Bahiagrass-Rhizoma Peanut Mixtures as an Alternative to Attenuate Nitrogen Fertilization in Hay Fields

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Introduction

- ✓ Nitrogen manufacture, transportation, storage, and distribution is a potential source of environmental pollution. In addition, low nitrogen use efficiency, type of synthetic nitrogen fertilizer and climate conditions may increase nitrogen losses and compromise farmer's profitability.
- ✓ Hay operation is one of the most important agricultural activities in North Florida. Bahiagrass, bermudagrass, and rhizoma peanut (RP) are the main forage crops used as hay in this region.
- ✓ Forage legumes are capable of fixing atmospheric nitrogen in association with rhizobia bacteria. Once growing together with grasses, this nitrogen may be utilized for both and mitigate the need for N fertilization.

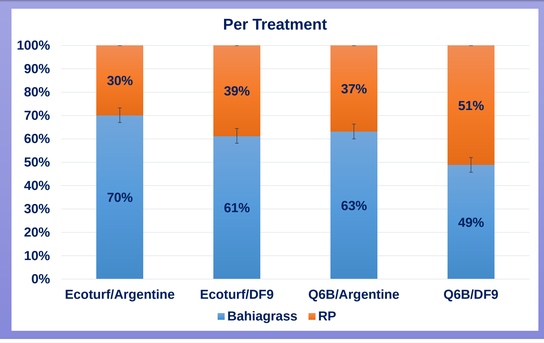
Objective

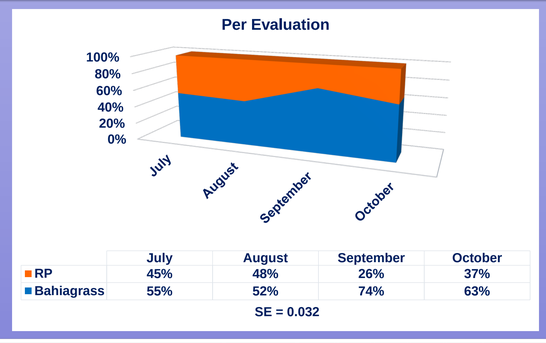
- ✓ To contrast herbage mass, botanical composition, *in vitro* organic matter digestibility, and crude protein of bahiagrass-rhizoma peanut mixtures with their monocultures.

Methods

- ✓ **RCBD (8 treatments and 3 replicates)**
  - 2 entries of bahiagrass (+ 90 kg N ha^{-1} $haverst^{-1}$): Argentine and DF9.
  - 2 entries of rhizoma-peanut (RP): Ecoturf and Q6B .
  - 4 mixtures: Argentine/Ecoturf, Argentine/Q6B, DF9/Ecoturf, and DF9/Q6B.
- ✓ **Herbage mass:** 0.5 m^2 at 7.5 cm every 6 weeks.
- ✓ **Botanical composition:** hand-separated, dried at 55 °C for 72h.
- ✓ **Crude protein:** Elemental analyzer (N).
- ✓ ***In vitro* organic matter digestibility** (Tilley and Terry, 1963).
- ✓ Data was analyzed using proc mixed from SAS and LSMEANS compared using PDIFF adjusted by Tukey ($P < 0.05$).

Botanical Composition

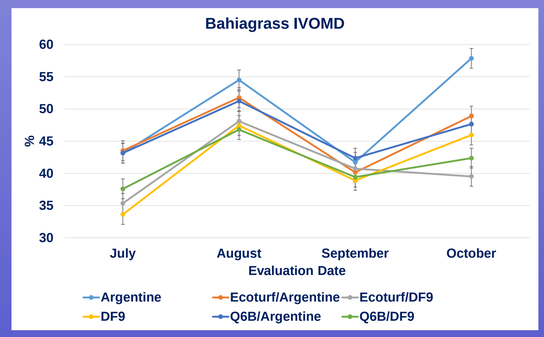


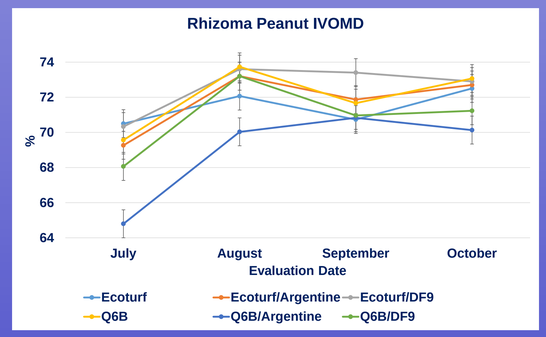


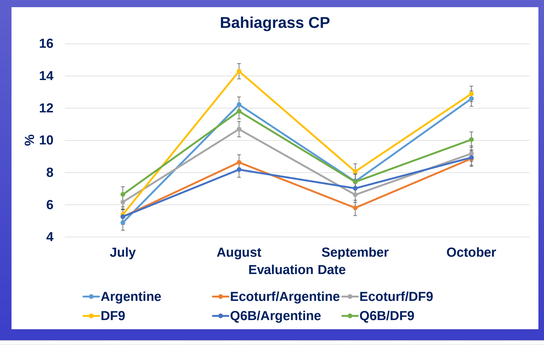
	July	August	September	October
RP	45%	48%	26%	37%
Bahiagrass	55%	52%	74%	63%

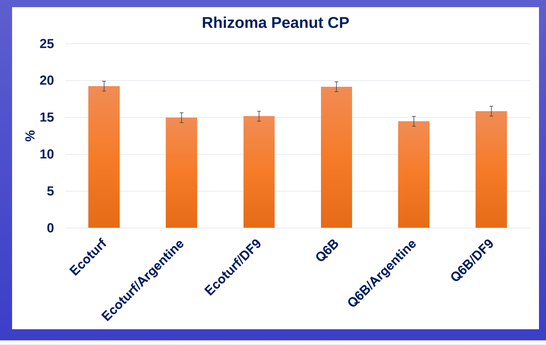
SE = 0.032

IVOMD and CP

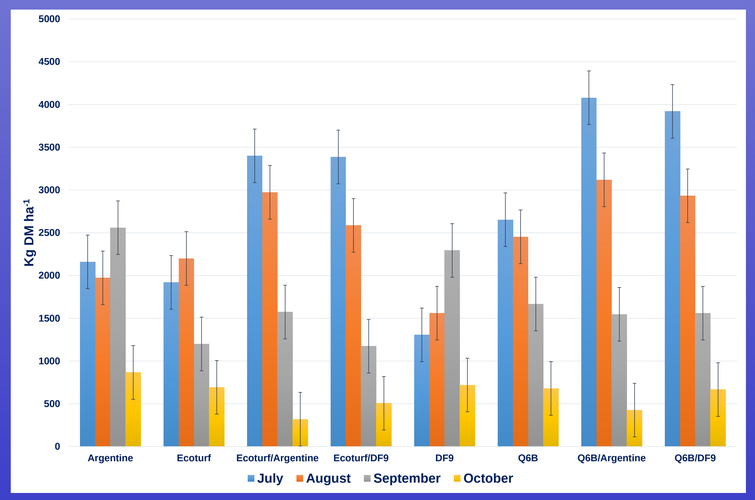








Herbage Mass



Conclusions

- ✓ Mixing bahiagrass and rhizoma peanut increased overall herbage mass and decreased crude protein and *in vitro* organic matter digestibility in legumes and grasses. The entry Q6B presented a better competitiveness with bahiagrass when compared to Ecoturf. Mixing these forage legumes may decrease nitrogen fertilizer application, increase DM production, and enhance forage nutritive value.