



Early Reaping of Potato Tubers under Changing Climate for Better Profit

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Abstract

The innovative field study was laid out during 2017 and 2018 at Kannauj district on farmer's fields. The site of pilot project located in the catchments area of river Kali. The soil of pilot area was sandy loam, having pH 8.0, organic carbon 0.28%, total nitrogen 0.02%, available phosphorus 9.0 kg/ha and available potassium 273 kg/ha. The three varieties of potato i.e., *Kufri Bahar*, *Kufri Garima* and *Kufri Khayti* were tested under changing climate. Since cultivar *Kufri Bahar* is much popular among the farming majority but its yield level low under early reaping, therefore, *Kurfi Garima* and *Kufri Khayti* newly developed varieties were compared with popular variety in term of tubers yield and better profit. The harvesting was done after 75 DAS. The yield contributing characters recorded in term of single tuber weight, tubers/plant and tubers weight/plant, which showed higher in *Kufri Garima* and *Kufri Khayti* except number of tubers/plant. The higher yield by 269.50 q/ha weighed under *Kufri Khayti* followed by *Kufri Garima* (239.50 q/ha). Therefore, higher productivity by 44.90 q/ha recorded from *Kufri Garima* and 74.90 q/ha noted under *Kufri Khayti* in comparison to *Kufri Bahar*. The *Kufri Bahar* gave yield by 194.60 q/ha under early harvesting, which was lowest in comparison to other two tested cultivars. The higher net return Rs. 182631.00/ha and BCR 3.10 calculated under cultivar *Kufri Khayti* followed by net return of Rs. 152631.00/ha and BCR 2.75 from *Kufri Garima* under early harvesting. The lowest net return of Rs. 107731.00 and BCR 2.24 was computed from the *Kufri Bahar*. The yield contributing traits were commensurable to the tubers yield.

Keywords: Early planting, *Kufri Bahar*, *Kufri Garima*, *Kufri Khayti*, Net return.

Introduction

In the race of relay cropping, potato play an important role under intensive cropping system. Potato is the base crop of multiple cropping systems. It is short duration, high yielder, require light soil, paying crop and easily accommodate in almost all possible multiple cropping systems. Among the potato growing district, Kannauj is well known for intensive cultivation because it is situated in riverine tract of Uttar Pradesh. The intensity of cropping is reached maximum upto 400 percent by growing of four crop in a year on same field. Since the potato is the main cash crop of short duration and farming majority use to rotate only those crop which fit well with potato. Therefore, district Kannauj

occupies a prestigious position, so far, as potato production is concerned after harvesting of maize. The farmers of this district are very analytical they compute over all net profitability of cropping systems, thereafter follow the crop rotation i.e. maize-early potato-late potato, maize-early potato-late wheat, maize-early potato-summer groundnut and maize-potato-hybrid maize cropping systems are in vogue among the farming majority on large area.

Since the potato is not thermo resistance crop, therefore, its tubers are more susceptible to high temperature. Feedback received from the farming majority, they want smart agronomy in term of growing potato in thermal

condition. Therefore, for obtaining higher profitability with early reaping of tubers of potato is the subject matter of this manuscript.

Materials and Methods

The field study was laid out during winter season of 2017 and 2018 at potato growing tract of Kannauj district of Uttar Pradesh. The soil of selected area was sandy loam, having pH 8.0, organic carbon 0.28%, total nitrogen 0.02%, available phosphorus 9.0 kg/ha and available potassium 273 kg/ha. The pH was determined by Electrometric glass electrode method (Piper, 1950), while organic carbon was determined by Colorimetric method (Datta. *et al.*, 1962). Total nitrogen was analyzed by Kjeldahl's method as discussed by Piper (1950). The available phosphorus and potassium were determined by Olsen's method (Olsen. *et al.*, 1954) and Flame photometric method (Singh, 1971), respectively. The three varieties of potato i.e., *Kufri Bahar*, *Kufri Garima* and *Kufri Khayti* were tested under climate changing situation. Out of three selected varieties, no any variety is thermo resistance and *Kufri Bahar* was planted by farming majority as a main season and harvested after complete maturity. But to observe its yielding capacity during early planting and compared its productivity in comparison to *Kufri Garima* and *Kufri Khayti*. The potato was planted between 25-30 September and harvested after 75 days of planting. The recommended smart agronomical practices were used for early crop of potato. The recommended dose of NPK was applied to potato crop. The irrigations were given as and when required and protected soil from moisture stress condition. The net return and BCR were calculated after finalization of experiment on pooled results basis.

