

# Tifton-85 bermudagrass mixed with annual or perennial peanut for hay production in North Florida



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## Introduction

- ✓ Rhizoma peanut (*Arachis glabrata* Benth) is one of the few warm-season perennial legumes available for producers in the Southeastern USA, however, high costs of planting and slow establishment have reduced its adoption.
- ✓ Incorporating legumes into existing Tifton-85 bermudagrass (*Cynodon* spp.) pastures can reduce demand for N fertilizer as well as increase nutritive value of a pasture.
- ✓ Seeded peanut (*A. pinto* Krapov. & W.C. Greg., and *A. hypogaea* L.), with proper management, can be a viable alternative in North Florida.

## Objectives

- ✓ The overall objective of this project was to assess the performance of various peanuts planted in mixed stands with Tifton-85 bermudagrass in low-input systems.
- ✓ Determine the potential use of seeded peanuts mixed with Tifton-85 bermudagrass sod.

## Methods

- ✓ Experiment took place at UF/IFAS North Florida Research and Education Center (NFREC), Marianna, FL
- ✓ Complete randomized block design with four replications per treatment.
- ✓ Treatments included: (i) unfertilized Tifton-85 bahiagrass monoculture, (ii) Tifton-85 + *A. glabrata* cv. Ecoturf, (iii) Tifton-85 + *A. glabrata* cv. Florigraze, (iii) Tifton-85 + *A. pinto* cv. Amarillo, (iii) Tifton-85 + *A. hypogaea* cv. TufRunner727
- ✓ Response variables included total dry matter yield (DMY), N concentration, %N derived from atmosphere (%Ndfa), biological N<sub>2</sub>-fixation (BNF), IVOMD, botanical composition, and peanut stand.
- ✓ Harvests occurred during three growing seasons (2014-2016) and plots were harvested at a stubble height of 10 cm every 5 wks
- ✓ BNF evaluated using natural abundance <sup>15</sup>N technique.
- ✓ Data analyzed using proc mixed from SAS and LSMEANS compared using PDIFF adjusted by Tukey ( $P < 0.05$ )



Figure 3. *Arachis glabrata* cv. Ecoturf established in Tifton-85 bermudagrass 3 yrs. after planting.

