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Louisiana Cotton Bulletin

Understanding and Managing a Declining NAWF at Peak Bloom—Sandy Stewart, Ph.D.

A common concern over the past few days has been with nodes above white flower (NAWF) in many fields. Specifically, the concern is that "white blooms are coming up the stalk" and NAWF is either low or has declined considerably. This observation is a concern during the first week of July, which should be close to peak bloom in Louisiana and begs the questions of what it means and what can we do about it?

What Does NAWF Tell Us?

NAWF can be thought of as a measure of the plant's momentum or potential for new growth. NAWF usually declines after early bloom as terminal growth slows and fruit load on the plant increases. The decline is the result of the source-sink relationship on plant, with increasing sinks (bolls and squares) drawing on the source (carbohydrate supply) produced by the plant.

"NAWF can be thought of as a measure of the plant's momentum or potential for new growth."

Cotton plants will usually begin the bloom period with a NAWF of 8-10. NAWF for a 'normal' crop will decline gradually over the bloom period. Cutout can be loosely defined as the point at which vegetative growth slows to the point that very few, if any, new fruiting sites will be added to the plant. Once cutout occurs, the boll load on the plant is effectively set. There are a multitude of opinions as to when cutout occurs, but most would agree that it is sometime between NAWF of 3-5.

The relatively low number for NAWF observed in many fields is basically a function of two interrelated things – fruit load and stress. As stated above, NAWF declines as a result of the source-sink relationship on the plant. Square and boll retention has been very high (exceeding 85%) in many fields. Thus far, square shed sue to physiological reasons and/or plant bug feeding has been minimal. With so many fruiting sites retained on the plant, maintaining NAWF of 8-10 cannot be expected for very long.

Along with high fruit retention, moisture stress in some fields has limited vegetative growth. Some areas have received plenty of rain, but many fields have been under some sort of moisture stress between pinhead square and early

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Dean Lee Field Day, Alexandria—Aug. 21

Beltwide Cotton Conferences, San Antonio, Jan. 5-8, 2008

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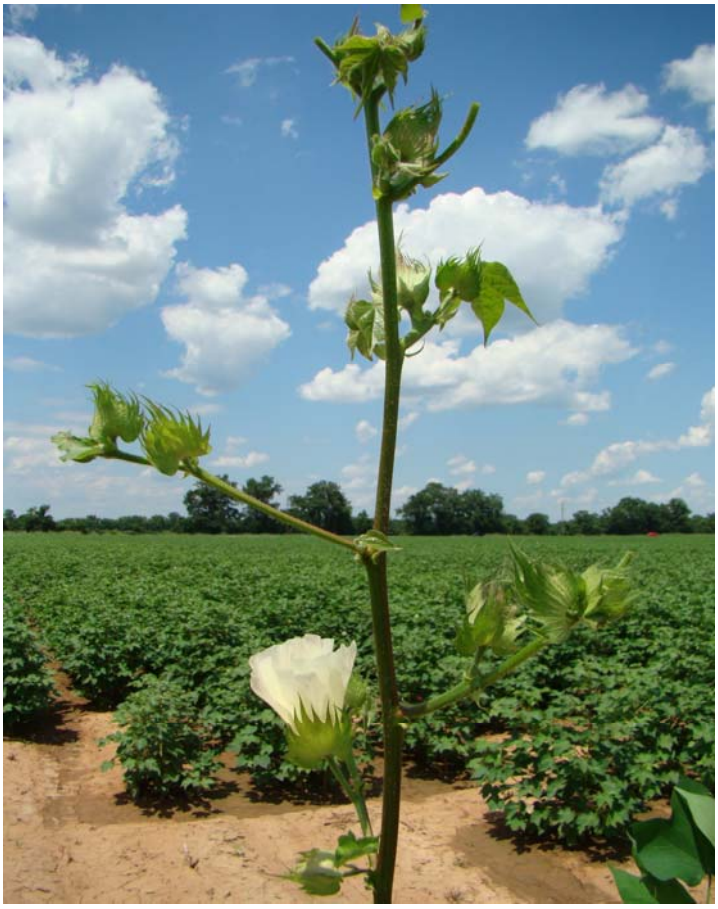
bloom. Additionally, much of the Louisiana cotton crop emerged under cool conditions, which can prune tap root formation as discussed in the April 14, 2008 issue of the *Louisiana Cotton Bulletin*. If this is the case, the plant's ability to withstand moisture stress and supply this heavy fruit load is limited.

What is the Trend for NAWF?

There is a tendency to focus on what the NAWF is today. While this number is important, the trend during peak bloom is a better indicator of what is going on with the plant. One scenario is that NAWF is declining each week. For example, it may have been 7 last week, and is 5 this week. In this scenario, cutout is fast approaching. Another scenario may be that NAWF is holding steady. For example, it may be 6 for two weeks in a row, indicating that terminal growth is slow, but not stopping and cutout can be avoided for a few more weeks.

A rapidly declining NAWF indicates that cutout may be imminent. Protecting the bolls on the plant is the highest priority and additional fruit set is not expected. In the second scenario of a steady NAWF from week to week, the alleviation of any moisture stress through irrigation is the highest priority. It is not unheard of for NAWF to decline to 3 or 4 and maintain that level for several weeks, giving a producer a chance for setting a significant number of bolls in the top third of the plant. Some square shed from plant bugs, physiological reasons, or what-



Seven nodes above white flower-avoiding moisture stress is a key to avoiding cutout.

Four nodes above white flower—cutout may be imminent.

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ever, usually helps to maintain terminal growth and NAWF by reducing the fruit load on the plant.

Management Options Limited at Peak Bloom

As NAWF declines below 5, the options for management that can extend the bloom period become limited. In past years, this would have been less of a concern because of the acreage planted to DP 555 BG/RR. That particular variety is has so many full-season characteristics that cutout is difficult to ever define. All of the newer Roundup Ready Flex varieties are earlier maturing than DP 555 under normal conditions and cannot be expected to have the same tolerance to stress.

Irrigation

Alleviating moisture stress on plants with a NAWF of 6 or less at peak bloom should be the highest priority. More than any other factor, irrigation is the best option a producer has to prolong the bloom period. Drought stress on a plant with a declining NAWF and a heavy frit load is a recipe for premature cutout.

Supplemental Nitrogen

Many producers have applied or are considering an application of supplemental N to prolong the bloom period. For a number of reasons foliar feeding should not be expected to delay cutout and prolong the bloom period of cotton that has a rapidly declining NAWF. There is an old adage that foliar feeding can make a good crop a little better. This is still true today, but foliar feeding has a poor track record of rescuing cotton crops.

Granular sources can be more effective than foliar feeding because they are not so dependent on foliar uptake of N. Applying dry fertilizer, however, should be done with caution for two reasons. The first is that there should be some realistic expectation of success. Without good moisture, additional N will have little positive effect on the plant. The second is that nitrogen may not be truly limiting and additional applications can increase problems with insect pests, boll rot and harvest preparation.

Plant Growth Regulators

In situations with low or declining NAWF, plant growth regulators are not warranted. Specifically, when NAWF is 6 or less and declining, no mepiquat is warranted. The fruit load on the plant is a stronger PGR than mepiquat. If NAWF is greater than 6, mepiquat may be warranted, but only if soil moisture is good, and retention has declined. In all cases, decisions should be made on a field by field basis and applications should not be automatic.

Cotton 'blooming out the top.' Management options to prolong bloom are limited.

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