Aphid and leafhopper control in celery

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APHID MANAGEMENT

Aphids pose an annual challenge to Michigan's celery growers. Aphid infestations can be spotty, making scouting difficult. Once present, numbers can increase rapidly and lead to significant problems. Their feeding is focused on the newer growth, causing curled foliage that can stunt the plant. Also, aphids vector viruses and, if present at harvest, can lead to the rejection of a load for processing.

Aphid control is difficult, especially since they situate themselves on the underside of the leaves and deep down in the heart of the plant where it's difficult to get good insecticide coverage. Nevertheless, current control practices rely heavily on insecticides, making it important to evaluate both registered and experimental products for their efficacy in the field.

In 2012, we set up a foliar insecticide trial on a commercial farm with six insecticides representing different modes of action. All tested insecticides were applied with Silwet, which is a penetrating surfactant. Insecticides were applied on August 29, 2012 and aphids were visually checked weekly for four weeks thereafter. Other than Dimethoate, all products significantly lowered aphid numbers compared to the untreated control (Fig. 1). Movento performed significantly better than all other tested products and was the only treatment that lowered aphid numbers to commercially acceptable levels. All the insecticides that were included in our trial are currently registered products in celery.

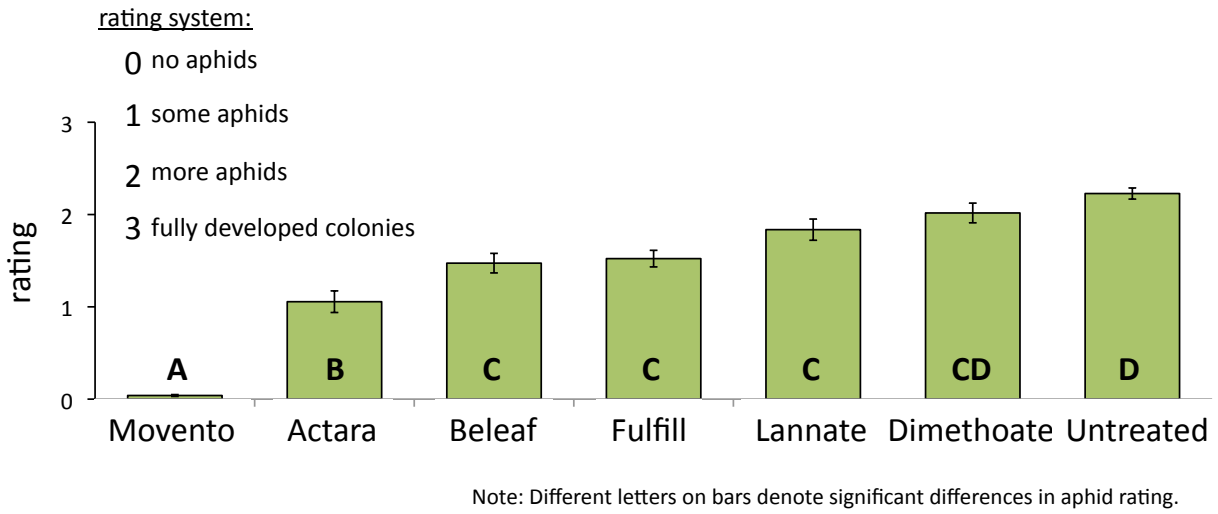

Figure 1. Impact of insecticide treatments on aphid infested celery plants. All products were applied with 0.5% v/v **Silwet** (penetrating surfactant). The following rates were applied: Movento (5 fl oz/A), Actara (3 oz/A), Beleaf (2.8 oz/A), Fulfill (2.75 oz/A), Lannate (3 pt/A), and Dimethoate (1 pt/A).

In order to determine the efficacy of Movento with and without the penetrating surfactant (Silwet, 0.5%v/v), we decided to conduct a follow up experiment to determine if the surfactant was a necessary addition. This trial was also conducted at a commercial celery farm, applications were made on September 3, 2012, and aphid numbers were visually checked for two weeks thereafter. Movento with Silwet again significantly reduced aphid numbers, while using Movento without Silwet did not reduce aphid numbers relative to the untreated plants (Fig. 2).

