

Cotton Production in an Integrated Crop-Livestock System in Mississippi

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Background

Integrated Crop-Livestock Systems (ICLS) allow for dual use of land using the outputs from one, as inputs for another. Combining cover crop grazing when the ground is not in crop production, can have positive effects on soil properties without negatively affecting subsequent crop yield. Cotton is a major cash crop in Mississippi. However, limited research has been done to evaluate the production of cotton in an ICLS in Mississippi.

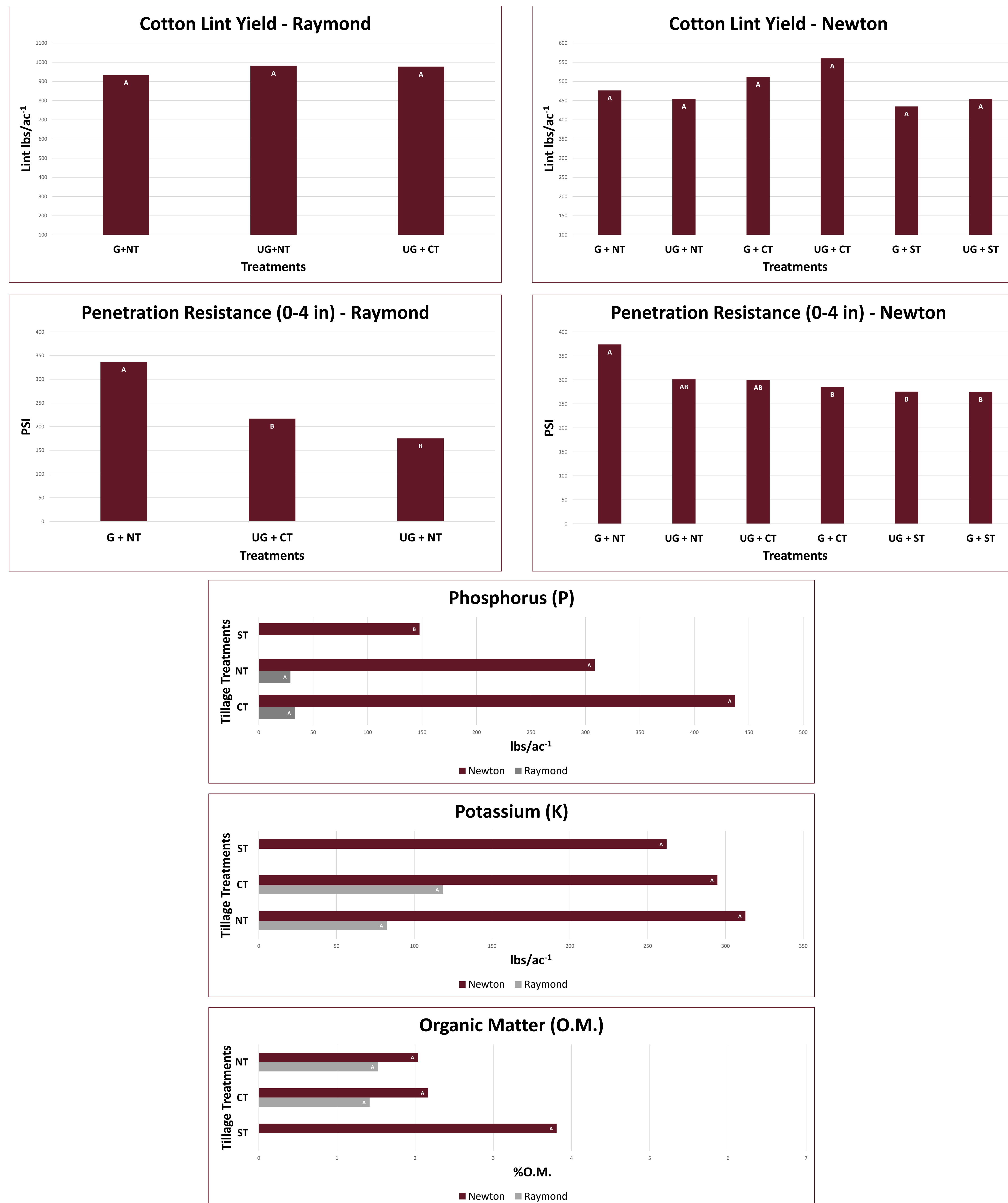
Objectives

- Determine the impact grazing and tillage systems have on cotton growth and yield
- Monitor the change in soil physical, chemical, and biological properties during each phase of production
- Assess the economic productivity of each phase of production

Methodology

The experiment was a randomized complete block design with three replications at both Raymond and Newton. Raymond treatments were grazed (G) + no-till (NT), ungrazed (UG) + NT, and ungrazed + conventional tillage (CT). Newton treatments were G+NT, G+CT, G+strip-till (ST), UG+NT, UG+CT, UG+ST. Both locations had a stocking density of 5,000lbs a. Cotton was planted at a target population of 38,000. Cereal rye was planted at 80lbs/a. Penetration resistance, soil samples, and volumetric water content samples were taken between each phase of production. Each plot was grazed for 7 days as forage mass permitted. Lint yield was determined from Mississippi State University's microgin. All soil amendments based on Waters Agricultural Laboratories, INC. TM

Results



Conclusions

- Raymond - Cotton lint yield was not statistically different between each treatment
- Newton – Cotton lint yield was not statistically different between any combination of grazing or tillage
- Raymond - Penetration resistance, post grazing, was statically different in the G+NT plots at a shallow depth (0-4 in)
- Newton – Penetration resistance, post grazing, was statistically greater in the shallow depth (0-4 in) in G+NT plots compared to all other plots
- Raymond – No significant difference in O.M., P, K, between each treatment
- Newton – O.M. and K had no significant difference between any combination of grazing or tillage
- Newton – P in CT plots was 30% greater than ST and 66% greater than NT

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