TEXAS A&M AGRILIFE EXTENSION

TERRY COUNTY AG NEWS

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Cotton Insects

Lygus bugs in the Texas High Plains and their threat to cotton

There are several species of Lygus reported to infest different crops including cotton. However, the dominant species of Lygus bugs we normally find in High Plains cotton is the western tarnished plant bug (Lygus hesperus), which accounts for approximately 97% of our Lygus population. Adult insects are about ¼ inch long, oval, greenish in color with reddish brown to black markings on wings and a prominent black triangle in the back (see figure 1). Immatures or nymphs look similar except they do not have wings. Their sizes vary with the developmental stage, but they are greenish in color, have black dots on the back and tip of the antenna is reddish in color (see figure 1, page 2).

Lygus bugs are one of those insect pests which can be damaging during the critical developmental stages of cotton fruit; from squaring to boll formation. Both adults and immatures are capable of causing injury to cotton fruits. Feeding injury during the early crop development stages can result in significant square loss, but this situation is not typically observed in High Plain cotton where Lygus are more commonly recognized as a mid to late season cotton pest. When Lygus feed on either developing flowers or bolls, they are capable of damaging the inner contents of a fruit such as anthers in case of squares/ flowers and developing seeds in case of young bolls (see figure 2, page 2). However, as boll development progresses, the outer wall of the bolls become hard and become less susceptible to Lygus injury. In terms of heat units, cotton beyond 350 heat unit after "cut--- out" (i.e., 5 or fewer mainstem nodes above white flower) is considered to be safe from Lygus.

Typically, we observe our Lygus populations being more noticeable in cotton after peak flowering to the late boll development stage. However, their populations may build---up in cotton even before flowering and in that situation, the cotton crop is more vulnerable to damage by this insect. A research study conducted by Apurba Barman and Megha Parajulee for three years (2006 to 2007) in Lubbock quantified the amount of fruit loss and lint yield difference caused by artificially released Lygus at two different densities (1PP = one Lygus bug per plant and 3PP = three Lygus per plant) as compared to plots of undisturbed crop which were either not sprayed (NC = natural control, no spray and no artificial Lygus release) or protected through regular pesticide applications (SC = three weekly sprayings). It was found that the extent of fruit loss four weeks after three consecutive Lygus releases could be as high as 38% under high insect pressure (3 Lygus per plant) and 24% under low insect pressure (see figure 3, page 3). Although it was not proportionate to the amount of fruit loss, the lint yield was significantly less on plots receiving artificial Lygus releases. This study also indicates that the presence of Lygus in cotton fields during the squaring stage can reduce lint yield in the realm of 100 lbs/acre (see figure 4, page 3). Details of this study can be found in the article recently published in the Journal of Economic Entomology by the Entomological Society of America.

The recommended action threshold for Lygus in High Plains cotton varies with the crop stage and method of sampling. Several sampling methods such as drop cloth, sweep net and beat---bucket can be used to assess the abundance of Lygus in cotton fields. For more information on sampling and the action threshold, call 637-4060.

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Educational programes conducted by the Texas A&M AgriLIFE Extension serves people of all ages regardless of socioeconomic level, race, color, sex, religion, disability or national origin. The Texas A&M University System, the United States Department of Agriculture, and the County Commissioners Courts of Texas cooperating.

Cotton Insects, *continued from page 1*

Lygus action threshold

Cotton stage	Sampling method	
	Drop cloth	*Sweep net*
First two weeks of squaring	1-2 per 6 row-feet with unacceptable square set	8 per 100 sweeps with unacceptable square set
Third week of squaring to first bloom	2 per 6 row-feet with unacceptable square set	15 per 100 sweeps with unacceptable square set
After peak bloom	4 per 6 row-feet with unacceptable fruit set first 4-5 weeks	15-20 per 100 sweeps with unacceptable fruit set first 4-5 weeks