## Results

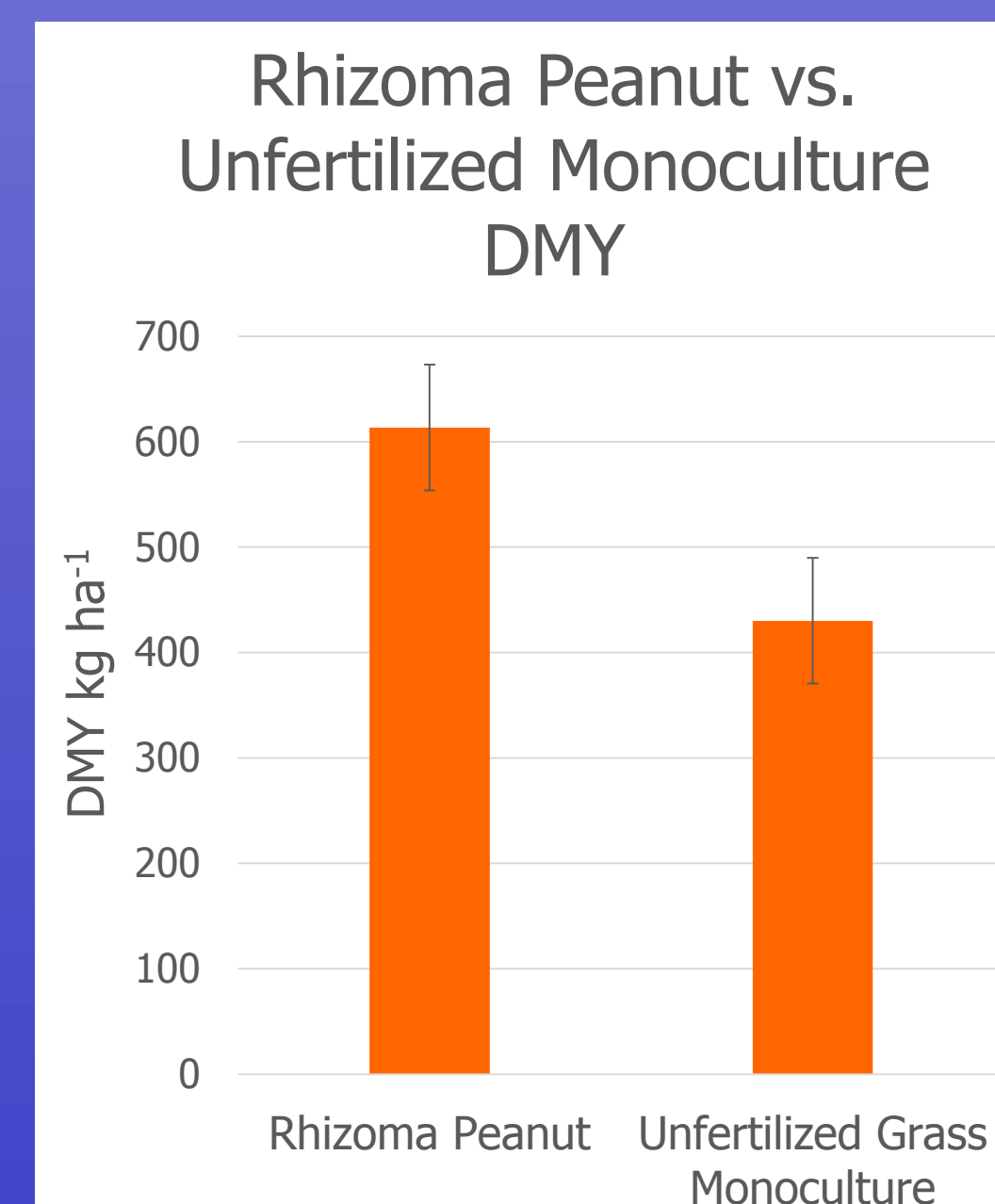


Figure 4. Dry matter yield (DMY) of rhizoma peanut/bahiagrass mixtures compared with unfertilized grass monoculture ( $P=0.022$ )

