

# ASA, CSSA, and SSSA 2010 International Annual Meetings

Oct. 31-Nov. 4 | Long Beach, CA



**Green Revolution 2.0: Food+Energy and Environmental Security**

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172-4 Precision and Accuracy of Field Capacity Estimative in Oxisols - A Simple Approach to Improve Water Use Efficiency.

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Tuesday, November 2, 2010

Long Beach Convention Center, Exhibit Hall BC, Lower Level

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The objective of this study was to assess the accuracy and precision of the soil field capacity estimative methods and its spatial variability for a Red Latosol (RL) as a way to improve irrigation management and increase water use efficiency. Disturbed and undisturbed soil samples from soil depths of 0-25 cm and 25-50 cm were taken at four different locations. The samples were submitted to the four most common field capacity estimative methods: tension-table sandbox (SB), Richards pressure plate apparatus (RPP), moisture equivalent (ME) and the adjusted moisture equivalent (AME). The accuracy and precision of each method was achieved by comparing the estimated values to the Field Standard method measurements. For the study of the field capacity spatial variability, samples taken at a 50 x 50 m sampling grid, on a 38-ha center pivot area, 0-25 and 25-50 cm soil depths, in quadruplicates, were submitted to all four field capacity estimative methods. There were 152 sampling points, and 2432 disturbed and undisturbed soil samples. The SB method showed the best precision and accuracy on all estimative methods analyzed. The AME showed to be a practical and low cost method, but more sampling replications are necessary to improve the precision of this method. The spatial variability of field capacity was evident; however, more studies should be conducted to improve its modeling and zones delineation. The irrigation management simulations showed the potential of improving evapotranspiration, net precipitation, and irrigation demand estimatives when field capacity spatial variability is taking into account. Improving field capacity estimatives precision, accuracy and its spatial variability is a simple approach to increase water use efficiency and increase agriculture sustainability and profitability.

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