

Fertilizer Effects on Tifton 85 Bermudagrass Quantity and Quality

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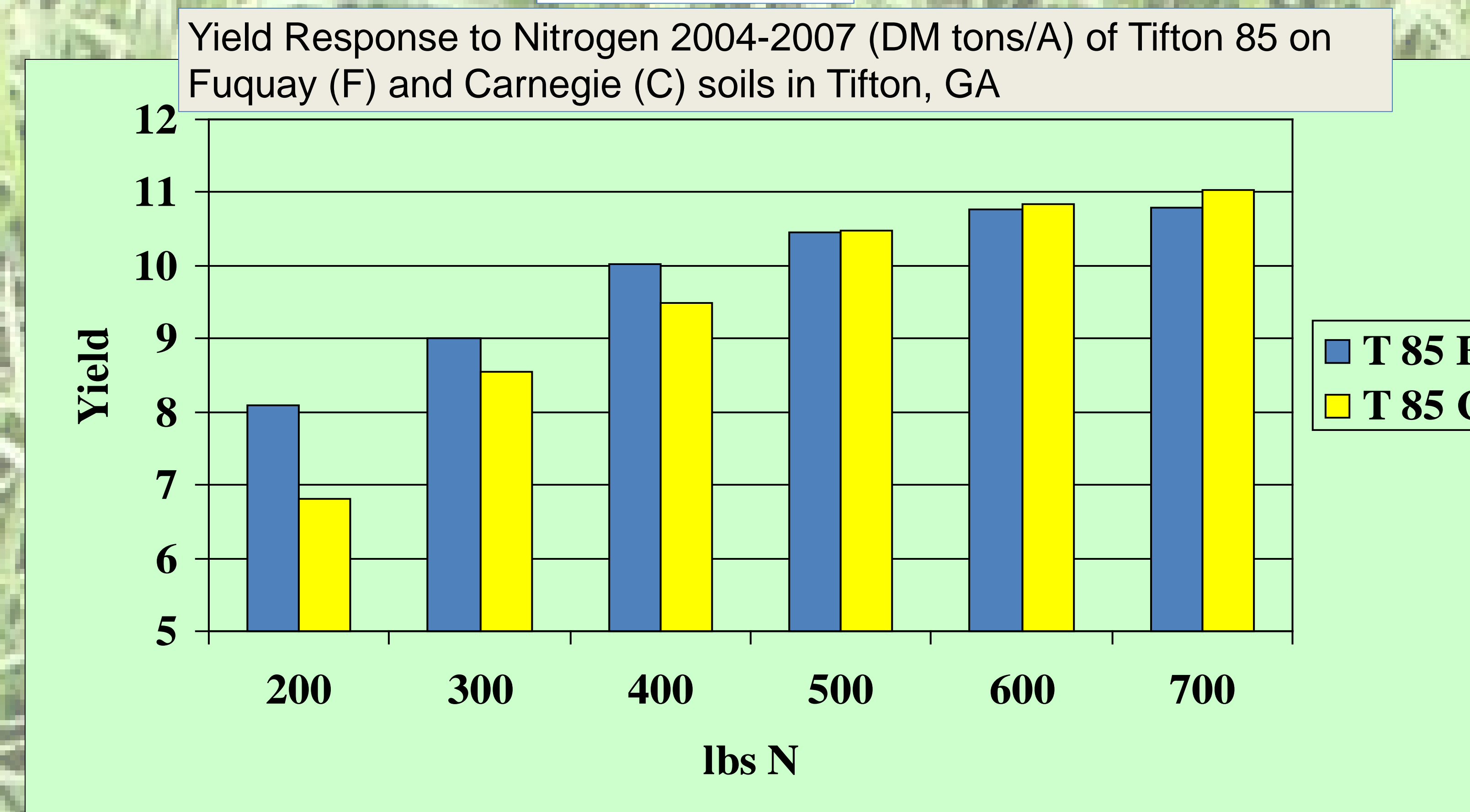


