



Study of Sugar Cane Management Systems in Brazil Using Laser Induced Fluorescence

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Brazil is the largest producer of cane sugar, consequently, is a leader in the production of bio-ethanol, a clean and renewable energy that fits the model of sustainable economy as discussed and pursued by our society. Our state of São Paulo concentrates 60% of national production, representing a sizeable share in the range of world production. All this economic potential is closely monitored by the scientific community, which develops numerous studies seeking an improvement in production efficiency and reduced environmental impacts caused by the planting. However, the study of soil samples, in plantation areas, demands results about the content and structural forms of organic matter (OM). Also, the soil carbon stocks depend on the type of management. Our goal is to study OM of soil samples from four sugar cane management systems: (i) unburned cane harvest, (ii) preharvest burned, (iii) addition of sugarcane bagasse ash and (iv) addition of residue from the extraction of sucrose, using Laser Induced Fluorescence Spectroscopy of solid state. All the emission spectra were acquired using the system called LIFS-405, which consists of a diode laser Coherent, model cube with excitation at 405 nm, maximum output power of 50mJ and a mini-spectrometer, Ocean Optics USB2000-high sensitivity, with range of 194-894 nm and a fiber-optic bundle design (six excitation fibers in a circular path and one central fiber the collect the fluorescence). In this work, we will present the preliminary results evolving the humification index (HLIFS) of soil OM and total carbon amount (TC) for the different types of management. HLIFS shows a close correlation with the humification index of humic acid in solution obtained by means 2D conventional fluorescence spectroscopy.