GAINES COUNTY IPM NEWSLETTER

Manda G. Cattaneo, Extension Agent - IPM
101 S. Main RM B-8
Seminole, TX 79360
(432)758-8193 office
(432)758-2039 fax

http://gaines-co.tamu.edu
http://www.tpma.org
http://ipm.tamu.edu
mgcattaneo@ag.tamu.edu

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General Situation

A majority of the cotton and peanut fields are exhibiting symptoms of stress caused by the dry and hot conditions that have prevailed for the last several weeks. A majority of the cotton fields have cutout. Bolls are starting to open in several cotton fields. High winds, very little rain, and severe hail damage was associated with a thunderstorm that passed through Gaines County last Thursday.

Please see *Table 1* to determine the amount of Heat Units (H.U.) that your crop has accumulated since it cutout. For example: If you field cutout around August 10th, then it has accumulated around 366 H.U. and should no longer be susceptible to lygus. However, it is still susceptible to first and second instar bollworm larvae.

We have not found any significant "worm" populations in Bt or Widestrike cotton. In non-Bt cotton we have not found any first and second instar bollworm larvae this week. However, we are still finding larger bollworm larvae (½ inch to ¾ inch) that were likely feeding in the bolls when insecticides were applied last week. These bollworms are feeding in bolls lower in the canopy and can only be found if you are doing whole plant inspections. Along with the bollworms we have also observed smaller populations of fall armyworms and beet armyworms. Most of the fall armyworms have been observed feeding in the blooms. The beet arymworms have been feeding on leaves, squares, small bolls and bracts.

***Table 1*. Accumulated Heat Units (H.U.) from August 1, August 5, August 10, and August 15 to August 18, 2009**

	Date				
	August 1	**August 5**	**August 10**	**August 15**	**August 20**
Accumulated Heat Units	538	469	366	263	148

Fusarium wilt

This year is a little unusual in the fact that we have found a lot of cotton fields that Fusarium wilt has come on late in the season. Fusarium wilt is *usually* observed prior to bloom. However, during the last 2 weeks we have taken plants from several fields to the Texas AgriLife Extension and Research Center in Lubbock where Dr. Jason Woodward's lab has confirmed that these plants are infected with Fusarium wilt. Growers do not have any options for management of the disease in the current crop. However, confirmation of whether they are dealing with Fusarium or Verticillium wilt will aide them in variety selection in future years. *Figure 1* is a picture of a Fusarium wilt susceptible cotton variety and a tolerant variety. This picture was taken in Dr. Terry Wheeler's Gaines County Fusarium wilt test plot last year.

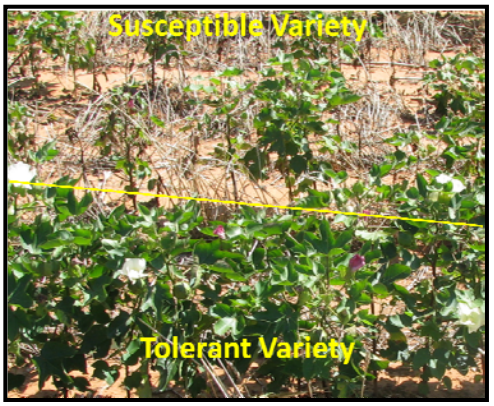

***Figure 1.* Stand loss in a cotton variety that is susceptible to Fusarium wilt.**

Rhizoctonia Pod Rot

We are starting to observe more Rhizoctonia Pod Rot along with Pythium pod rot in peanut fields. Pods infected with Pythium usually have greasy dark brown-black lesions and pods may have a wet loose white fungus mat. Whereas, pods infected with Rhizoctonia have a drier dull dark brown lesion (see *Figure 2*). It is very hard to determine whether you are dealing with Rhizoctonia or Pythium pod rot in the field. Laboratory confirmation is the only way to positively determine which pathogen you are dealing with.

***Figure 2*. Pythium pod rot on the left. Rhizoctonia pod rot on the right.**

Collection of Agriculture Waste Pesticides - October 14, 2009

Location: Agriliance – 101 Loop Hwy., Seagraves, TX 79359
Contact: Terry Millican, 432-758-4006, ext. 238 or at gaines@ag.tamu.edu

Damaged Cotton Leaves

I received a couple of call from growers who were observing some unusual leaf damage in their limited irrigation and dryland cotton fields south of Loop. The leaf damage was observed 2-3 days following a ½ inch to ¾ inch rainfall that occurred on Saturday August 15th. Prior to this rain event, the fields were suffering from low soil moisture. Since water availability was limiting, this resulted in the leaf cells having very little water in them and high levels of ions (sucrose). When the rainfall came, the cells starting observing a lot of water quickly and as a result the cells ruptured (see *Figure 3*). Of course, I am an entomologist trying to explain plant physiology. So please see the paragraph below for a scientific explanation from retired Cotton Physiologist and Professor at Texas Tech University, Dr. Dan Krieg.

***Figure 3*. Cotton leaf with ruptured cells**

"The problem is common across a lot of dryland and lightly irrigated fields in many years when we get rain after prolonged drought. It was evident in my dryland this year following a 0.5 inch rain in late August. It is the result of excessive accumulation of osmotica in the leaves as a result of severe soil water shortages. The plant must ocmotically adjust in order to maintain cellular integrity when the soil water supply declines from -0.2MPa toward -1.5MPa. The source of osmotica is both organic molecules and inorganic ions. When fresh water (Rain) hits the leaf, the water is immediately taken into the cells in response to a very steep potential gradient. The volume that can be accumulated exceeds the ability of the mesophyll cell walls to contain the volume and cell rupture occures. The salts were in the leaves prior to the rain and not as a result of the rain. It takes 2-3 days for the death symptoms to become visible. The sympotoms are usually more pronounced at the leaf margins because those cells usually have more starch and sucrose in them because they can't get it out due to distance from the vascular system. As the cells rupture and organic molecules are released, various bacteria and fungi have a food source and become obvious. This problem occurs every year in the hot dy areas."

