

“Performance of Some Improved and Local Varieties of Radish (*Raphanus Sativus* L.)”.

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ABSTRACT: The present investigation entitled “Performance of some improved and local varieties of Radish (*Raphanus sativus* L.)” was carried out during Rabi 2012-13 at College of Agriculture, Latur. The experiment was laid out in Randomized Block Design (R.B.D.) with twelve treatments and three replication. Nine improved and three local varieties of radish were used for the study as treatments. The results of the present investigation clearly showed significant differences with respect to the growth and yield of different radish varieties under study. Radish varieties Indem Sweta, Ankur Naveen, Ganesh Synthetic and Pusa Reshmi had shown the significantly superior performance with respect to most of the growth and yield quality attributes. Among local varieties, the variety Pune local had performed better. Hence this genotype can be involved in further breeding programme for improving the yield and quality of radish.

Key words: Local varieties, Performance, Radish.

INTRODUCTION

Radish is grown for its young tender tuberous roots which are eaten raw as 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 homeopathy they are used for neurologic headaches, sleeplessness. Roots, leaves, are active against positive bacteria. The roots are useful in urinary complaints, piles and in gastrodynia. The juice of fresh leaves is used as diuretic and laxative. The primary root and hypocotyls develop into edible portion of radish root. In India it is grown over an area 40,675 ha with an annual production of 8.05 lakh tones. The average productivity of radish is 12.77 t/ha (Thamburaj and Singh, 2005). 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 Reshmi, Minakshi, Ketaki Long, Radish J.W, Radish Selection are grown in different parts of the state. The hybrids like Ankur Naveen, Indem Sweta and Ganesh Synthetic are also available in the market which are having high yielding potential. In recent years, due to increased urbanization and change in food habits, the demand for salad vegetables is increasing very fastly. The consumers as well as growers are demanding for the varieties having good qualities. As radish is an important salad vegetable, it is in demand throughout the year in big cities. The information regarding the radish varieties suitable for Marathwada region is not available. Farmers are asking for high yielding varieties with good quality of roots. The growth and yield performance of the radish varieties varies from place to place and region to region. Some local types are also under cultivation over a long period. The productivity and quality of which is not yet tested scientifically. Hence, in order to study these aspects critically the present investigation was conducted.

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MATERIAL AND METHODS

The field experiment entitled was carried out during *Rabi* 2012-13 at the Department of Horticulture, College of Agriculture, Latur. The experiment was laid out in simple RBD with three replication and 12 treatments. The treatment included 9 improved varieties Pusa Chetaki, Pusa Reshmi, Ankur Naveen, Radish J.W., Minakshi, Ketaki long, Radish Selection, Indem Sweta, Ganesh synthetic and three local varieties viz., Latur Local, Pune Local, Solapur Local.

The land used for experimental layout was fairly uniform with gentle slope. The soil of experimental site was medium black in color with good drainage. Representative soil samples were collected and processed for physio-chemical properties like available 'N'155 (kg ha⁻¹), available 'P'9.78 (kg ha⁻¹) available 'K'264 (kg ha⁻¹) pH 8.17 and Ec 0.49 (ds m⁻¹). The land was brought to a fine tilth by ploughing, clod crushing and two cross harrowings. An area was demarked in 36 plots each having 4.5 × 2.25 m² sizes. The distance of 0.5 m was kept between two plots and 1.0 m between two replications. The ridges were prepared at a distance of 30 cm after application of FYM @ 20 t/ha. The chemical fertilizers (NPK) were applied @ 80:60:60 kg /ha, in which half dose of nitrogen through urea along with the full dose of phosphorous (single super phosphate) and potassium (murate of potash) was applied as a basal dose. The remaining half dose of nitrogen was applied after 30 days of seed sowing. The seeds of different varieties of radish were dipped in cold water for 24 hours and treated with bavistin @ 2.5 g and were dried in shade. The sowing of these seeds was done as per layout at the middle portion of the ridges opened at 30 cm apart, keeping 15 cm distance between the plants by dibbling method. Gap filling was done six days after sowing. Irrigations were given as per the requirement. The irrigation was also given one day before the harvesting. All the cultural practices were adopted. The observations on length of root, its diameter, weight of root, leaves plant and yield were recorded and analysed statistically.

RESULTS AND DISCUSSION

Weight of whole plant (g)

As regards to the weight of whole plant, the results indicated significant differences among the different varieties. The variety Ankur Naveen recorded significantly highest weight of whole plant (301.33 g) which was statistically at par with variety Radish J.W. (260.00 g), while the minimum weight of whole plant

(154.67 g) was recorded in variety Solapur Local (Table 1). The variations in weight of whole plant among different varieties of radish have also been reported by Deotale *et al.* (1994); Who reported that, the maximum weight of plant (299.12 g) in variety Pusa Reshmi and minimum in Japanese white (216.10 g), which confirms the results of present findings.

Weight of root (g)

The weight of roots was influenced significantly among the different varieties. It was observed maximum (255.33 g) in variety Ankur Naveen which was statistically at par with Radish J.W. (218.67 g) and Pune local (208.67 g), while the minimum weight of root (130.67 g) was recorded in variety Solapur local (Table 1). The variation in the weight of root might be due to the genetic variation. The present findings are in conformity with the work of Dixit *et al.* (1980), Bhatti *et al.* (1983) and Deotale *et al.* (1994). They reported variations in root weight ranging from 24.38 g to 279.50 g among the different cultivars of radish under different agroclimatic conditions. The root weight obtained in the present investigation is well within the range of the results obtained by these workers.

