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Performance of difference Genotypes of Radish

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ABSTRACT

The present study was carried out at Experimental Unit, Tilak Dhari Post Graduate College, Jaunpur Uttar Pradesh during winter season of 2018-19 to investigate growth, yield and qualitative parameters of various radish varieties. The experiment was laid out in Randomized Block Design (R.B.D.) with ten treatments and three replicatations. Ten varieties of radish, used for the study as treatments were viz., Pusa Chetaki, Pusa Himani, Kashi Hans, Subhra-32, Menu Early, Desi Local, Japanese White, Palak Patta, Kashi Sweta and Local-1. The growth parameters like Germination percentage (%) was maximum in Kashi Sweta (95.03 %), while it was minimum in Local-1 (81.20 %), The maximum plant height (56.52 cm), Number of leaves/plant (19.81), Leaf length (33.38 cm), Leaf width (13.04 cm), Chlorophyll contents (42.82 SPAD), Root length (30.89cm), Root Diameter (54.64 mm), Root weight (165.46gm), Leaf weight (110.38 gm), Whole plant weight (275.870 gm), Root yield/plot (4.467 kg) and Root yield/ha (446.50 q) were found in Kashi Sweta. Whereas the minimum plant height (40.96 cm), Number of leaves/plant (9.86), Leaf length (21.56 cm), Leaf width (7.05 cm), Chlorophyll contents (33.38 SPAD), Root length (19.50 cm), Root Diameter (38.83 mm), Root weight (121.15 gm), Leaf weight (80.94 gm), Whole plant weight (202.093 gm), Root yield/plot (3.271 kg) and Root yield/ha (327.07 q) were found in Local-1.

KEYWORDS

Kashi Sweta, Pusha Himani, Chlorophyll contents, Germination Percentage, Pusa Chetaki

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INTRODUCTION

Radish (*Raphanus sativus* L.) is one of the most important root crops belonging to the family Cruciferae. It is grown both in tropical and temperate regions of the world and is probably a native of Europe and Asia. It can be cultivated under cover for early production but large scale production in field is more common in Haryana, West Bengal, Punjab, Bihar, Assam, Madhya Pradesh and other some state of India. Radish is a dicotyledonous, biennial herbaceous plant that is usually grown as an annual vegetative crop for its enlarged fleshly tap root (Zaki and Takahata, 2012). Radish is grown for its young tender tuberous roots which are eaten raw as a salad or cooked as a vegetable. It is relished for its pungent flavor and is considered as an appetizer. The young leaves are also cooked as vegetable and eaten. Radish has refreshing and depurative properties. Radish is useful in liver and gall bladder troubles. In homoeopathy, they are used for neuralgic headache, sleeplessness and chronic diarrhea. Roots, leaves, flower and pod are quite effective against gram positive bacteria. The roots are said to be useful in urinary complaints, piles and in gastrodynia. A salt extracted from roots, dried and burnt to white ash is said to be used as diuretic and laxative. Radish has pungent taste when eaten raw which is due to presence of glucosinolates and the major glucosinolates present in radish is isothiocyanates. It is good source of vitamin and minerals like ascorbic acid, calcium, potassium and phosphorus. Radish is predominantly a cool season vegetable crop but Asiatic types can tolerate higher temperature than European varieties. Being a cool season crop it is sown during winter from September to January in Northern plains. In the climatic condition of Indian Peninsular India, radish can be grown almost all the year round except for few months of summer. The growth and yield of radish greatly depends on soil and climatic condition. Radish is grown in most types of soil if it is well managed. It is grown under a wide range of climatic conditions.

The new trend in vegetable production is not only to obtain higher yields but also to have better quality produce, as producers are getting higher price for quality produce. There are several factors like variety, season of planting, nutrition and irrigation which plays a dominant role in yield contribution and quality production.

