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Field Crop Notes
Kings/Tulare County

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Spider Mites in Field Corn

Based on the spider mite counts in a corn trial that we just sprayed on May 31, this could be an early and heavy spider mite season. Application by ground is much more effective than by air and in most cases will be well worth the effort of closing ditches or picking up pipe. Spider mites are predominantly found on the underside of leaves and spray coverage is a critical factor for miticide performance. Check the underside of the lowest leaves and if spider mites are apparent, spray before plants are too tall for ground application. The choices for miticides are Comite, Oberon, Onager, and newly registered Zeal.

In 2010, a large scale trial was conducted in Tulare County with Comite, Oberon, and Onager, the miticides registered at that time. Each plot was 12 rows (38-inch beds) by a quarter mile. Each treatment was replicated 4 times. Treatments were applied by a custom applicator using drop nozzles and a volume of 20 gallons per acre. Corn plants were approximately 6 ft high at the time of application on June 25. Treatments included Oberon at 12.8 and 16 fl oz/acre, Onager at 16 fl oz/A, Comite at 3 pt/acre, and an untreated check. A non-ionic surfactant was applied with Oberon and Onager but not with Comite.

Spider mites were counted on a weekly basis. As the population increased and moved up the plant, sometimes different aged leaves were selected so don't directly compare counts from week to week. But on any particular date, the same sampling and counting methods were used for each treatment so comparing counts on a specific date is ok.

Spider mite counts are listed in Table 1. Spider mite pressure was moderate with higher counts on the west side of the plot than on the east side. Counts in untreated plots were fairly high in early August.

Table 1. Spider Mite Counts from 2010 Miticide Trial in Silage Corn, Tulare County, CA

	Average Number of Mites per Leaf							
Based on:	16 leaves	16 leaves	16 leaves	10 leaves	10 leaves	10 leaves	10 leaves	10 leaves
Date collected	2-Jul	9-Jul	16-Jul*	23-Jul	3-Aug	10-Aug	17-Aug	23-Aug
Untreated	8	29	139	189	573	68	2	0
Oberon @ 12.8 oz	1	1	1	9	89	26	37	7
Oberon @ 16 oz/A	1	0	0	1	18	20	29	4
Onager @ 16 oz/A	2	1	2	4	34	18	14	1
Comite @ 3 pt/A	2	1	0	1	37	26	36	4

Treatments applied June 25, 2010. Oberon and Onager applied with NIS at 0.25% v/v.
July 2 through August 3: mites on the entire leaves were counted
August 10 through August 23 only 6-inch section of each leaf was counted and then multiplied by 5 to simulate a whole 30-inch long leaf.
* July 16 counts were from reps 1-3 only

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Counts in untreated checks declined after August 3 due to predator mites and leaves in poor condition.

For the five weeks after treatment, all the miticides had significantly fewer spider mites than the untreated check. The same was true for spider mite eggs (counts not shown) through July 23. By August 10, the number of spider mites on the untreated control declined due to predation and to the fact that the leaves had dried out and were no longer able to sustain high spider mite populations. In early counts, there were no differences among the miticides – all were much lower than the untreated checks but not different from each other. On August 10, the spider mite population on the low rate of Oberon appeared to be increasing but high populations did not develop in any of the treatments.

Harvest was on August 31. Five of the interior rows of each plot were harvested for yield data. Trucks were weighed at a nearby scale house and samples for moisture and quality were collected at the silage pile. These samples were placed in zip lock bags and put in an ice chest. That same day, three separate sub-samples from these bagged samples were weighed and dried for 48 hours. An average was taken to determine the moisture content for each plot. The 3 sub-samples per plot were then re-combined and sent to the UC Analytical Lab for analysis of fiber, nitrogen and starch.

The yield summary is in Table 2. Although the lower leaves in the untreated plots appeared drier than lower leaves in the treated plots, there were no differences in moisture between the untreated check and the miticide treatments. There was a significant difference in yield between the untreated check and the miticide treatments of approximately 6 tons per acre whether looking at the yield "as harvested" or as tons adjusted to 70% moisture. (The adjusted tons are calculated from the dry matter so that is why the probability and the coefficient of variation are the same in the 2 columns). There were no differences among the miticide treatments however.

