

COTTON CULTIVAR RESPONSE TO NITROGEN FERTILIZATION

Christopher L. Main
University of Tennessee
Jackson, TN
L. Tom Barber
University of Arkansas
Little Rock, AR
Darrin M. Dodds
Mississippi State University
Starkville, MS
S. R. Duncan
Kansas State University
Manhattan, KS
Keith L. Edmisten
North Carolina State University
Raleigh, NC
Michael A. Jones
Clemson University
Florence, SC
Jared R. Whitaker
University of Georgia
Statesboro, GA
Gaylon Morgan
Texas AgriLife Extension Service
College Station, TX
Shane Osborne
Oklahoma State University
Altus, OK
Randall K. Boman
Texas AgriLife Extension Service
Lubbock, TX
Randall Norton
University of Arizona
Safford, AZ
R. L. Nichols
Cotton Incorporated
Cary, NC

Abstract

Research was conducted at 11 locations across the cotton belt during 2009 and 2010 to investigate nitrogen use of cotton based on seed size (small seed >5500 seed per lb, medium seed 4400-5000 seed per lb, large seed <4400 seed per lb). Soil samples were collected from each site (either from each plot or by replication block) to a depth of 24 inches. Samples were divided into 0-6 inch and 6-18 inches subsamples for analysis nitrate analysis. Residual nitrate analysis indicated from 24-96 lbs of available nitrate in the 24 inch profile depending on soil type (sandy loam to clay loam) and environment (southeast, mid-south, and west). Nitrogen was applied at rates of 0, 40, 80, 120 lbs/ac as a factorial arrangement based on cultivar seed size for a total of 12 treatments. Plant height, total number of nodes and nodes above cracked boll (as a maturity measure) increase as nitrogen rate increased. Lint percent was not influenced as nitrogen rate increased. When pooled across all location lint yields increased when 40 or 80 lbs of nitrogen were applied, but did not increase with 120 lbs of nitrogen. When investigating locations with a significant nitrogen response, 100-175 of total available nitrogen (soil residual nitrate + applied nitrogen fertilizer) optimized cotton yield.