Indian Journal of Agronomy **70** (2): 204–210 (June 2025)
DOI: 10.59797/ija.v70.i2.5604

Research Paper

Performance of potato (*Solanum tuberosum*) under varieties different potassium levels

G.L. CHOUDHARY[1], P.K. YADAV[2], PARAS NATH[3] AND ANIL KUMAR[4]

Agriculture Research Station, (Sri Karan Narendra Agriculture University, Jobner, Jaipur, Rajasthan) Navgaon, Alwar, Rajasthan 301 025

Received: March 2025; Revised accepted: May 2025

ABSTRACT

A field experiment was conducted during *rabi* seasons of 2018–21 at the research farm of Bhola Paswan Shastri Agricultural College, Purnea, Bihar to find out the performance of different varieties of potato under varying levels of potassium. The experiment consisted of three varieties ('Kufri Pukhraj', 'Kufri Kanchan' and 'Kufri Sindhuri') in main plots and five levels of potassium (Control, 75% RDK, 100% RDK, 125% RDK and 150% RDK) in sub-plots. The experiment was laid out in split plot design and replicated thrice. Late variety of potato i.e. 'Kufri Sindhuri' produced significantly taller plants, higher number of leaves per plant, number of stems/plant, number of tubers/plant, tuber weight/plant and tuber yield as compared to other varieties. 'Kufri Sindhuri' was also taken significantly more number of days to maturity (126 days) than 'Kufri Pukhraj' (85 days) and 'Kufri Kanchan' (106 days). However, early variety of potato i.e. 'Kufri Pukhraj' recorded significantly higher average tuber weight over other varieties. Significantly higher net returns of ₹1,87,557/- along with B:C ratio of 1.32 was fetched by 'Kufri Sindhuri' over early and medium varieties. Whereas, significantly higher production efficiency (262.0 kg/ha/day) was recorded with 'Kufri Pukhraj'. With respect to quality parameters, late variety (Kufri Sindhuri) recorded significantly higher value of total soluble solids (TSS) and the lowest physiological weight loss, sprouting loss, rotting loss and total weight loss during storage as compared to early and medium varieties of potato. Increasing levels of potassium up to 125% RDK (187.5 kg K_2O/ha) significantly increased the plant height, number of leaves per plant, number of tubers per plant, tuber yield and production efficiency as compared to lower levels. However, number of stems per hill was increased up to 125% RDK but significant impact was observed only up to 75% RDK over control. Average tuber weight of potato was increased from control to 150% RDK but the significance response was observed only up to 100% RDK. Whereas, tuber weight per plant was increased significantly up to the highest level of potassium (150% RDK) over lower levels. Application of 150% RDK (225.0 kg K_2O/ha) being at par with 125% RDK (187.5 kg K_2O/ha) fetched significantly highest net returns of ₹2,07,185/- along with B:C ratio of 1.47 over control, 75% RDK and 100% RDK. Quality parameters of potato i.e. total soluble solids (TSS), physiological loss of weight, sprouting loss, rotting loss and total weight loss were influenced significantly with application of potassium.

Key words: Net returns, Potassium, Quality, Total soluble solids, Tuber yield

Potato (*Solanum tuberosum* L.) is one of the most important food and cash crop of India as well as worldwide. Internationally it is the 4th most important food crop with respect to the production, after wheat, rice and maize. India stands at second position after China in annual production of potatoes with 14.51% share. Annual planting area of potato in India during 2021-22 was 2.23 million hectares and production was 56.18 million tonnes with productivity of 25239 kg/ha (GOI, 2023). Major potato growing states are Uttar Pradesh, West Bengal, Bihar, Madhya Pradesh, Gujarat, Punjab, Assam, Jharkhand, Chhattisgarh and Haryana. Utter Pradesh ranked 1st in area, production and productivity of potato among Indian states (GOI, 2023). Potato is a food crop containing less energy but containing higher quality of protein, essential minerals including trace elements and vitamins (Jatav *et al.,* 2018). It contains higher amount of carbohydrates (22.6 g/100 g), minerals (Ca, Mg, K, P, Cu, Fe and Na), and vitamin C (17 mg)

[1]Corresponding author's Email: gopal.agron@gmail.com
[1]Associate Professor & Zonal Director Research, Navgaon, Alwar, Rajasthan 301 025; [2]Assistant Professor-cum-Junior Scientist, Department of Soil Science, Irrigation Research Station, Madhepur, Bihar 852 113; [3]Professor-cum-Chief Scientist, Department of Entomology, Bihar Agricultural College, Bhagalpur, Bihar 813 210; [4]Assistant Professor-cum-Junior Scientist, Department of Horticulture, BPS Agricultural College, Purnea, Bihar 854 302

and comprises 97 kilo calories energy per 100 g of edible portion. It is consumed as vegetable alone or mixed with other vegetables such as cabbage, tomato, beans, brinjal, cauliflower etc. It is used for making chips and other products. It is also used for production of several industrial products such as starch, alcohol, dextrin, glucose, dyes etc.

