Monitoring Fall Armyworm with Pheromone Traps in Hay Fields During 2019.

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Summary. Fall armyworm moth activity was monitored with pheromone traps to determine if trap catches could be used to alert growers to the need to sample fields for fall armyworm larvae.   Twenty-one traps were monitored in 10 counties in northcentral, north and east Texas. Throughout August and September, the number of captured moths was very low, ranging from 0-6 moths per trap per week. In September, 43% of the 21 monitored fields were treated for fall armyworm infestations. However, there was no clear increase in the number of captured moths in the week prior to finding these treatable infestations of larvae. Additional years of data are needed to determine if pheromone traps are useful in anticipating fall armyworm infestations in pastures and hay in northeast Texas. The drought status of an area should also be investigated as a useful predictor of the risk of armyworm infestations.

Introduction.

   Male fall armyworm moths can be captured in traps baited with the female sex-attractant pheromone. Moth activity as determined by trap captures is used to alert growers to the risk of fall armyworm damage to sweet corn in the northeastern US. However, the value of trap data in anticipating the risk of fall armyworm larvae infestations in hay fields in Texas has not been well documented. To determine how useful trap monitoring might be, the number of fall armyworm moths captured in pheromone traps was monitored in 21 traps located in 10 counties in North and East Texas. Also, fall armyworm larvae were sampled with a sweep net in the field in which a pheromone trap was located. The objective of the study is to determine the value of pheromone trap captures in alerting growers to the need to sample fields for fall armyworm larvae.

Methods. A green bucket trap, also called Universal Moth Trap, was used to trap fall armyworm moths. The trap was baited with a pheromone lure purchased from Scentry Biologicals or Trece Inc. A Hercon Vaportape was placed in the trap to kill captured moths. One trap was placed on the margin of a hay field and the number of captured fall armyworm moths was counted once a week. Lures were replaced every 4 weeks.

        To determine the relationship between the number of captured fall armyworm moths and infestation levels of larvae, each field with a trap was sampled weekly for larvae using a 15-inch sweep net. The hay field was divided into four areas of about equal size. Each of the four areas was sampled by sweeping the net through the hay 25 times (total of 100 sweeps per field) and then recording the number of armyworm larvae in the net. Larvae were recorded as small (less than ½ inch), medium (1/2 to ¾ inch) and large (> ¾ inch). Trap locations and the number of traps per location are shown in Table 1.

Results

Traps were monitored at seven locations in June and traps captures were very low, 0-5 moths / trap/ week, at these sites (Table 2). The number of trapping locations then increased and during July and August. Trap captures in all ten counties remained low, 0-5 moths / trap/week (Table). In August, fall armyworm larvae were found in four of the sampled fields and these two of the 21 fields (10%) were treated with insecticide for fall armyworm. These two fields, in Camp and Red River Counties were treated on August 17 and rain was received at these two locations the week before. However, there was no increase in the number of captured moths prior to finding treatable infestations at these three sites. Weather conditions at other sites were hot and dry.

During September to the first week in October, treatable infestations of larvae were found in Overton (2), and Franklin (3), Red River (1) and Cherokee (1) and Jasper Counties (2), total of 9 fields of 21 fields (43%.) At three locations, Franklin and Jasper County and Overton, the number of captured moths remained very low, 0-1 moths/week, 1-2 weeks prior to finding treatable infestations of larvae. In Red River and Cherokee Counties, moth catches increased very slightly, from 0-2 to 2-6 moths per week, a week before finding a treatable infestation of larvae. Thus, at the nine locations were fall armyworm infestations were present in September, there was little or no increase in moth numbers prior to finding treatable infestations.

Discussion

The fact that two fields (10%) in August and nine fields (43%) in September were treated with insecticide for fall armyworms raises concern about the value of trap captures since very few moths, only 0-6 moths/trap/week, were captured in these treated fields prior to finding treatable infestations of larvae. The lack of captured moths or lack of a clear increase in the number of captured moths could provide a false sense of security when in fact armyworm larvae are or soon will be present in the field.

