

## Growth and yield of potato influenced by irrigation regimes, planting layout and fertilizer levels

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### ABSTRACT

Growth contributing characters in potato (cv. KUFRI JYOTI) viz., plant height, spread, number of leaves, number of branches and total dry matter weight and yield contributing characters viz., number of tubers plant<sup>-1</sup>, size of potato, weight of tuber plant<sup>-1</sup>, tuber yield, haulm weight ha<sup>-1</sup> significantly increased with the application of 50mm CPE irrigation regimes with normal planting on ridges and furrows and at higher fertilizer levels 160:80:80 kg NPK ha<sup>-1</sup>.

**Key words :** Kufri jyoti, Irrigation regimes planting layouts, Fertilizer levels

### INTRODUCTION

Potato (*Solanum tuberosum* L.) is an important crop of the world in vegetable. It is widely grown in world on large scale, ranking on fourth in food production after wheat maize and rice. The district of North Satara and Poona which lie in the jurisdiction of Mahatma Phule Krishi Vidyapeeth, Rahuri are the most important growing areas and have 80 per cent of total area under the crop in the state. The plains of Maharashtra are well suited for increasing the area under potato crop.

As the potato crop is susceptible to the excess and shortage of irrigation water the optimum level of irrigation water should be applied at particular time. A systematic attempt has not been made so far to relate yield with climatic data and different levels of irrigation water on the basis of cumulative pan evaporation for potato crop in this region. Similarly, the information regarding the performance of potato under varied rows spacing and planting systems with surface irrigation under Rahuri conditions is to be standardized through investigation. Similarly, fertilizer application is needed to meet the nutrient requirement of potato crop in most of the Indian soils.

Potato which is underground tuber crop needs more nutrient as compared to cereals. Nutrient management is an important agronomic factor responsible for increasing the yield of potato and the quality of potato.

In view of the above considerations, an experiment entitled. "Effect of irrigation regimes, planting layouts and fertilizer levels on growth and yield of potato (cv. KUFRI JYOTI)" was planned during *Rabi* 1998-99.

### MATERIALS AND METHODS

The field experiment was conducted at the Institutional farm of interfaculty Department of Irrigation

Water Management, Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist. Ahmednagar during *Rabi* 1998. The soil was sandy clay loam, low in available nitrogen (146.20 kg ha<sup>-1</sup>) and phosphorus (10.82 kg ha<sup>-1</sup>) and high in potassium (252.10 kg ha<sup>-1</sup>) with slightly alkaline in reaction (pH 8.1). The experiment was laid out in Factorial Randomized Block Design (F.R.B.D.) with twelve treatment combinations including three fertilizer levels viz., 80:40:40 kg NPK ha<sup>-1</sup>, 120:60:60 kg NPK ha<sup>-1</sup> and 160:80:80 kg NPK ha<sup>-1</sup>. two irrigation regimes at 50 mm CPE, at 6 cm depth and irrigation at 75 mm CPE at 8 cm depth, also again there were two treatments of planting layouts for potato crop *i.e.* ridges and furrows and broad bed furrows with three replications. The gross plot size was 6.0 x 4.8 m<sup>2</sup> while net plot size was 5.40 x 3.60 m<sup>2</sup>, respectively.

### RESULTS AND DISCUSSION

Biometric observations on growth attributes were recorded at harvest in (Table 1). The height of plant was progressively increased with the advancement in the age of crop, maximum height of 42.98 cm was recorded at 50 mm CPE than 75 mm CPE. Ingale and Dahatonde (1975) reported similar results in potato when irrigation were applied at 40 mm CPE than 60 mm. Similarly, plant height was higher under ridges and furrows than broad bed furrows. Plant height was also higher at 160:80:80 kg NPK/ha of fertilizer level than lower levels of fertilizer *i.e.* 80:40:40 NPK and 120:60:60 kg NPK/ha. Ingale and Dahtonde (1975) reported similar results with the application of 100:100:50 NPK kg ha<sup>-1</sup>. The difference in spread of the plant due to irrigation regimes were statistically significant at all stage of crop growth however the maximum plant spread was observed as 50 mm CPE (41.50 cm) than 75 mm PCE (39.33 mm). Plant spread in

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