# Nonlinear modeling of crop production: A case study on jowar and greengram in Guntur district

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## ABSTRACT

Guntur district in Andhra Pradesh is a key agricultural area known for its significant crop production. Nonlinear statistical growth models play a very important role in understanding the dynamics of an agricultural system. Present study made an attempt to develop nonlinear statistical growth models to describe trends of Production of Jowar and Green gram from Guntur district of Andhra Pradesh, by using 26 years of data i.e. from 1998-2023. Here, different statistical growth models viz., Power, Cubic, Richards, Gompertz, Logarithmic, Weibull, Hoerl, Exponential, MMF models were titled and comparative study was made for selecting best fitted models. By this study, Cubic and Weibull model were found to be quite successful for describing the growth pattern of Jowar and Green gram, based on selected diagnostic criterion and assumptions of residuals. Projection of production of Jowar and Green gram were found to be 12.63 (‘000 tonnes) and 19.47 (‘000 tonnes) by 2028 respectively.

**Keywords:** *Green gram, Jowar, MAPE, MAE, Nonlinear growth models, Production and RMSE*