

Estimation of Hydrological Soil Properties for Design of Drainage System in Bulandshahr Area

M. K. Shukla and B. Soni

Abstract

High irrigation intensities or excess precipitation may cause drainage congestion on the surface of the soil or in the root zone of crops. If the top soil of such area is less permeable than the situation becomes alarmingly worse. Such a situation is found in the Bulandshahr district situated in the western part of Uttar Pradesh. The gross area of Bulandshahr district is 4568 sq.km. It has been reported that the area is suffering from waterlogging problem and drainage congestion. This study deals with the estimation of hydrological soil parameters needed for design of drainage system.

The eastern part of the Bulandshahr was selected as pilot area. The soil samples were collected from different locations and were analysed for textural classification. It was observed that the soil of the area is mostly sandy loam with sand content varying from 25 to 80%, silt content from 25 to 72% and clay content from 5 to 30%. The in situ measurement of saturated hydraulic conductivity was carried out by Guelph Permeameter at different locations. The chemical analysis of the soil of the area showed that the soil is containing carbonate.

The analysis of groundwater table data of the area revealed that in general the water table of the area was fairly deep and as such there was no problem of waterlogging due to high water table. Thus, in general from the study it could be ascertained that the Bulandshahr area is suffering from the problem of surface drainage. This is because of the presence of carbonate in the soil which reduces the hydraulic conductivity of the soil and increases 'surface runoff. The inadequate capacity of existing drainage system in the area is possibly responsible for water stagnation in the field.