

Research
Paper

Effect of bio-fertilizers on potato tuber yield under varying fertility levels

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ABSTRACT

Seed production of potato variety kufari Pukhraj gave maximum seed tuber yield with the application of 100 per cent of NPK (150:80:100 NPK kg/ha) along with *Azotobacter* 3 kg/ha and sprayed with ethrel @ 250 ppm twice at 25 and 50 days after planting under agro-climatic region of gird region of Madhya Pradesh. Thus it is clear that yield of seed size tubers (q/ha) was the maximum under treatment combination F₂ B₁ due to highest weight and large number of seed size tubers per plant and lowest weight and numbers of small size tubers per plant.

Rajput, B.S., Lekhi, R. and Samadhiya, R.K. (2011). Effect of bio-fertilizers on potato tuber yield under varying fertility levels, *Adv. Res. J. Crop Improv.*, 2 (2) : 244-246.

KEY WORDS : Potato, Biofertilizers, Yield, Quality

Potato is one of the most important food crops after wheat, maize and rice, historically contributing to food and nutrition security in the world. It is recognized as a nutritionally goldmine with favourable protein carbohydrate balance and high quality proteins. In Madhya Pradesh, potato is cultivated as a rabi crop. However, in some areas, it is also grown as kharif crop. The major potato producing district are Indore, Dewas, Shajapur, Chhindwara, Sagar, Ujjain and Satana. The annual production of potato in M.P. is 562400 tones from 42800 hectare with a productivity of 13.14 t/ha (Commissioner, Land Records MP 2005-06).

Potato is being vegetatively propagated by seed tubers and from true seed. Potato production from seed tubers is popular because of the ease by which tubers can be planted, the fast and vigorous growth of plant, the uniformity of harvested tubers besides its high yield potential. In spite of all these advantages, the method has presented important problem, which hampered the adoption and expansion of potato in India. The main problem is the non availability of good quality seed for planting purpose.

Under normal production technology, farmers use non-judicious chemical fertilizer to obtain the high commercial yield, which leads to more large size tubers in the produce. Which leads to the proportion of seed size (25-75g) tubers is less. Apart from this, the chemical fertilizers alone are known to deteriorate the soil health and create nutrient imbalance. At the same time, application of bio-fertilizers alone dose not produce

spectacular increase in the yield due to their low nutrient status and requirement in huge quality. Hence, an effort was initiated in this investigation to study influence of chemical and bio-fertilizers on the growth and tuber yield. Bio fertilizers are eco-friendly and their use reduces the cost of chemical fertilizers. The effective use of bio-fertilizers not only provides economic benefit but improves and maintains the soil fertility and health.

RESEARCH PROCEDURE

The experiment was carried out at the Horticulture Nursery, College of Agriculture, Gwalior which is located at 26°13' N latitude 78°14' E longitude at a height of 211.5 metre above the mean sea level. The experimental field was laid out in the Split Plot Design. Main plot treatments were fertility levels whereas sub plot treatments were three bio-fertilizer treatment. Total treatments combination were eighteenth. All the treatments were replicated three times. Variety *Kufari* Pukhraj was used as seed with tuber size 40-50 g.

The treatment details given are : factor Ist (Main plot treatments) fertility levels (F): F₁- 50% of recommended dose of NPK, F₂- 100% of recommended dose of NPK (150:80:100 NPK kg/ha), factor IInd (Sub plot treatments) : Bio fertilizers (B), B₁ - *Azotobacter*, B₂ PSB and B₃ control. The haulms of the plant were killed by grammxone spray @ 3kg/ha at 80 DAP. The tubers were