

Comparative study on growth of different varieties of potato (*Solanum tuberosum* L.) in Manipur condition

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ABSTRACT

A field experiment entitled "Comparative study on growth of different varieties of potato (*Solanum tuberosum* L.) in Manipur condition" was conducted during *rabi* season of 2014-15 at the Research Farm of College of Agriculture, Central Agricultural University, Imphal, Manipur. The treatment consists of Kufri Jyoti (T₁), Kufri Kanchan (T₂), Kufri Himalini (T₃), *Aberchaibi* (T₄), Kufri Giridhari (T₅) and Kufri Shailja (T₆) with four replications under Randomized Block design. Observations on growth parameters such as plant height, number of leaves, number of stem were recorded for testing the significance of variance of the different treatments. Kufri Giridhari (T₅) was found the maximum plant height 8.75 cm, 28.65 cm and 35.67 cm at 30, 60 and 90 DAS respectively compare to other varieties and number of leaves were also found higher in Kufri Giridhari (T₅) variety. The number of stems were higher in *Aberchaibi* (T₄) variety 4.40, 5.15 and 6.40 in 30, 60 and 90 DAS respectively.

Key words: Comparative, Growth, Varieties and Potato

Introduction

Potato (*Solanum tuberosum* L.) is the fourth most important food crop in the World after rice, wheat and maize in terms of human consumption. More than a billion people Worldwide consume potatoes and its global total crop production exceeds 300 billion tonnes. Potato seems to have evolved through geographical and ecological isolation. While the cultivated species were at one time confined to Andes of South America and the lowlands of Southern Chile, adapted to the cool temperature climates of these regions. Potato is well adapted to temperate regions but it can also be cultivated successfully under subtropical areas. It thrives best under short day condition coupled with abundant sunshine and cool nights.

In Manipur area, production and productivity of

potato recorded 1.7 ha, 15.2 tonnes and 89.4 q/ha respectively (Anonymous, 2010). The productivity of potato in Manipur region is very low compared to national productivity of potato. This may be due to high cost of cultivation, high input of seeds and chemical fertilizers and use of less yielding variety etc. For reducing the costs of cultivation of many potato growers are using high yielding varieties. But no systemic work has been done to determine the suitable variety for a particular region which has a great impact on the yield of the crop.

Materials and Methods

The field experiment was conducted during *rabi* season of 2014-15 at the Research Farm of College of Agriculture, Central Agricultural University, Imphal situated at about 24°46' N latitude and 93°54'

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E longitude and an altitude of about 760 metres above Mean Sea Level. The experimental field was acidic in reaction, high in organic carbon (1.20%), medium in available nitrogen (282.53 kg/ha), medium in available P_2O_5 (18.55 kg/ha) and medium in K_2O (125.69 kg/ha). The treatment consist of six treatments such as Kufri Jyoti (T_1), Kufri Kanchan (T_2), Kufri Himalini (T_3), *Aberchaibi* (T_4), Kufri Giridhari (T_5) and Kufri Shailja (T_6) with four replications under Randomized Block design. During the period of sowing season of 2013-2014, minimum temperature was found to be 6.2 °C in the month of January and maximum temperature 28.5 °C in the month of March. In the following year, i.e 2014-2015, during the crop season, minimum temperature was found to be 4.6 °C in the month of January and maximum temperature of 30.5 °C was recorded in the month of April.

Results and Discussion

Comparison on growth parameters of potato varieties

The highest plant height was associated with the variety Kufri Giridhari (T_5). Plant height depends on the varietal genetic difference and seed tuber size too. The plant heights were recorded 8.75 cm, 28.65 cm and 35.67 cm at 30, 60 and 90 DAS in Kufri Giridhari (T_5). The lowest plant height was observed in *Aberchaibi* (T_4) which were recorded 8.35 cm, 24.34 cm and 31.40 cm in 30, 60 and 90 DAS respectively. This might be due to higher reserved food material for better initial growth in larger seed tuber as well as better soil environment. The integration of or-

ganic and inorganic nutrient sources also influenced to increase the plant height. Similar results were also pointed out by Kushwah (1980), Rashid and Ahmad (1979) and Sultana *et al.* (2001).

The maximum number of leaves per plants was observed in Kufri Giridhari (T_5) which was recorded 15.46, 26.30 and 34.38 respectively at 30, 60 and 90 DAS. *Aberchaibi* (T_4) gave lesser number of leaves per plant which were recorded 13.60, 23.76 and 30.50 at 30, 60 and 90 DAS. The increase on number of leaves per plant due to higher seed tuber was also supported by Kushwah (1980).

The number of stems per plant were found higher than other varieties was in *Aberchaibi* (T_4) due to its genetical differences compare to other varieties. The recorded stems per plant were 4.40, 5.15 and 6.40 respectively in 30, 60 and 90 DAS. The minimum number of stems was found in Kufri Himalini (T_3) which were recorded 3.12, 4.38 and 5.15 respectively at 30, 60 and 90 DAS.

Conclusion

On the basis of results from the present investigation, it can be concluded the growth and development increased significantly with Kufri Giridhari (T_5) due to its genetic factors. A significant increase in the number of leaves per plant was always associated with Kufri Giridhari (T_5) whose genetic factors influenced compared to other varieties.

Conflict of Interests

The authors declare that there are no conflicts of interests within them.

Table 1. Comparison on Plant height (cm), number of leaves per plant and number of stems per plant of different varieties of potato

| Treatments | At 30 DAS | | | At 60 DAS | | | At 90 DAS | | |
|-----------------------------|-------------------|-------------------------|------------------------|-------------------|-------------------------|------------------------|-------------------|-------------------------|------------------------|
| | Plant height (cm) | No. of leaves per plant | No. of stems per plant | Plant height (cm) | No. of leaves per plant | No. of stems per plant | Plant height (cm) | No. of leaves per plant | No. of stems per plant |
| Kufri Jyoti (T_1) | 8.51 | 14.64 | 3.34 | 25.49 | 24.58 | 4.50 | 32.72 | 31.58 | 5.31 |
| Kufri Kanchan (T_2) | 8.65 | 14.68 | 3.38 | 25.59 | 24.72 | 4.63 | 33.46 | 31.79 | 5.58 |
| Kufri Himalini (T_3) | 8.50 | 14.56 | 3.12 | 25.43 | 24.43 | 4.38 | 32.49 | 31.46 | 5.26 |
| <i>Aberchaibi</i> (T_4) | 8.35 | 13.60 | 4.40 | 24.34 | 23.76 | 5.15 | 31.40 | 30.50 | 6.40 |
| Kufri Giridhari (T_5) | 8.75 | 15.46 | 3.91 | 28.66 | 26.30 | 4.75 | 35.67 | 34.38 | 5.91 |
| Kufri Shailja (T_6) | 8.68 | 14.70 | 3.71 | 27.64 | 25.53 | 4.68 | 34.50 | 33.36 | 5.71 |
| S.E(d)(±) | 0.08 | 0.19 | 0.14 | 0.34 | 0.33 | 0.13 | 0.44 | 0.42 | 0.10 |
| CD _(p=0.05) | 0.18 | 0.41 | 0.30 | 0.73 | 0.70 | 0.27 | 0.94 | 0.90 | 0.21 |

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