Being a high yielding crop potato exhaust huge amount of nutrients from the soil, thus requires balanced nutrition for better growth and development. Potato requires higher amount of primary nutrients than the other crops. Many farmers widely used nitrogen and phosphorus while potassium is usually ignored causing serious loss in crop productivity and also responsible for depletion in availability of potassium in the soils (Ladha *et al*., 2003 and Lal *et al.,* 2007). Potato absorbs 1.5 times more K than N and four times more K than P (Blagoeva *et al.,* 2004). Potassium is one of the most important essential nutrient elements in potato cultivation and its uptake is highest among all the nutrient elements. K essentially takes part in synthesis, translocation and storage of carbohydrates, tuber quality and processing characteristics as well as imparts resistance in crop plant against abiotic and biotic stresses. It also plays an important role in maintaining growth and vigour of the plants (Singh *et al*., 1996 and Banerjee *et al.*, 2016). Potassium is also considered as "Quality Element" because of its response on tuber size, shape, colour, taste and shelf life (Lakshmi *et al*., 2012). Application of increasing levels of potassium resulted significant improvement in crop growth, productivity and quality of the produce (Abay & Sheleme, 2011 and Latif *et al.,* 2011). Thus, keeping these facts in mind, the present study has formulated to evaluate the performance of different maturity group varieties of potato under varying levels of potassium.

MATERIALS AND METHODS

A field experiment was conducted at the research farm of Bhola Paswan Shastri Agricultural College, Purnea, Bihar for three consecutive years during *rabi* seasons of 2018–19, 2019–20 and 2020–21 to find out the performance of different varieties of potato under varying levels of potassium. The experimental farm is situated at 25º49′11″ N latitude, 87º30′44″ E longitude and 40 m above mean sea level. The experimental soil was sandy loam in texture and slightly acidic in reaction (*p*H 6.7). The soil was low in organic carbon (0.43%) and available nitrogen (135.1 kg N/ha), medium in available phosphorus (23.3 kg P/ha) and potassium (265.4 kg K/ha). The experiment consisted of three varieties {V_1, 'Kufri Pukhraj' (early), V_2, 'Kufri Kanchan' (medium) and V_3, 'Kufri Sindhuri' (late)} in main plots and five levels of potassium {K_0, Control, K_1, 75% RDK (112.5 kg K_2O/ha), K_2, 100% RDK (150.0 kg K_2O/ha), K_3, 125% RDK (187.5 kg K_2O/ha) and K_4, 150% RDK (225.0 kg K_2O/ha)} in sub-plots. The experiment was laid out in split plot design and replicated thrice. Potato tubers were planted at 60 cm (row to row) × 20 cm (plant to plant) spacing and net plot size of 4.8 × 4.0 m^2 was used. Recommended dose of fertilizers for the present experiment was 150 kg N, 90 kg P_2O_5 and 150 kg K_2O/ha. Urea, Diammonium phosphate (DAP) and muriate of potash (MOP) were used as fertilizer and half dose of nitrogen and full dose of phosphorus was applied as basal dose at the time of sowing and remaining half dose of nitrogen were applied in split along with irrigation water to all the plots including control. Potassium was applied as per the treatments at the time of sowing as basal dose. The crop was grown with recommended package of practices (Singh *et al.,* 2020).

