

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

In 2017, 5.1 million hectares were planted to cotton in the United States. Upland and American Pima cotton were cultivated in 97.6% and 2.4% of total area, respectively. In Mississippi, 252,875 hectares were planted to cotton, which represents an increase of 45.3% compared to 2016. Cotton is a perennial crop with indeterminate growth which is managed as an annual. Therefore, crop termination through chemical defoliation is a key process in preparing cotton for harvest. Questions arise continually regarding harvest aid application timing, products, and rates for optimal defoliation.

An experiment was conducted at the R. R. Foil Plant Research Center in Starkville, MS to evaluate the response of six cotton cultivars to three harvest aid programs. Six varieties, PHY 490 W3FE, PHY 444 WRF, PX4A52 W3FE, PX4A54 W3FE, PX4A57 W3FE, and PX4A62 W3FE were planted on 05 May at a population of 111,200 plant ha⁻¹ and harvested on 26 October. Plots consisted of four 97 cm rows that were 12.2 m in length. Treatments consisted of three harvest aid programs as follows: moderate single product mixture [Ethephon (Ethephon 6 L, Arysta Lifescience North America LLC, Cary, NC 27513) at 1.17 L ha⁻¹ plus Thidiazuron (Thidiazuron 4 SC, Arysta Lifescience North America LLC, Cary, NC 27513) at 0.11 L ha⁻¹ plus S,S,S-Tributyl phosphorotrithioate (Folex[®] 6 EC, AMVAC Chemical Corporation, Los Angeles, CA 90023) at 0.29 L ha⁻¹]; aggressive single product mixture which included ethephon at 2.33 L ha⁻¹ + thidiazuron at 0.18 L ha⁻¹ + Folex at 0.58 L ha⁻¹]; and moderate-premix which included thidiazuron at 0.46 L ha⁻¹ + Ethephon + Cyclanilide (Finish[®] 6 Pro, Bayer CropScience LP, Research Triangle Park, NC 27709) at 1.75 L ha⁻¹. Harvest aid application was made at 60% open bolls on 25 September. Data collection consisted of percent defoliation, percent desiccation, percent green leaves, percent open bolls, percent turnout, and lint yield. Data were subjected to ANOVA using PROC MIXED procedure in SAS[®] Software v. 9.4 and means were separated using Fisher's Protected LSD at $\alpha=0.05$.

Aggressive single product mixture and moderate-premix harvest aid programs provided significantly greater defoliation compared to moderate single product mixture. Moreover, aggressive single product mixture and moderate-premix harvest aids resulted in significantly less percent green leaves. Percent open bolls was significantly greater following aggressive harvest aid rates of Ethephon + Thidiazuron + S,S,S-Tributyl phosphorotrithioate and Thidiazuron + Ethephon. Nevertheless, lint yield and turnout did not differ across harvest aid programs. PX4A57 W3FE significantly provided the greatest level of turnout. In addition, PHY 444 WRF and PX4A54 W3FE had greater lint yield compared to PHY 490 W3FE and PX4A62 W3FE.