

UPDATING NITROGEN RECOMMENDATIONS for Cotton in Florida



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Situation

UF/IFAS collaborating with the Florida Department of Agriculture and Consumer Services, has conducted one of a two-year project to develop improved nutrient management recommendations in conjunction with the Best Management Practices (BMPs) program. The current UF cotton nitrogen (N) rate of 60 lbs/acre was based on non-peer reviewed work from 1981 when average yield was 601 lbs/acre. In 2019 average yields were 930 lbs/acre, a 55% increase. BMP enrollment requires following UF recommendations, but 60 lbs/acre N constraint hinders participation.

Methods

A randomized complete block design with four replications and six N treatments (0, 45, 90, 135, 180 and 225 N/acre), allowed for destructive sampling. Nitrogen was broadcast as urea, and one location had lysimeters to quantify leaching. Fertility, aside from N, followed Mehlich-3 recommendations. Sampling included soil, plant tissue, petiole, and leachate. Crop development was recorded, data included stand establishment, NDVI, LAI, and yield.

Objectives

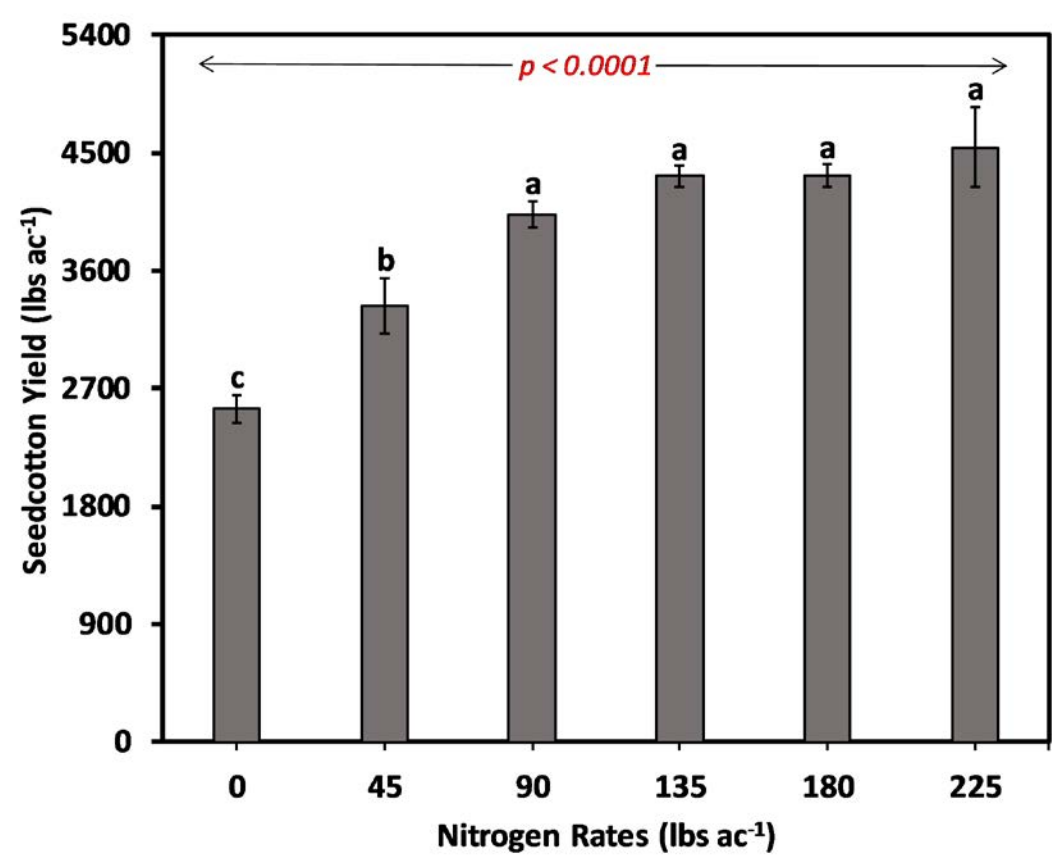
1. Provide justification of updated rates to achieve high yields without impacting water quality and
2. Quantify yield optimization and N leaching under different rates.