Five plants were selected randomly from each plot, tagged permanently and used for measurement of growth parameters and yield attributes. Height of five plants from base to tip were measured at the time of maturity and averaged them for calculation of average plant height. Total number of leaves and stems of all the five tagged plants were counted and averaged for calculation of number of leaves and stems per plant at the time of maturity. Days taken to maturity was calculated from date of sowing to date of harvesting of crop. Tagged plants were uprooted after maturity and tubers of the plants were counted and weight for calculation of number of tubers per plant, average tuber weight (g) and tuber weight per plant (g). After maturity of the crop all the plants from net plot area were uprooted and left in the plots for drying of soil then wipe of the soil from the tuber surface and weight of tuber yield per plot. Tuber yield per hectare was calculated for each treatment on the basis of harvested yield and net plot area. Economics of different treatments were worked out by considering the cost of inputs and income obtained from output based on the prevailing market price. Production efficiency (PE) was calculated by dividing total tuber yield with days taken to maturity by respective treatment. Total soluble solids (TSS) value of each and every treatment were measured after harvesting of crop by using brix hand refractometer. Five kg clean and uniform size tubers from each treatment were packed individually in hessian cloth bags and kept at room temperature. The bags containing tubers were stored for 75 days allowing sufficient space of air movement between bags at ambient room temperature. After 75 days physiological loss of weight (%), sprouting loss (%), rotting loss (%) and total weight loss (%) were measures for every treatment. Statistical analysis of the data was carried out using standard analysis of variance (Gomez and Gomez, 1984).

RESULTS AND DISCUSSION

Growth parameters

Growth parameters of potato, viz. plant height, number of leaves/plant, number of stems/hill and days taken to maturity were significantly affected under different cultivars (Table 1). Potato variety 'Kufri Sindhuri' (late variety of potato) produced significantly taller plants with significantly greater number of leaves/plant, number of stems/plant and days taken to maturity as compared to early 'Kufri Pukhraj' and medium 'Kufri Kanchan' duration varieties. Highest number of days to maturity was taken by 'Kufri Sindhuri' (126 days), whereas, least number of days to maturity was taken by 'Kufri Pukhraj' (85 days). The differences in growth parameters between different cultivars might be due to variability in genetic makeup and differential behaviour under diverse agroclimatic conditions (Abubaker *et al.,* 2011; Zelelew *et al.,* 2016 and Mankar *et al.,* 2022; Kumar *et al.,* 2023a)

Application of different levels of potassium brought significant impact of growth parameters of potato, viz. plant height, number of leaves/plant and number of stems/hill and days taken to maturity by the crop (Table 1). Increasing levels of potassium up to 125% RDK (187.5 kg K_2O/ha) significantly increased the plant height and number of leaves per plant over lower levels. Further increase in potassium level up to 150% RDK (225.0 kg K_2O/ha) increase the plant height and number of leaves/plant over 125% RDK but magnitude was not up to the level of significance. However, number of stems/hill was increased up to 125% RDK but significant impact was observed only up to 75% RDK (112.5 kg K_2O/ha) over control. Whereas, significance response on days taken to maturity by different varieties were observed only up to 75% RDK (112.5 kg K_2O/ha). The favourable effect of increasing levels of potassium on these parameters might be ascribed due to crucial role of K in maintenance of tissue water relation, assistance in photosynthesis and enhances uptake of nitrogen and synthesis of protein resulting in better foliage growth (Singh and Lal, 2012; Zelelew *et al.,* 2016 and Behera *et al.,* 2019).

Yield attributes

Different duration varieties of potato were also brought significant impact on yield attributes, viz. number of tubers/plant, average tuber weight and tuber weight/plant (Table 2). Significantly higher number of tubers/plant (9.21) and tuber weight/plant (341.93 g) were recorded under late variety of potato i.e. 'Kufri Sindhuri' as compared to early and medium duration varieties. However, early variety of potato 'Kufri Pukhraj' recorded significantly highest average tuber weight (40.85 g/tuber) over rest of the varieties. Similarly to the growth parameters, yield attributes were also differed significantly between different maturity group varieties could be attributed due to variation in their genetic makeup and differential environmental behaviour (Kumar and Minhas, 2013; Sadawarti *et al.,* 2018 and Mankar *et al.,* 2024).

