Efficacy of Selected Acaricides on Spider Mites in Corn – 2011

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Objectives: To compare the efficacy of selected registered and experimental acaricides against spider mites in silage corn

Planting Date: early May 2011

Application Date: 5 July 2011

Study Location: UC West Side Research and Extension Center near Five Points, CA; Fresno County

Environmental Conditions at Application: temperature 85-90^{0}F, full sun, winds calm

Application Equipment: John Deere high clearance sprayer

Application Parameters: 25 GPA, 40 p.s.i., 3.5 MPH

Plot Size: 6 rows x 120' feet, 4 replications; 38" row spacing

Plot Design: Randomized Complete Block

Plot Condition: irrigated corn ('X9015RR')

Sample Dates:
Pretreatment – 5 July 2011; number of mite-damaged leaves and number of leaves with living mites, arthropods (spider mites, aphids, thrips) density
1 week after treatment (WAT) – 11 July; number of mite-damaged leaves and number of leaves with living mites, arthropods (spider mites, aphids, thrips) density
2 WAT –18 July; arthropods (spider mites, aphids, thrips) density
3 WAT –26 July; arthropods (spider mites, aphids, thrips) density
4 WAT –1 Aug.; arthropods (spider mites, aphids, thrips) density
5 WAT –8 Aug.; arthropods (spider mites, aphids, thrips) density
6 WAT –15 Aug.; arthropods (spider mites, aphids, thrips) density

Sample Method:
Spider Mites, Thrips, & Cotton Aphids - number per 20-leaf sample (lowest leaf nearest the soil that was 50% or greater still green) per plot; mites, thrips, and aphids recovered with a leaf washing technique; count specimens with aid of microscope; individuals separated into immatures and adults; on 15 Aug. 10 bottom leaves and 10 upper leaves (ear leaf) were sampled per plot

Target Pest: Spider Mites - two-spotted spider mite (*T. urticae*)
Secondary Pests: Aphids (*species not determined*)
Western Flower Thrips (*Frankliniella occidentalis)*

Environmental Conditions during Test: see attached page

Phytotoxicity Noted: none noted

Data Analyses: ANOVA of arthropod densities and Least Significant Differences Multiple Range Test ($p < 0.05$).

Treatments:
Treatment list for corn spider mite test in 2011, California.

	Product	**Product per A**
1	Untreated	---
2	Zeal*	2 oz/A
3	Zeal*	1.5 oz/A
4	Oberon SC*	16 fl. oz/A
5	Onager EC*	16 fl. oz/A
6	Comite 6.55EC	48 fl. oz/A
	* NIS @ 0.1% v/v	

Summary:

Mite populations developed in early July as the corn was reaching the point of not being able to spray with high clearance ground equipment. On 29 June, less than 1 mite per 20 leaves was sampled; this number had increased to ~30 mites per 20 leaves 1 week later when the applications were made. The population was mostly immature mites so this was an infestation that was building.

Data for percentage mite-damaged leaves and percentage mite-infested leaves were collected in the pretreatment and one week samples. Later in the season, these data really do not have any importance and were not tallied. On the day of treatment, both these values were less than 1 leaf (out of 20 leaves). At 1 WAT, the lowest value for damaged leaves was in the untreated and this value was significantly lower than the values in two of the treatments. The number of leaves with live mites across treatments ranged from 4 to 8 (out of 20 leaves) with both Zeal treatments having significantly lower values than that in Comite-treated.

Populations of thrips and aphids were counted as well. Populations were low until the last two sample dates. I would not expect any effects of these treatments on aphids or thrips especially at 4 to 5 weeks after application. Data are not shown in the summary.

At 1 WAT, mite levels in the untreated were fairly constant with the pretreatment levels. There were no significant differences in mite populations among the six treatments for immature, adults, and total mites. There were significant differences in numbers of immature mites at 2 WAT with the numbers in the Zeal 2 oz. rate being less than that in Comite; populations were intermediate in the untreated. Numbers of adult mites and total mites showed similar trends. The mite populations increased by 1.5 to 2-fold in all treatments, compared with the previous date, except Zeal 2 oz. Mite population in the untreated increased substantially at 3 WAT as conditions were obviously