Among these factors variety is a predominant. Several varieties of radish are available in the market having varying length, size, colour, taste, yield potential and quality parameters. The varieties like Pusa Chetaki, Pusa Himani, Kashi Hans, Subhra-32, Menu Early, Desi Local, Japanese White, Palak Patta and Kashi Sweta are grown in different parts of the state. Higher yield, long sized roots and earliness are some of the characters which might be responsible for increase in the profit of radish growing farmers. In recent years, due to increased urbanization and change in food habits, the demand for salad vegetables is increasing very rapidly. The consumers as well as growers are demanding for the varieties

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having good qualities.

The growth, yield and quality performance of the radish varieties varies from place to place and region to region. Some local types are also under cultivation since long time. Further, some new varieties from State Agriculture Universities, National Institutes and Centers were also released during the recent past.

MATERIALS AND METHODS

Field experiment was conducted at the Experimental Unit of the Department of Horticulture, Tilak Dhari Post Graduate College, Jaunpur, Uttar Pradesh, India during year 2018-19. The climatic condition of Jaunpur is subtropical with three distinct seasons i.e., winter, summer and rainy. During the winter season (December-January) temperature fall, 5°C or even low, while in summer season (May-June) it reaches as high as 45°C. Occasional spell of frost and precipitation may occur during winter. The mean temperature is minimum 15-20 ^{0}C and maximum 18-32 ^{0}C, maximum relative humidity 95% and minimum 55% with annual rainfall of 850-1100 mm. The genotypes cultivated are viz., Pusa Chetaki, Pusa Himani, Kashi Hans, Subhra-32, Menu Early, Desi Local, Japanese White, Palak Patta, Kashi Sweta and Local-1. The soil was sandy loam with pH ranges from 6.5 - 7.5 with organic carbon content of 0.45 - 0.50 %. The radish was planted in Randomized Block design (RBD) with 3 replications. Allocation of different treatments was made to various plots by using random sampling. Sowing was done on mid-October during rabi season. Seeds were dibbled half way down the ridge at a distance of 15 cm in the soil. The distance of plant to plant is 15 cm and row to row 30 cm. Thinning was done at 8 days after sowing. The crop was harvested at full maturity, when the soil moisture was optimum. The plants were pulled out without damaging the roots from the net plots. The soil adhering to the roots was removed. Observations were recorded for Germination percentage (%), Plant height (cm), Number of leaves per plant, Leaf length (cm), Leaf width (cm), Chlorophyll contents (SPAD), Root length (cm), Root diameter (cm), Root weight (gm), Leaf weight (gm), Whole plant weight (gm), Yield of roots per plot (kg), Yield of roots per hectare (q). The obtained data were analyzed using analysis of variance (ANOVA) under RBD following the procedure as stated by Panse and Sukhatme (1967).

RESULTS AND DISCUSSION

It was observed that significantly maximum germination percentage (95.03 %), plant height (56.52 cm), Number of leaves per plant (19.81), Leaf length (33.38cm), Leaf width (13.04 cm) and Chlorophyll contents (42.82 SPAD) were recorded in Kashi Sweta followed by Kashi Hans and Japanese White. While the minimum germination percentage (81.20 %), plant height

Table 1: Performance of different genotypes of Radish on germination percentage, plant height, number of leaves/plant, leaf length, leaf width and chlorophyll contents.

Treatments	Germination percentage (%)	Plant height (cm)	Number of leaves/plant	Leaf length (cm)	Leaf width (cm)	Chlorophyll content's (SPAD)
T_1 – Pusa Chetki	91.58	50.56	16.85	28.78	09.26	39.75
T_2 – Pusa Himani	91.90	48.96	14.81	26.26	07.73	38.82
T_3 – Kashi Hans	92.58	53.60	17.79	30.61	11.25	41.16
T_4 – Subhra-32	88.12	45.58	10.70	25.80	07.85	34.79
T_5 – Menu Early	91.81	50.68	11.73	25.61	08.63	37.61
T_6 – Desi Local	83.67	43.29	10.84	22.63	06.33	35.46
T_7 – Japanese White	92.22	51.47	15.84	29.88	08.87	40.26
T_8 – Palak Patta	85.71	45.51	13.69	24.00	07.01	37.81
T_9 – Kashi Sweta	95.03	56.52	19.81	33.38	13.04	42.82
T_{10} – Local-1	81.20	40.96	9.86	21.56	07.05	33.38
C.D. at 5%	**2.376**	**2.174**	**1.432**	**2.10**	**9.26**	**1.566**
SEm±	**0.794**	**0.726**	**0.478**	**0.70**	**7.73**	**0.523**

Table 2: Performance of different genotypes of Radish on root length, root diameter, root weight, leaf weight, whole plant weight, root yield/plot and root yield.