RESULTS

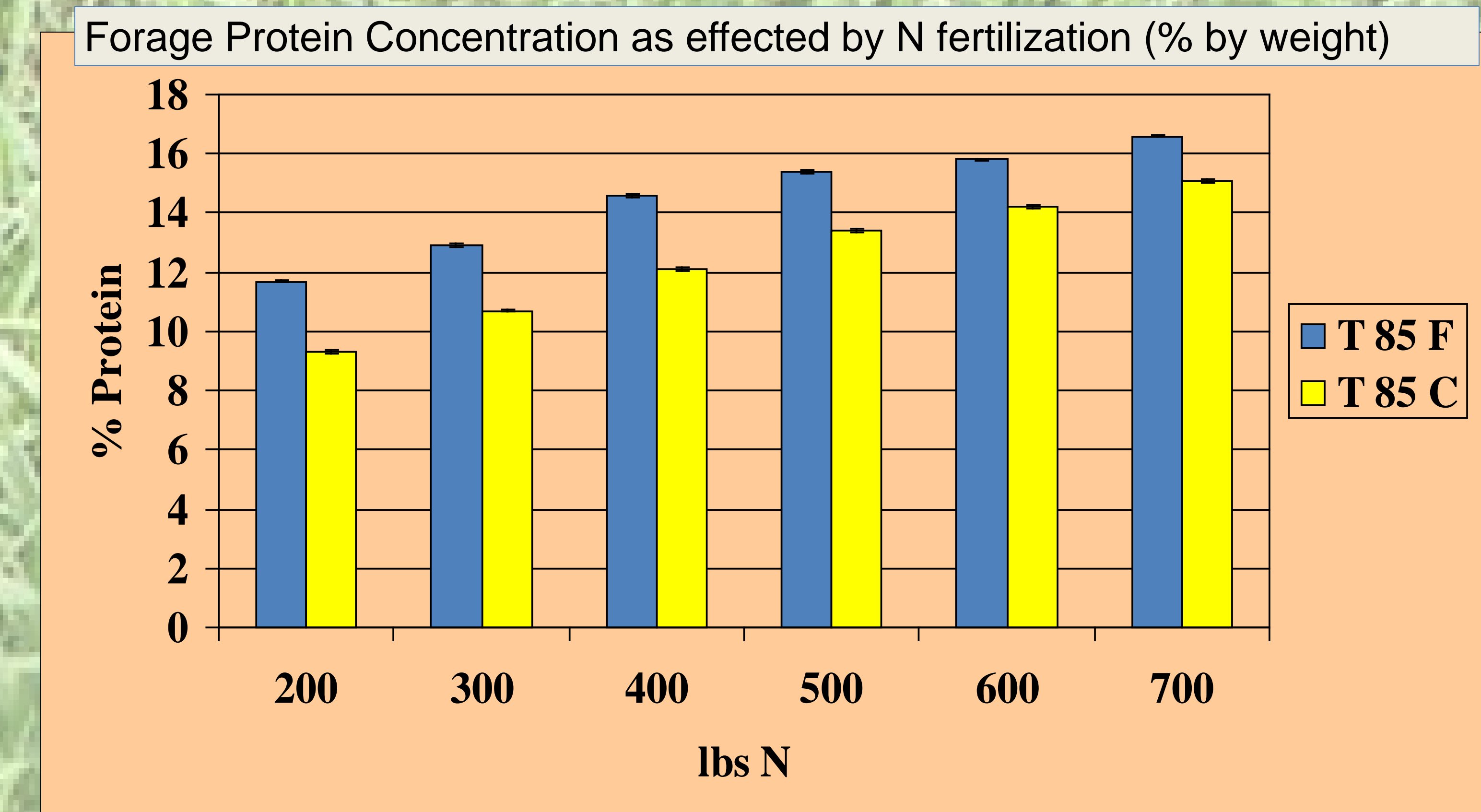
ABSTRACT

Bermudagrass is the primary perennial grass forage for Southern United States. Most fertilization recommendations for forage bermudagrass (*Cynodon dactylon* L.) are based on extensive research with 'Coastal' bermudagrass which is grown throughout the Southeastern United States since its release in 1943. 'Tifton 85', which is phenotypically quite different than Coastal, is now being grown on increasing acreage due to higher yields and better forage quality. A 4-year study was conducted at two sites for Tifton 85 to determine the effects of six nitrogen rates and three phosphorus/potassium levels on dry matter yields, nitrogen uptake and forage quality. N rates ranged from 200 to 700 lbs/acre. The three sub-plot treatments were P-K applications at 50%, 100%, and 150% of plant uptake. Plots were harvested at 5 week intervals over three years. Dry matter yields responded to nitrogen levels significantly in all years up to 400 lbs/acre, predominantly in the first and last of five clippings. Yield differences among P-K treatments were observed in only the third and fourth year of the study. There were no significant effects among N-P-K treatments on soil nitrogen or carbon; however, there were location effects on the upper 12 inches of soil which caused differential responses to nitrogen application between locations of Tifton 85. An improvement of digestibility occurred up to 500 lbs N/acre. A linear increase in IVDMD occurred with increased yield and with increased forage nitrogen.