Cotton fields should be regularly monitored so that early Lygus population build---up can be detected. Studies in other parts of the country where Lygus is a pest of different crops suggest that this insect could be difficult to control. Research conducted in the Mississippi Delta region indicates that Lygus lineolaris (another close relative of our western tarnished plant bug) has developed resistance to acephate. However, in the Texas High Plains, there are no issues of acephate resistance in Lygus populations. Luckily, Lygus pressure in High Plains cotton has been fairly low and area specific, therefore our populations have never received multiple, area-wide insecticide applications as occurs in some other regions where Lygus is more troublesome. Insecticides that can be used for managing Lygus in cotton are: Centric® 40WG @ 1.25---2.5 oz/acre, Intruder® WSP @ 1.1 oz/acre, Belay® @ 3---6 oz/acre, Orthene® 97S @ 4---16 oz/acre, CarbineTM 50WG @ 1.7---2.8 oz/acre, Admire Pro® 1.3---1.7 oz/acre and Transform® WG 1.5---2.25 oz/acre. Under heavy Lygus pressure, use of the highest dose is recommended to obtain satisfactory control.

Another aspect of Lygus management is understanding the abundance and phenology (growth stage) of alternate host plants of Lygus in the landscape. Alfalfa is commonly recognized as the most preferred host for Lygus and the presence of volunteer alfalfa (present along roadways) can attract Lygus and allow them to build up their population densities. However, alfalfa is less abundant in the High Plains landscape, instead there are several other host plants such as pigweed, Russian thistle, smartweed, woolyleaf bursage and yellow sweetclover that can be found in and around the perimeters of our cotton fields. Among these weed hosts; Russian thistle is a better host in terms of supporting both adults and immatures of Lygus. This was found through a two---year Texas High Plains study conducted by Stanley Carroll and Megha Parajulee in which dozens of prevalent weed species in the landscape were sampled for adult and immature Lygus bugs. Thus, checking some of these weed species near cotton fields can give us an idea if there is any potential for a future invasion by Lygus into the cotton field.

Apurba Barman
Extension Entomologist

See Figure 2 below and Figure 3 and 4 on page 3.

Figure 1. Adult and immature (nymph) of western tarnished plant bug (Lygus hesperus). Note the triangle on the back in adult and black dots on nymph. (Photo credit: Cotton Entomology Program, Lubbock, TX)

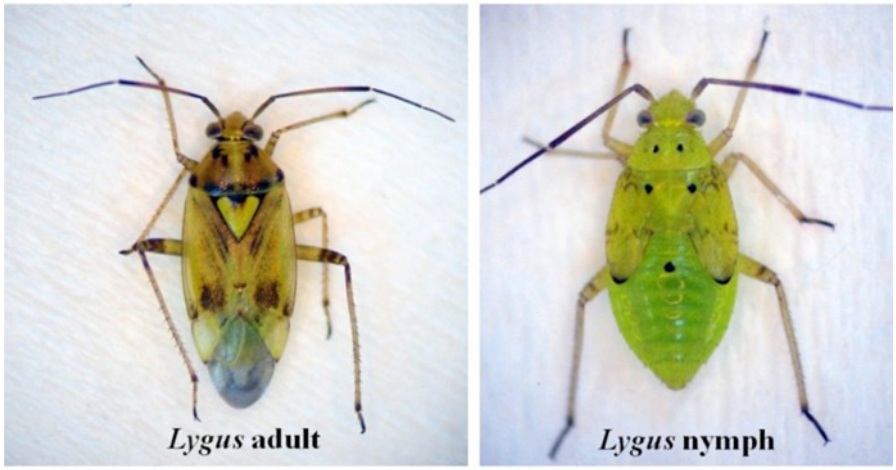
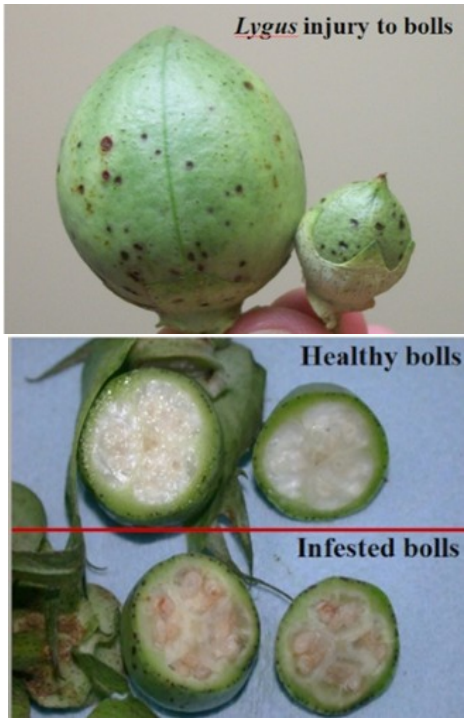