Weight of shoot (g)

The weight of shoot was significantly influenced among the different varieties. The maximum weight of shoot (46 g) was recorded in variety Ankur Naveen and the minimum (24 g) in variety Solapur local (Table 1). The variations in shoot weight among different varieties have also reported by Bhatti *et al.* (1983). They reported that the maximum weight of shoot (220 g) in variety Minno ochali and minimum (20 g) in Round Red.

Root: shoot ratio

The root: shoot ratio indicated significant differences among the different varieties. The maximum root: shoot ratio was obtained (6.54) in Ketki long and minimum (3.05) in Radish Selection (Table 1). The variations in root: shoot ratio among different varieties of radish were also observed by Kumar *et al.* (2012). They reported that the maximum root: shoot ratio was (4.40) in White Ickle and minimum (1.62) in CGN - 11996, which supports the results of the present investigation.

Length of root (cm)

Data in respect of length of root indicated that, maximum root length was recorded in variety Ankur Naveen (30.13 cm) which was at par with varieties

Pune local, Ganesh Synthetic, Radish J.W., Ketaki long and Pusa Reshmi. The minimum length of root (24.17 cm) was recorded in variety Solapur local (Table 1). The root length of a cultivar is the factor which is of main concern to the research. Long root is an important character regarding root quality and it is useful to classify the varieties for consumer acceptability which might be due to genetical diversity in different varieties and ecological condition. Pujari *et al.* (1977), Rajagopal *et al.* (1979) and Chapagain *et al.* (2010), which supports the results of the present investigation.

Root yield per plot (kg)

The results indicated that, the root yield per plot was significantly influenced due to different varieties under study. The maximum root yield (38.22 kg/plot) was recorded in variety Indem Sweta which was followed by varieties Pusa Reshmi (33.39 kg/plot) and Ketaki long (33.33 kg/plot) (Table 1). The minimum (17.68 kg/plot) was recorded in variety Solapur local. The root yield is a result of translocation of more quantum of carbohydrates from the source to the sink. As the varieties which have shown superior performance in yield have significantly more number of vigorous leaves on it, which could have synthesized more food material and supplied to the roots, that might have resulted in increasing the length and diameter of roots and ultimately resulted in getting higher root yield in these varieties. The minimum yield in variety Solapur local could be attributed to poor growth in terms of number of leaves and minimum leaf area leads to the production of less quantity of carbohydrates and ultimately the poor yield. Singh and Taj (2005) and Deotale *et al.* (1994) also reported that, cultivars exhibiting higher yield contained longer length of root which ultimately caused more root yield, which supports the results of present findings.

Root yield (t/ha)

A perusal of data on yield of radish indicated that, the maximum (37.75 t/ha) yield was recorded in variety Indem Sweta which was followed by Pusa Reshmi (32.97 t/ha) and Ketki long (32.92 t/ha). The minimum (17.47 t/ha) was recorded in Solapur local (Table 1). It is obvious that the varieties which performed better in a unit area are likely to perform better on large scale as the yield per hectare was calculated by multiplying yield per plot with hectare factor. The yield is the result of interaction of the

genotype to a given agroclimatic and management factors. Further, yield is suppose to be the reflections of the yield components. The yield variations among these twelve varieties may be considered as varietal difference, as all these varieties are tested under same soil, managemental and similar agroclimatic conditions. Deotale *et al.* (1994) reported that, the variety Pusa Reshmi had performed best under Nagpur condition, but in present study it was found second best. The variations in yield among the radish varieties were also reported by several workers (Rajagopal, *et al.* 1979; Singh *et al.* 1979; Dixit *et al.* 1980; Bhatti *et al.* 1983; Khokar *et al.* 1987; Singh and Taj 2005 and Kumar *et al.* 2012) from different parts of the country. Hence, the results of the present investigation are on parallel line with the findings of earlier workers.

Table 1
Performance of different radish varieties in respect of growth and yield parameters

Tr. No.	Varieties	Weight of whole plant (g)	Root weight (g)	Shoot weight (g)	Shoot: Root ratio	Length of root (cm)	Root yield (kg/plot)	Root yield (t/ha)
T ₁	Pusa Chetaki	190.67	148.00	42.66	3.47	27.40	31.52	31.13
T ₂	Pusa Reshmi	170.00	143.33	26.66	5.38	28.33	33.38	32.97
T ₃	Ankur Naveen	301.33	255.33	46.00	5.55	30.13	30.53	30.16
T ₄	Radish J.W.	260.00	218.67	41.33	5.29	28.67	26.08	25.76
T ₅	Minakshi	196.67	166.00	30.66	5.41	27.27	31.65	31.26
T ₆	Ketaki Long	180.67	161.33	24.66	6.54	28.53	33.33	32.92
T ₇	Radish Selection	178.00	134.00	44.00	3.05	26.53	29.89	29.53
T ₈	Indem Sweta	192.67	158.67	34.00	4.66	27.67	38.22	37.75
T ₉	Ganesh Synthetic	224.00	186.67	37.33	5.00	29.20	26.25	25.93
T ₁₀	Latur Local	164.00	135.33	28.66	4.72	24.73	26.74	26.41
T ₁₁	Pune Local	248.67	208.67	40.00	5.21	29.60	28.82	28.47
T ₁₂	Solapur Local	154.67	130.67	24.00	5.44	24.17	17.68	17.47
	SE ±	17.10	17.50	2.70	0.21	1.15	0.55	0.56
	CD at 5%	50.07	51.24	8.19	0.66	3.38	1.70	1.69
	C.V.	14.44	17.78	13.83	7.75	7.27	3.42	3.42

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