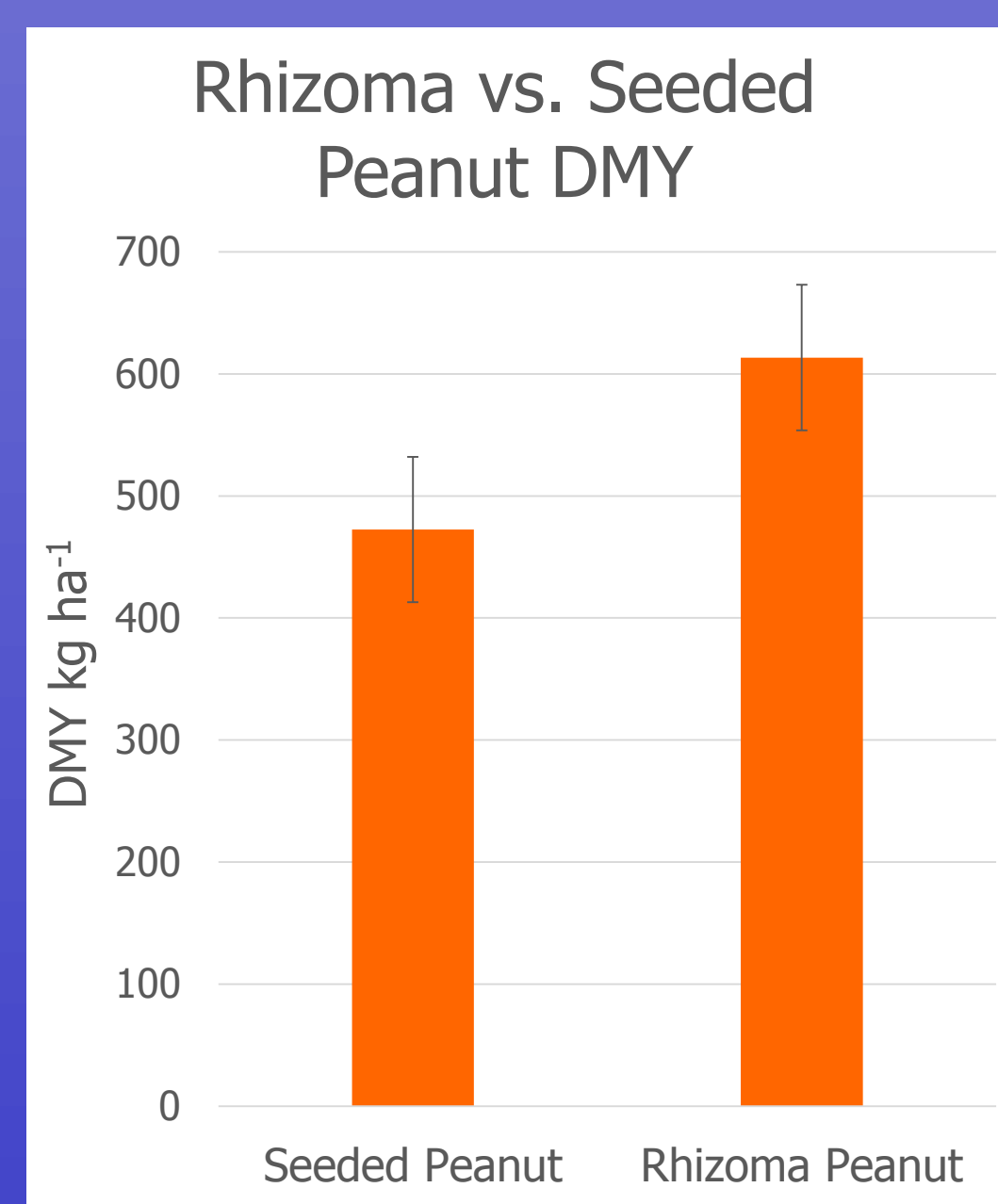


Figure 5. Dry matter yield (DMY) of seeded and rhizoma peanut mixtures ( $P=0.029$ ).