Yield attributes of potato (number of tubers per plant, average tuber weight and tuber weight per plant) were affected significantly by increasing levels of potassium (Table 2). Application of 125% RDK (187.5 kg K_2O/ha) being at par with 150% RDK (225.0 kg K_2O/ha) produced significantly higher number of tubers per plant over control, 75% RDK and 100% RDK. However, average tuber

Table 1. Growth parameters of different varieties of potato under various levels of potassium (pooled mean data of 3 years)

Treatment	Plant height (cm)	Number of leaves/plant	Number of stems/hill	Days taken to maturity
Varieties				
'Kufri Pukhraj'	41.3	41.9	5.14	85
'Kufri Kanchan'	50.4	46.4	4.87	106
'Kufri Sindhuri'	57.3	56.4	5.40	126
SEm±	0.55	0.52	0.05	0.3
CD (P=0.05)	1.70	1.59	0.17	0.8
Potassium levels				
Control	42.7	42.8	4.66	104
112.5 kg K_2O/ha	47.9	46.7	5.15	105
150.0 kg K_2O/ha	50.9	49.0	5.25	106
187.5 kg K_2O/ha	52.8	50.7	5.33	106
225.0 kg K_2O/ha	53.9	52.0	5.28	106
SEm±	0.63	0.60	0.06	0.4
CD (P=0.05)	1.78	1.69	0.18	1.1

Table 2. Yield attributes of different varieties of potato under various levels of potassium (Pooled mean data of three years)

Treatment	Number of tubers /plant	Average tuber weight (g)	Tuber weight/ plant (g)
Varieties			
'Kufri Pukhraj'	6.79	40.85	275.07
'Kufri Kanchan'	7.96	38.54	308.96
'Kufri Sindhuri'	9.21	36.92	341.93
SEm±	0.09	0.42	3.51
CD (P=0.05)	0.27	1.29	10.81
Potassium levels			
Control	6.34	35.86	222.39
112.5 kg K_2O/ha	7.66	37.86	284.26
150.0 kg K_2O/ha	8.41	39.48	326.79
187.5 kg K_2O/ha	8.86	40.23	347.79
225.0 kg K_2O/ha	8.67	40.41	362.02
SEm±	0.10	0.50	4.07
CD (P=0.05)	0.29	1.41	11.47

weight of potato was increased from control to 150% RDK but the significance response was observed only up to 100% RDK. Whereas, tuber weight per plant was increased significantly up to the highest level of potassium i.e. 150% RDK (225.0 kg K_2O/ha) over lower levels. The significant improvement on yield attributes might be due to the role of K on photosynthesis, favours high energy status which helps the crop for timely and proper nutrients translocation and water absorption by roots resulting in more availability of photosynthates to produce higher number of tubers per plant, average tuber weight and tubers weight per plant (Zelelew and Ghebreslassie, 2016 and Behera *et al.,* 2019).

Yield and economics

Tuber yield, economics and production efficiency of potato crop were also varied significantly by different cultivars (Table 3). Late variety of potato 'Kufri Sindhuri' produced significantly higher tuber yield (26.72 t/ha) along with net returns of ₹1,87,557/ha and B:C ratio of 1.32 as compared to early and medium duration cultivars. However, significantly higher production efficiency of 262.0 kg/ha/day was found under early maturing cultivar i.e. 'Kufri Pukhraj' as compared to medium and late maturing cultivars of potato. Improved growth parameters and yield attributes resulted in to higher tuber yield under particular

Table 3. Tuber yield and economics of different varieties of potato under various levels of potassium (pooled mean data of 3 years)

Treatment	Tuber yield (t/ha)	Cost of cultivation (₹/ha)	Net returns (₹/ha)	B:C ratio	Production efficiency (kg/ha/day)
Varieties					
'Kufri Pukhraj'	22.28	136,938	137,958	1.01	262.0
'Kufri Kanchan'	24.63	139,508	164,253	1.18	232.6
'Kufri Sindhuri'	26.72	141,971	187,557	1.32	211.3
SEm±	0.27	-	3,351	0.02	2.50
CD (P=0.05)	0.84	-	10,326	0.07	7.71
Potassium levels					
Control	17.63	137,110	80,354	0.59	172.5
112.5 kg K_2O/ha	23.23	139,079	147,379	1.06	223.6
150.0 kg K_2O/ha	25.98	139,735	180,708	1.29	247.7
187.5 kg K_2O/ha	27.65	140,391	200,653	1.43	263.8
225.0 kg K_2O/ha	28.22	141,048	207,185	1.47	268.9
SEm±	0.32	-	3,983	0.03	3.23
CD (P=0.05)	0.91	-	11,230	0.08	9.11

variety (Zelelew and Ghebreslassie, 2016; Sadawarti *et al.,* 2018 and Mankar *et al.,* 2024). Increased net returns under respective variety might be due to the higher tuber yield as compared to cost involved for production (Zelelew *et al.,* 2016; Sadawarti *et al.,* 2018; Behera *et al.,* 2019 and Kumar *et al.,* 2023b).

