EFFECT OF NITROGEN FERTILZIER RATES ON COTTON (*GOSSYPIUM HIRSUTUM*) VARIETY PERFORMANCE

John J. Williams
Darrin M. Dodds
Lucas X. Franca
Jacob P. McNeal
Savana Davis
Bradley Norris
Mississippi State University
Mississippi State, MS
Tom Eubank
Phytogen Cottonseed
Greenville, MS

Abstract

Excessive nitrogen fertilizer applications can either limit yield or cause undesired vegetative growth. Therefore, pairing cotton varieties with proper nitrogen fertilizer rates is critical. The objective of this study was to evaluate the cotton growth and development and lint yield effects of nitrogen fertilizer on cotton. The effect of four nitrogen fertilizer rates (0, 67, 134, 202 kg N ha^{-1}) and five Phytogen® varieties (PHY 350 W3FE, PHY 480 W3FE, PHY 3B09 W3FE, PHY 3C06 W3FE, and PHY 4A69 W3FE) were investigated on a Marietta fine sandy loam near Starkville, MS Experimental units were arranged in a randomized complete block design with four replications and was planted on 24 May 2018 at 111,000 seed ha^{-1}. Each experimental unit consisted of four rows that were 12.2 m long on 97 cm raised beds. All data were analyzed with PROC GLM in SAS v. 9.4 with means separated using Fisher's LSD at $\alpha = 0.05$. These data indicate that plant height and total main stem nodes at 60% open boll and were greater with each increase in nitrogen fertilizer rate. Nodes above cracked boll (NACB) was greatest when nitrogen fertilizer was applied at 134 and 202 kg N ha^{-1}. First fruiting branch was lower in plots that did not receive nitrogen fertilizer. PHY 4A69 W3FE matured later than all other varieties except for PHY 3B09 W3FE. PHY 3B09 W3FE and 3C06 W3FE produced the greatest lint yield. In conclusion, nitrogen fertilizer application rates greater than 67 kg ha^{-1}, regardless of cotton variety, did not increase lint yield and slightly delayed maturity. PHY 3B09 W3FE and PHY 3C06 W3FE generated the greatest lint yields. No interaction between nitrogen fertilizer rate and cotton variety was observed.