IMPACT OF NITROGEN APPLICATION RATE AND PLANT GROWTH REGULATOR APPLICATION ON DOUBLE-CROPPED COTTON T.H. Dixon D.M. Dodds J.D. Copeland D.Z. Reynolds C.A. Samples J.J. Varco Mississippi State University

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Abstract

This study was conducted to determine the effect of nitrogen application rate and plant growth regulator application strategy on cotton growth, development, and yield following wheat production. Given that double-cropped cotton following wheat production will be planted later than usual, managing for earliness is critical. Management factors that can have a direct impact on earliness include nitrogen application rate and plant growth regulator application. Optimizing nitrogen application rates is important in order to maximize yield without promoting excessive vegetative growth. Plant growth regulators are typically used to manage excess vegetative growth. With that in mind, this study was developed to determine the effect of nitrogen application rate and plant growth regulator application application on double-cropped cotton growth, development, and yield.

Studies were conducted in 2012 and 2013 at the R.R. Foil Plant Science Research Center near Starkville, MS and at the Black Belt Branch Experiment Station near Brooksville, MS as well as at the Delta Research Extension Center near Stoneville, MS during 2013. Soil type in Starkville was a Leeper silty clay loam whereas the soil type at Brooksville was a Brooksville silty clay and a Bosket very fine sandy loam in Stoneville. DP 0912 B2RF was planted at a seeding rate of 52,000 seeds per acre. Plots consisted of four – 38" rows that were 40 feet in length with the exception of Stoneville where the plots consisted of four – 40" rows that were 35 feet in length. Plots were replicated four times at each location. Nitrogen was applied as 32% UAN in a single application at pinhead square. Nitrogen application rates consisted of the following (lbs/acre): 0 (untreated), 30, 60, 90, and 120. Plant growth regulator applications (PGR) strategies were as follows: no PGR, a single mepiquat chloride application of 16 fl oz/acre at first bloom, and two mepiquat chloride applications with the first being 12 fl oz/acre applied at pinhead square followed by a second application of 16 fl oz/acre at first bloom. All data were subjected to analysis of variance and means were separated using Fisher's Protected LSD at p = 0.05.

Data from 2012 and 2013 indicates that nitrogen applied at rates greater than 30 lbs N/acre resulted in the most total nodes regardless of PGR application. However, across all nitrogen rates, plant heights were reduced by one or two PGR applications. Nitrogen application rates greater than 30 lbs N/acre delayed maturity; however, PGR applications tended to reduce this effect. Nitrogen application rates of 90lbs N/acre resulted in greatest seed cotton yield. Therefore, we conclude that increased nitrogen rates result in increased heights and total nodes as well as delay maturity; however, nitrogen applied at 90 lbs/acre also maximized yield. PGR application had no effect on seed cotton yield.