

## Assessing the climate based productivity potential of soybean in Madhya Pradesh

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### ABSTRACT

Present study was undertaken to study the effect of rainfall on soybean productivity in three districts of Madhya Pradesh. The secondary data were collected related to area, production and productivity of soybean. The present study revealed that Jabalpur and Indore showed increasing trend in productivity until mid nineties and there after it started declining whereas at Chhindwara declining trend in productivity of soybean. But normalized yield at Chhindwara showed no change. However, a plot of normalized yield with normalized rainfall of these districts shows that there was an increased in yield with increased rainfall at Indore and Chhindwara, but yield declined with increased rainfall at Jabalpur.

**Key words:** Soybean, rainfall, productivity, normal, yield trend

Soybean (*Glycine max.* L.) is one of the important commercial oilseed crop cultivated in Madhya Pradesh during kharif season in almost all parts of the state in different climatic conditions. It covers an area of about 4.35 million ha with production of 4.40 million tons and productivity of 1110 kg ha<sup>-1</sup>, against the national average yield of 1226 kg ha<sup>-1</sup> Madhya Pradesh is popularly known Soya State in the country. Currently soybean production has suffered in all parts of the state and this dwindling soybean production in the state is a matter of serious concern, There are decreasing trends in soybean productivity in recent years which has been attributed to various factors e.g. Disease like Yellow Vein Mosaic, Soybean Rust and other insect pest problems which are becoming more serious. However, among climatic factors, rainfall is the most important factor; since any change in its quantity and distribution would adversely affect the soil moisture status and reduce the crop yield to significant extent (Sharma and Gupta, 2002). Therefore present study aims to investigate the influence of rainfall on yield of soybean.

### MATERIALS AND METHODS

Three soybean producing districts located at different agro-climatic zones of the state were chosen based on annual rainfall viz. Jabalpur in high rainfall (>1300 mm), Chhindwara (1000 mm) and Indore in rainfall (900 mm). The rainfall data of these districts were collected from the JNKVV Research Station located in these districts. The productivity data of Soybean were collected and compiled from the office of Commissioner

of Land Records, Madhya Pradesh. For working out the impact of rainfall on productivity deviation between normal yield of soybean against normal rainfall of these districts was plotted.

### RESULTS AND DISCUSSION

The study indicated that long-term trends of productivity in these districts have been different. At Jabalpur and Indore there was an increasing trend in productivity until mid nineties and there after it started declining whereas at Chhindwara downward trend in productivity of soybean (Fig 1, 2 & 3). But normalized yield at Chhindwara showed no change. However, a plot of normalized yield with normalized rainfall of these districts shows that there was an increased in yield with increased rainfall at Indore and Chhindwara, but yield declined with increased rainfall at Jabalpur (Fig 4, 5 & 6). This showed the negative effect of high rainfall on soybean productivity at Jabalpur. Deosthali *et. al.* (2005) also reported that most of the districts in M.P. are characterized by low yield and high rainfall soybean topology. Whereas Ahirwar *et. al.* (2006) observed that lagged rainfall did not revealed any significant impact on current year acreage under soybean in Malwa region except Dhar district where lagged rainfall adversely affected the soybean acreage during current year.

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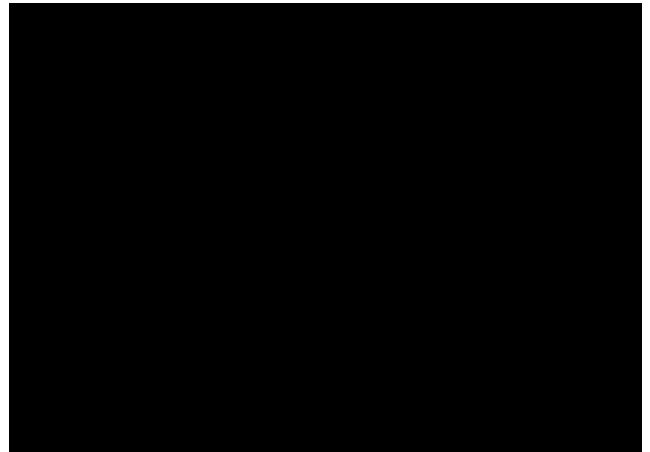
**Fig. 1:** Deviation of productivity of soybean from normal in Jabalpur



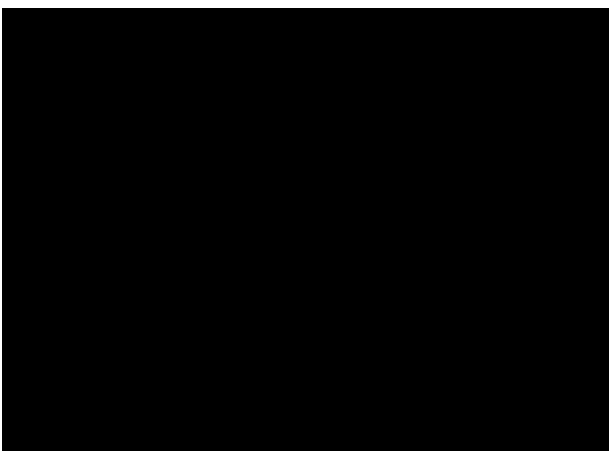
**Fig. 2:** Deviation of productivity of Soybean from Normal in Chhindwara



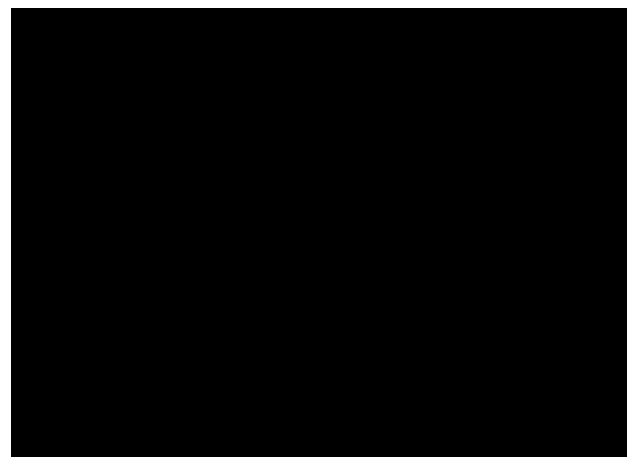
**Fig. 3:** Deviation of productivity of soybean from normal in Indore



**Fig. 4:** Deviation between normal productivity and normal rainfall



**Fig. 5:** Deviation between normal productivity and normal rainfall



**Fig. 6:** Deviation between normal productivity and normal rainfall.

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