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. pintoi Krapov. & W.C. Greg., and A. hypogeae 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.
- Response variables included total dry matter yield (DMY), N concentration, %N derived from atmosphere (%Ndfa), biological N2 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 15N technique.
- Data analyzed using proc mixed from SAS and LSMEANS compared using PDIFF adjusted by Tukey (P < 0.05)

Results

- Figure 3. Arachis glabrata cv. Ecoturf established in Tifton-85 bermudagrass 3 yrs. after planting.
- 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).
- Figure 6. Peanut botanical composition across evaluations (P=0.0021)
- Figure 7: Biological N2 fixation by peanut varieties across evaluations. (P < 0.001)
- Figure 8. Grass N concentration across evaluations (P < 0.01)
- Figure 9. Peanut N concentration across evaluations (P < 0.001)

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. pintoi was largely under-represented for this trial due to its prostrate growth, but its stand increased over the three-year period of this trial.