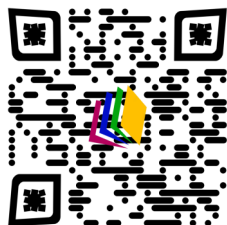




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ARIMA Model for Forecasting of Black Gram Productivity in Odisha

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ABSTRACT:

A study was conducted on forecasting the productivity of black gram in Odisha. Box-Jenkins Autoregressive integrated moving average (ARIMA) time-series methodology was considered for Black gram yield forecasting. Different ARIMA models are selected on the basis of Autocorrelation Function (ACF) and Partial autocorrelation Function (PACF) at various lags. The data from 1971-72 to 2006-07 are used for model building of different ARIMA models and from 2007-08 to 2015-16 is used for successful cross-validation of the selected model, which is based on the Mean absolute percentage error (MAPE). To check the stationarity, ARIMA Models are fitted to the original time series data as well as first difference data. Based on the significant coefficient of autoregressive and moving average components, the possible ARIMA Models are identified. Based on low value of Root Mean Square Error (RMSE) and Mean Absolute Percentage Error (MAPE), the best fitted ARIMA models are selected. ARIMA (0,1,1) without constant found to be best fitted model for Black gram productivity having absolute percentage error ranging from 19.99% to 43.29% in cross-validation of the model. The best fitted ARIMA model has been used to forecast the productivity of black gram for the year 2016-17 to 2018-19. The model showed the forecast in productivity for the year 2018-19 to be about 221.45 kg per hectare with lower and upper limit 90.36 and 392.89 kg per hectare respectively.

KEY WORDS: ARIMA, Black gram, Productivity, ACF, PACF, RMSE, MAPE

Introduction

Pulses are an important commodity group that are grown in all the districts of Odisha. Pulses are the major source of protein & it provide