

**UNIFORM HARVEST AID PERFORMANCE
AND FIBER QUALITY EVALUATION
A JOINT PROJECT OF THE COTTON
DEFOLIATION WORK GROUP COMMITTEE**

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Abstract

Successful cotton harvest practices are largely dependent upon the use of harvest aid chemicals. Application of harvest aid materials terminates crop development and facilitates harvest scheduling. While harvest aids are advantageous to the producer, very little uniform information is available about the ultimate effect of these materials on fiber quality. In light of premiums and discounts for fiber quality brought about by the introduction of High Volume Instrumentation (HVI), proper choice of harvest aid chemicals is of paramount importance. Additionally, crop responses after application of these materials are often inconsistent. Improper choice of harvest aid material or harvest aid failure confounds the impact of the treatment on fiber quality. A coordinated uniform effort across the cotton belt is needed to define the most appropriate conditions for ideal defoliation and crop termination.

The overall objective of this uniform beltwide project is to develop effective, contemporary harvest aid recommendations that contribute to harvest efficiency and high quality fiber; specifically by evaluating performance of standard defoliation treatments on a uniform basis and relating performance to biotic and environmental factors.

Members of the Cotton Defoliation Work Group Committee who are conducting the field trials are:

SOUTHWEST

Texas (stripper) – J.W. Keeling

Texas (spindle) – J.T. Cothren

Texas (stripper) – J.R. Supak

Texas (spindle) – J.E. Bremer

Oklahoma (stripper) – J.C. Banks

MIDSOUTH

Arkansas – C.B. Guy

Louisiana – D.B. Reynolds

Mississippi – C.E. Snipes

Missouri – G. Stevens

Tennessee – R.M. Hayes & O. Gwathmey

SOUTHEAST

Alabama – M.G. Patterson

Georgia – E.F. Eastin

N. Carolina – K.L. Edmisten

S. Carolina – K.E. Lege

Florida – B.J. Brecke

B. A. Roberts represents California in a West region.

There are seven core treatments applied beltwide which are as follows:

- 1.) Untreated
- 2.) Folex/Def (1.5 pts/A)
- 3.) Dropp 50WP (0.2 lb/A)
- 4.) Harvade + Crop Oil Concentrate (8 oz/A + 1 pt/A)
- 5.) Harvade + Prep + Crop Oil Concentrate (6.5 oz/A + 1.33 pt + 1 pt/A)
- 6.) Folex/Def + Prep (0.75 pt/A + 1.33 pt/A)
- 7.) Dropp + Prep (0.1 lb/A + 1.33 pt/A)

Additionally, at least five treatments with specific applications in the separate regions are selected and applied regionally. This results in 12 treatments applied on a uniform basis in each of the four regions. All treatments are initiated at 55% ±5% open bolls.

Standardized evaluation data recorded by each participant includes: PERFORMANCE INDEX at 7 and 14 days after treatment (DAT) defined as the evaluator's overall impression of the treatment on a relative scale of 0 to 100 where 0 equals unacceptable or poor performance and 100 equals completely acceptable or excellent performance. PERCENT DEFOLIATION at 7 and 14 DAT which is defined as the percentage of leaves present at time of application that were removed by treatment on a scale of 0 to 100. PERCENT DESICCATION at 7 and 14 DAT which is defined as the percentage of the total leaf number remaining on the plant that are desiccated as a result of the treatment on a relative scale of 0 to 100 where 0 equals no remaining desiccated leaves and 100 equals all leaves desiccated and remaining on the plant. REGROWTH at 21-28 DAT is determined by counts along a 1-m row section of plants with terminal regrowth resulting in leaves larger than 10 mm in size. The number of plants with basal regrowth larger than 10 mm is also determined. PERCENT OPEN BOLLS at 7 and 14 DAT is estimated by actual counts made in a 1-m row and SEED COTTON YIELD is determined by machine harvesting at 14±2 DAT.

Standard agronomic practices such as variety, planting date, fertilizer use, etc., are recorded for each test site. Production practices specific to the site, % open at time of application, node number of highest harvestable boll expected to be harvested, and node number of cracked boll at time of application are among other items recorded for each site.

At harvest, seed cotton samples are collected by plot for all treatments and shipped to Dr. John R. Gannaway of the Texas A&M Research and Extension Center in Lubbock, TX, for ginning. Lint collected from ginned samples are used for HVI analyses. Additionally, all remaining seed cotton for each core treatment is collected for use in fabric tests. These larger samples are ginned at the USDA Ginning Facility by Stanley Anthony of the USDA/ARS Cotton Ginning Laboratory in Stoneville, MS, and shipped to Dr. Ken Bragg, USDA/ARS Cotton Quality Research Station in Clemson, SC. Tests conducted on these samples include white spec count in dyed fabric.

Preliminary field data indicates that two defoliant applied in combination provide better results than either applied alone. Fiber analysis data indicate that defoliants, when applied properly, do not adversely affect fiber quality. Further, differences in year or location accounted for variations in fiber quality more so than any defoliant treatment evaluated.

The project was initiated in 1992 and is planned to be a 5-year project. Funding in 1992 was provided by the National Cotton Council. All funding subsequent to 1992 will be provided by Cotton Incorporated, the fiber company of American cotton producers. The Cotton Defoliation Work Group Committee appreciates the support of the National Cotton Council and Cotton Incorporated.