Plant Archives Vol. 24, Special Issue (GABELS), 2024 pp.574-576 e-ISSN:2581-6063 (online), ISSN:0972-5210

Plant Archives

Journal homepage: http://www.plantarchives.org
DOI Url : https://doi.org/10.51470/PLANTARCHIVES.2024.v24.SP-GABELS.087

PERFORMANCE OF POTATO VARIETIES ON QUALITY PARAMETER UNDER MARATHWADA CONDITIONS

R.D. Baghele[1*], M.A. Kharat[2], D.R. Bhise[3], and Joginder Singh[4]
[1]AICRP on Vegetable Crop, VNMKV, Parbhani, Maharashtra, India
[2]Dept. of Horticulture, College of Agriculture Parbhani, VNMKV, Parbhani, Maharashtra, India
[3]Dept. of Horticulture, Post-Graduation Institute, Mahatma Phule Krishi Vidyapeeth Rahuri,
[4]Department of Horticulture, J. V. College, Baraut U.P. India
*Corresponding author Email: rdbaghele@gmail.com

ABSTRACT

An experiment was conducted to evaluate the performance of different varieties of potato (*Solanum tuberosum* L.) for quality parameters under Marathwada conditions. The experiment was laid out in a Randomized Block Design with four replications and six treatments during *Rabi* 2021-2022 at Experimental farm, Horticulture Research Scheme (Vegetable), Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani. The result indicated that there was a significant variation among the varieties with respect to quality parameters of potato. Kufri Pukhraj recorded maximum TSS (6.27 ^{0}Brix). The maximum dry matter percentage was found in Kufri Chipsona-1 (22.81%). Kufri Chipsona-1 had the highest specific gravity (1.19 g/cm^{3}). The highest starch content was found in Kufri Chipsona-1 (23.42%) and Kufri Frysona (22.76%) respectively. The variety having maximum volume of tuber is Kufri Chipsona-1 (165.10 ml).

Keywords: Potato, Marathwada, Varieties, quality,

Introduction

The nutritional content of food is enhanced and improved by vegetables. They are the primary supplier of minerals, vitamins, secondary metabolites from plants, and other elements required for human nutrition and well-being. While they are eaten as staple foods everywhere, vegetables especially roots and tubers have a high calorie content and are especially well-liked in tropical climates. While constituting fewer than 1% of all plants worldwide, vegetables have remarkable genetic, anatomical, and morphological variety.

In India, potatoes (*Solanum tubersoum* L.) are the most significant tuber crop. The potato is recognized as the "king of vegetables" (*Solanum tuberosum* L.). According to Abubaker et al. (2011), it is the most well-known vegetable in the Solanaceae family worldwide. After rice, wheat, and maize, it is the fourth-most significant food crop in the world (Das *et al*., 2021). Most potato crops are farmed in regions with mild climates. Potatoes are a crop native to temperate regions, but they may grow in a wide range of conditions. Its growth is limited to areas that are only moderately cold during the growing seasons. The ideal temperature for tuber development is 20°C, but the average temperature for plant growth is 24°C.

Without potatoes, an Indian vegetable basket is incomplete. The potato has the power to guarantee the nutritional security of the nation. 25 mg of vitamin C, 2.8 mg of edible protein, 16.3 g of starch, 0.6 g of total sugar, 0.5 g of crude fiber, and 22.6 g of carbohydrates are among the substantial amounts of energy found in an average 100 g of fresh tuber (Bhuvneshwar *et al*., 2013).

China is the world's top producer of potatoes in terms of both area and production; India comes in second. Potatoes are one of the most important commercial crops in the country. India may now export potatoes to other nations in addition to being self-sufficient in potatoes. In India, potatoes have more

yearly area, productivity, and production than other major food crops. Potato production in 2023–24 (First Advance Estimates) is predicted to be approximately 589.94 lakh tonnes, down from approximately 601.42 lakh tonnes in the previous year. This decline is ascribed to West Bengal.

In Maharashtra, potatoes are one of the most important cash crops. The most important areas for potato production are the districts of Pune and Satara, which make up 72% of the land and 76% of production (Nikam *et al*., 2008). The output has increased as time has gone on. In 2042, Maharashtra produced 3.43 million tonnes of potatoes.

In the Marathwada region, potatoes are grown by the majority of farmers. Nevertheless, there aren't enough resources because people don't know enough about its variations and cultivation.

Materials and Methods

The experiment was laid out at Experimental farm, Horticulture Research Scheme (Vegetable), Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani during *Rabi* season, 2021-2022 Six varieties Kufri Garima, Kufri Frysona, Kufri Pukhraj, Kufri Lauvkar, Kufri Jyoti, Kufri Chipsona -1 were produced from Punjab Agriculture University, Ludhiana. The study was conducted in Randomized Complete block design with four replications and and six number of treatments they are as follows (T_1 - Kufri Garima, T_2 - Kufri Frysona, T_3 - Kufri Pukhraj, T_4 - Kufri Lauvkar, T_5 - Kufri Jyoti, T_6 - Kufri Chipsona-1). Healthy, uniform sized tubers were planted at a spacing of 60 cm x 20 cm. The observations for quality parameters were recorded from randomly selected plants from each replication and each plot the data was statistically analysed, and treatment variations were assessed for significance using the F-test (Cochran and Cox, 1957).