Potassium fertilization also brought significantly impact on tuber yield, production efficiency and economics of potato crop (Table 3). Significantly higher tuber yield of 28.22 t/ha along with production efficiency of 268.9 kg/ha/day was recorded under application of 150% RDK (225.0 kg K_2O/ha) over control, 75% RDK and 100% RDK. The response of 150% RDK and 125% RDK was remained at par with each other on tuber yield and production efficiency of potato. Application of 150% RDK (225.0 kg K_2O/ha) being at par with 125% RDK (187.5 kg K_2O/ha) and fetched significantly higher net returns of ₹ 2,07,185/- along with B:C ratio of 1.47 over control, 75% RDK and 100% RDK. The cumulative positive effect of growth parameters and yield-attributing characters was finally reflected on tuber yield of potato (Al-Moshileh *et al*., 2005; Singh and Lal, 2012 and Pulok *et al.,* 2016). Increased net returns with increasing levels of potassium could be due to the increased tuber yield as compared to the cost involved for production (Singh and Lal, 2012; Pulok *et al.,* 2016 and Behera *et al.,* 2019).

Quality parameters

Quality parameters of potato i.e. total soluble solids (TSS), physiological loss of weight, sprouting loss, rotting loss and total weight loss were also influenced significantly under different maturity duration variety (Table 4). Significantly higher value of total soluble solids (7.74 ºBrix) along with lesser physiological loss of weight (6.64%), sprouting loss (0.13%), rotting loss (0.19%) and total weight loss (6.96%) during storage as compared to early and medium duration cultivars of potato. The variation in the TSS value could be due to the genetic characteristic differences among the varieties used (Baloch, 2010). Storability of the potato under non-refrigerated conditions depends on the dormancy period of the varieties. Among the tested varieties Kufri Pukhraj belongs to low dormancy, Kufri Kanchan among medium dormancy and Kufri Sindhuri belongs to longer dormancy period (Gupta *et al.,* 2015). Shorter dormancy period potato varieties sprout early and resulted in to higher storage losses as compared to medium and longer dormancy period varieties (Bhutani and Khurana, 2005 and Mehta *et al.,* 2006).

Quality parameters of potato i.e. total soluble solids (TSS), physiological loss of weight, sprouting loss, rotting loss and total weight loss were influenced significantly with application of potassium (Table 4). Application of 150% RDK (225.0 kg K_2O/ha) recorded significantly highest TSS value of potato (7.01ºBrix) over control and 75% RDK and remained at par with application of 100% RDK and 125% RDK. Application of 150% RDK being at par with 125% RDK recorded significantly lowest physiological loss of wight and total weight loss as compared to control, 75% RDK and 100% RDK. Significantly lowest sprouting loss was recorded under application of 150% RDK (225.0 kg K_2O/ha) over lower levels of potassium. Whereas, significantly lowest rotting loss was recorded with application of 125% RDK (187.5 kg K_2O/ha) over control, 75% RDK, 100% RDK and 150% RDK. Reduced

Table 4. Quality parameters of different varieties of potato under various levels of potassium (pooled mean data of 3 years)

Treatment	Total soluble solids (ºBrix)	Physiological loss of weight (%)	Sprouting loss (%)	Rotting loss (%)	Total weight loss (%)
Varieties					
'Kufri Pukhraj'	5.90	8.71	0.37	1.02	10.10
'Kufri Kanchan'	6.13	8.91	0.26	0.63	9.80
'Kufri Sindhuri	7.74	6.64	0.13	0.19	6.96
SEm±	0.07	0.10	0.003	0.007	0.11
CD (P=0.05)	0.21	0.31	0.009	0.023	0.34
Potassium levels					
Control	5.69	11.20	0.44	1.26	12.91
112.5 kg K_2O/ha	6.46	8.56	0.28	0.67	9.50
150.0 kg K_2O/ha	6.81	7.58	0.21	0.45	8.24
187.5 kg K_2O/ha	6.98	6.62	0.18	0.32	7.11
225.0 kg K_2O/ha	7.01	6.49	0.16	0.37	7.02
SEm±	0.08	0.11	0.004	0.009	0.13
CD (P=0.05)	0.23	0.32	0.010	0.026	0.35

moisture loss during storage is as important quality parameters of potato since it maintained weight and shape of the tubers. Reduced storage losses due to application of potassium might be due to the role of K in enhanced dry matter content, hardening of tuber skin and reduced moisture content in the tuber (Dubey *et al.,* 1997; Bansal and Trehan, 2011 and Kumar *et al.,* 2020).