favorable for mite build-up. Although there was a wide range in mite populations, there were no significant differences in numbers of immatures and total mites across the treatments. For total mites, there was a 3x range in levels with the two Zeal treatments showing the fewest mites and Onager the most mites; the untreated had intermediate mite numbers. Results at 4 WAT, showed the greatest impact of the miticides. For immature mites, populations in the two Zeal treatments were significantly lower than those in the untreated and in Oberon. Similar results were seen for total mites. The level of control was 79%. For mite adults, the two Zeal treatments differed significantly from the Oberon treatment but not from the untreated. The two rates of Zeal started to "separate" at 5 WAT. Mite levels in the 2 oz. rate were significantly lower than the highest populations (Oberon and Comite for immature and total and all other treatments for adults), whereas mite levels in the 1.5 oz. rate were not significantly lower than these treatments. Comparing the two Zeal rates, mite levels were 3 to 4 times higher in the 1.5 oz. vs. 2.0 oz. rates. On the bottom leaves on 15 Aug., mite populations in the two Zeal treatments were significantly lower (about 50%) than the other four treatments for immature and total mites. Similar results were seen for adult mites but the significance was only from the two highest values (Oberon and Comite). These same results held for the ear leaf samples on 15 Aug.; however, the mite levels were "across the board" much higher.

Spider Mites on Field Corn, CA, 2011

Numbers per 20 leaf sample		29-Jun					5-Jul					11-Jul					18-Jul	
Product	**Product per A**	**Number Damaged Leaves**	**Number Leaves with Mites**	**Immature Mites**	**Adult Mites**	**Total Mites**	**Number Damaged Leaves**	**Number Leaves with Mites**	**Immature Mites**	**Adult Mites**	**Total Mites**	**Number Damaged Leaves**	**Number Leaves with Mites**	**Immature Mites**	**Adult Mites**	**Total Mites**	**Immature Mites**	**Adult Mites**
1 Untreated	---	0	0	0.25	0.38	0.63	1.25	0.5	30.25	4.5	34.75	2.0	5.0	15.0	5.5	20.5	33.8	12.0
2 Zeal*	2 oz/A											3.5	4.0	24.5	3.3	27.8	12.0	3.0
3 Zeal*	1.5 oz/A											7.5	4.0	26.3	3.3	29.5	35.0	8.5
4 Oberon SC*	16 fl. oz/A											6.5	5.8	37.3	14.0	51.3	65.8	21.0
5 Onager EC*	16 fl. oz/A											7.8	6.8	55.0	15.8	70.8	32.3	9.5
6 Comite 6.55EC	48 fl. oz/A											4.3	8.0	35.3	5.0	40.3	79.8	24.3
* NIS @ 0.1% v/v											*LSD value*	*3.2*	*3.2*	*48*	*16.8*	*63.6*	*44*	*13.1*

	26-Jul			1-Aug			8-Aug			15-Aug bottom leaves			15 Aug ear leaves		
Total Mites	**Immature Mites**	**Adult Mites**	**Total Mites**	**Immature Mites**	**Adult Mites**	**Total Mites**	**Immature Mites**	**Adult Mites**	**Total Mites**	**Immature Mites**	**Adult Mites**	**Total Mites**	**Immature Mites**	**Adult Mites**	**Total Mites**
45.8	135.3	49.0	184.3	369.5	106.3	475.8	348.0	127.0	475.0	1050.8	310.0	1360.8	6457.0	1586.8	8043.8
15.0	100.5	29.5	130.0	76.0	25.5	101.5	82.0	32.8	114.8	433.0	189.3	622.3	1901.0	744.8	2645.8
43.5	76.0	27.0	103.0	72.8	30.0	102.8	308.3	105.8	414.1	411.5	194.0	605.5	2976.0	964.5	3940.5
86.8	249.5	60.5	310.0	462.5	130.0	592.5	562.3	159.5	721.8	981.0	364.5	1345.5	6219.0	1873.3	8092.3
41.8	273.8	89.3	363.0	187.0	63.5	250.5	316.0	116.0	432.0	1033.3	343.8	1377.1	6113.0	1641.3	7754.3
104.0	238.5	56.5	295.0	315.0	98.3	413.3	515.0	127.5	642.5	993.0	362.5	1355.5	7979.0	1771.5	9750.5
55.6	*208.4*	*59.6*	*263.4*	*278.1*	*88.1*	*363.7*	*315.5*	*68.9*	*370*	*351.9*	*156.4*	*468.7*	*2737.8*	*693.8*	*3326.7*