Results and Discussion

The pooled results of two years obtained from the experiment are summarized in Table-1 and discussed here under appropriate heads.

Yield Contributing Characters and Tubers Yield

The higher tubers/plant was counted in cv. *Kufri Garima* (12.00 tubers/plants) followed by

Kufri Khayti (10.50 tubers/plant). *Kufri Bahar* produced the tubers per plant by 9.50, which was lowest in comparison to the *Kufri Garima* and *Kufri Khayti*. The single tuber weight was also noted higher under *Kufri Khayti* by 61.90 gram/tuber, while *Kufri Garima* displayed the single tuber weight by 53.30 gram/tuber. Under early sowing condition *Kufri Bahar* exhibited tuber weight by 45.30 gram/tuber. The results indicate that *Kufri Khayti* produced higher weight of single tuber under early planted condition over the other two cultivars. The highest weight of tubers/plant was found under *Kufri Khayti* by 650 g/plant followed by *Kufri Garima* (640 g/plant). Cultivar *Kufri Bahar* produced lowest weight of tubers/plant by 430 g/plant.

The highest yield of tubers was registered under early cultivation of potato by *Kufri Khayti* (269.50 q/ha), followed by *Kufri Garima* (239.50 q/ha). *Kufri Bahar* yielded lowest tubers by 194.60 q/ha. The higher single tuber weight and weight of tubers/plant were responsible for higher and lower yield of tubers per hectare. In the early sowing, *Kufri Khayti* had higher single weight of tuber and tubers weight/plant means it possessed higher sink capacity to utilize the photoassimilates translocated from source. It resulted in higher weight of tubers/plant and more tubers yield (q/ha). These results are commensurable to the findings of Panwar, J.D.S. *et al.*, (1986), Shrivastava and Bharadwaj, (1986), Pachpor and Shete, (2010), Singh, R.A. *et al.*, (2015), Singh, R.A. *et al.*, (2015), Singh, R.A. *et al.*, (2016) and Singh, R.A. *et al.*, (2017).

Economic Study

The highest net return of Rs. 182631.00/ha and Rs. 152631.00/ha were found from cultivars *Kufri Khayti* and *Kufri Garima*, respectively under early planting of potato over *Kufri Bahar* (107731.00/ha). The BCR in *Kufri Khayti* recorded by 3.10 while it was recorded by 2.75 with the cultivar *Kufri Garima* during early season planting. The good return with *Kufri Khayti* was due to higher yield of tubers in early planting period. The similar results have also been reported by

Singh, A. et al., (2013) and Singh, A. et al., (2013).

Table 1: Statement showing the yield traits, tubers yield and economics of different varieties under early harvesting
(Pooled data of two years)

S.N.	Variety	Tubers/ plant	Weight of single tuber (g)	Weight of tubers/plant (g)	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs./ha)	Net return (Rs./ha)	BCR
1.	Kufri Bahar	9.50	45.30	430.00	194.60	86869	194600	107731	2.24
2.	Kufri Garima	12.00	53.30	640.00	239.50	86869	239500	152631	2.75
3.	Kufri Khayti	10.50	61.90	650.00	269.50	86869	269500	182631	3.10

Market rate of potato Rs. 1000.00 quintal

Conclusion and Recommendation

In early planting period *Kufri Khayti* and *Kufri Garima* gave higher yield, therefore, the farm families of potato growing tract may be advocated for early planting with *Kufri Khayti* and *Kufri Garima*.

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