

Research Paper

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Effect of plant growth regulators and methods of application on growth and yield of potato (*Solanum tuberosum* L.) cv. KUFRI BADSHAH

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ABSTRACT : The present investigation of plant growth regulators and methods of application on growth and other yield components were carried out on potato. Out of 10 treatment combinations comprised of two levels of methods of application viz., M₁ (Seed treatment) and M₂ (Spray treatment) and five levels of plant growth regulators R₁ (control), R₂ (GA₃ 25 ppm), R₃ (GA₃ 50 ppm), R₄ (IBA 100 ppm) and R₅ (IBA 200 ppm). Spray treatment of IBA 200 ppm was effective in maximum germination percent, growth, number of shoots per plant, days taken for physiological maturity, number of tubers harvested per plant and yield of tuber kg ha⁻¹ and application of spray of GA₃ 50 ppm was superior for minimum days taken for germination and average weight of tuber.

Key Words : Potato, Plant growth regulators, Methods of application, Growth attributes, Yield attributes

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Potato belongs to the family Solanaceae, genus *Solanum* and species *tuberosum*. Potato is a native of South Africa. Potato produces more carbohydrates, fibers and vitamins per unit area and time than the other major food crops. Potato is a low energy food and it provides 138 Kcal/ 200 g of boiled potato. It is rich in potassium and phosphorus (Shekhawat *et al.*, 1992).

Gibberellin application enhanced shoot emergence, increased shoot height, stems per hill and number of tuber per hill (Khurana and Pandita, 1987). However, IBA is preferred than other growth substances as, it has low auxin activity and destroys relatively slowly by auxin degrading enzymes. IBA is persistent in nature. The application of IBA recorded its superiority over other plant growth regulators for plant height, number of branches and number of leaves; therefore, it is resulted in highest dry weight of foliage (Bhatia *et al.*, 1992). IBA at the concentration of 200 ppm should be sprayed on the potato foliage at 40 days and 55 days after planting.

RESEARCH PROCEDURE

An experiment was conducted during 2011 at Horticulture Instructional Farm, C.P. College of Agriculture, S.D. Agricultural

University, Sardarkrushinagar. The experiment was laid out in Factorial Randomized Block Design with three replications. There were 10 treatment combinations comprised of two levels of methods of application viz., M₁ (Seed treatment) and M₂ (Spray treatment) and five levels of plant growth regulators R₁ (control), R₂ (GA₃ 25 ppm), R₃ (GA₃ 50 ppm), R₄ (IBA 100 ppm) and R₅ (IBA 200 ppm) (Table 1). The soil of experimental plot was sandy loam in texture, low in organic carbon and available nitrogen, medium in available phosphorus and rich in potassium status. The variety of potato was 'Kufri Badshah' and seed rate of potato was 3000 kg/ha. The potato was fertilized with 275:140:275 NPK kg/ha.

RESEARCH ANALYSIS AND REASONING

The results obtained from the present investigation have been discussed in the following sub heads:

Growth attributes:

Growth parameters like length of main shoot (at 60, 75 and 90 DAS) and number of shoot per plant were significantly affected by methods of application (Table 1), but the growth parameters like days taken for germination, germination (%),