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Crop Management Newsletter

News about Crop Management for producers in Dawson and Lynn Counties.

Thanks to the sponsors and the gins who support the Dawson/Lynn IPM Program
(found on page 2)

Snapshot

All but one of the fields in scouting program now have open bolls.

Fields are safe from insects.

Open Boll

Boll development is divided into three overlapping phases: the enlargement phase, the filling phase and the maturation phase.

Bolls grow rapidly after fertilization with the most rapid growth occurring between days 7 to 18 and full size reached between days 20 to 25. Along with obtaining maximum boll size during this period, maximum seed size and maximum fiber length are established.

The maturation period from white flower to open boll is influenced strongly by temperature. Approximately 800-850 HU's are required for full maturity which might take as few as 40 days or as many as 70 days.

Based on historical records for our area, August 6 is the date in which there is an 85% chance to accumulate enough HU to mature a white flower and August 12 is the date in which there is a 50% chance to accumulate enough HU to mature a white flower.

Boll opening is under the control of hormones. Ethylene is responsible for triggering the process of boll opening and is the active ingredient in compounds such as Prep.

Boll range is size from under 3 grams (0.0066 pounds) to over 6 grams (0.013 pounds). The seeds account for about 60% of the mature bolls weight - the remainder is lint. This translates into about 200 to 400 full-sized bolls to produce a pound of lint, or 100,000 to 200,000 full-sized bolls to produce a bale of cotton. I use 160,000 full-sized bolls when estimating yields.

When to Defoliate

Timing defoliation is usually a difficult decision, because we are balancing potential yield and quality loss in the bottom bolls versus additional weight gain in the top bolls. There are several techniques to determine when we can apply harvest aids and still retain maximum yield. These include percent open boll, sharp knife and Nodes-Above-Cracked-Boll (NACB).

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The Texas A&M University System, U.S. Department of Agriculture and the County Commissioners Courts of Texas cooperating.

Distinguishing which green bolls will be harvestable is an important skill needed to use these techniques. Not all unopened bolls on a plant will be harvestable at defoliation. Characteristics of mature harvestable bolls include: 1) they are too hard to depress between thumb and forefinger, 2) they are too hard to slice easily with a sharp knife, 3) they have lint that strings out when bolls are sliced with a sharp knife, 4) they have seed coats that are dark yellow to tan in color and 5) they have seed cavity filling with no jelly material present.

Crop maturity determination is critical for a successful harvest-aid program. Premature crop termination has been shown to reduce lint yield, seed quality, micronaire, and fiber strength. Harvest-aid chemicals cannot increase the rate of fiber development. Only additional good growing weather including open skies and adequate heat units combined with functional leaves can mature cotton bolls.

Percent Open Boll

Long term approaches have been to apply a defoliant when 60% to 75% of bolls are open, and a dessicant application when 80% or more of bolls are open and remaining green bolls can be cracked when squeezed. Although this is a useful gauge, more accurate techniques are available. When the crop has a “fruiting gap” the percent open boll technique can give erroneous recommendations.

To calculate, count the number of open bolls and total harvestable bolls per plant on 3 row feet from four randomly selected areas of a field. Divide the number of open bolls by the number of total harvestable bolls, then multiply by 100.

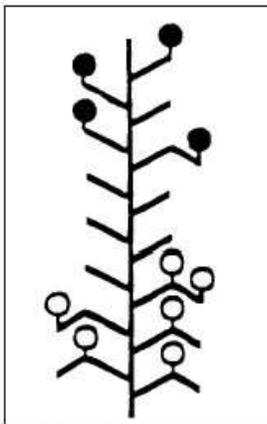


Figure 1. At 60 percent open boll, this crop would not be fully mature and safe to defoliate.

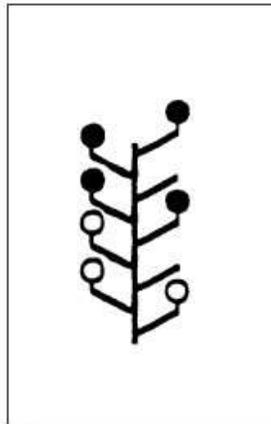


Figure 2. Even at 45 percent open boll, this crop would be mature enough for safe defoliation.

Special THANKS to those who support
Agriculture and the Lynn/Dawson IPM
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Many Thanks to the Gins who participate and support the Lynn/Dawson IPM Program

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Sharp Knife Technique

Cutting into green bolls is a highly accurate method. Inspect the cross section of the seeds looking for signs of immaturity: jelly surrounding the seed, glistening water in the boll, cotyledons white and not yellow-green, and white seed coat instead of tan or black.



Immature

Requires more heat units
-boll opener will probably
open but will not fluff.



Towards maturity

Ready for boll opener.



Mature

Fully mature - should
open with a dessicant
(paraquat)

Nodes Above Cracked Boll (NACB)

NACB helps determine when a field is safe to treat with harvest aids and still obtain 98% to 100% of the yield potential. Defoliating cotton at NACB less than or equal to 4 results in less than a 1% total yield loss. Defoliating at this stage does not reduce fiber quality. However, defoliating when NACB is greater than 4 introduces immature fibers from some of the younger bolls.

The average number of nodes above the cracked boll (NACB) helps determine the proper time to apply defoliant, taking into account the potential yield loss and the quality loss from immature bolls. Ideal timing for defoliation is when unopened harvestable bolls are an average of four or less nodes (including missing branches) above the highest first position cracked boll.

How to monitor NACB:

Select random plants from representative areas of the field.

Choose plants that have a cracked boll on a first position fruiting branch.

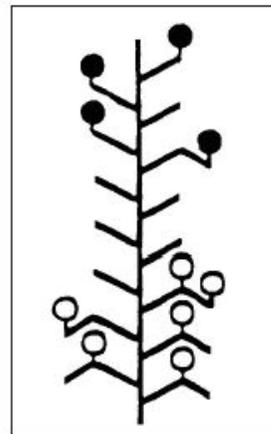
Find the uppermost cracked first-position boll and count this as fruiting branch zero.

Count the number of nodes, including nodes with no boll, above fruiting branch zero until you reach the **uppermost harvestable** boll on the plant.

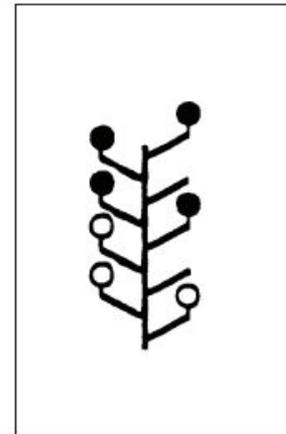
This is a boll that is large enough and mature enough in development that it will open before the scheduled harvest date.

The number of nodes counted above fruiting branch zero is the NACB for that plant.

Take the average across the plants sampled to obtain the NACB for the field.



10 NACB



5 NACB