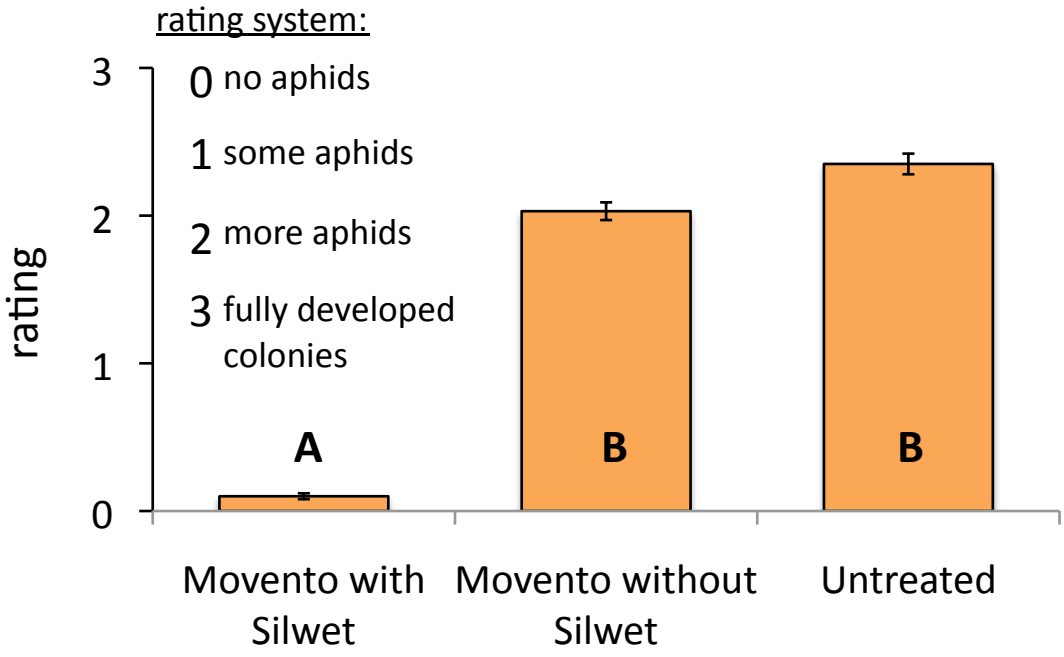

Figure 2. Suppression of aphid numbers on celery using Movento with or without Silwet (a penetrating surfactant). The Movento rate was 5 fl oz/A and Silwet was applied at 0.5% v/v.

ASTER LEAFHOPPER MANAGEMENT

Aster leafhoppers are a significant insect pest of fresh market vegetables primarily because they transmit *aster yellows phytoplasma*, which is a disease of celery, carrots, lettuce and, occasionally, onions and potatoes. Disease symptoms vary from crop to crop, but affected plants typically have distorted, discolored foliage, taste bitter and are therefore unmarketable.

MANAGING THE ASTER YELLOWS - ASTER LEAFHOPPER COMPLEX

1. The cornerstone of aster yellows management is the use of foliar insecticides to reduce leafhopper pressure.

2. Insecticides are applied based on threshold, where available**. Thresholds are determined based on the level of phytoplasma in the insects ➔ the higher the infectivity the lower the threshold.**

3. Thresholds are crop species dependent, for example lettuce is more sensitive than celery, and celery is more sensitive than carrots. So carrots typically have the highest threshold out of these three crops.

4. The level of infectivity in the leafhoppers is measured by PCR reaction in the MSU Plant Diagnostic Lab. The typical turnaround for a sample from submission to results is 2-4 days. Crop scouts and extension personnel then use this to inform growers whether their fields are below or above threshold.

