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SARIMA model for generation and forecasting of pomegranate (*Punica granatum* L.) evapotranspiration of Solapur district of Maharashtra, India

Deodas T. Meshram, S. D. Gorantiwar, N. V. Singh and R. K. Pal
National Research Centre on Pomegranate, India

This paper deals with the stochastic modeling of weekly pomegranate evapotranspiration in semi-arid climatic condition by using seasonal Auto Regressive Moving Average (ARIMA) model. The daily values of reference crop evapotranspiration (ETr) were estimated by Penman-Monteith method for 32 years (1981 to 2011); which were summed up to obtain the weekly values. These weekly ETr values were used to fit the ARIMA models of different orders. ARIMA models of 2nd order were selected based on autocorrelation function (ACF) and partial autocorrelation function (PACF) of the ETr series. The parameters of the selected models were obtained with the help of maximum likelihood method. The diagnostic checking of the selected models was then performed with the help of three tests (i.e. standard error, ACF and PACF of residuals and Akaike Information Criteria) to know the adequacy of the selected models. The ARIMA models that passed the adequacy test were selected for forecasting. One year ahead forecast (i.e., for 2012) of ETr values were obtained with the help of these selected models and compared with the values of ETr obtained from the climatological data of 2012 by root mean square error (RMSE). The lowest RMSE was obtained for ARIMA (2, 1, 2) $(2, 1, 0)_{52}$ and hence is the best stochastic model for generating and forecasting of weekly ETr. These best weekly ETr values were used to estimates for pomegranate evapotranspiration (litres/day/tree) of pomegranate orchards in Western part of Maharashtra, India.

Biography

Deodas T. Meshram completed Bachelors (1995) in Agriculture Engineering from PDKV, Akola and Master (1997) in Water Resources Development and Management from Indian Institute of Technology, Kharagpur. Recently completed (2010) Ph.D. from CTAE, MPUAT, Udaipur with specialization of Irrigation Water Management Engineering. He is having total 15 years experience and written number 31 national, 11 international research papers and 3 books. Presently he is working as Scientist, SS (Soil and Water Conservation Engineering) at NRC on Pomegranate, Indian Council of Agriculture Research, Solapur.

gomesh1970@rediffmail.com