# IMPACT OF CULTIVAR VARIATION IN COTTON SEED CHARACTERISTICS AND NITROGEN APPLICATION RATE ON CROP DEVELOPMENT AND YIELD COMPONENT RESPONSES

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## Abstract

Seed and nitrogen application costs represent a substantial portion of the total cotton production budget. Fertilization rates are best utilized at a level that promotes crop development while diminishing excess nutrients that are hazardous for the environment and overall operational profitability. Cotton production goals are primarily focused on the yield of high quality lint. To obtain this goal, an understanding of the plant response to nitrogen application for a given cultivar is required. With new cultivars being commercially released at high rates, there is insufficient time for growers to familiarize themselves with the best management practices for each specific cultivar. Therefore, the need arises to quantify these cultivars by their seed physical and chemical characteristics and evaluate those factors for potential correlations to yield and nitrogen applications to better aid in initial management practices of future cultivars. The study created for this goal was executed in a 2.9 acre field at The University of Georgia Lang farm in Tifton, Georgia. It entailed the use of six cultivars with physically (mass) and chemically (oil and protein content) distinguishable seeds grown at six separate nitrogen application rates. Measurements included seedling vigor, growth, maturity, yield, yield components, and fiber quality. Because seed-associated proteins are the main sink for nitrogen in the cotton plant and because seed mass can strongly influence seedling vigor, it is expected that seed mass and protein content will influence cultivar responses to nitrogen.