## Results

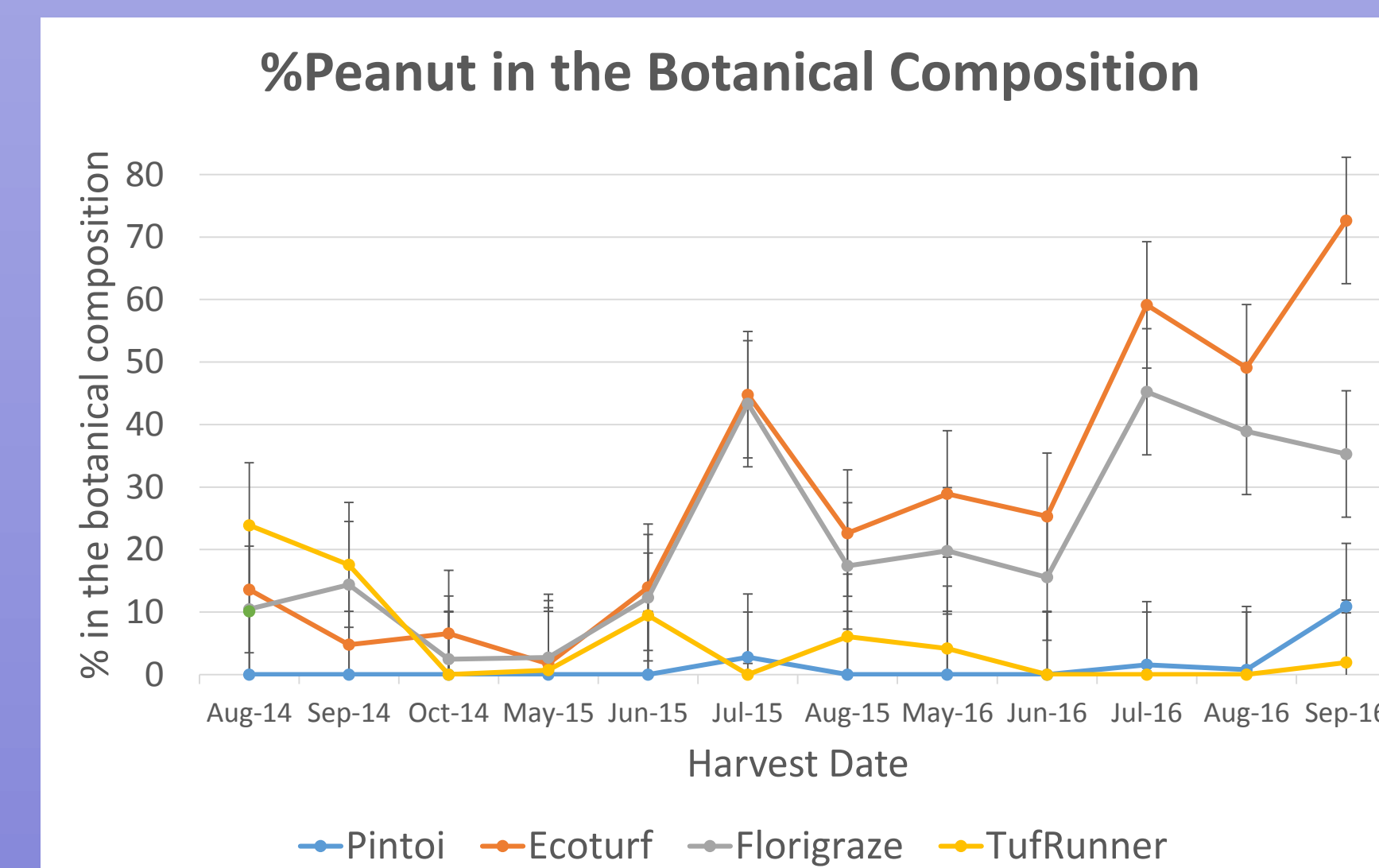


Figure 6. Peanut botanical composition across evaluations ( $P=0.0021$ )

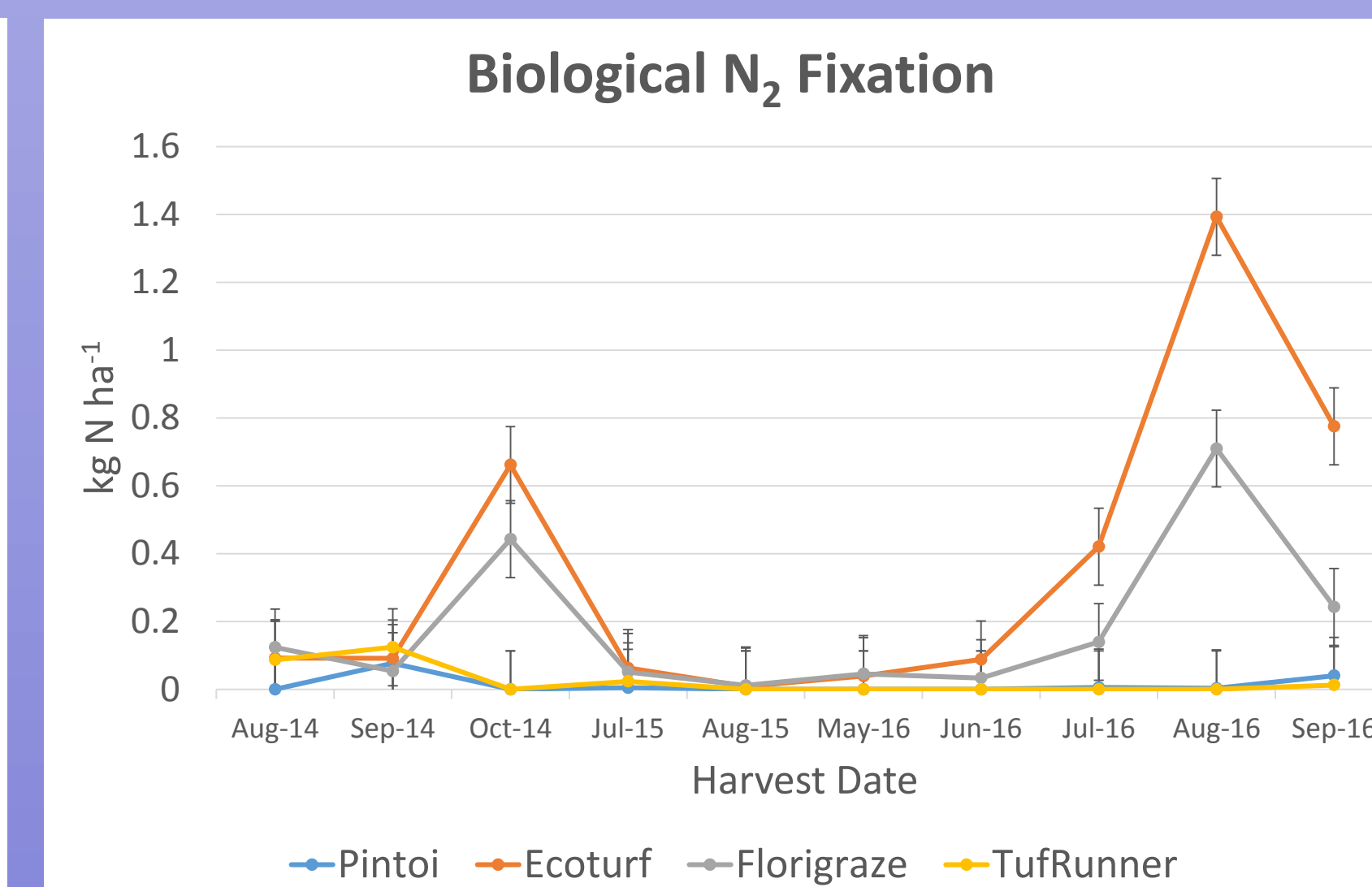


Figure 7: Biological N<sub>2</sub> fixation by peanut varieties across evaluations. ( $P < 0.001$ )

