

Evaluation of Miticides for Two-Spotted Spider Mite Control in Carrots Grown for Hybrid Seed in Central Oregon, 2013

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Abstract

Two-spotted spider mites are an important pest on hybrid carrot seed production in central Oregon. Concern about two-week knock down period and re-entry interval (REI) for Comite (propargite) prompted a search for other products that could be used. Agri-Mek (abamectin) at two rates was compared to Comite and a combination of the two products. Results indicated a significant difference in mite populations between treated and the untreated check 11 days after treatment (DAT), with no significant difference between treatments. Testing for percent germination indicated no difference between treatments and the untreated control.

Introduction

Two-spotted spider mites are a significant pest in hybrid carrot seed in central Oregon. Spider mite populations can increase dramatically during the time bees are present to pollinate the crop from late June until mid-August. During this time, no insecticide applications are made. Once bees are removed from the fields, a cleanup application to control insect pests often includes a combination of Orthene (acephate) and Comite (propargite). However, Comite is problematic due to the two weeks it takes for mites to die and the two week re-entry interval (REI) that prevents rouging crews from accessing the fields. There can be two weeks or less between the cleanup spray and swathing the fields for harvest so a product with a shorter REI is necessary.

The objective of this project was to compare efficacy for two-spotted spider mite control for a potential new product, Agri-Mek (abamectin), with Comite.

Methods and Materials

Research was conducted in a commercial hybrid carrot seed field near Madras, Oregon. Plots consisted of four female rows 10 ft x 20 ft replicated four times in a randomized complete block design. The entire plot area was covered with agricultural paper and held down on the edges with dirt during aerial application of Orthene plus Comite to the remainder of the field on August 10, 2013. Pre-application mite counts were taken August 13 and again on August 20. Mite counts were taken by counting the number of mites on 20 flower bracts per plot from secondary umbels, with a maximum of 25 mites counted per bract.

Treatment of plots was delayed until after the second pre-count to allow time for populations to increase. Treatments were applied August 22, using a CO₂-pressurized, hand-held boom sprayer at 40 psi and 10 gals per acre water. A non-ionic surfactant at 1 qt/100 gal was included with all treatments. A clean-up spray of Orthene at 1 lb/acre plus Brigade (bifenthrin) at 6.4 oz/acre to control lygus and other insect pests was applied to the entire plot area with the treatments.

Post-treatment mite counts were taken 5, 8 and 11 days after treatment (DAT). Prior to commercial swathing of the field, a random sampling of 8 secondary umbels per plot were collected for testing percent germination to determine if there was any detrimental effect from treatments applied. Germination testing was conducted by Agri Seed Testing, Inc. in Salem, Oregon.

Results and Discussion

Although there were no statistical differences between any of the treatments 5 DAT and 8 DAT, there was a statistical difference between treated and untreated plots 11 DAT (Table 1). There were no statistical differences between insecticide treatments. Testing for percent germination indicates no significant difference between treated and the untreated control. Although there was a significant difference between Agri-Mek SC at 3.5 fl oz/ac and 7 fl oz/ac (abamectin at 0.02 lbs a.i./acre and 0.04 lbs a.i. acre), it is likely an anomaly in the sampling procedure and does not raise concern over use of this product in seed carrots. This project will be conducted to generate a second year of data during the 2014 season.

Table 1. Number of mites per flower bract and percent seed germination following insecticide treatments to control two-spotted spider mites on hybrid seed carrots near Madras, Oregon, 2013.

| Treatment (product/ac) | Mites/Flower Bract | | | | | Seed Germination % |
|--|--------------------|----------|----------------------|-----------|--------|--------------------|
| | ---Pre Counts--- | | -----Post Spray----- | | | |
| | 8/13 | 8/20 | 8/27 | 8/30 | 9/2 | |
| Untreated Check | 98.5 | 101.3 b | 54.8 | 30.5 | 50.3 a | 78.3 ab |
| Agri-Mek SC 3.5 fl oz/ac | 96.3 | 135.5 ab | 47.0 | 25.0 | 15.5 b | 83.2 a |
| Agri-Mek SC 7 fl oz/ac | 118.5 | 128.0 ab | 33.5 | 23.8 | 16.0 b | 72.8 b |
| Comite 2.5 pt/ac | 113.0 | 154.8 a | 51.5 | 32.0 | 10.8 b | 77.1 ab |
| Comite 2.5 pt/ac + Agri-Mek SC 3.5 fl oz/ac | 89.0 | 136.0 a | 32.0 | 15.0 | 15.8 b | 78.8 ab |
| <i>LSD</i> | <i>NS</i> | 34.5 | <i>NS</i> | <i>NS</i> | 29.6 | 7.3 |