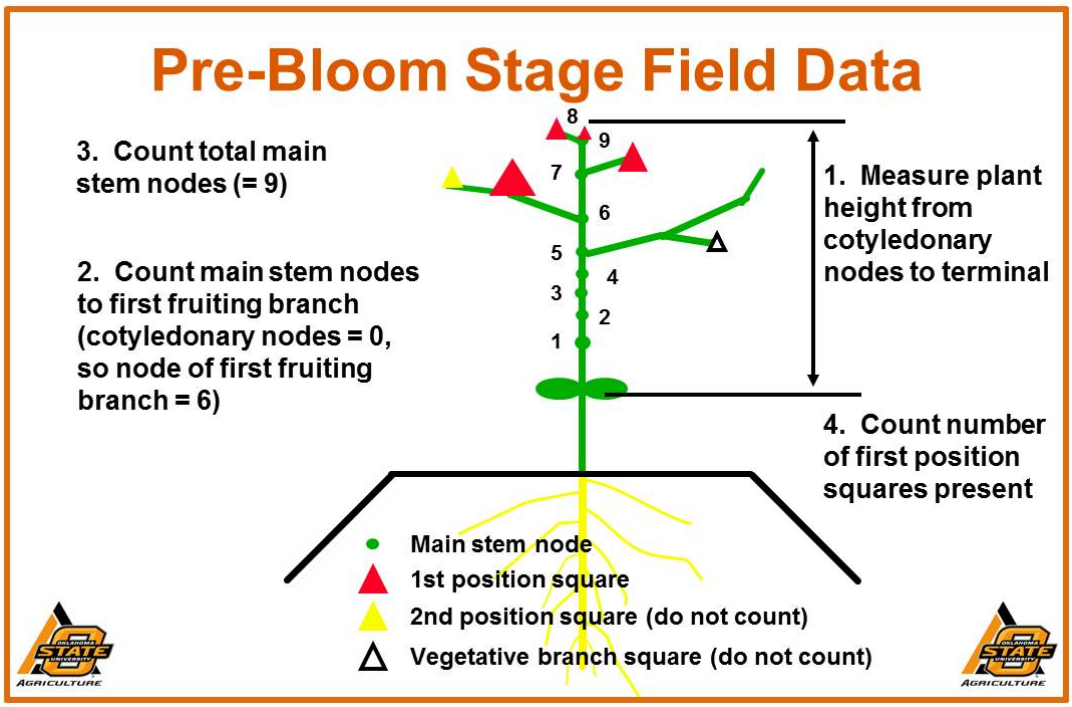
MONITORING PRE-BLOOM COTTON FRUITING IN OKLAHOMA

Dr. Randy Boman
OSU Southwest Research and Extension Center, Altus

Monitoring fruiting is an important management consideration. First position fruit is very quickly counted, and is generally adequate for "getting a handle on the crop". Pre-bloom cotton fruit retention is an important observation and is key to determine future growth potential. Significant early-season insect or environmental damage will result in low fruit set and typically triggers extra vegetative growth. Also, the match-head sized square stage can be important in terms of plant growth regulator management. The pre-bloom period also sets the stage for future yield potential. It should be noted that the period from square initiation to first flower is likely the most critical period in the life of the cotton plant. Stress during this time will limit the potential fruit number as a result of reduced production of main stem nodes. The post-bloom environment, which may limit genetic potential of the planted variety can play a significant role in determination of fiber quality. Plant mapping can be used to help monitor the progress of the crop and determine some important crop factors.



Important plant mapping and observation data for pre-bloom cotton include:

Stand counts

A minimum of 20,000 plants per acre are necessary to obtain reasonable yield. Stands can range from about 1.5 plants per row-ft up to about 4.5 plants per row-ft. Densities less than 1.5 plants per row-ft can limit yield of irrigated fields. Dryland fields may still be productive at that density. Densities greater than about 4.5 plants per row-ft may result in "barren plants" which ultimately produce no contribution to yield, therefore can technically be considered "weeds."

Node of first fruiting branch

Most modern varieties typically set the first reproductive branch (also called fruiting branches or sympodia) on main stem nodes 5 to 8. In normal fields, once the first fruiting branch is set, all remaining main stem branches above that will be reproductive. This is not always true due to environmental damage or extreme heat (such as we experienced in 2011).

Fruit retention

Total 1st position squares present and missing:
(retained squares / total square sites = % square retention)

When checking for square development, one must be careful to count squares in terminal. With practice this becomes easier. The pre-bloom square retention goal is at least 75 - 85%. If square retention falls below 75%, the field may have insect issues or other problems (such as environmental damage).

Height to node ratio

This can be defined as the plant height from the cotyledonary nodes (those at that bottom, which are always opposite one another, where the "seed leaves" are or were attached to the main stem) to the terminal. One can define the terminal node as the uppermost unfurled leaf with a diameter of about 1 inch. Although not necessarily a critical value for the first few main stem nodes of growth, the observation of height to node ratio can be useful for vigor determination. A ratio of < 1 indicates environmental stress, common in the Texas High Plains, whereas a ratio of > 1.5 can be found in irrigated cotton planted into terminated small grains cover in OK. The protection afforded by the cover crop many times results in excellent seedling growth and vigor if adequate moisture is available.

Early season insect management

This includes scouting for insects such as thrips, fleahoppers and possibly plant bugs (such as lygus). Many times cotton is emerging simultaneously with the dry down for small grains crops such as wheat. Migrations of thrips may impact newly emerged cotton fields. Thrips typically result in damage to the first four to five true leaves and can cause maturity delays. Fleahoppers can reduce fruit retention and fields should be closely scouted. Other insects such as lygus may only be occasional pests in our area. No OSU Extension personnel have yet noted significant lygus populations, but other areas such as the Texas High Plains can have issues with this insect.

Herbicide damage

Cotton tissue is extremely sensitive to hormone hericides (such as 2,4-D and dicamba). Phenoxy herbicides can volatilize and damage cotton from quite a distance. Physical drift (direct contact by herbicide application) can also cause issues. Plants can exhibit symptomology such as “strapped” leaves early. What is important is to watch new growth (new leaves unfurling in the terminal) to see if the dose was high enough to cause issues with the new growth. If leaves continue to “strap” this may be an indicator that a substantial dose was received. Once the plants reach the reproductive phase yield can become considerably more affected. It should also be noted that Roundup (glyphosate) and Liberty 280SL herbicides are excellent tank and hose cleaners. Spray tank cleanout is important. It is best to have a sprayer that is completely dedicated to cotton pesticide applications, because tank cleanout can be difficult at best.