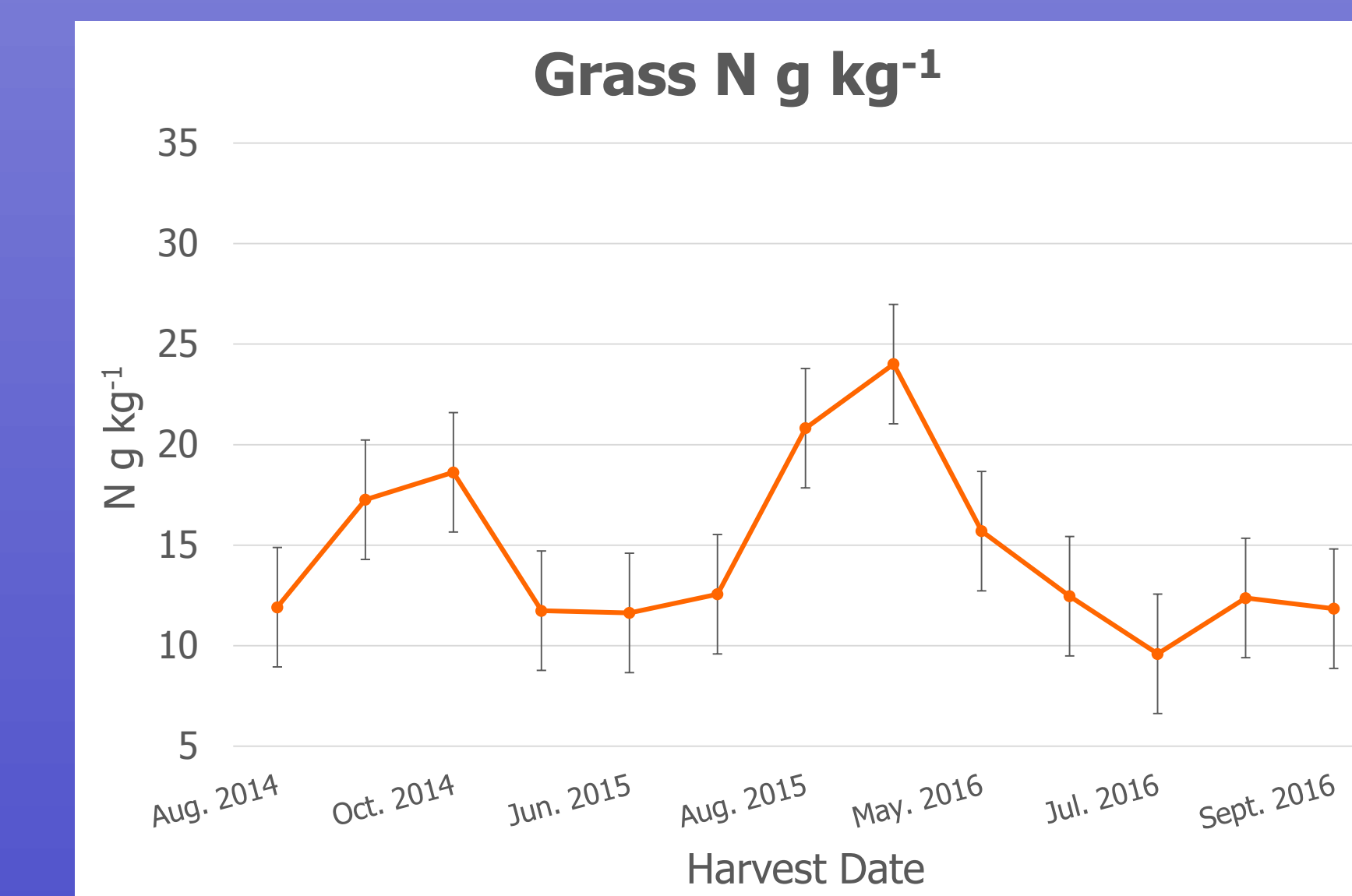


Figure 8. Grass N concentration across evaluations ( $P < 0.001$ )

