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Tushar Jain
Department of Agriculture, Baba
Farid College, Deon, Bathinda,
Punjab, India

Jitender Singh
Department of Agriculture, Baba
Farid College, Deon, Bathinda,
Punjab, India

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Effect of the rainfall on productivity of Rice in Punjab

Tushar Jain and Jitender Singh

Abstract

Rice is the most important cereal staple food crop of more than half of the world's population, whereas in Asia more than 90 percent of the total population depends on rice. The major rice growing countries in Asia are China, India, Thailand, Indonesia, Bangladesh, Japan, etc. The major rice growing states in India are Punjab, West Bengal, Uttar Pradesh, Andhra Pradesh, Haryana, Uttarakhand, etc. Most of the population as well as area of Punjab is involved in the cultivation of rice. Productivity of any crops mainly depends upon climate conditions. Plants obtain all the nutrients they required from an environment around them. Rainfall is one of the most important condition which play a major role in the production of rice. At the places where the ground water cannot be used in agriculture or for any other purpose or the water table is low, the rainfall is the only source of water and natural way for the plants to obtain moisture. The rainfall anomalies occurred in recent years has the potential to cause undesirable effects on crop production and food security. The present study is an overview of the effect of the rainfall on rice production in Punjab from 2014 -2018.

Keywords: Rice, rainfall, productivity

Introduction

The thrust of green revolution was on fine cereal crops i.e. rice and wheat which primarily belong to irrigated ecosystem. Though green revolution has ensured food security to the country but with passage of time many unwanted consequences are also raised. These include over exploitation of ground water, pollution and ecological imbalances, etc. Climate changes and increasing population pressure has created a challenge of ensuring food and nutrition security in a sustainable manner. Agriculture is the central point of global food security, because it not only provide the food that people are dependent for survival but also provide livelihood and shelter (Sujay Rakshit *et al.*, 2019) [8]. Productivity of any crops mainly depends upon climate conditions. Rainfall is one of the most important condition which play a major role in the production of any crop. Rainfall is the only the natural way for plants to get water. Since crops like Rice need more water as compared to other crops like Maize, Barley, Sorghum, etc. So in case of less rainfall ground water is used for irrigation, which leads to depletion of water table. The rainfall anomalies occurred in recent years have the potential to cause undesirable effects on crop production and food security. So it becomes important to study the effect of rainfall on rice production.

Material and Method

The monthly (June to September) total rainfall data during the year 2014-2018 were taken from Punjab. The information was gather to observe the relationship of rainfall with productivity of Basmati and long grain non-Basmati rice.

Results

Analysis of effect of rainfall on rice production in Punjab

Analysis of data from year 2014 to year 2018 show some fluctuations.

Year 2014

Under year 2014 the production of total Basmati and Long grain non-basmati was 3521 (000'

Correspondence

Tushar Jain
Department of Agriculture, Baba
Farid College, Deon, Bathinda,
Punjab, India

tons), in total cultivation area 863.8 (000'ha) of Punjab (Geotrans Technologies Pvt. Ltd., 2017) ^[5]. Maximum total rainfall from month of June to September was reported as 244.6 mm (Dr.(Mrs.) Surinder Kaur *et al.*, 2014) ^[2].

Year 2015

In year 2015 total rainfall from month of June to September was 338.1mm (Dr. (Mrs.) Surinder Kaur *et al.*, 2015) ^[3]. Where the production of Basmati and Long grain non-basmati was increased to 3562 (000' tons), total area under Basmati and long grain non-basmati cultivation was 869(000'ha) (Geotrans Technologies Pvt. Ltd., 2017) ^[5]. and This means that with increase of 38.2 % in rainfall and 0.6% in area under cultivation, production was increased by 1.16%.

Year 2016

Total Basmati and Long grain non-basmati production was 2358.8 (000' tons), total area under Basmati and long grain non-basmati cultivation was 620.8 (000'ha) (Geotrans Technologies Pvt. Ltd., 2017) ^[5] and total rainfall from month of June to September is 367.9 mm (M.K. Purohit *et al.*, 2016) ^[6]. So with increase of 8.8% in rainfall but decrease of 28.5% of area under cultivation, production decreased by 33.7%.

Year 2017

Total Basmati and Long grain non-basmati production was 2164.2 (000' tons), total area under Basmati and long grain non-basmati cultivation was 567.9(000'ha) (Geotrans Technologies Pvt. Ltd., 2017) ^[5] and total rainfall from month of June to September is 390.1 mm (B.P. Yadav *et al.*, 2017) ^[1].

This means that with increase of 6% in rainfall but decrease of 8.5% area under cultivation, production decreased by 8.2%.

Year 2018

Total Basmati and Long grain non-basmati production was 1986.2 (000' tons), total area under Basmati and long grain non-basmati cultivation was 552.9 (000'ha) and total rainfall from month of June to September is 527mm (Geotrans Technologies Pvt. Ltd., 2018) ^[4]. Which reveal that increase of 35% in rainfall but decrease of 2.6% of area under cultivation, production decreased by 8.2%.

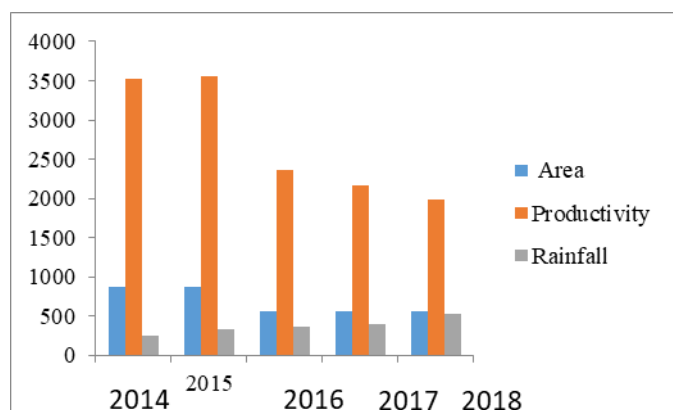


Fig 1

Conclusion

The finding of study exposed that average seasonal rainfall can be considered as an explanatory climate parameter on rice production in Punjab. It is observed that rainfall had positive effect on rice yield (Nguyen Thi Chung *et al.*, 2015) ^[7]. Some fluctuations are observed, these may be due to other factors

like hailstorm, temperature variation, ground water level, etc. So it is clear that rice yield is connected to climate variability trends. The consideration of enhancing or perfecting techniques needed to improve the seasonal climate forecast while simultaneously disseminating current climate conditions and predictions are a needed requirement to help sustain, improve and increase the agricultural development (Nguyen Thi Chung *et al.*, 2015) ^[7].

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