Figure 2. Symptom of external injury to cotton bolls by Lygus (top picture). Comparison of healthy and Lygus infested cotton bolls after cutting the bolls open (bottom picture). (Photo credit: Cotton Entomology Program, Lubbock, TX)



Cotton Insects, *continued from page 2*

Figure 3. Percent fruit loss caused by Lygus in two different population densities released on early squaring cotton.

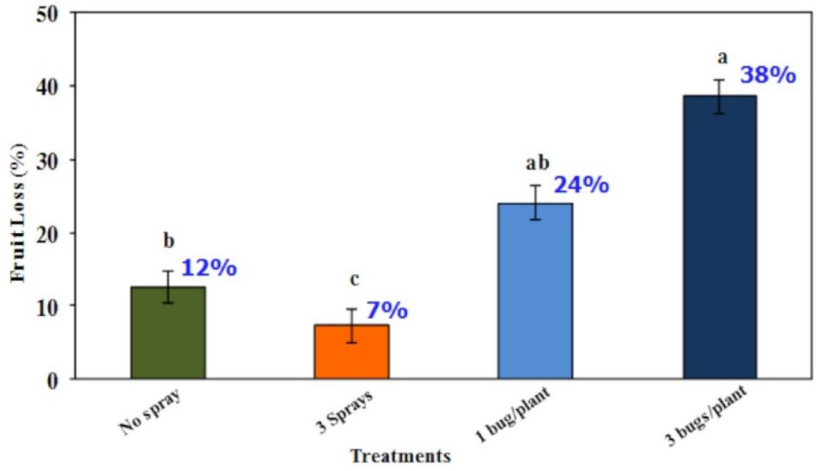
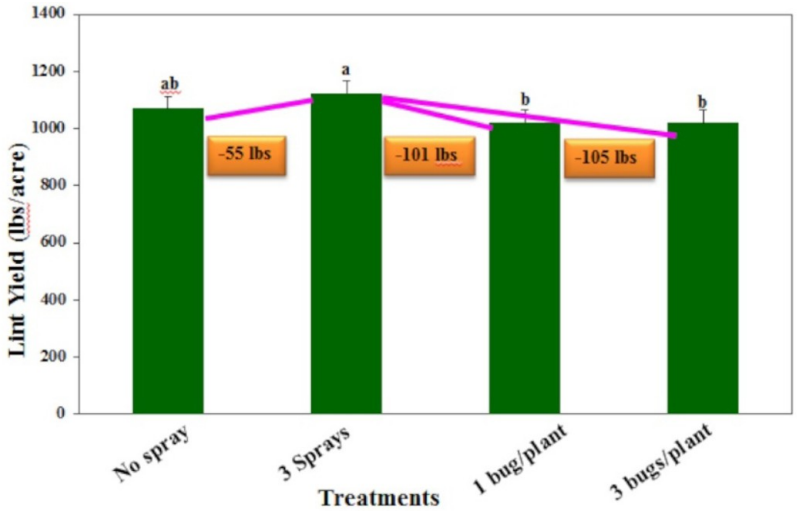


Figure 4. Lint yield difference in Lygus infested plots and plots treated with insecticides.



Cotton Disease Update

Although few blooms were observed on the fourth of July, flowering is in progress in many fields across the Southern High Plains. Water demand will continue to increase over the next several weeks as the crop reaches peak bloom. While the cooler temperatures and widespread rainfall received in the region are welcome, such conditions are ideal for the development of Verticillium wilt, caused by the soilborne fungus Verticillium dahliae. The pathogen has a broad host range of more than 400 plant species that can be infected, with peanut being one of the most susceptible rotation crops grown with cotton in west Texas. It is important to know the history of a field with respect to Verticillium wilt, as the fungus can