Fall armyworms

Reported by Dr. David Kerns in the August 21, 2009 edition of Focus on South Plains Agriculture
Fall armyworms (see *Figure 4*)are being picked up in moderate numbers in non-Bt cotton in Gaines County. They may be in other areas, but I can't be certain. The worms we have been seeing have been feeding primarily in the blooms. If you have Bt cotton, and notice fall armyworms feeding in the

blooms, watch them closely. Bollgard II or Widestrike varieties do have activity towards fall armyworm. But the blooms do not express the Bt toxin as high as in other portions of the plant and under very high populations, enough worms may survive long enough to gain enough size to take a small boll or two before dying. If you are growing an older Bollgard variety (not BG2), watch these fields very closely; research has shown that Bollgard (BGI) is not very effective towards fall armyworms.

***Figure 4*. Fall armyworm**

Unfortunately we do not have a research based threshold for fall armyworms, but we do have some good guesses based on experience. This late in the season in non-Bt cotton, if you are picking small (< ¼ inch long) fall armyworm in the upper portions of the plant feeding in terminal tissue or blooms, then 8,000-10,000 worms per acre is a good threshold. However, if the worms are feeding deep in the canopy or if they are larger than ¼ inch in length, then a threshold of 5,000 worms per acre is probably a better choice. If possible target these worms while they are feeding in those upper blooms and exposed. Once they start moving into that canopy, good coverage and control may be difficult.

Currently, we do not have much information on insecticide efficacy towards fall armyworm in cotton. However, Intrepid and Tracer have both demonstrated good activity in the past. Pyrethroids are weak against fall armyworms, especially if the worms are deep in the canopy or have much size to them. If you have a mix of fall armyworms and bollworms, a pyrethroid should kill the bollworms but will miss the armyworms. Intrepid and Tracer on-the-other-hand are weak on bollworms but much better on fall armyworms. Belt or Coragen may prove to be good alternatives. They both have shown activity towards armyworms and although somewhat weaker, they do have activity towards bollworms. However, we do not have much data on these products; none for fall armyworms in cotton. Regardless, of what you use, maximize coverage and again, try to target those worms while exposed in the blooms in the upper portion of the plant. All of the fall armyworm products mentioned above are most effective if eaten by the worm. Tracer, Coragen and Belt all have translaminar activity. This means that the plant tissue will absorb them and then when that portion of the plant is eaten, the worm will consume the poison. Intrepid is not translaminar and thus tends to be more coverage sensitive. For Intrepid, the worm must eat the product off the surface of the plant tissue.

Lygus

Reported by Dr. David Kerns in the August 21, 2009 edition of Focus on South Plains Agriculture

Lygus are becoming more prevalent throughout the region, mostly in low, sub-economically damaging levels. The threshold at which you should consider treating for Lygus time of year is 4 Lygus per 6 ft-row based on drop cloth sampling, or 15-20 Lygus per 100 sweeps.

Adult Lygus appear to be very transitory, moving into the field, laying eggs and vacating within a few days. These populations are easily missed, and what we are detecting in the cotton are populations comprised of about 80% nymphs and 20% adults. Be careful, small Lygus and small cotton fleahoppers are very difficult to tell apart. If you have a lot of very small plant bugs and you are not sure if they are Lygus or fleahopper, don't panic and spray. At this point in time of the season the small Lygus are not likely to be able to cause much damage. Their mouthparts are simply too small to consistently pierce the carpal wall of the boll. Fields I have been in that were infested with very small Lygus had plenty of bolls with external stings, but none of them went through into the inner boll to cause damage to the lint. So, if you have a lot of small Lygus and/or fleahoppers and you can't tell what is what, wait a few days for the Lygus to gain a little size and then you will be able to get an accurate assessment of the population.

Lygus will feed on both squares and bolls, but at this point in the season we are not too concerned with square damage, it's the boll damage we need to watch for. Fruit susceptibility is size of fruit and size of Lygus dependent. For instance, research has shown that 1st-3rd instar Lygus are not capable of feeding on the anther sacs of large squares (those over 0.3-inch in diameter). Regarding boll susceptibility, data is currently limited but Dr. Megha Parajulee's lab is working on this matter. However, I would suspect that the larger the boll, the less susceptible it is to feeding, especially to small nymphs. We do know that once a boll accumulates about 350 heat units (a boll about 1-inch in diameter), it is no longer considered susceptible to Lygus damage. So essentially we need to protect those bolls that are 1-inch in diameter or smaller, and capable of maturing.

***Figure 5*. Dark specking is a symptom of Lygus feeding on a boll**

***Figure 6*. Darkened lint at a Lygus feeding site indicates successful carpal wall penetration and feeding**

Lygus damaged bolls will have small, dark, sunken lesions on them (see *Figure 5*). Each spot represents where the Lygus' mouthparts penetrated into the carpal wall. Now just because you find Lygus stings on a boll doesn't necessarily mean you have sustained damage. Small Lygus may be incapable of fully penetrating the carpal wall or the Lygus may have simply been superficially probing. To determine if a boll is damaged you will need to dissect it with a knife. If the Lygus penetrated the carpal wall you will see a spot on the inside of the wall and stained lint (see *Figure 6*). When a boll is internally damaged, the lock may not develop properly and may be stained or have other quality issues. Small bolls that are fed upon will often be aborted by the plant, especially if the boll has multiple feeding sites on it.

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