Geophysical Research Abstracts, Vol. 8, 02094, 2006
SRef-ID: 1607-7962/gra/EGU06-A-02094

Plot-scale measurement and modeling of soil water regime in a lowland paddy field

K. K. Garg, Md. Safeeq, B. S. Das, P. B. S. Bhadoria

Agricultural and Food Engineering Department, Indian Institute of Technology, Kharagpur, West Bengal India, 721302, (bsdas@iitkgp.ac.in/Fax: +91 3222 282244)

In monsoon climate, prolonged dryspells often coincide with the critical growth stages of paddy crop. Dryspells lead to soil water deficit that directly affects dry matter production and grain yield. Availability of simulation environments has made it possible to predict the soil water status for a forthcoming season provided weather data for that season and soil hydraulic properties are known. Future weather data may be predicted from existing weather records. However, soil hydraulic properties are highly spatially and temporally variable and also depend on the scale of measurement. We compared several methods of hydraulic property determination for their efficacy in predicting soil water status for a complete growing season for lowland paddy. A field experiment was conducted during autumn seasons of 2004 and 2005 in twelve 6 m x 5 m plots to effectively estimate soil hydraulic properties and model soil water status in a lowland paddy field. Piezometric heads were monitored daily at 20, 40, 60, and 80 cm soil depths throughout the cropping season in both the years. Measured amount of water was applied in each plot to maintain continuous flooding. Pressure heads measured with piezometers were used to estimate soil hydraulic properties using the inverse parameter estimation method built in to HYDRUS-1D model. Standard methods were also used to measure hydraulic properties in each plot. Results show that the inverse modeling approach of estimating soil hydraulic properties is most suitable for predicting soil water status in lowland paddy condition.