

**PHYSIOLOGICAL AND AGRONOMIC RESPONSE TO N FERTILITY IN SOUTHERN GEORGIA IN A
LONG-TERM CONSERVATION TILLAGE SYSTEM**

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Abstract

The cotton crop is highly responsive to N fertility, especially on coarse-textured soils of the coastal plain, and established N recommendations exist for lint yield goals up to 1500 lb/acre in Georgia. However, the near constant release of improved, higher-yielding Upland cotton varieties necessitates a reevaluation of yield response to N fertility and of the underlying physiological processes that influence yield response to N management. Furthermore, information is even more limited on the physiological and agronomic responses of the cotton crop to N fertility when the crop is grown under long-term conservation tillage. The current study addressed the physiological and agronomic responses of cotton to N fertility rates of 0, 75, 94, 112, 131, and 150 lb N per acre in a long-term conservation tillage production environment in 2015 and 2016 in southern Georgia. Measurements included plant height, number of total mainstem nodes, nodes above white flower (NAWF), net photosynthesis, photosynthetic electron transport rate, chlorophyll content, and seedcotton yield. Physiological parameters such as photosynthetic responses and leaf chlorophyll content increased with higher rates of N fertility by the last sample date of the year in both growing seasons. Differences in seedcotton yield, NAWF, plant height, and total nodes were only observed between the 0 N rate treatment and all other N rate treatments. Specifically, N deficiency in the 0 N treatment decreased seedcotton yields, limited plant height, and hastened cutout relative to all other N rates.