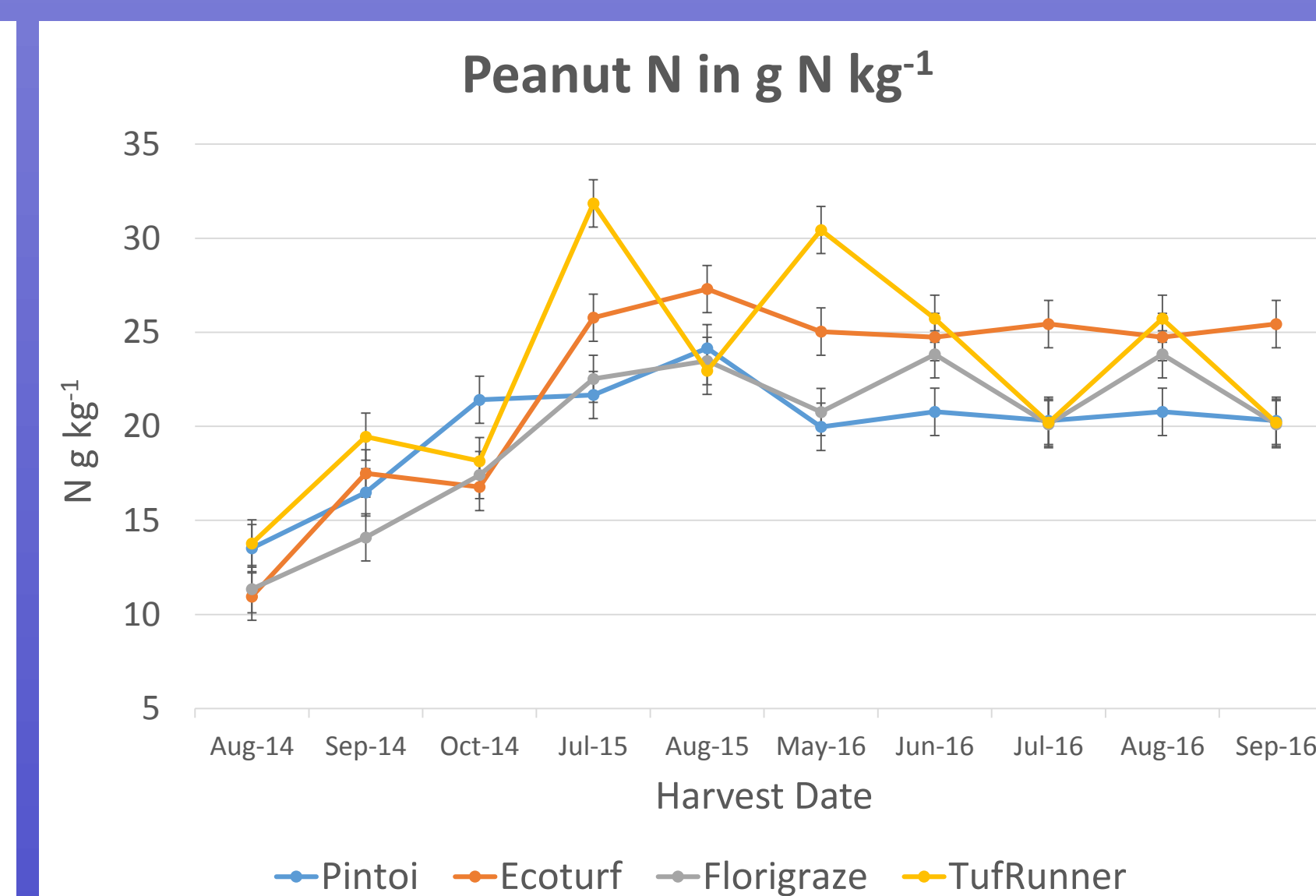


Figure 9. Peanut N concentration across evaluations ( $P < 0.0001$ )

## Conclusions

Overall, Ecoturf-Tifton 85 mixture performed better than other mixtures and unfertilized grass monocultures. Annual seeded peanut (*A. hypogaea* cv. TufRunner727) can be a viable alternative as warm-season legume, however its stands decrease significantly after the first year of planting. *A. pinto* was largely under-represented for this trial due to its prostrate growth, but its stand increased over the three-year period of this trial.



Figure 1. Forage harvesting.



Figure 2. Rhizoma peanut planting.