



RIO18
21st World Congress
of Soil Science

21 WORLD CONGRESS OF SOIL SCIENCE
Sunday 12 – Friday 17 August 2018
Rio de Janeiro, Brazil

Rio de Janeiro August | 12 - 17

Arbuscular Mycorrhizal Fungal Diversity in Sugarcane Plantations under Different Management Systems

Rosalba Ortega Fors¹; Itamar Garcia Ignácio²; Eliane M. Ribeiro da Silva²; Ricardo L. Louro Berbara¹; Orivaldo J. Saggin Júnior²

Universidade Federal Rural do Rio de Janeiro¹; Embrapa Agrobiologia²

Brazil is the main sugarcane producer worldwide with approximately nine million hectares planted with this crop. Arbuscular mycorrhizal fungi (FMA) (Phylum Glomeromycota) are considered indicators of soil quality. The present work aimed to evaluate the AMF communities associated with different sugarcane management systems. Pre-planting and post-harvest AMF surveys were carried out in sugarcane renovation areas (rotated -RA- or not -MA- with *Brachiaria ruzizensis*) and in a sugarcane expansion area (EA) (previously under pasture). Five composed soil samples were collected in each of the areas and seasons, totalizing 30 samples. AMF spores were extracted from soil by wet sieving and decanting. For each sample, spore density and species richness in 50 cm³ of soil were evaluated. Identification of the AMF species was based on the morphology of the spores. In total, 21 AMF species were identified, distributed in six families and ten genera, with *Acaulospora* and *Glomus* accounting for the highest number of species. Nine species (43%) were considered exclusive, being seven of them from the EA. Generalist species, present in all the areas and seasons, were *Diversispora tortuosa*, *Acaulospora scrobiculata*, *Racocetra fulgida*, *Gigaspora* sp., *Glomus clavisporum*, and *Ambispora leptoticha*. The species richness was higher in the EA with 18 species, followed by the RA and MA, with 13 and 11 species, respectively. These results might be due to differences in soil fertility. Soil environment conditions resulting from monoculture, such as high P concentrations and changes in soil structure, negatively affect AMF species richness. Rotation with *B. ruziziensis* did not influence the species richness in the MA. Changes in AMF communities depend on the disturbances, considering intensity, frequency, spatial extent, and duration. Spore density (SD) showed variations between the three areas and seasons, with the highest values detected in the EA and after the sugarcane harvest. Variations in water availability between seasons and/or changes in the physiological state of sugarcane plants, as well as seasonal changes in the sporulation of each fungal species, may have led to these differences. It was concluded that prolonged monoculture of sugarcane affects the diversity of AMF communities, as well as their spore density. In addition, rotation with *B. ruziziensis* after years of sugarcane monoculture does not imply short-term recovery of AMF communities.

Keywords: Glomeromycota; Saccharum sp.; monoculture; community; crop rotation.

Financial Support: PEC-PG CNPq; Project: EMBRAPA - QUATA S/A - FUNARBE



**Brazilian Soil Science
Society**

<https://www.21wcss.org>
21wcss@21wcss.org
commercial@21wcss.org