Automatic Gamma-Ray Equipment for Multiple Soil Physical Properties Measurements. (S01-vaz160525-Poster)

Authors:

- C.M.P.Vaz* - *Embrapa Agricultural Instrumentation*
- J.M.Naime - *Embrapa Agricultural Instrumentation*
- A.Macedo - *Embrapa Agricultural Instrumentation*
- S.Crestana - *Embrapa Agricultural Instrumentation*

Abstract:

A gamma-ray attenuation equipment was developed to measure some soil physical properties as particle size distribution (PSD), soil bulk density (BD), water content (WC) and water conductivity and estimate others as water retention curves, particle density and total porosity. PSD is determined by measuring the particles sedimentation of a dispersed soil sample solution and the water retention curve is estimated with the PSD measured, using the Arya and Paris approach. Bulk density and water content are measured in undisturbed soil samples, collected in steel cylinders of 72 mm diameter and up to 200 mm height, with a spatial resolution down to 2 mm. Soil particle density is estimated by an empirical correlation obtained with the mass attenuation coefficient , that is measured for each soil and also used in the PSD, BD, WC and conductivity determinations. The total porosity distribution can be estimated using the measured bulk density profile and the estimated particle density value of the soil. Results obtained for different classes of soils showed good accuracy of the measured and estimated soil physical parameters.

Corresponding Author Information:

Carlos Vaz
Brazilian Agricultural Research Corporation
R. XV de Novembro, 1452
Sao Carlos, SP 13560-970
Brazil

phone: 16 274-2477
fax: 16 272-5958
e-mail: vaz@cnpdia.embrapa.br

Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 4:00-6:00 pm
Poster Board Number: 1708

Keywords:

soil physical properties, soil texture, soil bulk density, soil water content