It has long been known that fall armyworm infestations typically appear following rainfall in late summer and fall. Thus, rainfall and drought maps may indicate the risk for armyworm outbreak. Texas drought maps, as shown at https://droughtmonitor.unl.edu/ , are shown for August and September 2019 (Figs 1, 2). The drought status of each county involved in the trapping study is shown in Table 3 along with the number of fields treated for armyworm infestations. Cherokee County is listed as north and south as these areas differed in drought status in September.

Six locations experienced drought in September and treatable armyworm infestations were found at only one of these sites (Overton) (Table 3). The remaining four sites did not experience drought and armyworms infestations were present in all but one location (Hunt County). The only other reports of fall armyworm infestations from the region during August and September were from Cooke and Hopkins Counties, locations which were not experiencing drought.

Conclusions.

Drought was common across much of the eastern one-half of Texas during August and September 2019, and these dry conditions likely kept fall armyworm numbers low across the entire region. Very few fall armyworm moths, 0-6 per week, were typically captured in pheromone traps at 10 locations

during August and September. Despite these low numbers, about 50% of the study fields were treated for fall armyworm infestations in September. The number of captured moths did not increase or increased very slightly in the week prior to finding treatable infestations in these sampled fields. Further studies are needed to determine if trap monitoring can be useful in anticipating fall armyworm infestations in pastures and hay in northeast Texas.

   Locations not under drought stress had a greater risk of experiencing fall armyworm infestations as shown on drought maps https://droughtmonitor.unl.edu/. In contrast, areas under drought stress had less risk of armyworm infestations. These results confirm the long-term observation that increased risk of fall armyworm infestations develop following rain in late summer and fall.

Table 1. Locations where traps were monitored, and fields were sampled for fall armyworm larvae.

Location	Reporting	Number of Traps Monitored	Number of Fields Sampled
Hill County	T. Mays	2	2
Jasper County	B. Fry	2	2
Overton, TX	V. Corriher-Olson	2	2
Camp County	K. Davis	2	2
Cass County	J. Rymel	1	1
Franklin County	S. Brod	4	4
Dallas Center	A. Knutson	2	0
Red River County	B. Triplet	2	2
Hunt County	D. Drake	2	2
Comanche County	M. Berry	2	2
Cherokee County	A. Low	2	2

Table 2. Number of fall armyworm moths captured per week and number of study fields treated with insecticide for fall armyworms.

| Location	Number of Moths July	Number of Moths August	No. fields treated for armyworm in August	Number of Moths September	No. fields treated for armyworm in September to Oct 8
Hill County	0-4	0-1	0	0	0
Jasper County	-----	0-2	0	0-6	2 treated Sept 1
Overton TX	0	0	0	0	2 Sept 25
Camp County	0-1	0-2	1 treated Aug 17	0	0
Cass County	0	0	0	0-1	0
Franklin County	0-5	0-1	0	0-3	3 of 4 fields treated
Dallas Center	0	0	-----	0-3	------
Red River	----	0-4	1 treated Aug 17	0-4	1 treated Oct 5
Hunt County	0	0	0	0	0
Cherokee, north	----	0	0	0-2	0
Cherokee, south	-----	0-2	0	0-6	1 treated Sept 20
Comanche	-----	0	0	0-3	0

Table 3. Drought status and presence of fall armyworm field infestations at monitored sites.

Survey Location: County	August, 2019		September, 2019	
	Drought Intensity	FAW Field Infestation	Drought Intensity	FAW Field Infestation
Hill	Abnormal	No	Extreme	No
Camp	Abnormal	1 of 2 fields	Moderate	No
Cass	Moderate	No	Abnormal	--
Overton TX	Moderate	No	Moderate	Yes
Cherokee north	Moderate	No	Moderate	No
Comanche	None	No	Moderate	No
Hunt	None	No	None	No
Cherokee south	None	Yes	None	Yes
Red River	None	Yes	None	Yes
Franklin	None	Yes	None	Yes
Jasper	None	No	None	Yes
Cooke[1]	None	No	None	Yes
Hopkins[1]	None	No	None	Yes