Thus, it can concluded that the late maturing variety of potato i.e. Kufri Sindhuri proved significantly better in terms of growth, yield and economics over early and mid-varieties. Among potassium fertilization treatments, increasing levels up to 125% RDK (187.5 kg K_2O/ha) resulted significant improvement on most of the growth parameters, yield attributes, yield and economics of potato over lower levels. Further, application of potassium also increased the TSS value in potato tuber and resulted lesser storage losses.

REFERENCES

Abay, A. and Sheleme, B. 2011. The influence of Potassium Fertilizer on the Production of Potato (*Solanum tuberosu* L.) at Kembata in Southern Ethiopia. *Journal of Biology, Agriculture and Healthcare* **1**(1): 1–12.

Abubaker, S., AbuRayyan, A., Amre, A., Alzubil, Y. and Hadidi, N. 2011. Impact of cultivar and growing season on potato under Center Pivot Irrigation System. *World Journal of Agricultural Sciences* **7**(6): 718–721.

Al-Moshileh, A.M., Errebhi, M.A. and Motawei, M.I. 2005. Effect of various potassium and nitrogen rates and splitting methods on potato under sandy soil and arid environmental conditions. *Emirates Journal of Agricultural Sciences* **17**(1): 01–09.

Baloch, M.N. 2010. Vegetable crops. In M. N. Malik. *Horticulture* (pp. 490-491). Biotec Book. New Delhi, India.

Banerjee, H., Rana, L., Ray, K., Sarkar, S., Bhattacharyya, K. and Dutta, S.K. 2016. Differential physiological response in potato (*Solanum tuberosum* L.) upon exposure to nutrient omissions. *Indian Journal of Plant Physiology* **21**: 129–136.

Bansal, S.K. and Trehan, S.P. 2011. Effect of potassium on yield and processing quality attributes of potato. *Karnataka Journal of Agricultural Sciences* **24**(1): 48–54.

Behera, M., Das, S., Saha, A. and Kumar, D. 2019. Studies on varying potassium levels on early duration potato varieties. *Journal of Pharmacognosy and Phytochemistry* **SP5**: 264–268.

Bhutani, R.D. and Khurana, S.C. 2005. Storage beha-viour of potato genotypes under ambient conditions. *Potato Journal* **32**(3/4): 209–210.

Blagoeva, V., Iliev, E. and Nikolova, E. 2004. Potatoes cultivation, diseases and pests, and storage. Publisher, Enjovche" Sofia. 105 p.

Dubey, Y.P., Shankhyan, S.D. and Kaistha, B.P. 1997. Effect of potassium of yield and storage behaviour of potato (*Solanum tuberosum* L.) in Lahul valley of Himachal Pradesh. *Journal of Potassium Research* **13**: 273–276.

GOI. 2023. Agricultural Statistics at a glance. Directorate of Economics and Statistics, Department of Agriculture, Cooperation and Farmers Welfare. Ministry of Agriculture and Farmers Welfare, Government of India, New Delhi.

Gomez, K.A. and Gomez, A.A. 1984. *Statistical Procedures for Agricultural Research*. Edn 2, 680 pp. John Wiley & Sons, New York.

Gupta, V.K., Luthra, S.K. and Singh, B.P. 2015. Storage behaviour and cooking quality of Indian potato varieties. *Journal of Food Science and Technology* **52**(8): 4,863–4,873.

Jatav, A.S., Kushwah, S.S., Mishra, S.N. and Naruka, I.S. 2018. Effect of potato varieties and nitrogen levels on dry matter accumulation, chlorophyll content, grade wise tuber yield and post-harvest nutrient content in plant and soil. *International Journal of Agricultural Sciences* **14**(1): 46–55.

Kumar, D. and Minhas, J.S. 2013. Evaluation of indigenous potato varieties, advanced clones and exotic genotypes against water deficit stress under sub-tropical environment. *Indian Journal of Plant Physiology* **18**(3): 240–249.

