

Texas Corn Producers Board Funded Research 2009
Second Quarter Project Summary

By

E. D. Bynum, G. J. Michels, Jr., J. B. Bible, and C. Garzon
Texas AgriLife Extension Service and Texas AgriLife Research
6500 Amarillo Blvd. West
Amarillo, TX 79106

A. Mite – Corn Silage Damage Trial

Field plots were established in June on field corn at the Texas AgriLife Research farm at Etter, Tx. On July 13, spider mite infested corn leaves were collected from a producers field north of Sunray, Tx and were used to infest field plots at designated infestation levels. These infestations were designed to establish plots with different mite densities and damage levels (See Plot Plan). Spider mites migrated from the collected mite infested leaves to the plants in the plots and colonized for a week. Data sampling was initiated on July 20, 2009, one week after infesting plots and then sampled weekly until silage samples were collected. On a sample date, five plants per plot will be evaluated by counting female mites and beneficial insects on all leaves from one side of the plant. Damage ratings per plot will also be made weekly using a 1-10 damage scale; 1 = 1-10% of the leaf area on a plant damaged by mite feeding, 2 = 11-20% of the leaf area damaged, . . . 10 = 91-100% of the leaf area damaged.

Mite infestations increased at different rates across the infested plots until plots were hand harvested for silage on September 1. Plants from 10 linear ft. per plot were hand cut, weighed, and chopped with a motorized tree limb chopper. Aliquot samples of the green chop were collected and weighed. Some were air dried and others were frozen for quality comparison.

Data summaries and analyses will be completed this fall.

B. Oberon Efficacy and Base-line Resistance Study

Spider mite infested leaves used to infest the Mite-Corn Silage Damage experiment were used to infest other plots for the Oberon field efficacy test and for establishment of a laboratory colony. Two field trials were established in July on tasseled corn when mite populations were building rapidly and beginning to cause plant damage. Oberon was applied at a rate of 5 fl. oz per acre in one trial. A second trial compared Oberon at 4.25 fl. oz per acre to applications of Hero. Each trial was randomly designed and treatments were applied with a hand carried boom. Plots were sampled prior to being treated and at different sampling dates depending on chemical efficacy. Table 1 provides a summary of Oberon efficacy when compared to Hero and an untreated check. Initially, Oberon suppressed mite populations for 7 days after being treated, but control was not sustained, as shown by mite numbers at the 16 day after treatment sample.

Laboratory dosage-mortality bioassays will be conducted this fall to determine susceptibility level of spider mites. From the laboratory studies we can identify if the

poor control of the field applications were related to mite tolerance or factors related to application and possibly spray coverage.

Table 1. Efficacy of Oberon and Hero for field control of spider mites. Etter, Tx. 2009.

Treatment	Rate/ac	Surfactant	Pretrt	7 DAT	16 DAT
Hero	10.3 oz	1% v/v COC	92.5 a	224.9 a	520.0 a
Hero	5.1 oz	1% v/v COC	86.5 a	170.1 ab	414.0 a
Oberon	4.25 oz	1% v/v COC	56.7 a	55.2 c	485.3 a
Untreated			68.2 a	133.5 b	286.0 a
		CV	65.71	54.4	64
		Replicate F	11.82	17.38	2.5
		Rep Prob(F)	<0.0001	<0.0001	0.0914
		Trt F	1.63	12.01	2.16
		Trt Prob(F)	0.1926	<0.0001	0.1039

Plot Plan

Mite-Silage Damage Test

Objective: Evaluate effect of mite feeding damage to corn silage yield and nutritional quality			
County: Moore	Planting Date:	Trial ID:	BMSilage-09
Plot Size: 12 rows (30 in.) x 75 ft long	Exp. Design: RCB	Reps: 6	
Infested Plot Size: 4 center rows (30 in.) x 70 ft long			
Fertilizer Type and Amount:		Fertilizer Date:	
Herbicide Type and Amount:		Herbicide Date:	
Field Location: Etter Station			

Trt No.	Mite Inf.	Plot No. By Rep					
		1	2	3	4	5	6
1	Low	103	201	303	402	504	602
2	Medium	101	204	301	404	501	603
3	Heavy	104	202	304	403	502	604
4	Non-infested	102	203	302	401	503	601

Infestating Plots

Low: 1 infested leaf end to end on plants in the center 4 rows/treatment plot

Medium: 2 infested leaves end to end on plants in the center 4 rows/treatment plot

Heavy: 4 infested leaves end to end on plants in the center 4 rows/treatment plot

C. Southwestern Corn Borer and Western Bean Cutworm:

1. Flight Patterns and Management Options for Western Bean Cutworm and Southwestern Corn Borer on the Texas High Plains.
2. Evaluation of Traps to Predict Western Bean Cutworm Egg Deposition and to Assist with Timing Insecticide Applications for Control

Sampling continued throughout the summer at weekly intervals for these two projects. We will continue to sample traps into October until trap counts decline to zero. The results to date are contained in the table and four figures below. Peak trap catches for both species occurred between July 15th and August 19th, with Western bean cutworm peaks occurring earlier than Southwestern corn borer peaks regardless of geographical area. The peak number of moths captured, regardless of species, was significantly higher in Dallam and Moore counties in the northern Panhandle than in the southern counties. This difference may be due to the lower overall corn acreage in the south compared to the north, or differences in Bt corn acreage.

There does not seem to be a noticeable difference in when moths were first collected by geographical area. Non-corn sites in Hartley and Oldham counties were significantly lower than corn sites in the other counties, as expected, but did show that these two species are found in non-corn areas. The data collected in 2009, along with data collected in 2008 will be analyzed in regard to temperature and rainfall data at the conclusion of the season. In addition, we are currently contacting a number of corn researchers in Texas and Kansas to obtain historic records of Southwestern corn borer and Western bean cutworm moth catches in order to build a larger database from which models can be constructed in the future.

In regard to the timeline for the research, data collection is on schedule and analyses of the data will be completed by the December due date for final reports.

Table 1. Southwestern corn borer and Western bean cutworm moth trap catches at five location in the Texas Panhandle, 2009.

Week of	Southwestern corn borer moths/trap					Western bean cutworm moths/trap				
	Castro	Oldham	Hartley	Moore	Dallam	Castro	Oldham	Hartley	Moore	Dallam
5/18	0	0	0	0	0	0	0	0	0	0
5/26	0	0	0	1	0	0	0	0	0	0
6/2	2	0	0	2	0	0	0	0	0	0
6/10	5	0	0	4	4	0	0	0	0	0
6/16	2	0	0	4	4	0	0	1	1	1
6/23	4	0	0	7	9	0	0	0	0	0
6/30	1	0	0	3	8	2	0	1	26	39
7/7	0	0	0	1	4	14	0	0	153	57
7/15	0	0	0	1	1	40	0	1	266	131
7/22	6	0	1	4	9	13	0	0	815	273
7/29	32	8	10	38	179	3	7	8	195	259
8/3	96	7	10	110	144	1	12	2	50	47
8/12	99	10	10	198	450	1	1	2	15	46
8/19	99	6	18	89	288	0	0	0	1	0
8/26	10	3	3	95	176	0	0	0	1	0
9/2	1	0	2	26	32	0	0	0	0	0
9/9	1	0	0	3	5	0	0	0	0	0