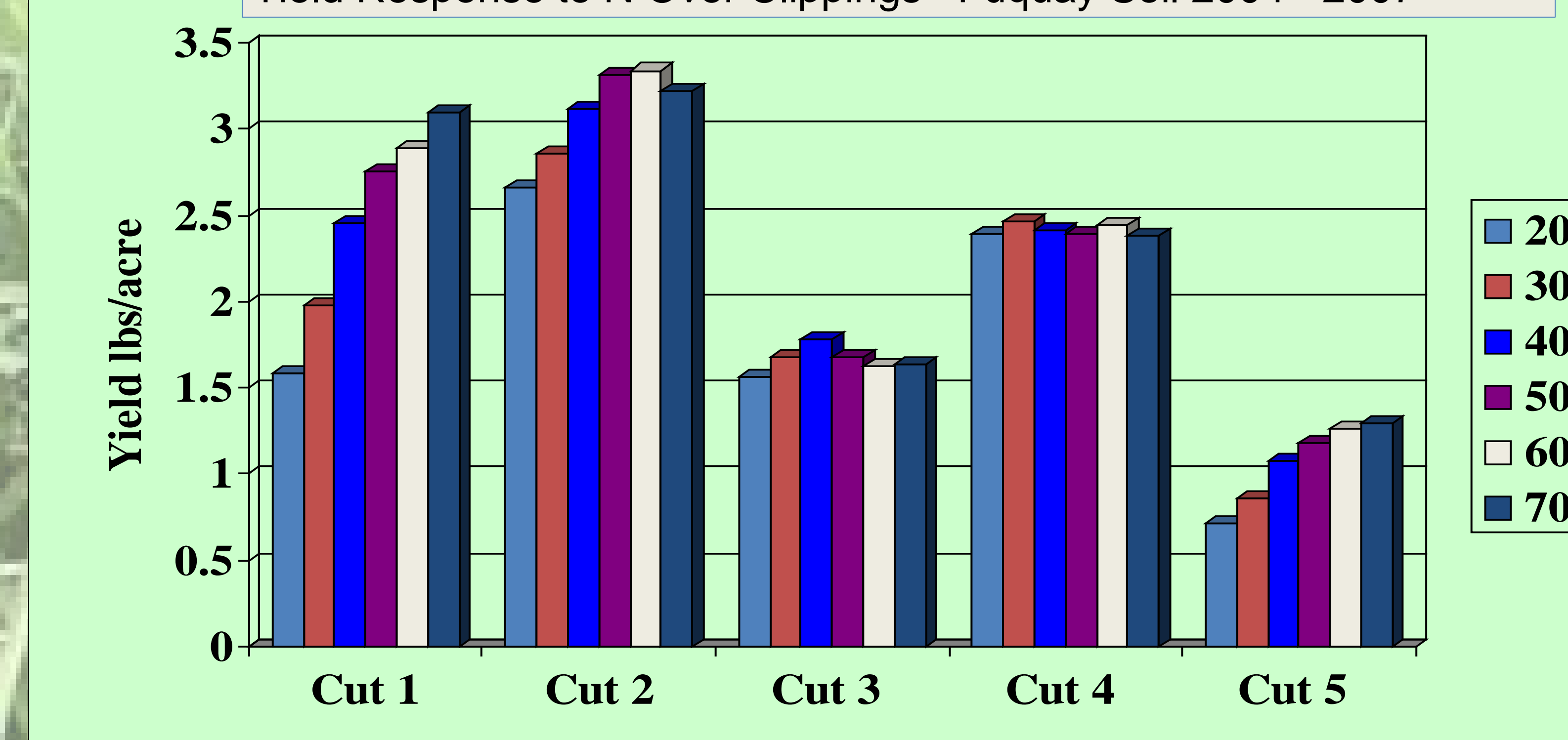
Quantity



