

DEFOLIATION BASED ON HEAT UNITS BEYOND CUT-OUT ON LATE MATURING COTTON

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Abstract

Timing of harvest aids continues to be a difficult decision for producers. Producers and crop advisors often are tempted to wait as long as possible on young immature bolls in the top of the plant before making the decision to defoliate. These bolls are often insect damaged, small, and account for little additional gain, but the perception of additional harvestable lint is difficult to overcome. The objective of this study was to validate the heat unit (HU) concept of timing defoliation beyond the last effective boll population as defined by COTMAN to allow producers to make this decision with greater confidence and allow for an earlier harvest. The 850 HU timing beyond cutout allowed the crop to be terminated earlier, without yield loss, and with greater economic returns than conventional harvest aid timings.

Introduction

Traditional timings for defoliation include four or less nodes above cracked boll (NACB) and open bolls at 60% to 65% (Robertson, 2000). The crop status at the different timings indicates this to occur near 950 HU after physiological cutout (NAWF=5)(Table1). However, in practice grower standards tend to approximate 1050 HU. A heat unit based system to identify harvest aid timings based on the last effective boll population would be less subjective and allow for an earlier harvest.

Materials and Methods

The defoliation timing study was conducted over three consecutive years with locations in Northeast, Central, and Southeast Arkansas. Replicated strips ran the length of the field and standard defoliation treatments were used at all locations. Dropp (0.1 lb prod./acre) + Def (0.5 pt prod./acre) + Ethephon (5.3 oz prod./acre) followed by Ethephon (1 qt prod./acre) + Def (0.67 pt prod./acre) was used at each location and timing. Defoliation timings were scheduled on 750, 850, 950, and 1050 HU beyond cutout. The replicated strips were harvested with the producers picker as each treatment became ready for harvest as weather allowed. Lint fraction, fiber quality, and loan values were determined from large samples, which were processed through a 20 saw gin with one lint cleaner. Loan values were calculated from HVI analysis. Value per acre was calculated by multiplying pounds of lint produced by the calculated loan value.

Results

Average delays in defoliation from a timing of 850 HU to a standard of 1050 HU is approximately 13 days. This time delay is often enhanced in comparing harvest dates. Yield penalties and reduced loan values are consistently observed with defoliation timings prior to 850 HU. Yields generally plateau between 850 and 1050 HU. Harvest losses due to rainfall events are primarily responsible for the yield plateau. Loan values were greatest at the 850 HU timing. Defoliation at 850 HU resulted in numerically greatest returns per acre (Figure 1). Impact of the earlier defoliation on reducing micronaire of our most common cultivars grown, and the quality deterioration as a result of weathering with delayed harvest dates in a wet environment, can result in greater value (pounds lint X loan price) generated per acre.

Summary

Defoliation timing based on heat units beyond cutout is an effective and easy way of determining the most economical time to terminate the crop without suffering from yield loss and or discountable fiber qualities. The 850 HU timing allowed the crop to be terminated earlier and without yield loss in the study on the most widely planted cultivars we grow across Arkansas at this time. It is important to remember that as cultivars we grow change especially with regard to maturity and fiber quality packages that these timings could likely change as well.

Literature Cited

Robertson, W. 2000. Cotton harvest aids. University of Arkansas Cooperative Extension Service, AG592-9-00

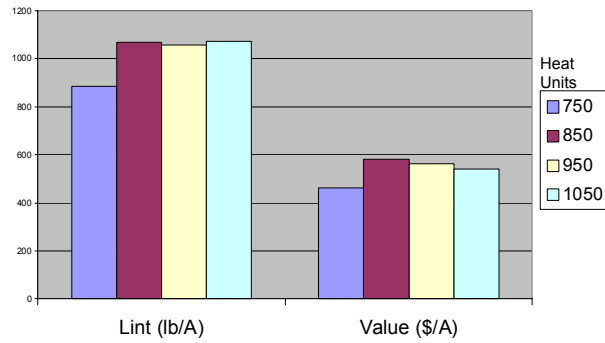


Figure 1. Lint yield and value of crop/A with harvest aid programs initiated at various heat units beyond cutout (2001-2003).

Table 1. Percent open bolls and NACB at various heat units beyond cutout (2001-2003).

Variable	Heat Units Beyond Cutout			
	750	850	950	1050
Percent open bolls	27	43	57	70
NACB	5+	4.5	3.3	2