A MODEL FOR SOIL MOISTURE PREDICTION USING BEST EVAPOTRANSPIRATION METHOD

By

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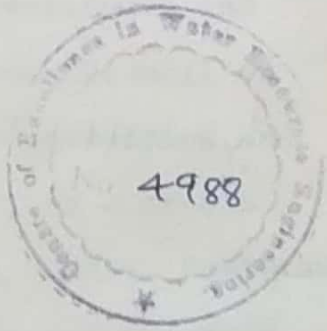

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ABSTRACT

Consumptive use and soil moisture balance studies are two important factors, that when properly managed, can result in significant improvements in agricultural practices. In this research study an endeavour is made to get a knowledge of reliable procedures for these two factors. Six well known methods for consumptive use have been compared to find out the best using monthly time period for local conditions. These methods are compared with measured data. The measured data corresponds to three crops i.e. maize, wheat and sugarcane, at five locations in Punjab Province. These locations cover almost all the climatological zones of this province. The meteorological data of these sites, used for computations, corresponds to the duration for the particular crop under study.

Penman method was found to give results comparable to the observed values. The ranking is as under:

i) Penman method
ii) Jensen-Haise method
iii) Blaney-Criddle method
iv) Hargreaves method
v) Radiation method
vi) Pan evaporation method

However, all the methods are showing acceptable results except Pan evaporation. Blaney-Criddle and Hargreaves methods are presenting nearly similar results, but Blaney-Criddle is

some what superior. Hargreaves method is suggested for the areas having insufficient climatological records.

Soil moisture balance study has also been dealt in this research project. A model, which was on weekly basis, has been modified for daily soil moisture prediction. This model predicts soil moisture for growing root depth on daily basis. The equations in this model are so adjusted that if we only set a variable 'RootD=1.0', then this model works for a fixed soil layer. Field data of moisture content for three crop seasons at two locations is used for comparing computed soil moisture. This model is tested for a variable as well as for a fixed soil layer of 150 cm (60 inches) and in the both cases results are very encouraging.

In this study the linear regression coefficients for Penman wind function and solar radiation are also suggested for the areas under study. The results of this study can be used in any water resources scheme wherever is required under similar conditions.