Current Research Projects – Lynn E. Sollenberger

Project 1

Title - Rhizoma Peanut Proportion in Mixed-Species Pastures with Bahiagrass Affects Nutrient Cycling and Greenhouse Gas Emissions

Objectives:

1. To quantify the effects of N fertilizer of bahiagrass (BG) swards and the proportions of rhizoma peanut (RP) and bahiagrass on litter decomposition rate and nutrient disappearance, and to identify the carbon source (C3, RP; C4, BG) of decomposing litter in mixtures of various proportions of RP and BG litter using carbon isotope fractionation.
2. To quantify the effects of N fertilization of BG monoculture and proportion of RP in mixtures with BG on methane and nitrous oxide emissions from pasture-based livestock production systems.
3. To obtain emission factors for urine and dung of animals consuming contrasting diets of 75% RP- 25% BG mixtures or pure BG.

Project 2

Title - Rhizoma Peanut Contribution to Productivity and Ecosystem Services of Low-Input Pasture Systems

Objectives:

1. To quantify the distribution of forage dry matter and nutritive value in year-round production systems based on rhizoma peanut (RP) or nitrogen-fertilized Tifton 85 bermudagrass and overseeded with cool-season forages.
2. To quantify organic carbon and nitrogen accumulation in bulk soil and soil particle size fractions in different soil strata under forage systems based on RP or nitrogen-fertilized bermudagrass and utilized for either hay or grazing.
3. To quantify N₂O emissions from forage systems based on RP or nitrogen-fertilized bermudagrass and utilized for either hay or grazing.

Project 3

Title – Establishment and Grazing Management of Ecoturf Rhizoma Peanut

Objectives:

1. To determine establishment success of Ecoturf rhizoma peanut when planted using several methods differing in degree of competition with bahiagrass.
2. To quantify the effect of various combinations of grazing frequency and grazing intensity on productivity, persistence, and nutritive value of Ecoturf RP.

**Project 4**

Title - Growing Environment, Genotype, and Management Affect Biomass Partitioning during Rhizoma Peanut Establishment

Objectives:

1. To quantify how genotype (including differences in growth habit and rhizome characteristics), growing environment (temperature and soil N status), and management (planting date and N fertilization) affect the growth and development of rhizoma peanut after planting.
2. To determine how observed changes in morpho-physiological characteristics influence rhizoma peanut establishment and performance.

**Project 5**

Title - Novel Approaches to Establish Rhizoma Peanut (*Arachis glabrata* Benth) on Bahiagrass (*Paspalum notatum* Flüggé) Pasture: From Research to On-farm Application

Objectives:

1. To compare establishment performance of two RP cultivars when strip-planted into bahiagrass sods.
2. To evaluate seedbed preparation techniques for strip planting RP into bahiagrass sods.
3. To compare on-farm performance of strip planting technology at four farms distributed throughout Florida from north to south.

**Project 6**

Title - Evaluation of New Forage Germplasm with Potential for Use in Florida Livestock Systems

Objectives:

1. To evaluate the potential of Mulato brachiariagrass (*Brachiaria* spp.) as a new forage in North Florida by assessing its performance in comparison with Tifton 85 bermudagrass on regional dairy farms and in small plot experiments.
2. To evaluate the potential of Jiggs bermudagrass (*Cynodon dactylon*) as a new forage in North Florida by assessing its performance in comparison with Tifton 85 bermudagrass on regional dairy farms and in small plot experiments.

**Project 7**

Title - Defining the Importance of Soil pH, Potassium, and Phosphorus in Reversing Bahiagrass Pasture Decline on Florida Cattle Ranches

Objectives:

1. To quantify the effect of liming to optimum soil pH and applying P and K fertilizer on subsequent yield, percent stand, and nutritive value of already declining bahiagrass pastures on Florida ranches.
2. To determine what rates of P and K are needed to restore declining stands of perennial grasses on research center pastures in Florida.