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Gaines County IPM Newsletter

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Cotton General Situation

A majority of the cotton has reached cutout during the last couple of weeks and several fields have started to **shed squares and small bolls**.

Cracked bolls have been observed in a couple of fields. Cotton stages range from 0 to 7 Nodes Above White Flower (NAWF), with a majority of the fields in the 2-4 NAWF. Knowing when a field reaches cutout (5 NAWF) will help you with your end of the season management.

Heat Unit (H.U.) Accumulation since July 23, July 30, and August 6

Date Cutout	H.U. Accumulation
July 23	535
July 30	382
August 6	206

At 350 H.U. after the white flower, the inner layer of the bur wall hardens making it hard for insects to feed on the developing boll. Fields that have accumulated 350 H.U. since cutout are safe from lygus damage and a bollworm egg lay. However, cotton that is still blooming is still very attractive to bollworms and as long as we have soft bolls that are susceptible to worm feeding and blooms and small bolls present to get a bollworm population going, we should take necessary steps to prevent bollworms from developing damaging populations.

Overall, insect pest pressure has been very light this year. Currently, we are finding very light populations of aphids, spider mites, bollworms, and armyworms. Beneficial insects (mainly spiders, green lacewings, and assassin bugs) are still hanging in there.

Monday (August 13) morning storms brought barely measure rainfall to most of the county, with the except of the Loop area which received 2.5 inches of rain and Seagraves received 0.63 inches.

Peanut General Situation

For the most part, the peanut crop looks very good. We are still picking up light populations of "worms" in peanuts. We are also picking up more pod rot caused by Rhizoctonia and Pythium. When applying fungicides, one of the most important factors in pod rot management is to get the product down to the pegging zone. This can be done by chemigation, or increasing the carrier volume, increasing droplet size, and/or irrigating right after the fungicide is applied. Fungicides can be quickly absorbed into the leaf, therefore, every effort should be made to get the product down into the pegging zone.

We are still in the high demand period when peanuts are developing and they should not be moisture stressed. In several fields we have small pods that will take time and water to reach full maturity. We want to push the plants as hard as we can to properly fill the load that we have developed. For pod development we are looking at 3-4 weeks from the time the peg enters the soil till the time it reaches full size. Although the pod has reached full size, kernel development has barely begun. Mature, harvestable pods require 60 to 80 days of development. Therefore, we are reaching the final stages of the season where we can have enough time develop a mature pod. Efforts need to be directed at maturing the current crop load instead of setting more blooms. For that reason, it is time to slow down the pivots and give the field a deeper soaking irrigation.

Salinity Issues in Peanuts

We have observed salt damage in a couple of peanut fields. Salts are left behind as the irrigation water evaporates. This allows for a buildup of salt in the root zone. If the salinity concentration in the soil is high enough, the plant will wilt and die, regardless of the amount of water applied. We need a good flushing rain to start leaching the salts below the root zone. Producers can have their water tested to determine the salinity levels in their water. Also, since we have not had any good flushing rains during the last two years, we have a double build up (2 years worth) of salts. Therefore, growers should also have their soil tested to get the full picture. The best indicator of the extent of salt problem is a detailed salinity analysis. The test measures the pH, electrical conductivity (EC), and water soluble levels of the soil. EC is a measure of the amount of dissolved salts in the paste of soil and water. Although, there is nothing we can do about the salt damage this year, knowing your salinity levels in your irrigation and soil levels will help you with your crop selection next year (keep in mind that peanuts are more susceptible to salinity issues than cotton).

Salty irrigation water can cause major problems in crop production. Salts compete with plants for water. Even if a saline soil is water saturated, roots are unable to absorb water and plants show signs of stress. Foliar applications of salty water commonly cause **marginal leaf burn** and in severe cases can lead to premature defoliation that creates yield and quality loss.

Toxic ions include elements like chloride, sulfate, sodium, and boron. Sometimes, even though the salt level is not excessive, one or more of these elements may become toxic to plants. Many plants are particularly sensitive to boron. In general, it is best to request a water analysis that lists the concentrations of all major cations (calcium, magnesium, sodium, potassium) and anions (chloride, sulfate, nitrate, boron) so that levels of all elements can be thoroughly evaluated.

Cotton boll development

The following is information obtained from Cotton Physiology Today August 1994 Newsletter.

Boll growth begins with pollination of the white flower at early to mid-morning. The boll grows rapidly after fertilization following an S-shaped curve, with the most rapid growth occurring between 7-18 days, and **full size reached in about 20-25 days**. A similar pattern of increase occurs for boll length, diameter and volume but dry weight increases until the boll is mature. **Boll development is often divided into three overlapping phases: the enlargement phase, the filling phase and the maturation phase.**

During the first three weeks (the enlargement phase) maximum boll size, maximum seed size and maximum fiber length are established. The maturation period from white flower to open boll is strongly influenced by temperature. The rapid achievement of full size followed by a lengthy maturation period during fall is a source of confusion and potential management mishap. Producers may delay harvest in the hop of realizing yields from top bolls that are full but immature.

Many preparatory events occur leading up to the time the flower bud opens. By this time the cells on the surface of the unfertilized seed, which will become fibers, already have been determined.

During the elongation phase, the individual lint cells elongate to about 25,000 or more times their original length before the secondary wall forms.

At the same time the fibers are expanding, the seed also is increasing in size. The periods of elongation of the fiber and expansion of the seed correspond to the enlargement of the boll wall, **so maximum length of the fiber is reached in about 20 days.** **Thus maximum boll volume, seed size and fiber length are determined during the first three weeks of development. Severe water stress during expansion can reduce size.**

The second half of boll development is characterized by accumulation of dry weight on the framework that developed during the first half. **While fiber length, and to some extent uniformity, is determined during early boll development, micronaire, maturity and strength are determined primarily thereafter. Premature defoliation and boll opening also can lower maturity.**

Boll opening is a process under the control of hormones. Ethylene is primarily responsible for triggering the process of boll opening. Ethylene is the active ingredient in such crop management compounds as Prep. High auxin produced by the developing seed counters the action of ethylene and prevents premature opening, but as the boll reaches maturity, auxin level drops and ethylene increases. Cells in a specialized layer in each suture of a boll enlarge and produce enzymes that dissolve their cell walls. Cracking along these sutures allows water to escape and the boll contents and bur wall begin to dry. A unique network of vascular strands causes the inner part of the bur wall to be more rigid than the outer part. Because of this, the outer part of the wall shrinks more than the inner upon drying, causing the wall to bend outward to give the characteristic bur of the open boll. Any factor that affects maturation of the capsule wall, such as boll age, carbohydrate stress or disease can lead to poor boll opening.

The final event in the development of cotton fiber occurs during drying after boll opening.

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Manda Anderson
101 S. Main Rm 111
Seminole, TX 79360

Phone: 432-788-0800
mganderson@ag.tamu.edu

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