Results and Discussion

The variety Kufri Pukhraj recorded maximum TSS (6.27 ^{0}Brix) followed by Kufri Garima (6.20 ^{0}Brix), Kufri Chipsona-1 (6.07 ^{0}Brix) and Kufri Lauvkar (5.52^{0}Brix). The minimum TSS was recorded in Kufri Jyoti and Kufri Frysona (4.35 ^{0}Brix). (Table 1) Abbasi *et al*., (2019) has also reported the change in TSS of selective potato varieties. Feltran *et al*., (2004) found TSS content varied significantly among potato genotypes. The maximum dry matter percentage was found in Kufri Chipsona-1 (22.81%) followed by Kufri Frysona (21.30%). The minimum dry matter percentage was found in Kufri Pukhraj (17.07%). Elfnesh *et al*., (2011) concluded that dry matter content and specific gravity of tubers were significantly influenced by the interaction effect of growing environment and cultivars. Kufri Chipsona-1 had the highest specific gravity (1.19 g/cm^3) followed by Kufri Lauvkar and Kufri Jyoti (1.07 g/cm^3). Kufri Frysona has the lowest specific gravity (1.05 g/cm^3). Kaur and Aggarwal (2014) noticed the high positive correlation of specific gravity with dry matter content and starch content.

The highest starch content was found in Kufri Chipsona-1 (23.42%), which was statistically at par to Kufri Frysona (22.76%). Kufri Garima reported a minimum starch content of 11.19%. Kaur and Khurana (2017) found that starch content in different potato cultivars varies due to the difference in dry matter content as starch and dry matter content of potato are directly related to each other. It was reported that the total starch concentration was affected by cultivar or growing location including environmental conditions and cultural practices during the growing season stated by Chung *et al*., (2014); Kumar *et al*., (2004). The variety having maximum volume of tuber is Kufri Chipsona-1 (165.10 ml) followed by Kufri Pukhraj and Kufri Lauvkar (102.67 ml). The variety having lowest volume of tuber is Kufri Jyoti (63.75 ml).

Table 1: Performance of potato varieties on different quality parameter during rabi season

Treatment	Variety	Total Soluble Solids (^{0}Brix)	Dry matter (%)	Specific gravity (g/cm^3)	Starch Content (%)	Volume oftuber (ml)
T_1	Kufri Garima	6.20	18.37	1.06	11.19	68.87
T_2	Kufri Frysona	4.35	21.30	1.05	22.76	76.30
T_3	Kufri Pukhraj	6.27	17.07	1.06	16.14	102.67
T_4	Kufri Lauvkar	5.52	18.11	1.07	11.32	102.67
T_5	Kufri Jyoti	4.35	20.96	1.07	17.29	63.75
T_6	Kufri Chipsona-1	6.07	22.81	1.19	23.42	165.10
SE(m) (±)		**0.27**	**0.76**	**0.02**	**0.43**	**6.19**
CD at 5%		**0.82**	**2.32**	**0.06**	**1.33**	**18.84**

Conclusion

The variety Kufri Chipsona-1 performed well concerning to all quality parameter

References

Abbasi, K.S., Qayyum, A., Mehmood, A., Mehmood, T. and Khan, S.U. (2019). Analysis of selective potato varieties and their functional assessment. *Food Science Technology Campinas*, 39(2), 308-314.

Abubaker, S., Aburayyan, A., Amre, Y., Alzu'bil, 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.

Cochran, W.G. and Cox, G.M. (1957). Experimentals Designs, (2nd ed.). Wiley, New York.

Chung, H., Li, X., Kalinga, D., Lim, S., Yada, R. and Liu, Q. (2014). Physicochemical properties of dry matter and isolated starch from potatoes grown in different locations in Canada. *Food Research International*, 57, 89-94.

Das, S., Mitra, B., Luthra, S.K., Saha, A., Hassan, M.M. and Hossain, A. (2021). Study on morphological, physiological characteristics and yields of twenty-one potato (*Solanum tuberosum* L.) Cultivars Grown in Eastern Sub-Himalayan Plains of India. *Agronomy*. 11, 335.

Elfnesh, F., Tekalign, T. and Solomon, W. (2011). *African Journal of Food Science.* 5(6):324 - 332.

Feltran, J.C., Leandro, B.L. and Vieites, R.L. (2004). Technological quality and utilization of potato tubers. *Scientia Agricola*, 61(6), 598-603.

Kaur, S. and Aggarwal, P. (2014). Studies on Indian potato genotypes for their processing and nutritional quality attributes. *International Journal of Current Microbiology and Applied Sciences*. 3(8) 172-177.

Kaur, S. and Khurana, D.S. (2017). Growth, yield and quality of different processing cultivars of potato (*Solanum tuberosum* L.). *International Journal of Pure Applied Bioscience.* 5(6): 94-599.

Kumar, D., Singh, B. and Kumar, P. (2004). An overview of the factors affecting sugar content of potatoes. *Annals of Applied Biology*. 145: 247–256.

Nikam, A.V., Shendage, P.N., Jadhav, K.L. & Deokate, T.B. (2008). Economics of production of kharif potato in Satara, India. *International Journal of Agricultural Sciences*, 4(1): 274- 279.