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# *Pest Management News*

## *News About integrated pest management for producers in Runnels-Tom Green Counties*

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## GENERAL SITUATION

Hot and sticky yesterday and rain showers today. I prefer the rain showers. Rainfall amounts varied from 0.5-inches to over 3-inches in some areas. That's Great! Insect pressure remains low with little to discuss. Questions this week primarily dealt with irrigation, fertility and foliar feeding cotton. There is a lot of variation in crop maturity from one area to the next and between dryland and irrigated so the information may or may not pertain to your situation. Hopefully everyone will benefit from some of the info....

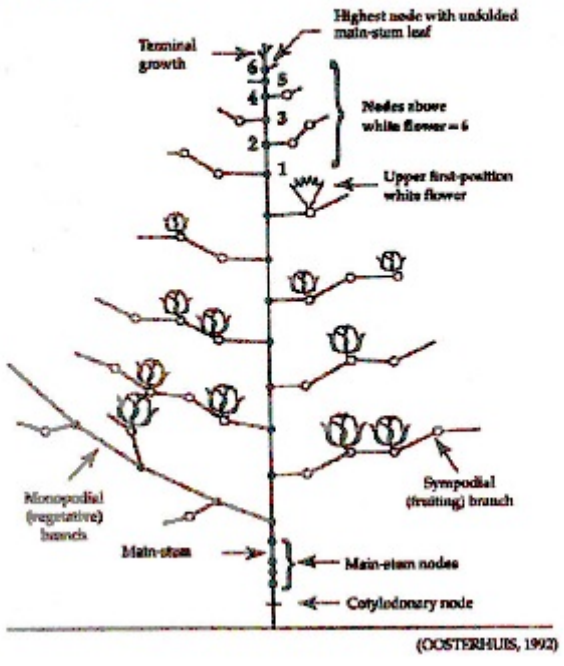
Bollworm egg counts ranged from 0 to 21 bollworm eggs per 100 plants and larval counts ranged from 0 to 8 small worms per 100 plants. Nothing to be alarmed about, but keep in mind adult moth trap numbers are increasing and I would expect an increase in bollworm activity soon.

Aphid infestations remain low and not a concern at this time.

Irrigated cotton checked this week averaged 24.1-inches in height, 16.7 total nodes per plant and had an average of 1.4-inches in height to node ratio....that's good. This cotton is progressing rapidly and many fields are going into peak bloom. Cotton is most susceptible to water and/or nutrient stress during this period. Any stress caused to the plant during this time will cause fruit shed. Water use during the peak blooming period can exceed 0.3-inches per day. So remember, "one-inch of rainfall will last about 3 days."

Irrigated cotton fields monitored this week averaged 5.3 nodes above white flower (NAWF). NAWF measures the growth of the mainstem terminal relative to the progression of flowering toward the terminal (Figure 1.) It is measured by

**FIGURE 1**
**PLANT GROWTH MONITORING**



counting the nodes above the first position white flower. We measure and monitor NAWF because it is a good indicator of the potential remaining boll loading sites. If there is sufficient energy (water, N, P, K) to support continued terminal growth, the progression of flowering and cutout can be delayed. On the other hand, if most energy (water, N, P, K) is already committed to boll development, terminal growth stops allowing a rapid progression toward the plant's carrying capacity and cutout. Therefore, if we were to attempt to delay cutout and extend the fruiting period, we cannot limit the water or nitrogen requirements now. We average 16.7 total nodes per plant and 3 plus bale yields typically require a season long enough to produce 20-25 nodes per plant. So we should try and push this crop and delay cutout if possible. A good two or three inch rain would be very beneficial.

The primary nutrients of interest in cotton production are nitrogen (N), phosphorus (P), and potassium (K). In high production, secondary nutrients such as calcium, magnesium, and sulfur may be needed as well as micronutrients iron, zinc, manganese, and copper. Nitrogen is, by far, the most important nutrient for cotton production.

The amount of N cotton requires depends on the yield potential of a given field. Texas AgriLife Extension Service recommends 50 pounds of N per acre (from all sources) be available for each bale produced (Table 1).

**Table 1. Nitrogen Recommendations for Various Yields of Cotton in Texas.**

| Yield (bales/acre) | Nitrogen Recommendation[1] (lbs/acre) |
|---|---|
| 0.5 | 25 |
| 1.0 | 50 |
| 1.5 | 75 |
| 2.0 | 100 |
| 2.5 | 125 |
| 3.0 | 150 |
| 3.5 | 175 |

[1]Recommended amount should be reduced by the amount of residual $No_3$-N in the soil and credits for $NO_3$-N from irrigation water.

**Foliar Feeding Cotton.** A number of growers have asked about benefits of foliar feeding cotton when fertility is low. Due to extreme dry conditions at planting, many dryland growers did not apply any fertilizer because the growing season looked bleak. Now in some areas, soil moisture conditions have improved and growers want to do something to help the crop along. The following information was taken from the newsletter "Physiology Today."