5. Thresholds from the diagnostic lab are given as follows: 4 leafhoppers / 100 sweeps.

2012 ASTER LEAFHOPPER FIELD TRIAL

Insecticides are an integral part of aster leafhopper management in celery, so it's important to evaluate both registered and experimental compounds for their control. Because growers are often forced to make many applications during the growing season, a combination of products may be needed. In 2012, we tested eight different insecticides at the MSU Muck Soils Research Farm in Bath, MI. Products were applied twice, first on July 18 and again on August 1, 2012. Most products did not differ from one another, and only Baythroid and Mustang Max significantly reduced aster leafhopper numbers compared to the untreated plots (Fig. 3).

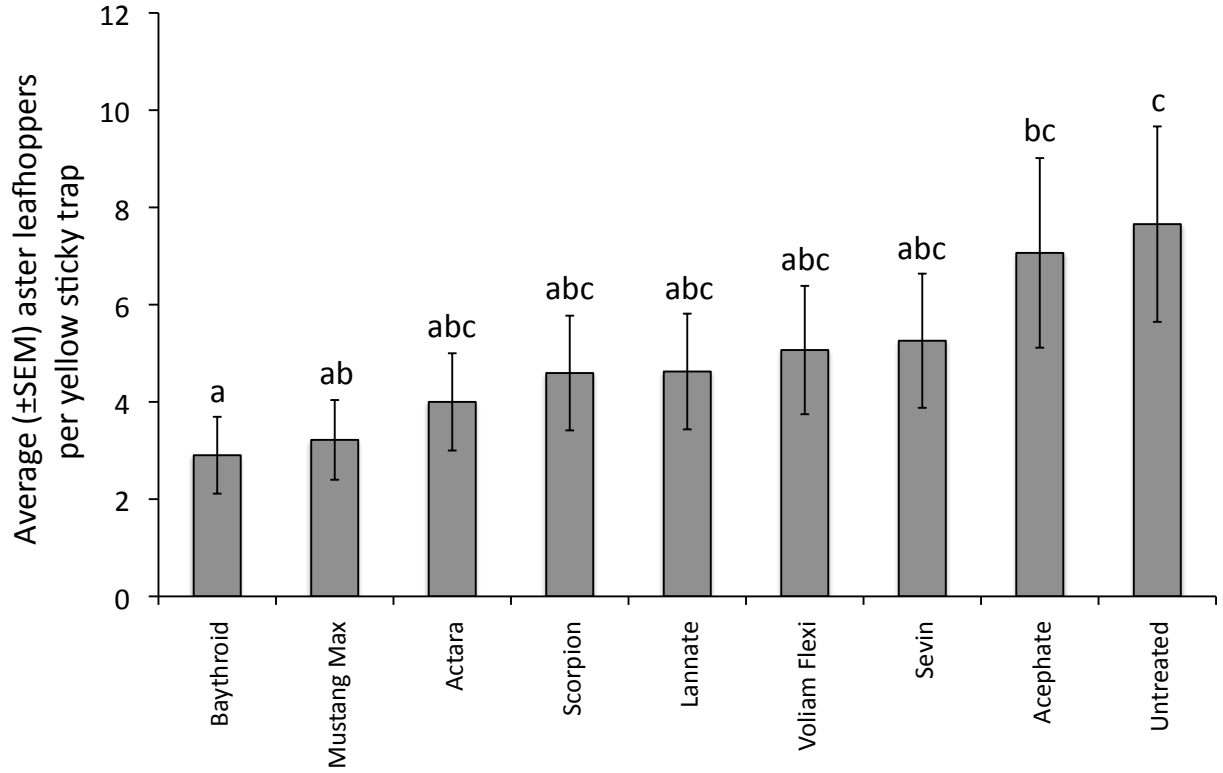

Figure 3. Average number of aster leafhoppers per yellow sticky trap in a field trial conducted at the MSU Muck Soils Farm. The following rates were applied: Baythroid (3.2 fl oz/A), Mustang Max (4 oz/A), Actara (3 oz/A), Scorpion (5.25 fl oz/A), Lannate (3 pt/A), Voliam Flexi (7 oz/A), Sevin (1 qt/A), and Acephate (16 oz/A). Bars with different letters denote significant differences in aster leafhopper numbers. All of the tested products are currently registered on celery.