INFLUENCE OF HARVEST AID STRATEGY ON FIBER QUALITY IN THE OKLAHOMA PANHANDLE

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Abstract

Cotton producers in northern areas of the southwestern Cotton Belt must contend with short season lengths and unfavorable weather, specifically in the late season periods when harvest aid applications occur. This is particularly true in the panhandle of Oklahoma, where heat unit accumulation typically plummets by mid-September and the average first freeze occurs by mid- to late October. Prior to stripper harvest in this area producers often must decide whether to attempt to defoliate or desiccate their crop, along with opening bolls, under temperatures too low for optimal harvest aid activity. The objectives of this study were to evaluate various harvest aid mixtures for defoliation and boll opening success. While fiber quality is the primary objective, classing data was not available at the time of the conference.

A large plot trial was conducted at the Oklahoma State Panhandle Research and Extension Center in Goodwell, OK in 2019. A comparison of two treatments was made at this location, consisting of a) 8 oz acre^{-1} tribufos and 32 oz acre^{-1} ethephon and; b) 1 oz acre^{-1} carfentrazone-ethyl, 32 oz acre^{-1} ethephon, and 0.25% v/v non-ionic surfactant. Visual observations of defoliation and boll opening were taken at harvest. An additional small plot trial was also conducted in 2019 to evaluate additional treatments. This trial was located at the Caddo Research Station in Fort Cobb, OK. Treatments at this site included a) 8 oz acre^{-1} thidiazuron+diuron and 32 oz acre^{-1} ethephon (thidiazuron); b) 16 oz acre^{-1} tribufos and 32 oz acre^{-1} ethephon (tribufos); c) 1.6 oz acre^{-1} carfentrazone-ethyl, 32 oz acre^{-1} ethephon, and 1% v/v crop oil concentrate (carfentrazone-ethyl) and; d) a non-treated control. Ratings defoliation and boll opening were taken at 7, 13, and 35 (day of harvest) days after application (DAA). At Goodwell applications were made 4 days prior to a killing freeze event, while a killing freeze occurred in Fort Cobb at 8 DAA.

At the Goodwell location, tribufos resulted in greater defoliation than carfentrazone-ethyl, even in the short time period in which the products have activity prior to the killing freeze. This observation was reinforced by the data collected in the small plot replicated trial at Fort Cobb. At Fort Cobb there was no difference observed between any of the harvest aid treatments regarding boll opening activity, as all resulted in greater than 90% open bolls by 7 DAA, all of which were greater than the NTC. This is likely due to all three treatments that applied harvest aid products consisted of the same 32 oz acre^{-1} rate of ethephon. However, like the observations at Goodwell, both the thidiazuron and tribufos treatments produced greater defoliation at 7, 13, and 35 DAA than carfentrazone-ethyl, which had greater defoliation ratings than the NTC at 7 and 13 DAA. From this research it appears that even in short windows of time prior to killing freezes, products such as tribufos and thidiazuron are better options for defoliation and don't sacrifice boll opening activity compared to carfentrazone-ethyl. Further, the killing freeze appropriately desiccated the crops in both locations for stripper harvest, although this may not occur every season. The inclusion of additional harvest aid products in the PPO chemical family in future harvest aid studies would provide a clearer picture of the fit for this classification of defoliants in this region.