Table 2. Yield data from 2010 Spider Mite Trial in Silage Corn, Tulare County, CA

Treatment and rate	**Moisture at harvest (%)**	**Tons/Acre at harvest**	**Tons Dry Matter/A @ harvest**	**Tons/A adjusted to 70% Moisture**
Untreated	67.8	30.7 b	9.9 b	33.0 b
Oberon @ 12.8 oz	68.2	37.3 a	11.8 a	39.4 a
Oberon @ 16 oz/A	67.4	35.4 a	11.5 a	38.4 a
Onager @ 16 oz/A	67.9	36.8 a	11.7 a	39.3 a
Comite @ 3 pt/A	68.0	36.5 a	11.7 a	38.9 a
Probability	*>50*	*0.00*	*0.02*	*0.02*
LSD	*NS*	*1.88*	*1.16*	*3.86*
Coefficient of variation (%)	*2.95*	*3.46*	*6.62*	*6.62*

Silage quality is summarized in Table 3. With a standard analysis of variation, there were no differences among the treatments for percent acid detergent fiber (ADF), percent total nitrogen (N), percent total digestible nutrients (TDN), percent neutral detergent fiber (NDF), or starch.

Table 3. Quality Data from 2010 Spider Mite Trial in Silage Corn, Tulare County, CA.

Treatment and rate	ADF (%)	Total N (%)	TDN (%)	NDF (%)	Starch (%)
Untreated	30.1	1.17	53.8	47.6	24.5
Oberon @ 12.8 oz	28.0	1.19	55.2	44.4	25.3
Oberon @ 16 oz/A	28.5	1.21	54.8	46.0	22.8
Onager @ 16 oz/A	27.9	1.19	55.3	45.0	25.2
Comite @ 3 pt/A	28.4	1.22	54.9	46.0	24.7
Probability	*0.33*	*0.746*	*0.32*	*0.26*	*0.75*
LSD	*NS*	*NS*	*NS*	*NS*	*NS*
Coefficient of variation	*5.59*	*4.49*	*1.96*	*3.08*	*11.95*

ADF=acid detergent fiber

TDN = Total Digestible Nutrients

NDF = Neutral Detergent Fiber

However, when all the miticide treatments were treated as a group and compared to the untreated control using orthogonal comparisons (Table 4), controlling spider mites significantly reduced (P=0.05) the percent acid detergent fiber (ADF) and increased the percent TDN. Controlling spider mites also reduced the percent NDF (P=0.06). Total N and starch were not affected.

Table 4. Results of orthogonal analysis of miticides as a group compared to the untreated check.

	ADF (%)	Total N (%)	TDN (%)	NDF (%)	Starch (%)
Untreated check	30.1	1.17	53.8	47.6	24.5
Miticides Combined	28.2	1.20	55.1	45.4	24.5
Probability	0.05	NS	0.05	0.06	NS

Summary

It pays to control spider mites. Untreated plots produced 6 tons less per acre than treated plots. Controlling spider mites can reduce fiber (ADF and NDF) and increase TDN.

Ground application, although not a subject of this study, is superior to air application. If there are spider mites in the field, even at low populations, treat by ground before lay-by.

What about the Newly Registered Zeal?

Zeal is included in the current Tulare miticide trial but was not registered on corn in CA in 2010. However, Larry Godfrey, Extension Entomologist from UC Davis, included Zeal at 2 oz/A in his 2010 and 2011 trials. Spider mite counts of plots treated with Zeal were among the lowest in the trials. No yield data were taken.

Photos of the 2010 Tulare County Spider Mite Trial in Silage Corn are available at
http://cetulare.ucdavis.edu/files/146067.pdf

Dr. Godfrey's reports of his 2010 and 2011 trial can be found at
http://cetulare.ucdavis.edu/Agriculture782/Agriculture/FIELD_CORN/

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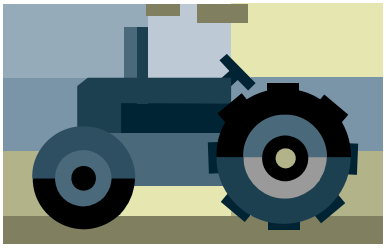

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