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

Erick R. S. Santos¹, Jose C. B. Dubeux Jr. ¹, Cheryl L. Mackowiak¹, Jennifer P. Shirley¹, Ann R. Blount¹, Lynn E. Sollenberger², Nicolas DiLorenzo¹, Tatiana P. Pereira¹.

¹University of Florida, North Florida Research and Education Center (NFREC)
²University of Florida, Agronomy Department

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 harvest⁻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 m² 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 PDFF adjusted by Tukey (P < 0.05).

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.