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Stochastic Modelling of Actual Black Gram Evapotranspiration

Author(s)

Pankaj K. PANDEY, Vanita PANDEY, RajVir SINGH, S. R. BHAKAR

ABSTRACT

The study was undertaken to develop and evaluate evapotranspiration model for black gram (Vigna Mungo L.) crop under climatic conditions of Udaipur, India. Pan evaporation data for the duration of twenty three years (1978-2001) and measured black gram evapotranspiration data by electronic lysimeter for duration of kharif season of 2001 were used for analysis. Black gram is an important crop of Udaipur region. No systematic study on modelling of black gram evapotranspiration was conducted in past under above said climatic conditions. Therefore, stochastic model was developed for the estimation of daily black gram evapotranspiration using 24 years data. Validation of the developed models was done by the comparison of the estimated values with the measured values. The developed stochastic model for black gram evapotranspiration was found to predict the daily black gram evapotranspiration very accurately.

KEYWORDS

Black Gram (Vigna Mungo L.) Evapotranspiration, Crop Water Requirement, Stochastic Modelling

Cite this paper

References

[1]   J. L. Doob, " Stochastic Processes," Wiley, New York, 1953.

[2]   P. A. W. Lewis, " Some simple models for continuous variate time series," Water Resource Bulletin, No. 21, pp. 635– 644, 1985.

[3]   J. R. M. Hosking, " Fractional differencing modelling in hydrology," Water Resources Bulletin, No. 21, pp. 670– 682, 1985.

[4]   G. E. P. Box and G. M. Jenkins, " Time Series Analysis, Forecasting and Control," Holden-Day, San Francisco, California, pp 553, 1976.

[5]   J. D. Salas, J. W. Dellur, V. Yevjevich and W. L. Lane, " Applied modelling of hydrologic time series," Water Resources Publication, Littleton, Coloredo, pp. 484, 1980.

[6]   A. K. Sharma, " Stochastic Modelling for Forecasting Jakham River Inflows," Ph.D. dissertation, Department of Soil and Water Conservation Engineering, College of Technology and Agricultural Engineering, Rajasthan Ag-ricultural University, Bikaner, pp. 259, 1998.

[7]   R. K. Gupta and R. Kumar, " Stochastic analysis of weekly evaporation values," Indian Journal of Agricul-tural Engineering, Vol. 4, No. 34, pp. 140– 142, 1994.

[8]   S. R. Bhakar, " Modelling of evaporation and evapotran-spiration under climatic conditions of udaipur," Ph.D dis-sertation, Faculty of Agricultural Engineering, Depart-ment of Soil and Water Conservation Engineering, Col-lege of Technology and Engineering, Maharana Pratap University of Agriculture and Technology, Udaipur, 2000.

[9]   D. Kumar, " Modelling of maize evapotranspiration under climatic conditions of Udaipur," M.Tech

dissertation, Faculty of Agricultural Engineering, Department of Soil and Water Conservation Engineering, College of Tech-nology and Engineering, Maharana Pratap University of Agriculture and Technology, Udaipur, 2001.