

Abstract #119997**Above and Belowground Biomass Characteristics of Rhizoma Peanut Entries and Their Relationship with Soil C and N**

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Abstract Text:

In forage systems, soil C and N are affected by many factors including above- and belowground biomass, root exudation, defoliation management, and tissue turnover dynamics. There is need to understand the main drivers of soil C and N accumulation under perennial forages, especially those factors associated with differences in growth and canopy characteristics. The objective was to determine soil C and N status and their relationship with above- and belowground characteristics of six rhizoma peanut (RP, *Arachis glabrata*) entries. Treatments were Apalachee, Chico, Ecoturf, Ona33, Peace, and Tito RP arranged in four replicates of a randomized complete block design. Stands were planted in 2010 and harvested twice per year after establishment. The area was previously a long-term bahiagrass (BH, *Paspalum notatum*) sward. Herbage accumulation (HA) and root-rhizome mass (RRM) and accumulation rate (RRA) were measured in 2016 and 2017. Existing litter and soil to 0-5, 5-10, and 10-20-cm depths were sampled in September and December 2018. Herbage and litter samples were harvested using two, 0.25-m² quadrats per plot. Three 10-cm diameter cores (20-cm depth) were taken per plot to measure RRM, while RRA was measured using ingrowth cores. Soil C and N concentrations were determined by dry combustion. Among entries, HA ranged from 6.7 to 10.5 Mg ha⁻¹, RRM from 5.5 to 8.6 Mg ha⁻¹, RRA from 10 to 33 kg ha⁻¹ d⁻¹, and litter mass from 1800 to 2300 kg ha⁻¹. Litter mass and RRA were negatively correlated to C and N stocks in the 0-5 cm layer and positively correlated with those in the 10-20 cm layer. This may be due to mineralization of nutrients in surface soil and use by plants to accumulate biomass, followed by release of exudates and tissue turnover at depth. Soil C and N stocks were less responsive to sward characteristics than expected.

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Division/Section: C06 Forage and Grazinglands
Session: Robert F. Barnes Ph.D. Oral (includes Society-wide student competition selection)
Preferred Format: Oral

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