Treatments	Root length (cm)	Root diameter (mm)	Root weight (g)	Leaf weight (g)	Whole plant weight (g)	Root yield/plot (kg)	Root yield/ha (q)
T_1 – Pusa Chetki	25.56	50.69	136.86	90.76	227.623	3.695	369.47
T_2 – Pusa Himani	27.53	49.93	131.02	98.54	229.563	3.537	353.70
T_3 – Kashi Hans	28.71	51.68	160.45	106.47	267.223	4.340	433.97
T_4 – Subhra-32	21.73	44.72	134.71	85.83	220.537	3.637	363.67
T_5 – Menu Early	22.75	41.82	145.18	86.95	232.133	3.919	391.93
T_6 – Desi Local	21.76	40.71	125.83	84.80	210.363	3.397	339.70
T_7 – Japanese White	27.53	49.42	150.42	92.47	242.887	4.061	406.10
T_8 – Palak Patta	21.70	43.67	140.81	85.55	226..360	3.801	380.13
T_9 – Kashi Sweta	30.89	54.64	165.46	110.38	275.870	4.467	446.50
T_{10} – Local-1	19.50	38.83	121.15	80.94	202.093	3.271	327.07
C.D. at 5%	**1.679**	**1.63**	**3.247**	**1.995**	**4.404**	**0.088**	**8.82**
SEm±	**0.561**	**0.55**	**1.085**	**0.666**	**1.471**	**0.029**	**2.92**

(40.96 cm), Number of leaves per plant (09.86), Leaf length (21.56 cm) Leaf width (07.05 cm) and Chlorophyll contents (33.38 SPAD) were observed in Local-1. Probably reasons for enhanced plant height, number of leaves and leaf length, Leaf width (cm) and Chlorophyll contents may be due to genetic makeup of the genotypes. Similar results have been reported by Parthasarathi *et al* (1990). Also, similar results have reported by Kumar *et al* (2012).

Significantly, maximum root length (30.89 cm), root diameter (54.64 mm), root weight (165.46 g), leaf weight (110.38 g) and whole plant weight (275.870 g) were recorded in Kashi Sweta followed by Kashi Hans and Japanese White. While the minimum root length (19.50 cm), root diameter (38.83 mm), root weight (121.15 g), leaf weight (80.94 g) and whole plant weight (202.093 g) was recorded in Local-1 may be due to genetic makeup of the genotypes. Similar results have been reported by Khokhar *et al* (1987) , Tewatia *et al* (2000) and Kotlinska *et al* (2001).

Significantly, maximum root yield (446.50 q/ha) was recorded in Kashi Sweta followed by Kashi Hans and Japanese White. While, the minimum root yield (327.07 q/ha) was recorded in Local-1. The difference in root yield may be attributed to genetic makeup of the genotypes. Similar results have been reported by Kumar and Sharma (2011) , Rawat *et al* (2014) and Baloch *et al* (2014) in radish.

CONCLUSION

This study confirms that the ten varieties of radish, used for the study as treatments were viz., Pusa Chetaki, Pusa Himani, Kashi Hans, Subhra-32, Menu Early, Desi Local, Japanese White, Palak Patta, Kashi Sweta and Local-1. The growth parameters was recorded maximum in the Kashi Sweta variety as compare to other tested varieties whereas it was recorded minimum in Local-1 cultivar. Based upon this study, Kashi Sweta proved superior over other, hence recommend for its cultivation under Jaunpur and similar agro-climatic conditions.

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