

Response of potato to different depths and methods

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ABSTRACT

The investigation entitled, "Response of Potato to Different Depths and Methods" was undertaken during *Rabi* 2002-03 with potato cv. Kufri Jyoti at Water Management Project, Mahatma Phule Krishi Vidyapeeth, and Rahuri. The field experiment was laid out in split plot design with three replications and twenty treatments comprising of four main plot treatments viz., sprinkler, micro-sprinkler, drip, surface and five sub plot treatments viz. depth of 3.53, 3.03, 2.43, 1.98, 1.50 cm. water at 25 mm CPE by sprinkler and micro-sprinkler, wetted area of 1.30, 1.10, 0.90, 0.70, 0.50 for drip, depth of 7.06, 6.05, 4.85, 3.95 and 3.00 cm water at 50 mm CPE by surface and method. The soil was clayey in texture, low in available nitrogen (182.68 kg ha⁻¹), medium in available phosphorus (16.80 kg ha⁻¹) and rich in available potassium (562 kg ha⁻¹) with slightly alkaline in reaction (pH 8.2). The growth and yield contributing characters attained maximum value under sprinkler method than other methods. The highest tuber yield (23.39-t ha⁻¹) and haulms yield (1.68 t ha⁻¹) was recorded due to sprinkler method. There was an increase of 64.55 per cent in tuber yield over surface method. The big size tubers were maximum under sprinkler methods, while the total number of tubers per plant was higher under micro-sprinkler method. The highest tuber yield (20.85-t ha⁻¹) was obtained from regime I₁ which was at par with regime I₂ (20.24 t ha⁻¹). The water requirement of regime I₁ (43.90 cm) was highest, but WUE (474.9-kg ha⁻¹ mm) was lowest. The gross and net returns were maximum for sprinkler and micro-sprinkler methods with regime I₁ with B : C ratio of 4.80 and 3.27, respectively, while the drip system was not economical for potato.

Key words : Potato, Irrigation depth, Irrigation methods.

INTRODUCTION

Potato provides vitamins, minerals, proteins and valuable food for those, who suffers from stomach acidity and low blood pressure. In the year 1999-2000 production of potato was 24.2 million tones from area of 1.24 million hectares, with the productivity 19.4 tonnes per hectare. (Anonymous, 2001). About 82 per cent area and 88 per cent production are contributed by it's winter crop alone (Sangwan, 1991).

Maharashtra accounts 15000 hectares are i.e. 1 to 2 per cent of all India acreage with productivity of 4.8 t ha⁻¹ (Anonymous, 1999). Irrigation water may be applied to the crops either by surface method or by pressurized irrigation methods such as drip, sprinkler and minor sprinkler. In order to overcome the losses which takes place by surface methods and to use available water efficiently, the modern pressurized methods are adopted. Optimum use of water as per crop requirement is the times need. The water production function is the quantitative expression relating yield output to irrigation input. It is a valuable tool to decide the level of water use. The formation of crop response to quantity of water applied will be of practical use in deciding upon the application of irrigation water to maximize the total production per unit input of irrigation water.

As the potato crop is susceptible to the excess and

shortage of irrigation water the optimum levels of irrigation water should be applied at particular time with modern methods of irrigation like drip, sprinkler and micro-sprinkler. A systematic attempt on the basis of IW/CPE ratio for potato has not been studied. For recommending the most appropriate irrigation method and the optimum irrigation depth, so that the present investigation was planned with following objectives.

1. To study the effect of different irrigation methods on growth and yield of potato.
2. To study the growth and yield response of potato to varying water application depth in relation to irrigation methods.

MATERIALS AND METHODS

The investigation entitled, "Response of Potato to Different Depths and Methods" was undertaken during *Rabi* 2002-03 with potato cv. Kufri Jyoti at Water Management Project, Mahatma Phule Krishi Vidyapeeth, and Rahuri. The field experiment was laid out in split plot design with three replications and twenty treatments comprising of four main plot treatments viz., sprinkler, micro-sprinkler, drip, surface and five sub plot treatments viz. depth of 3.53, 3.03, 2.43, 1.98, 1.50 cm. Water at 25 mm CPE by sprinkler and micro-sprinkler, wetted area of 1.30, 1.10, 0.90, 0.70, 0.50 for drip, depth of 7.06, 6.05,

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