

Poinsett County Cotton News

Cotton Harvest Aid Update -- Bill Robertson, Ph.D.

September 2019

We are quickly approaching the finish line with this cotton crop. Our plant activity is relatively high at this time in many of our fields which should be an indicator that we might need to continue to adjust our nitrogen rates. Most producers have started their harvest aid applications. Our picker capacity is stretched thin. It is time to get the pickers in the field and keep them moving. Mother Nature will soon be sending cool fronts our way which often complicate our programs. As always, try to avoid applying harvest aid products too close to extreme temperature/weather shifts either in front of or behind changing weather conditions. Defoliation and boll opening is an active process. Generally, the plant does not respond well to harvest aid applications which jumpstart the plants natural process if the plant is still in shock. Allowing the plant to have at least one good day with sunshine to acclimate to the new conditions will go a long ways toward the success of a defoliation program.

When to Start

There are several ways to determine when to treat cotton with a harvest aid product. An old rule of thumb is to defoliate when 60 percent of the bolls are open. Another method involves counting the nodes above the uppermost first position cracked boll (NACB) and the uppermost first position harvestable boll. When NACB values average four or less, the fields can be defoliated without significant weight or quality loss. Both of these measures of maturity assume a typical level of plant senescence as bolls mature. In situations like this season where conditions for growth are still very favorable, plants don't senescence as rapidly as expected. As a result, the occurrence of boll opening slows while fiber development within the boll continues. Thus, estimating field maturity by evaluating % open bolls may underestimate actual maturity by as much as 10 days.

A heat unit concept of timing defoliation beyond the last effective boll population, or cutout as defined by COTMAN allows producers to make this decision with greater confidence. This procedure is much less subjective than other measures of maturity and often allows for an earlier harvest. Initial harvest aid timing of 850 HUs beyond cutout is recommended in Arkansas

(Fig. 1.).

This season, percent open boll indicators are not matching well with the maturity of bolls. This is the result of cooler temperatures, good soil moisture, and active plants. Perhaps the most reliable method of timing a harvest aid application this year is to slice open bolls with a knife to determine boll maturity. Mature bolls will be too hard to dent when squeezed and cannot be easily cut with a sharp knife. Lint will string out when a mature boll is sliced, seed coats will be dark or black in color, and cotyledons will be well formed (Fig. 2.). Harvest aids can be applied when seed coats in the uppermost harvestable boll start getting dark.

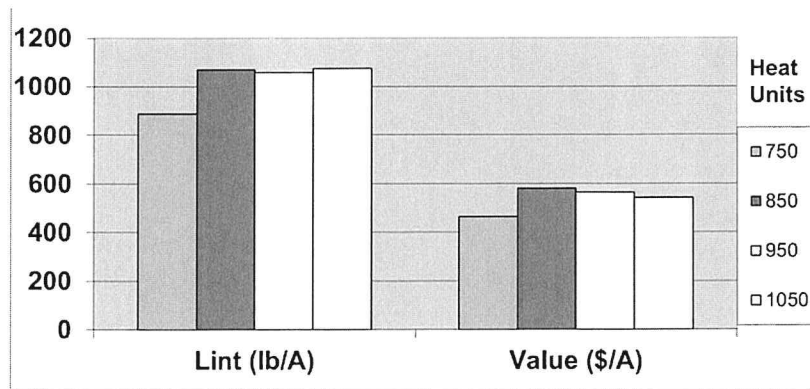


Figure 1. Results of multi-year on-farm large-plot studies to evaluate the impact of harvest aid timings based on heat units beyond cutout on lint yield and value of the lint. Weather events resulted in decreased fiber quality as harvest aid application was delayed.

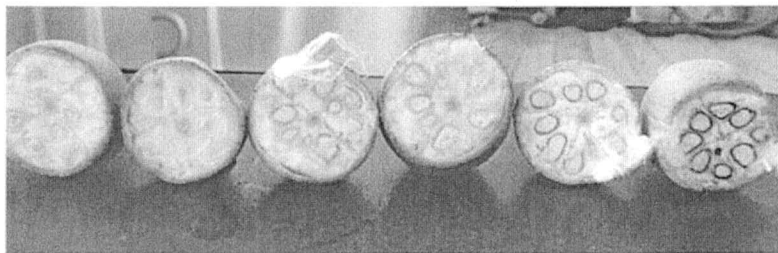


Figure 2. Boll slicing of first position bolls beginning with a mature cracked boll on the far right to the least mature boll in this image on the far left.

Timing of harvest aids can pose a difficult decision to growers since they are often encouraged to use at least two methods to determine maturity of the crop. However, to allow young immature bolls near the top of the plant to mature, producers are often tempted to delay defoliation applications. These last (upper) bolls can be misleading. Upper canopy bolls are often insect damaged, smaller, and account for little additional yield gains, but the perception of yielding more lint is difficult to overcome.

