

PERFORMANCE OF HARVEST AID PROGRAMS IN DIFFERENT COTTON CULTIVARS**L. X. Franca****D. M. Dodds****M. T. Plumblee****D. B. Denton****C. A. Samples****Mississippi State University****Starkville, MS****B. Blanche****Dow AgroSciences****St. Joseph, LA****Abstract**

Cotton was planted on 3.6 million hectares in the United States in 2015. Mississippi was responsible for 3.5% of the total hectares and produced an average lint yield of 1144 kg/ha. Cotton is a perennial crop with indeterminate growth managed as an annual crop. Therefore, cotton is forced to mature, which is used by harvest aids. Every year questions arise from farmers regarding when to defoliate and what products and rates to use.

An experiment was conducted in Starkville, MS to evaluate defoliation response of two different cotton varieties in order to optimize fiber properties. Two varieties, PHY 444 WRF and PHY 499 WRF, were planted on May 5th and harvested in November 4th at the R. R. Foil Plant Science Research Center in Starkville, MS. Plot size was 3.8 m x 12.2 m and the experiment was conducted in a randomized complete block design with 4 replications. Treatments consisted of four harvest aid programs as follows: moderate one-application (thidiazuron at 0.15 kg/ha + tribufos at 0.22 kg/ha + ethephon at 1.47 kg/ha); aggressive one-application (thidiazuron at 0.18 kg/ha + tribufos at 0.37 kg/ha + ethephon at 2.24 kg/ha); moderate two-applications (thidiazuron at 0.15 kg/ha + tribufos at 0.22 kg/ha + ethephon at 1.47 kg/ha followed by carfentrazone at 0.07 kg/ha + COC at 1.34 kg/ha + ethephon at 1.47 kg/ha); and aggressive two-applications (thidiazuron at 0.21 kg/ha + carfentrazone at 0.07 kg/ha + COC at 1.34 kg/ha + ethephon at 1.47 kg/ha followed by pyraflufen-ethyl at 1.47 kg/ha + NIS at 0.34 kg/ha + ethephon at 2.24 kg/ha). Data collection consisted of percent of defoliation, percent of green, percent of desiccation, percent of open bolls, turnout, lint yield, and fiber properties collected at 7 and 14 days after each application. Data were subjected to analysis of variance using PROC Mixed procedure in SAS 9.4 and means were separated using Fishers protected LSD at $p = 0.05$.

Harvest aid programs with two applications (moderate and aggressive) provided significantly greater defoliation compared to the one application program. The aggressive harvest aid program with two applications also had significantly less percent of green leaves and greater percent of open bolls at 7 days after the initial application; however, at 14 days after the initial one + 7 days after the final application no significant differences were observed across treatments. Lint yield and turnout did not differ significantly for all treatments in both varieties. The treatments used had no significant differences in lint micronaire, length, and strength in PHY 444 WRF. Nevertheless, harvest aid programs with two applications resulted in significantly greater lint strength in PHY 499 WRF. The adoption of harvest aid programs with two applications are effective for cotton termination.