**Trend analysis of weather parameters in relation to castor yield**

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ABSTRACT

The present study examined the trend analysis of weather parameters temperature, rainfall and with relation to castor yield. Long-term weather data of 47 years from 1970-71 to 2017-18 has been collected from IMD and castor yield data collected from DES, 2018. Mann Kendall nonparametric test for identification of trend indicated that annual as well as seasonal (June-sept) mansoon rainfall over India showed significant decreasing trend.  
Annual mean , maximum and minimum temperatures averaged over India showed significant warming trend. There was significant increase in total no of consecutive dry days of more than 5 days. Maximum and minimum temperature and rain fall showed significant positive correlation with yield.

**Keywords:** Castor yield, weather parameters, trend analysis, Mann Kendall and correlation

Changes in climatic variables may affect the crop yield (Smith *et al.* 2000, Chandrappa *et al.* 2011).) and these changes may lead to occurrence of new pests and diseases. Climate researchers have used trends for single location and extrapolated these trends for a larger area (Pielke *et al.* 2000). Therefore, there is need to relate the trends of climatic parameters with castor yield. Mann Kendall nonparametric test was used for identification of trend. For M-K test, the null hypothesis is H0 of no trend, the observations of series are randomly ordered in time, against the alternative hypothesis, H1, where there is an increasing or decreasing monotonic trend. To determine the relationship between yield and climatic parameters, correlation analysis was carried out.

The time series of annual maximum temperature in India showed significant increasing trend of 0.16, 0.11 and 0.14 0C per decade since 1981. Maximum warming trend is seen during post monsoon season. Total no of consecutive dry days with spell length more than 5 days has increased significantly. The time series of the annual minimum temperature in India showed significant increasing trend. Annual mean, maximum and minimum temperatures averaged over India showed significant warming trend. India receives 75 % of Annual rainfall from june –sept through summer monsoon season. Annual as well as seasonal (June-sept) mansoon rainfall over India showed significant decreasing trend. Time series of castor yield in India showed increasing trend which is an indication of improving yield over time. Gujarat covers 60 percent of castor area. Yield increased from 1.988 t to 2.072 ton per hectare.

Fig 1. Scatter diagram showing castor yield with relation to weather parameters

This scatter diagram showing how castor yields are vary with weather variables. Yield decreases with increase in temp. Yield has increased over most recent years despite increasing climatic variability. Yield was significantly and positively correlated (r=0.796) with maximum temperature, minimum temperature (0.617) and rain fall (0.314).

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