

# Parallel Session 25

## PS 25/P52

### DIFFERENTIAL CONTROL ON SOIL CARBON AND WATER CONTENT AMONG GENOTYPE ASSEMBLAGES OF THE SHORTGRASS STEPPE KEY SPECIES

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Inappropriate management in grazed ecosystems is the cause of losses of biodiversity. Long-term heavy grazing may differentially eliminate particular species/genotypes of the grass community. In grassland ecosystems exhibiting low species richness the genetic diversity of key species may play an important role in the control of ecosystem processes. In this study we examined assemblages of *Bouteloua gracilis* genotypes, the key species from the shortgrass steppe in Central Mexico. These assemblages could potentially result from diverse scenarios of grassland utilization/management. We selected individuals of *Bouteloua gracilis* of a characterized group that exhibited two phenotypes; “low” (3-3.75% MS) and “high” (4.5-5.5% MS) lignin content in leaf tissue. Individuals were vegetatively propagated and transplanted to the field into 1 sq m plots (9 plants/plot) combining individuals with high (HL) and low (LL) lignin content with the following proportions 1/3, 2/3, 3/3 (6 treatments with 7 replicates each). We examined population morphological traits (height, specific leaf area, above and below-ground biomass) soil volumetric water content (TDR), elemental C and N in plant tissue and soils. After three growing season plots including both HL-3/3 and LL-1/3 treatments exhibited significantly ( $P < 0.05$ ) more tillers, shorter stature, less leaf area, lower SLA and higher leaf tissue density than LL-3/3. No differences in soil N were observed among treatments, in contrast the HL-1/3 treatment that had 10% more soil carbon than the HL-2/3. Volumetric soil water content was permanently highest for the LL-1/3 and lowest for the LL-2/3. Our study provides evidences that genotype assemblages control differentially ecosystem processes.

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### INTEGRATED ANALYTICAL FRAMEWORK TO ASSESS ENVIRONMENTAL SERVICES IN A WATERSHED UNDER A SHIFTING CULTIVATION SYSTEM IN THE ATLANTIC FOREST OF SOUTHEASTERN BRAZIL.

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Understanding how the inter-relations amongst natural resources in rural landscapes influence environmental services is a challenge for researchers worldwide. Integrated impacts of soil, water, and biodiversity, on erosion control, water regulation, and carbon sequestration was assessed. The area is characterized by a mosaic of land uses, containing forests, fallow fields, crops, and pastures. Soil and water quality of a watershed under shifting cultivation in the Atlantic Forest of Southeastern Brazil was analysed and the results were correlated. A digital terrain model and land use map were used for planning the sampling. Soil loss parcels and an hydrosedimentologic monitoring station completed the field setup. The results highlight how landscape influences the impacts of agricultural use on natural resources. All crops impacted soil structure, microbial parameters, organic carbon and hydraulic conductivity. Water quality in sites receiving greater contributions from cropped fields was compromised, and soil erosion enhanced. However, the hydrosedimentologic data taken downstream did not show significant alterations, suggesting that landscape attributes had an attenuating effect. Results suggest that environmental services evaluations should be carried out at the landscape scale, integrating data from the different components (soil, water, and biodiversity).



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