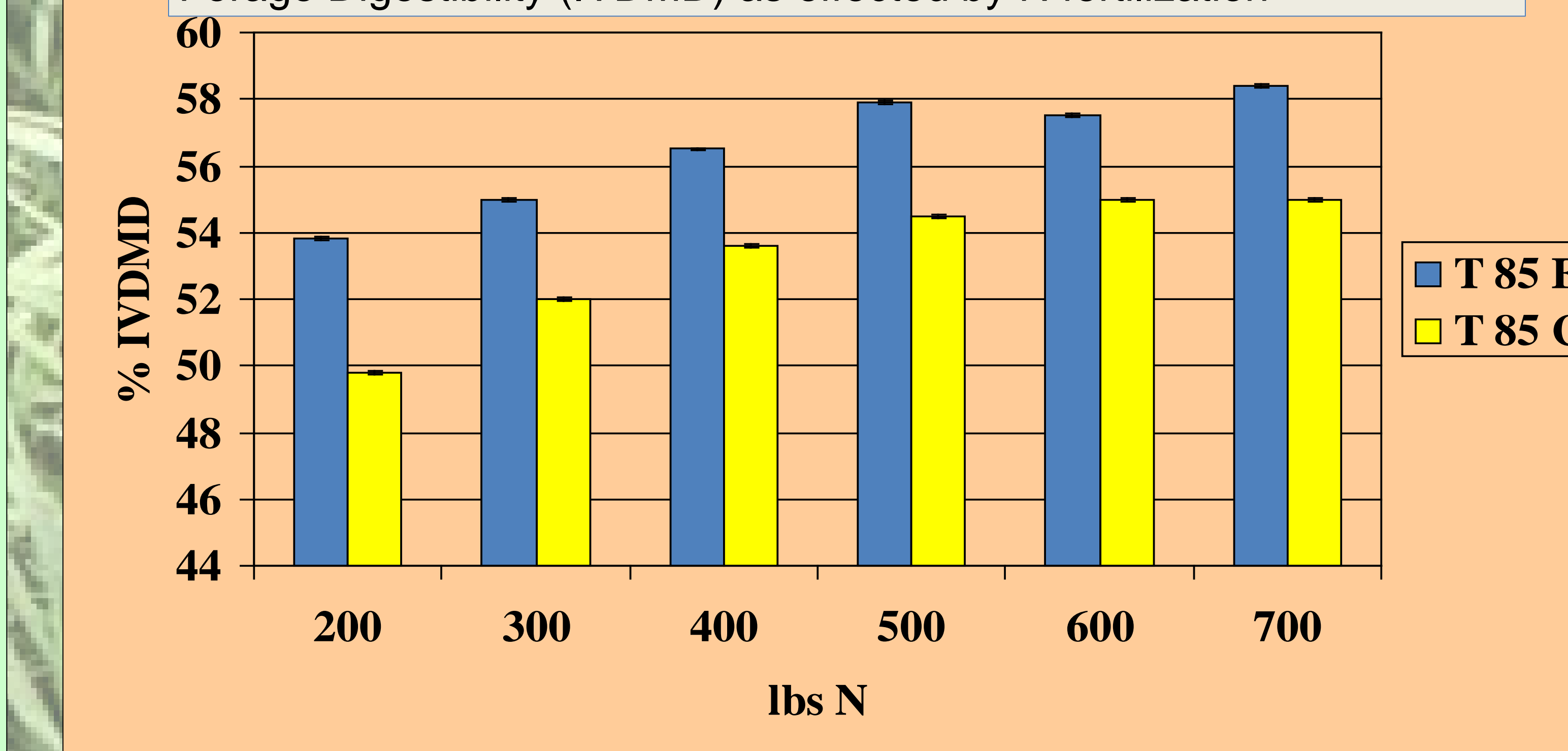
Quality



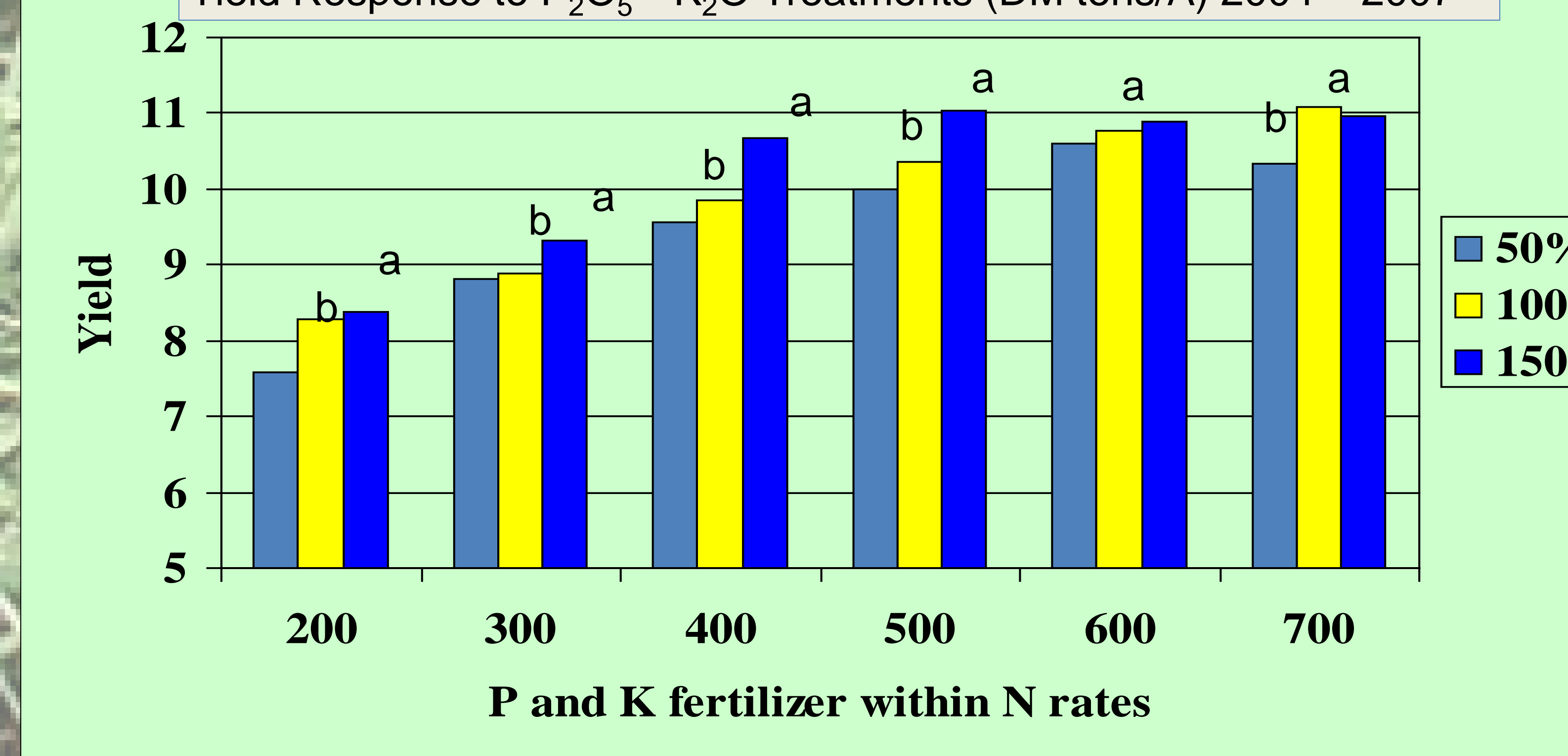
Yield Response to N Over Clippings –Fuquay Soil 2004 - 2007



