

Oral presentation: 60

Time series modeling of red onion production in Jaffna, Sri Lanka

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Onion is one of the most important commercial vegetable crops grown in Sri Lanka. Observing fluctuation of onion production is essential in the market economy. The level of the production and the fluctuation not only has a significant influence on farmers and consumers, but also a reasonable effect on the safe running of the onion in market. In this study, the annual production of red onion in Jaffna is modeled by using Box – Jenkins time series approach. The Onion production in Jaffna is cultivated in two seasons, *Maha* season: from September to March, *Yala* season: from April to August. The annual seasonal red onion production data was obtained from the office of the Deputy Provincial Director of Agriculture (Extension) during the period of 1987 to 2016. The main objective of this study is to find the suitable Auto Regressive Integrated Moving Average (ARIMA) model for the annual production of Red onion in Jaffna. Further, three statistical criteria such as *Akaike's information criteria*, *Bayesian information criteria*, *mean squared error* were carried out in order to select the best ARIMA model. Through the modeling, it was identified that ARIMA (1,1,0) is the best fitting model to the given data. Moreover, the model validation has been done using the actual figures. Further, the identified best model can be used to predict the red onion production of Jaffna in near future.

Keywords: ARIMA, forecasting, red onion, seasonal data