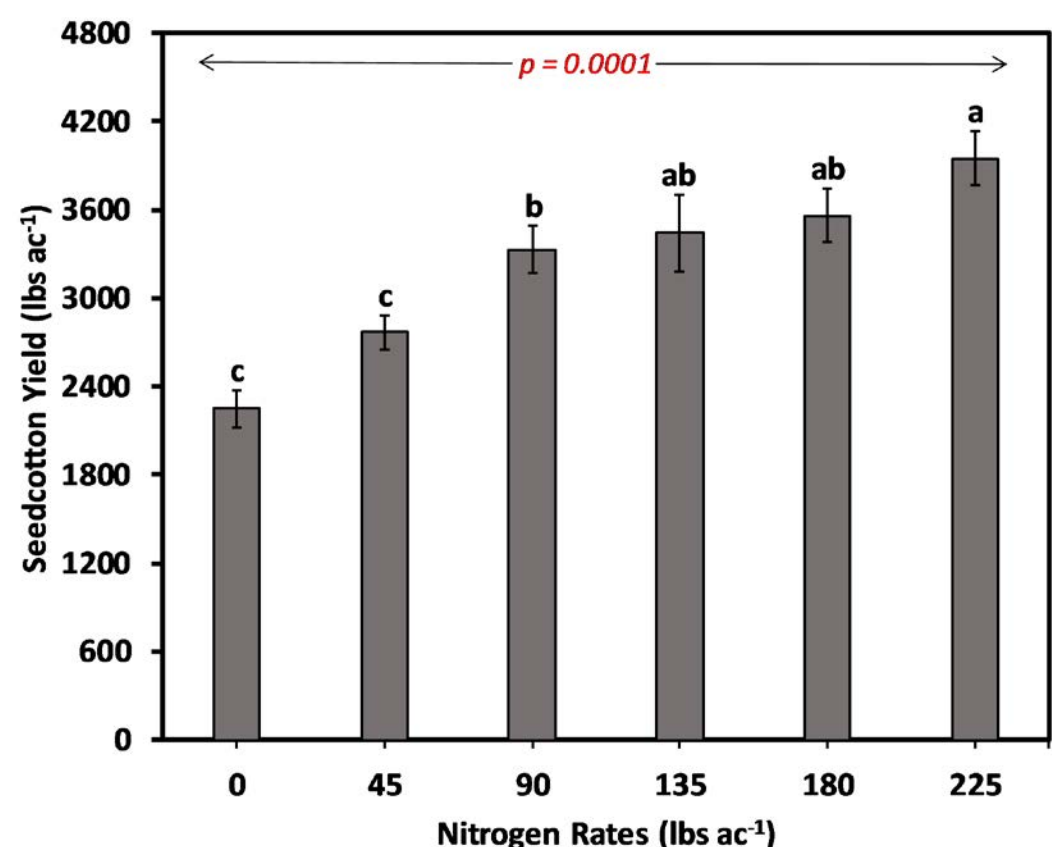
Results

These yields from year one establishes baseline data and the necessary foundation to begin the adjustment of the recommended UF/IFAS nitrogen rate in cotton. The current flat rate limit of 60 lbs/N is not sufficient with the current commercial varieties across most farm systems and soil types. This is corroborated by the yield tables from our two 2022 research station sites Jay (top) and Marianna (bottom). Each location found that nitrogen at a minimum of 90 lbs/A was statistically significant for best yields. Granted, these sites were on UF/IFAS research stations which have heavier soil types than much of the commercial farmland in the region. For 2023, the Marianna site will take place on two separate farms with sandier soil to determine if our year one results hold. Long term, we expect the UF/IFAS rate to be a range, based on farm practices (tillage type, cover cropping, livestock integration) and soil type. Other cotton nitrogen rate research is also being performed at UF evaluating nitrogen calibration strips in field, this complete body of work is integral for updating our states recommended nitrogen rate.

2022 Cotton Yields Jay



2022 Cotton Yield Marianna



Acknowledgements

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