

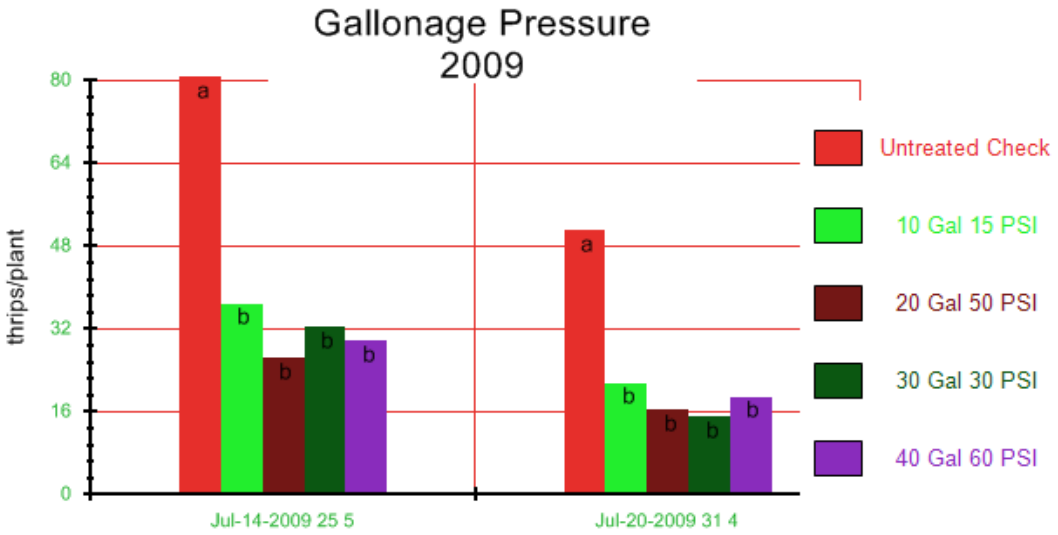
Gallonage Pressure
2009
thrips/plant
80
64
48
32
16
0
a
b
b
b
b
a
b
b
b
b
Jul-14-2009 25 5
Jul-20-2009 31 4
Untreated Check
10 Gal 15 PSI
20 Gal 50 PSI
30 Gal 30 PSI
40 Gal 60 PSI

Figure 4b.