Application Techniques

Harvest aid products generally are not translocated in the plant, therefore coverage is a very important part of the process. Successful defoliation requires uniform canopy coverage. Total spray volumes of 5 to 7 gallons per acre by air or 10 to 15 gallons per acre by ground are typical recommendations to ensure good coverage. Coverage also depends on speed of applicator, spray droplet size, atmospheric conditions and the canopy density. Generally, smaller spray droplets provide better coverage and canopy penetration but are more likely to drift in windy conditions or evaporation in high-temperature, low-humidity conditions. Larger spray droplets experience

less drift and evaporation, but provide poor coverage and canopy penetration. A balance must be struck to ensure product delivery to the target while maintaining desired coverage.

A demonstration conducted by Jason Davis to investigate the interaction of ground application speed, spray volume, and droplet size has provided some useful information. At a speed of 13 mph, coverage and efficacy of products were enhanced using 15 GPA as opposed to 10 GPA as expected. However, the use of a coarse to very coarse spray droplet tended to negate these differences and outperformed the medium or ultra-coarse droplet size at both application volumes. If demands on the ground applicator require a decrease from 15 GPA to 10 GPA, the proper tip and pressure to deliver a coarse to very coarse spray droplet is critical to achieve the desired results

In another demonstration also conducted by Jason Davis using the producer sprayer fitted with 4 different spray tips operated at the same pressure (40 psi), apparent coverage was doubled for all treatments when spray volume was increase from 10 GPA (15 mph) to 15 GPA (10 mph) and boom height was lowered from 4 to 5 foot above the canopy to the recommended height of 20 inches above the canopy. Using best management practices with regard to application techniques can have a bigger impact on coverage than many think.

Applicators can identify optimal pressure ranges to target droplet sizes by clicking on their nozzle manufacture's link- [Teejet](#), [Hypro](#), [Wilger](#), [Greenleaf](#), and [Deere](#). Nozzle specific pressure and droplet information can also be provided by contacting Jason Davis, U of A Application Technologist at (501) 749-2077.

Environmental Conditions

This time of year, it is important to pay close attention to the weather ahead of and three days after making defoliant applications. Reduced effectiveness of the thidiazuron products (Dropp, FreeFall) are likely if rain occurs within 24 hours of application. The variance in temperature can play a big role in efficacy of products. When nighttime low temperatures drop below 65 degrees, products containing thidiazuron will be less effective and much slower acting than when temperatures are in the upper 60's or 70's. When temperatures decrease to below 55 degrees, Folex becomes less effective. With the recent rains across the state there may be a good chance that we could see some re-growth in some fields. Thidiazuron products provide the best re-growth protection and can provide a little time if rains set in and harvest is delayed. In cooler temperature situations, adding Folex with the thidiazuron plus ethephon (three-way mix) will increase effectiveness of all products. Because the effectiveness of herbicide defoliants such as ET is not reduced under cooler conditions, their use will become an even better option to replace Folex in the second application when temperatures cool down. These products are also good options to address weed desiccation and to remove re-growth before harvest.

Product Selection

The standards that many start out with on the first application include a mixture of Folex, thidiazuron (Dropp, FreeFall, others) plus ethephon (Prep, Ethephon 6, others). The rates of Folex begin at 1 gallon to 20 acres (1:20), thidiazuron to start with when temperatures are high range from 1:60 to 1:45 (depending on needed regrowth protection) plus ethephon at 1:24. The second application will contain a boll opening rate of ethephon at 1:3.4, which uses up all of the season long use rate for ethephon, Folex at 1:20 to 1:16 depending on temperature. ET at 1.5

oz/A plus NIS or COC depending on temperatures is often substituted for Folex on the second application and should be used if desiccation of morning glories is necessary. Keep in mind as temperatures cool, rates and eventually products of choice will have to be adjusted. Always read and following label instructions.

For more information regarding products and tank mixtures in various scenarios, a very comprehensive defoliation program select guide is included in the 2018 Mid-South Cotton Defoliation Guide.

Few Critical Areas to Think About Ahead of the 2020 Cotton Crop

Cotton will be coming out of the field soon and we will be starting for square one for next year. Beginning with fertilize or cover crops. Some areas that could be thought about and discussed to possibly make 2020 better than 2019.

Did I soil sample properly and follow recommended rates?

Did I pick the right variety for this field?

Did I irrigate in a timely manner?

Did I sample for nematodes at the right time? (Fall is the best time)

Did I monitor and control insects according to recommendations?

Did I monitor and control diseases according to recommendations?

All of these questions are good to ask before going into next season. Poinsett County Extension office has helpful handouts that can assist you throughout the year.

MP44- Recommended Chemicals for weed and brush control

MP144- Insecticide recommendations for Arkansas

MP154- Arkansas Plant Disease Control Products Guide

2019 Cotton Quick Fact Sheets gives a quick look at what you could possibly run in to through the year. From Variety Selection, fertility, plant growth and development, weed management, Insect management, Disease and nematode management, irrigation management, and lastly harvest aid.

Sincerely,



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