**Uptake of Foliar Use. Urea**. Urea is the most common foliar N material applied to cotton, due to its low cost, ready uptake into the leaf and low salt hazard. Since urea enters the leaf by diffusion, if the concentration on the leaf surface is increased then diffusion into the leaf will be also increased. Temperature has a strong influence on uptake. Warm temperatures increase diffusion and soften the cuticle. The leaf cuticle is a waxy layer on the outside of leaves that protects the leaf from evaporation losses and adverse environmental conditions. This layer will be thick and composed of harder waxes (more resistant to diffusion) when leaves expand during hot, dry or water stress conditions.

Urea is readily absorbed across the waxy cuticle into the watery leaf because it is a neutral molecule, soluble in both oil and water. Research at the University of Arkansas has shown that under good conditions, 30% of the foliar-applied urea can be absorbed during the first hour after application. Within 6 hours, it could be detected in the bolls and within 24 hours, most of the N that the leaf had taken up moved into the bolls. Based on these studies, the efficiency of foliar urea is high, with 50 to 70% of the applied N recovered inside the plant. This compares to typical recoveries for soil applied N of 50%. Cotton that is drought stressed or treated with too high a rate of urea, will not be able to incorporate the ammonium, leading to ammonia toxicity.

Typical rates of foliar urea range from 10 to 15 lbs. of urea or 5 to 7 lbs. of N. One pound of dry urea can be easily dissolved in 1 gallon of water. I have always been told to not exceed 6 units of N or 12 lbs. of urea. Extreme care should be taken to avoid letting urea solutions stand for more than a few hours prior to application because urea will break down releasing ammonium.

Urea can burn leaf tissue. Applications should be made either early in the day or late in the evening to avoid burn. Even at cooler temperatures, foliar urea can still injure leaf tissue if applied to drought stressed cotton or applied at too high a rate.

**Potassium.** Potassium (K), like N, is an essential element required in large amounts for normal plant growth and fiber development. Potassium is taken into the leaf as the ion K+. Like urea, it diffuses across the leaf cuticle, and uptake is decreased into leaves that expands during a period of water stress. Likewise, applications of K should be made either early in the day or late in the evening to avoid any possible injury. Once inside the leaf, K is highly mobile within the plant.

**Physiological Demands of Boll Loading.** Plant requirements for three classes of nutrients-water, minerals and carbohydrates-exhibit peaks at or near peak bloom. A shortage of any one of these nutrients can alter the profile of peak bloom and limit final field performance.

**Water** use measured as evapotranspiration (ET)-the amount of water lost through soil evaporation plus plant transpiration-can exceed 1/3 inch per day during peak bloom. (Weather information collected from our station near Wall gave a seven day average PET of 0.29-inch per day.) It has been noted in several studies across the Belt that maximum water use occurs during peak bloom.

Bolls are primary sinks for most **mineral nutrients**. The requirement for nitrogen and potassium is high at peak bloom when the simultaneous development of many bolls increases demands on the plant's and soil's reserves. Nitrogen is vital to seed development as a component of storage proteins as well as enzymes.

**Carbohydrates** (sugars) produced during photosynthesis are used both as an energy source and building blocks in a cotton plant. The metabolic conversion of sugars and other sugar-derived materials produces energy needed to support maintenance respiration of established plant organs and new tissue, including seeds and vegetation terminals. Other metabolic routes transform these sugars into an array of building blocks used in fiber development (cellulose), enzymes (amino acids), and membranes (fatty acids), etc.

Carbohydrate demands can outstrip the plant's ability to supply them during rapidly boll loading particularly with an aging canopy. Leaf productivity declines with age. Peak bloom may arrive 90 days after planting. By this time, many leaves within the canopy are more than 40 days old and relatively unproductive. With little new vegetative growth, the crop's ability to support boll growth is declining rapidly. Additional boll loading is further strained by the high demands of older, retained bolls that are still developing. Carbohydrate uptake is highest in bolls that are less than 30 days old. This perhaps best explains why the bloom rate does not increase to infinity. (This probably is way more information than you wanted to read.)

## DATES TO REMEMBER!!!!!

**August 4th at 9:00 a.m.** Wall Coop turnrow meeting.

**August 5th at 8:30 a.m.** Ballinger turnrow meeting will be on the Courthouse 3rd floor in the meeting room.

| Wall Weather Station | | | | | | |
|---|---|---|---|---|---|---|
| Heat Accumulations | 2008 | 2009 | 2008 | 2009 | Rainfall | |
| Planting Date | June 21 | June 21 | July 26 | July 26 | February | 0.19 |
| May 01 | 1685 | 1615 | 1795 | 1718 | March | 1.76 |
| May 15 | 1501 | 1405 | 1616 | 1508 | April | 3.21 |
| June 01 | 1181 | 1206 | 1292 | 1309 | May | 0.17 |
| June 10 | 938 | 1039 | 1048 | 1142 | June | 1.71 |
| June 15 | 808 | 910 | 918 | 1013 | July 26 | 2.42 |