IMPACT OF NITROGEN FERTILIZER AND IRRIGATION ON COTTON (*GOSSYPIUM HIRSUTUM*) DEFOLIATION

Bradley Norris
Darrin Dodds
Lucas Xavier Franca
Jacob P. McNeal
Savanna Davis
John J. Williams
Mississippi State University
Mississippi State, MS

An experiment was conducted to evaluate the effect of irrigation timing and multiple nitrogen fertilizer application rates on cotton defoliation. Maximizing harvest aid performance is essential in order to prevent excessive cost and minimize detrimental effects on leaf grade and fiber quality parameters. Many irrigation and nitrogen fertilizer rates are employed throughout the Mid-South; therefore, research was conducted to evaluate the effect on nitrogen fertilizer application rate, furrow irrigation, and variety on cotton harvest aid performance.

Experiments were conducted in 2018 at the R.R. Foil Plant Science Research Center near Starkville, MS. Treatments were arranged as a factorial arrangement of treatments within a randomized complete block design. Harvest aid applications consisted of: 0.06 kg ai ha^{-1} thidiazuron + 1.1 kg ai ha^{-1} ethephon at 60% open boll followed by 0.0027 kg ai ha^{-1} pyraflufen-ethyl + NIS @ 0.25% v/v + 1.1 kg ai ha^{-1} ethephon. Three different nitrogen fertilizer rates (0 kg N ha^{-1}, 90 kg N ha^{-1}, 179 kg N ha^{-1}) were each applied to DP 1646 B2XF, ST 4949GLT, and PHY 340 W3FE. After the first harvest aid application, visual defoliation ratings were taken at 3 DAT, 7 DAT, and 10 DAT. Following the harvest aid application, we also collected defoliation ratings at 3 DAT and 7 DAT.

At 10 DAT, cotton receiving no nitrogen fertilizer resulted in the greatest harvest aid performance (50%). However, cotton to which nitrogen fertilizer application rates of 179 kg N ha^{-1} was applied resulted in 30% defoliation 10 DAT. Irrigation and varietal selection had minimal impact on defoliation when pooled over nitrogen fertilizer application rates. Seed cotton yields were maximized when nitrogen fertilizer rates of 90 kg ha^{-1} were used with DP 1646 B2XF.