[1] No traps were monitored in Cooke or Hopkins Counties

U.S. Drought Monitor
Texas

September 3, 2019
(Released Thursday, Sep. 5, 2019)
Valid 8 a.m. EDT
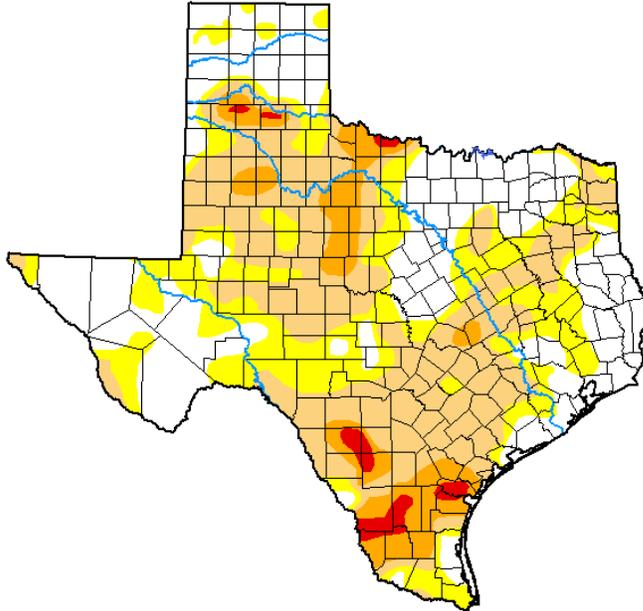
Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	33.59	66.41	42.90	10.26	1.73	0.00
Last Week 08-27-2019	25.90	74.10	37.58	8.75	1.21	0.00
3 Months Ago 06-04-2019	93.83	6.17	0.18	0.00	0.00	0.00
Start of Calendar Year 01-01-2019	92.99	7.01	1.32	0.00	0.00	0.00
Start of Water Year 09-25-2018	57.46	42.54	20.19	7.03	0.96	0.00
One Year Ago 09-04-2018	19.92	80.08	64.28	27.09	5.51	0.12

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.
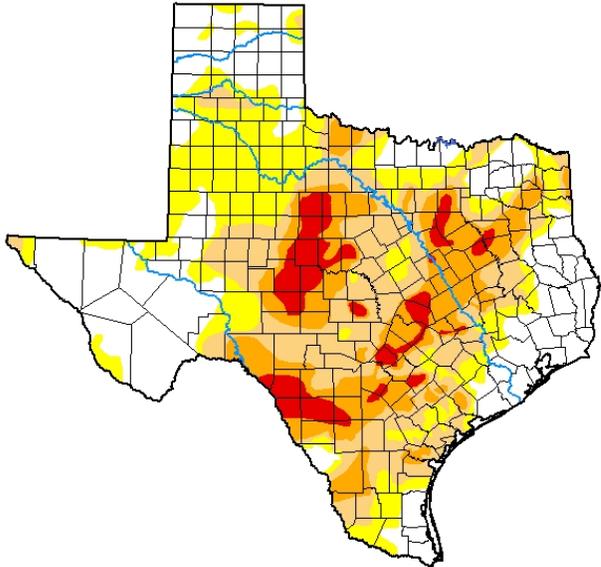
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U.S. Drought Monitor
Texas

October 1, 2019
(Released Thursday, Oct. 3, 2019)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	31.74	68.26	46.05	22.33	6.32	0.00
Last Week 09-24-2019	34.78	65.22	48.33	19.69	3.50	0.00
3 Months Ago 07-02-2019	94.84	5.16	1.34	0.05	0.00	0.00
Start of Calendar Year 01-01-2019	92.99	7.01	1.32	0.00	0.00	0.00
Start of Water Year 10-01-2019	31.74	68.26	46.05	22.33	6.32	0.00
One Year Ago 10-02-2018	61.59	38.41	18.01	7.04	1.04	0.00

Intensity:

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

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