



## Research Paper

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# Effect of potassium levels and its uptake on correlation between tuber yield and yield attributing characters in potato (*Solanum tuberosum* L.) var. KUFRI PUKHRAJ

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**ABSTRACT :** Field experiment was conducted during winter season of 2009-10 and 2010-11 on potato variety Kufri Pukhraj at farmers' field in participatory mode on sandy loam soils to study the correlation of potassium (K) levels with yield attributing characters and tuber yield in potato (*Solanum tuberosum* L.) var. KUFRI PUKHRAJ. The treatments consisted of 4 graded levels of potassium as MOP (0, 50, 100 and 150 kg K<sub>2</sub>O/ ha) at constant dose of nitrogen (150 kg/ha) and phosphorous (60 kg P<sub>2</sub>O<sub>5</sub>/ ha) in Randomized Block Design with 6 replications. The total tuber yield increased significantly with each increment of potassium dose. The increase in tuber yield was 19, 28 and 32 per cent at 50, 100 and 150 kg K<sub>2</sub>O ha<sup>-1</sup>, respectively over the control. The per cent contribution of large (>75g) grade tuber to the total tuber yield was increased from 33 per cent at 0 kg K<sub>2</sub>O/ ha to 43 per cent at 100 kg K<sub>2</sub>O/ha. The yield of large size tuber increased by 43, 71 and 84 per cent at 50, 100 and 150 kg K<sub>2</sub>O/ha as compared to no K application. The large (>75g) and medium (25-75g) grade tuber as well as total aggregate tuber number enhanced markedly with each increment in K levels from 0 to 100 kg/ha. The small (<25g) size tuber number decreased with increasing K levels. Different levels of potassium showed increase in K uptake from 83 kg K<sub>2</sub>O/ha in control to 149 kg K<sub>2</sub>O/ha in potato cv. KUFRI PUKHRAJ. The correlation of average plant height, leaf area index(LAI), tuber yield per plant, average tuber weight per plant, plant population, bulking rate and potassium uptake with tuber yield were found to be positive and significant indicating that simultaneous improvement in all these characters would be possible by improvement in potassium uptake.

**KEY WORDS :** Potato, Tuber yield, Potassium levels, Potassium uptake

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Potato (*Solanum tuberosum* L.) is one of the most important and widely cultivated vegetable crops of Eastern Indo-Gangetic Plains of India. In this region, Bihar is the 3<sup>rd</sup> largest potato growing and producing state of India accounting for nearly 9.8 per cent of total potato area and 4.2 per cent of the total potato production in the country. As per the state-wise final estimates of potato for 2007-08 released by the Directorate of Economics & Statistics, Ministry of Agriculture, Govt. of India, New Delhi. Bihar state occupies 152.4 thousand hectare of potato area with an annual production of 1203 thousand tones and 7.89 t ha<sup>-1</sup> productivity (Anonymous, 2008). The average productivity in the state is

below the national average yield of 18.33 t ha<sup>-1</sup> despite the fact that state is blessed with high fertile soil and good quality water resources, whereas the average productivity of the two neighboring states of Uttar Pradesh and West Bengal is more than 20.0t ha<sup>-1</sup>. Low use of fertilizers and severe imbalance in the nitrogen(N), phosphorus (P) and K application ratio and unbalanced fertilization in favour of N and lack of potassium application are of the major reasons responsible for low production of potato in the state (Singh, 1999).

Potassium is an important nutritional factor in crop management, which contributes to production of high yields of quality potato. Potato crop demands high level of soil