Kumar, Y., Singh, R. and Kumar, A. 2023(a). Relationship between weather factors and planting dates with references to growth and yield of potato (*Solanum tuberosum*) varieties. *Indian Journal of Agronomy* **68**(4): 413–419. https://doi.org/10.59797/ija.v68i4.5464

Kumar, A., Verma, V.S., Sharma, D.K. and Mishra, A.K. 2023(b). Effect of row proportions, organic and inorganic nutrient sources on growth and yield of potato (*Solanum tubersoum*) cultivars. *Indian Journal of Agronomy* **68**(2): 205–210. https://doi.org/10.59797/ija.v68i2.361

Kumar, V., Aulakh, C.S., Kaur, J. and Chawla, N. 2020. Nutrition management effects on productivity and tuber quality of potato (*Solanum tuberosum*). *Indian Journal of Agronomy* **65**(3): 337–343. https://doi.org/10.59797/ija.v65i3.2973

Ladha, J.K., Dawe, D., Pathak, H., Padre, A.T., Yadav, R.L., Singh, B., Singh, Y., Singh, Y., Singh, P., Kundu, A.L., Sakal, R., Ram, N., Regmi, A.P., Gami, S.K., Bhandari, A.L., Amin, R., Yadav, C.R., Bhattarai, S., Das, S., Aggarwal, H.P., Gupta, R.K. and Hobbs, P.R. 2003. How extensive are yield declines in long-term rice-wheat experiments in Asia? *Field Crop Research* **81**: 159–181.

Lakshmi, V.D., Padmaja, G. and Rao, P.C. 2012. Effect of levels of nitrogen and potassium on soil available nutrient status and yield of potato (*Solanum tuberosum* L.). *Indian Journal of Agricultural Research* **46**(1): 36–41.

Lal, K., Swarup, A. and Singh, K.N. 2007. Potassium balance and release kinetics of non-exchangeable K in a typic natrustalf as influenced by long term fertilizer use in rice-wheat cropping system. *Agrochimica* **51**: 95–104.

Latif, K.M.A., Osman, E.A.M., Abdullah, R. and Kader, N.A. 2011. Response of potato plants to potassium fertilizer rates and soil moisture deficit pelagia. *Research Library Advances in Applied Science Research* **2**(2): 388–397.

Mankar, P., Rawal, S., Kumar, D., Luthra, S.K., Gupta, V.K., Sharma, S., Lal, M., Subhash, S. and Kumar, M. 2022. Evaluation of potato varieties for export potential in early season. *Potato Journal* **49**(2): 131–140.

Mankar, P., Rawal, S., Luthra, S.K., Gupta, V.K., Sharma, S., Lal, M., Subhash, S., Kumar, D. and Kumar, M. 2024. Screening of potential Indian potato varieties for export promotion from western Uttar Pradesh and Gujarat. *Potato Journal* **51**(1): 19–27.

Mehta, A., Singh, S.V., Pandey, S.K. and Ezekiel, R. 2006. Storage behaviour of newly released potato cultivars under non-refrigerated storage. *Potato Journal* **33**(3/4): 158–161.

Pulok, M.A.I., Roy, T.S., Bhuiyan, M.S.R., Haque, M.N. and Nurunnahar. 2016. Effect of potassium and mulches on growth, yield and economics of potato. *Potato Journal* **43**(2): 200–210.

Sadawarti, M., Patel, K., Samadhiya, R.K., Gupta, P.K., Singh, S.P., Gupta, V.K., Roy, S., Chakrabarti, S.K. and Verma, D. 2018. Evaluation of table and processing varieties of potato (*Solanum tuberosum* L) for North-Central India. *International Journal of Chemical Studies* **6**(4): 823–833.

Singh, C., Singh, P. and Singh, R. 2020. Modern Techniques of Raising Field Crops. Third Edition. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi. pp. 376–380.

Singh, J.P., Marwha, J.S. and Grewal, J.S. 1996. Effect of sources and levels of potassium on potato yield quality and storage behaviour. *Journal of Indian Potato Association* **23**: 153–156.

Singh, S.K. and Lal, S.S. 2012. Effect of potassium nutrition on potato yield, quality and nutrient use efficiency under varied levels of nitrogen application. *Potato Journal* **39**(2): 155–165.

Zelelew, D.Z. and Ghebreslassie, B.M. 2016. Response of potato varieties to potassium levels in Hamelmalo area, Eritrea. *Journal of Plant Studies* **5**(1): 11–19.

Zelelew, D.Z., Lal, S., Kidane, T.T. and Ghebreslassie, B.M. 2016. Effect of potassium levels on growth and productivity of potato varieties. *American Journal of Plant Sciences* **7**: 1629–1638.