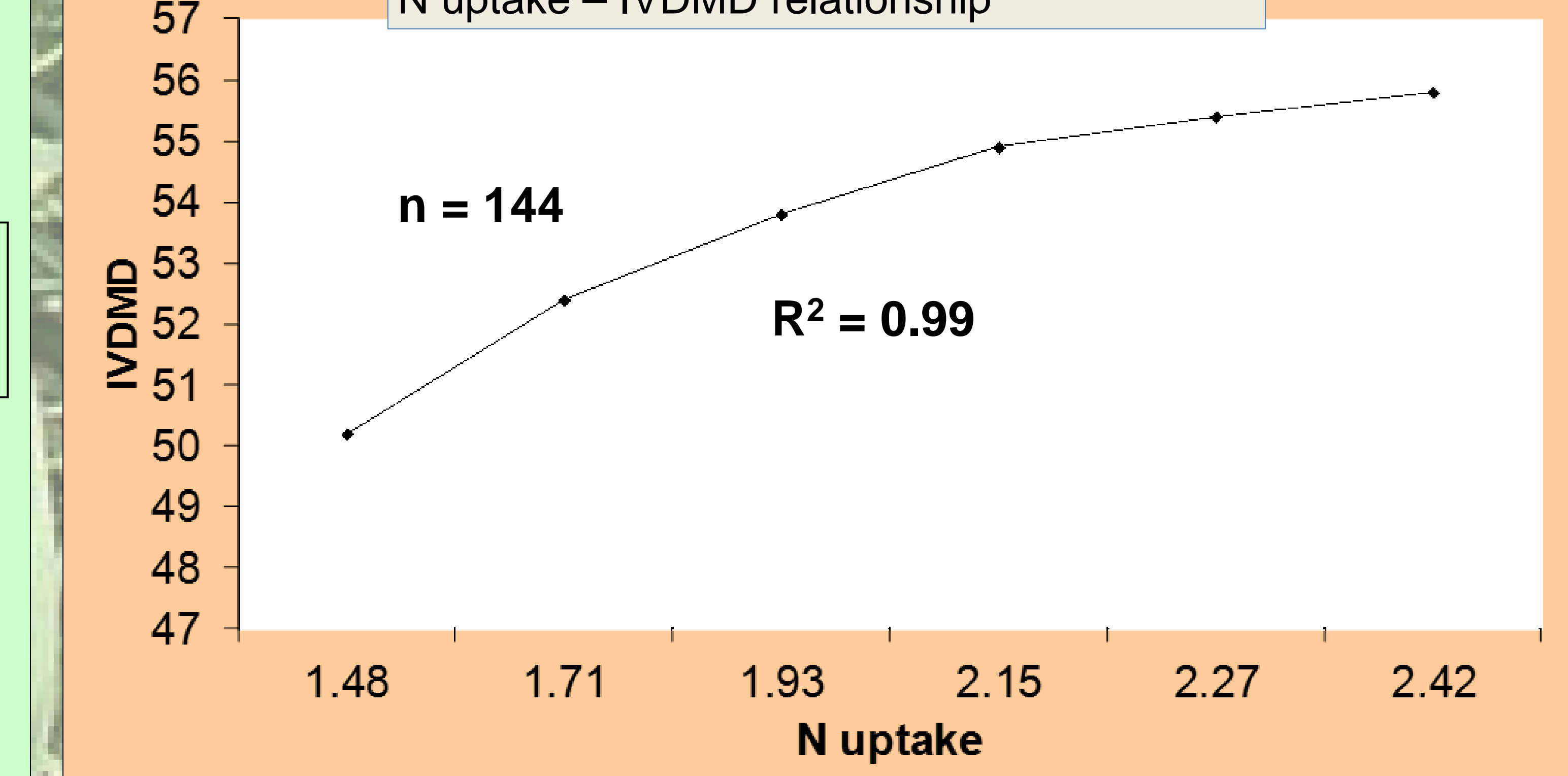
Forage Digestibility (IVDMD) as effected by N fertilization



Yield Response to P₂O₅ - K₂O Treatments (DM tons/A) 2004 - 2007



N uptake - IVDMD relationship



METHODS AND MATERIALS

Nitrogen, phosphorus and potassium fertilization are essential for forage yield and quality. Limited studies have been conducted on how varying rates of fertilizer affect the quality of bermudagrass. Six rates of nitrogen (200, 300, 400, 500, 600, 700 lbs/acre) were applied in a randomized complete block design with four replications on previously established Tifton 85 bermudagrass at two locations in Tifton, GA. Each plot was split with three rates of phosphorus and potassium fertilizer (50%, 100% and 150% of plant tissue uptake). Dry weight yields were determined and dried samples were ground and prepared for chemical composition and quality evaluation. *In vitro* dry matter digestibility (IVDMD), neutral detergent fiber (NDF) and acid detergent fiber (ADF) were estimated by near infrared spectroscopy (NIRS).

ACKNOWLEDGEMENTS

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CONCLUSIONS

- Generally, yields started leveling off at 500 lbs N/acre
- Most of the yield response was realized in the first clipping.
- Significant yield response to P and K levels occurred primarily in the last two years and varied by soil type and N application
- % Nitrogen (protein) continued to increase with Nitrogen application rates
- IVDMD increased over N application rates and correlated with protein uptake
- Highest rate of return occurs at the 200 to 300 lb N rate and with minimum PK rates



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