Cotton Crop Update

The May 2nd freeze, resulting in later than usual planting, crop damage from June hail and wind events, and the continued severe drought conditions in the Texas High Plains and Panhandle make it difficult, if not impossible, to generalize the current cotton crop conditions. Some of the irrigated crops that either escaped significant hail/wind damage or were planted into a cover crop are at early bloom, but they are still slightly behind as blooming typically starts in early July. As for the remainder of the crop, growth stages vary greatly across the region under irrigated production systems and range from pinhead to candling square stage. The condition of the remaining dryland cotton crop also varies greatly across the region as a result of the sporadic and scattered rainfall events observed to date. Those locations that received rain and got a stand established are struggling and in need of additional moisture to continue, or in some cases, resume growth and development. Unfortunately, in most cases, these dryland cotton crops exhibit skippy stands and are well behind developmentally. The fate of many of the remaining dryland acres is yet to be determined. At the time of this writing, July 17, much of the region has received, or is currently receiving, some rainfall from a system that is moving slowly across the area. According to the Texas Tech Mesonet website, 72

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Cotton Crop Update

hour rainfall amounts range from a trace to just over 6" across all of the station locations. Plainview currently has observed 6.21" over that time period. Other locations with high rainfall amounts include Denver City (3.95"), Sundown (3.54"), Plains (3.13"), and Wolfforth (2.75"). The Lubbock TTU and the Reese Center stations have reported 1.96" and 2.34", respectively over the past few days. Irrigated producers should get benefit from this slow moving steady rainfall event. With occasional breaks in the clouds, the potential for square shed should be minimized. Extended periods of cool, cloudy conditions can result in square shed. To date, percent square set under irrigated production systems has been exceptionally good across most of the region. This is attributed greatly to the light early season insect pressure that has been observed. Additionally, due to the lateness of the current cotton crops, and the uncertainty of additional rainfall, it is highly recommended that timely irrigation, insect control, and weed management decisions be made in order to maintain the current set fruit. With good growing conditions for remainder of the season and an open fall, good yields of high quality cotton is very possible in the Texas High Plains and Panhandle regions.

Mark Kelly
Extension Agronomist

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Cotton Disease Update

survive for extremely long periods of time in the soil (as specialized structures, called microsclerotia). Disease incidence and severity have been relatively low for the past two years, as a result of the extreme drought conditions experienced across the region. Initial infections occur early in the growing season, following germination of microsclerotia (which respond to root exudates, released in the soil by cotton seedlings). The fungus penetrates through the roots, invades the vascular system resulting in a systemic infection. Prolific growth in the xylem vessels disrupts the plant's ability to transport water and nutrients. Characteristic symptoms of Verticillium wilt consist of chlorosis and/or necrosis on the foliage of infected plants (See picture #1 below). As the disease progresses, severe stunting (See picture #2 on page 5) and premature defoliation can be observed. A transverse section of the stem will expose discoloration of the vascular system (See picture #3 on page 5). Younger bolls may abscise or become malformed. Symptoms of Verticillium wilt are easily confused with another disease (Fusarium wilt, caused by Fusarium oxysporum f. sp. vasinfectum) that has been observed over the past few weeks. While the two diseases have a similar appearance, management options (primarily variety selection) differ greatly. Distinction between the two wilt diseases in cotton may require laboratory diagnosis. Texas A&M AgriLife Research Plant Pathologist, Terry Wheeler continues to evaluate cotton varieties and advanced breeding lines for resistance to Verticillium wilt. The effects of

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Verticillium wilt foliar symptoms

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Cotton Disease Update

several management options on Verticillium wilt are being evaluated in various research trials. Results from such studies will be distributed as they become available. For more information on the integrated management of this disease can be found at the following web address http://lubbock.tamu.edu/files/2011/11/ IntegratedManagementVerticilliumWiltCotton.pdf. If you have any questions regarding Verticillium wilt or any other cotton diseases, contact Jason Woodward by call to 806-632-0762, or by e-mail to jewoodward@ag.tamu.edu.

Article and photographs by
Jason Woodward
Extension Plant Pathologist

Stunting caused by Verticillium wilt

Vascular discoloration caused by Verticillium wilt

The articles in this newsletter were published in a recent issue of ***FOCUS on South Plains Agriculture****, a newsletter from the Lubbock Research and Extension Center. http://lubbock.tamu.edu/focus.*

FOCUS Editor—Patrick Porter