




**24-29 May 2009
Uberlandia
Brazil**

ISSCT
Agronomy
Workshop

**INTERNATIONAL SOCIETY OF SUGAR
CANE TECHNOLOGISTS**



AGRONOMY WORKSHOP

Sugarcane production: integration among
sugar, alcohol, residue cycling and
sustainability

24-29 May 2009
Uberlandia, Brazil

EFFECTS OF THREE SOIL MANAGEMENT ON SUGARCANE ROOT SYSTEM AND YIELD IN A DEEP SOIL

M.C.B. AZEVEDO⁽¹⁾; J.L. CHOPART⁽²⁾; C.C. MEDINA⁽³⁾

(1) Instituto Agronômico do Paraná, IAPAR, Rua Paulo Antônio da Costa s/nº, CEP 87701-970, caixa postal 564, Paranavaí, Paraná, Brazil, azevedo@iapar.br, (2) CIRAD, Annual Cropping Systems Research Unit, 7 ch. de l'IRAT, 97410 St-Pierre, Réunion, France chopart@cirad.fr, (3) Universidade Estadual de Londrina (UEL), CEP 86051-990, caixa postal 6001, Londrina, Paraná, Brazil, medina@uel.br.

Crop and soil management may have substantial influence on sugarcane (*Saccharum spp*) productivity; mechanized operations may cause soil degradation and yield decrease. The aim of this study is to evaluate, in a Rhodic Eutrudox soil (Londrina, Paraná, Brazil), the effect of three soil management systems on mechanical soil resistance, sugarcane root development (Core Sampled Method) and yield components, during second (2004/05) and third (2005/06) ratoons of RB72 454 variety. The treatments were: (i) conventional tillage (CT): soil cultivation + disking (twice) at plantation, and soil cultivation followed by incorporated fertilization; (ii) minimum tillage (MT): soil cultivation, one disking at plantation and incorporated fertilization; and (iii) no tillage (NT): direct plantation and fertilization made at ground surface. The CT resulted in lesser mechanical resistance of the soil at 0-0.10 and 0-0.20 m depths. But there were not statistical differences between treatments in both ratoons for root development and sugarcane yield. Comparing different dates of measurements during the cycles, we did not found any statistical difference of root length densities (RLD). In both ratoons, in a 0-0.6 m depth profile, RLD averages were 0.51 (CT), 0.38 (MT) and 0.41 (NT) cm cm⁻³. Mean productivities of the two years were 98.0 (CT), 97.4 (MT) and 94.5 (NT) tons of sugarcane per hectare. Findings show that: (i) the root system of sugarcane ratoons does not change substantially according to the measurement dates and soil tillage; and (ii) the MT and NT soil management systems can be considered technical alternatives to CT.

Keywords: *Saccharum spp*, minimum tillage, no tillage, root length density.