Meteorological Model for Rice Yield Forecasting in Ludhiana Region

K.K. Gill, Raj Kiran and Surender Paul[1]

School of Climate Change & Agricultural Meteorology, Punjab Agricultural University, Ludhiana-141 004, India
[1]Director, India Meteorological Department, Chandigarh-160 037, India
E-mail: kgill2002@gmail.com

Abstract: An attempt was made to predict rice (*Oryza sativa* L.) yield by regression models. Three statistical models were developed for forecasting the yield of the rice in Ludhiana district by using the rice yield as well as meteorological data (1972-2012). The weekly weather variables used for this study were maximum and minimum temperature, relative humidity (morning and evening), sunshine hours, rainfall and number of rainy days. In the first basic model, sensitive period for rice yield with respect to weather parameters was identified for different weather parameters for selected windows and correlations were developed. The selected sensitive weekly parameters were taken for further regression analysis. In the second model (modified model), time trend was taken as one of the extra variable in multiple regressions. In the third model, multiple regression analysis was done using Statistical Package for the Social Sciences (SPSS) software. Regression equations were developed separately for all the three models and were used to predict the rice yield. The data for a period of (1972-2009) was used to develop the forecast model. The three year meteorological data (2010-2012) was used to validate the models. Among all the three models, basic model explained up to 64 per cent variation, modified model explained 67 per cent and SPSS model predicted highest i.e. 88 per cent variation in rice yield due to weather parameters. The results revealed that SPSS accurately predicted the rice yield as compared to other models and it had strong relation with rice crop yield.

***Key Words*:** Rice, Correlation, Multiple Regression, SPSS, Technology Trend, Yield Forecasting