International Journal of Agricultural Sciences
Volume 8 |Issue 2| June, 2012 | 325-328

RESEARCH PAPER

Weather based pre-harvest forecasting of wheat at Ghazipur (U.P.)

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Abstract : Wheat yield forecasts provide useful information to farmers, distributors, government agencies and other users. In the present study multiple linear regression (MLR) equations were derived for estimating wheat productivity for the district of Ghazipur in eastern Uttar Pradesh. Weather indices were computed using varied weather parameters for the year 1982-83 to 2005-06. The cross-validation of the developed forecast models were tested their accuracy using the year 2006-07. Based on a forecast error percentage it was found that the forecasting model produced the most accurate forecast for 15th week of the crop growing season. The relationship between actual and forecast wheat yield was highly significant being R^2 varied from 0.72 to 0.89 for the different weeks.

Key Words : MLR techniques, Wheat yield, Weather indices

View Point Article : Garde, Y.A., Singh, S., Mishra, G.C. and Singh, T. (2012). Weather based pre-harvest forecasting of wheat at Ghazipur (U.P.). *Internat. J. agric. Sci.*, **8**(2): 325-328.

Article History : Received : 05.11.2011**; Revised :** 25.01.2012**; Accepted :** 13.03.2012

INTRODUCTION

Agriculture is backbone of Indian economy, contributing about 40 per cent towards the gross national product (GNP) and provide livelihood to about 70 per cent of the population. Its share in country's GDP is about 17 per cent against 2-4 per cent in developed countries. Wheat (*Triticum aestivum* L.) is the most important food crop of the India, which plays a critical role in food security. Varanasi division comprises of four districts *viz*., Ghazipur, Varanasi, Chandauli and Jaunpur. Ghazipur has second largest total area (173793 ha) followed by Jaunpur and has productivity is about 26.60 (q/ha).

Forecasting opens menu window on to future. It is a medium guiding towards plans for the development of a better future. Crop yield forecasting based on weather, staff scheduling, business production planning and multistage management decision analysis are among distinctive examples of forecasting areas. Reliable pre-harvest forecast of crop yield is likely to provide valuable information in regard to sale, storage, export, industries and government for advanced planning. The use of statistical models in forecasting food production and prices for agriculture and livestock sectors holds great significance. Although no statistical model can help in forecasting the values exactly but by knowing even the approximate values can help in formulating future plans (Garde, 2009). Understanding the impact of climate variability and change on crop yields is fundamental to the success of such research. It is also an essential step towards the development of key adaptive strategies to scope up with climate change.

Similar work have been done by many scientist *viz*., Agrawal *et al*. (1980) developed forecasting models for the rice yield in Raipur district based on weekly data of weather parameters. It was found that forecasting of rice yield using weather variables is best possible only two and half months after sowing for a crop of five month duration. Jain *et al*. (1980) found that developed pre harvest model was reliable to forecast rice yield only after about two months of sowing. Agrawal *et al*. (2001) developed forecasting model for wheat in Vindhyanchal Plateue zone of Madhya Pradesh. It was reported that reliable forecasting yield could be obtained when

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