

EVALUATION OF MITICIDES FOR CONTROL OF SPIDER MITES ON SEED CARROTS IN CENTRAL OREGON, 2004

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Abstract

The miticide Zeal[®] was compared to Comite[®] in a June 1 application for control of spider mite adults and eggs in seed carrots grown near Madras, Oregon. A second trial was conducted with Zeal, Comite and Kelthane[®] on August 14. The three materials were evaluated for control of spider mite adults and eggs, and for their effect on spider mite predators commonly found in seed carrot fields in central Oregon. Results from the June 1 trial indicate greater early control (15 DAT) of both adults and eggs with Comite. However, the trend reversed and Zeal out-performed Comite from 28 DAT to 52 DAT. Results of the trial on August 14 indicated a trend in favor of Comite for spider mite adult and egg control. Comite appeared to be softer on predators 9 DAT, while Kelthane treated plots had the highest predator populations 19 DAT and 27 DAT.

Introduction

Carrot seed production is important to sustained economic viability of the agricultural community in central Oregon. Hybrid carrots are grown on 2,000 acres in central Oregon producing an annual income of \$6 million. Lygus, spider mites and aphids are the major insect pest on carrots grown for seed in this area. Comite has been used for control of spider mites, but other products are needed to provide rotation for resistance management. The object of this project was to compare the performance of Zeal with Comite and Kelthane.

Methods and Materials

Zeal at 2 oz/acre, Zeal at 3 oz/acre and Comite at 2 pt/acre were applied to multi-acre unreplicated plots by commercial ground equipment at 20 gal/acre water on June 1. A non-ionic surfactant was added at 1 qt/100 gal water. Plots were sampled for spider mite adults and eggs using five sub samples of 15 leaves per plot on June 16, June 23, July 1, July 9, July 16, July 23, July 30 and August 6.

A second trial was conducted to compare Zeal at 2.5 oz/acre to Comite at 2 pt/acre and Kelthane at 16 oz/acre. Treatments were applied by air at 10 gal/acre on August 14. Hyper-Active was added to all treatments at a rate of 32 oz/100 gals. Plots were evaluated for spider mite adults, eggs and predators using five sub samples of 15 leaves per plot on August 23, September 2 and September 10.

Results and Discussions

Results from the June 1 application indicate that Comite at 2.0 pt/acre had a better early knock down of both spider mite adult (Table 1) and egg populations (Table 2) as indicated by the June 16 (15 DAT) evaluations. However, the trend reversed and by July 9 (38 DAT) through July 23 (52 DAT) Zeal at both 2.0 oz/acre and 3.0 oz/acre provided significantly greater control of both adults and eggs.

The evaluation of Zeal, Comite and Kelthane following the August 14 application indicate a trend in favor of Comite for control of spider mite adults (Table 3) from 9 DAT to 27 DAT. Spider mite egg numbers were lowest in the Comite treated plots 9 DAT to 19 DAT (Table 4). Zeal performance on both spider mite adults and eggs was about midway between Comite and Kelthane on the September 2 evaluation (19 DAT). Predator populations were highest after the Comite treatment 9 DAT. Despite common belief, Kelthane appeared to be the softer material on predators 19 DAT and 27 DAT.

The early evaluation on June 1 would be expected to generate more reliable data. During that time insecticide coverage is better due to smaller plants and populations are generally less than later in the season. Zeal would appear to fit into a preventative application early in the season, while Comite could be used as a clean-up application later in the season.

Table 1. Effect of Zeal and Comite applied June 1 on adult spider mite populations in hybrid carrots, near Madras, Oregon, 2004.

Treatment	Rate	June 16	June 23	July 1	July 9	July 16	July 23	July 30	August 6
	prod/acre	-----average number of spider mites per 15 leaves -----							
Zeal	2.0 oz	0.6	0.0	4.2	7.6	9.8	25.6	63.0	80.0
Zeal	3.0 oz	7.6	0.4	8.2	6.6	6.2	20.6	51.2	91.0
Comite	2.0 pt	0.2	0.4	10.0	21.4	57.8	84	59.0	177.0

Table 2. Effect of Zeal and Comite applied June 1 on spider mites egg populations in hybrid carrots, near Madras, Oregon, 2004.

Treatment	Rate	June 16	June 23	July 1	July 9	July 16	July 23	July 30	August 6
	prod/acre	-----average number of spider mite eggs per 15 leaves -----							
Zeal	2.0 oz	3.6	0.0	2.0	2.8	11.8	17.0	64.0	57.0
Zeal	3.0 oz	3.8	0.6	5.2	2.2	12.4	9.0	43.0	36.0
Comite	2.0 pt	0.8	2.8	5.0	18.4	32.6	36.0	51.0	59.0

Table 3. Effect of Zeal, Kelthane and Comite applied August 14 to hybrid carrots for control of adult spider mite populations, near Madras, Oregon, 2004.

Treatment	Rate	August 23	September 2	September 10
	prod/ac	---average number of spider mites per 15 leaves---		
Kelthane	16 oz	45.00	34.75	3.5
Zeal	2.5 oz	44.75	13.25	5.0
Comite	2.0 pt	30.25	3.75	0.25

Table 4. Effect of Zeal, Kelthane and Comite applied August 14 to hybrid carrots for control of spider mite egg populations, near Madras, Oregon, 2004.

Treatment	Rate	August 23	September 2	September 10
	prod/ac	---average number of spider mite eggs 15 leaves---		
Kelthane	16 oz	27.5	27.5	0
Zeal	2.5 oz	21.3	8.25	0
Comite	2.0 pt	15.5	0	0

Table 5. Effect of Zeal, Kelthane and Comite applied August 14 to hybrid carrots on spider mite predator populations, near Madras, Oregon, 2004.

Treatment	Rate	August 23	September 2	September 10
	prod/ac	average number of spider mite predators per 15 leaves		
Kelthane	16 oz	1.25	16.5	5.6
Zeal	2.5 oz	2.75	5.25	1.25
Comite	2.0 pt	18	11.5	0.25