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PERFORMANCE OF SOME EARLY MATURING RADISH CULTIVARS IN RESPECT OF YIELD AND CERTAIN GROWTH CHARACTERS

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Eight exotic cultivars of radish (*Rephanus sativus* L.) were evaluated for time taken to attain edible size, root length and breadth of root per plant and per hectare. These were grown in the experimental farm at National Agricultural Research Centre, Islamabad during the year 1984 - 85. Significant differences were observed among the cultivars with regard to the number of days for root to attain edible size, root length and breadth and yield per hectare. The cultivars Ijskegel, Middle East Giants and Flevo were found to be the best in all respects, exhibiting root yield of 7.16, 6.33 and 6.15 t/ha, respectively.

INTRODUCTION

Radish (*Raphanus sativus* L.) occupies an eminent position in vegetable crops of Pakistan. Although most of the cultivars under cultivation in the country are long-rooted and medium to late in maturity but early maturing radishes are very favourite because of their red skin colour and flavour. These are ready for use in three to six weeks from time of seed sowing. Thompson and Kelly (1957) reported that the spring group were quick maturing and could be planted at any time of the year. The winter varieties required about twice as long to mature as the spring varieties. There are very few early maturing varieties of radish so far introduced in the country whereas the introduction of germplasm from foreign sources has played an important role in the development of different crops all over the world. Approximately 5/8th of the cultivated vegetable crops in the United States of America are foreign introductions. (Hawthorn and Pollard, 1954). To obtain a good crop yield in an area, knowledge of growth and other characters exhibited in the environmental conditions are of greater importance. In order to provide good quality radishes to the consumers new cultivars have to be introduced and evaluated for their performance.

Earlier Sudell (1942) recommended 'French Breakkast' and 'Sparkler' for home gardening becaues they were quick in maturity while, Talbert (1953) recommended radish varieties 'Early Scarlet Globe' and 'White Icicle' as these were early and could mature in about 30 days. Devos (1968), compared seven new radish varieties with the standard 'Cherry Belle' and reported that 'Novitas' proved to be the best as its flavour and colour were desirable.

Yousaf and Shafi (1971) observed that among different varieties, Burpees Red Giant, White Icicle Burpee white Sparkler, 'Scarlet Globe' and French Breakfast were desirable for root characters. Thamburaj *et al.* (1982) had reported that the new white radish 'CV. Co-I' yielded 22 t/ha; 20.7 per cent more than the 'CV. Local' Control. Stolk and Cools (1982) observed that among different cultivars, Briljant, Tamina and Koraal were considered the best.

Reppenhorst and Schenk (1984) reported that out of thirteen radish cultivars, Karissima was the earliest and the heaviest producing variety of high quality. The evaluation and selection of foreign as well as local varieties is a work of continuous nature. The acqusition of superior cultivars from such material accomplishes the same purpose as that of developing a superior cultivar through deliberate breeding programme. The present study was undertaken with the objectives to select high yielding early maturing radish cultivars adaptable to our climatic conditions.

MATERIAL AND METHODS

Sene early maturing cultivars received from Holland, and one cultivar Round Red developed at the Ayub Agricultural Research Institute, Faisalabad were evaluated at the experimental farm at National Agricultural Research Centre, Islamabad, during the year 1985.

All the varieties were sown on 4.3.1984. The first fruit of these varieties did not mature on the same day, therefore the harvesting operation was carried out on the dates of maturity of various varieties as mentioned in the following table.

The experiment was laid out in randomized complete block design with four replications having plot size 6.0 m x 3.0 m

Varieties	Date of harvest of first fruit
T-96	13.5.1984
Chichawatni	16.5.1984
Hales Best Jamboo	22.5.1984
Galia	29.5.1984
Perlita	23.5.1984
PMR - 45	2.6.1984
Honey Dew	14.6.1984
Polmyra Special	2.6.1984
Polidar	1.6.1984

The yield and the following growth characters of the cultivars were measured :

— Time takehen by roots to attain edible size (days)
— Weight of root per plant (g)
— Length of root per plant (cm)
— Breadth of root per plant (cm)
— Total yield of root per hectare (tonnes)

The root of radish was considered edible when it was still tender and not started to become pithy or to show interior break-down and opaque discolouration of the flesh. A small V-shaped section was cut out of root as sample per row to check the interior.

RESULTS AND DISCUSSION

The roots of different cultivars behaved differently in colour, length, breadth and weight. (Table 1) The roots were bright red in all the cultivars except the Ijskegel which was white. In Meddle East Giants the roots were pink red. However in cultivar Lanquette the the upper half part of root was bright red while the rest of it was white in colour. These are genetic characters specific to some cultivars (Bhatti *et al.*, 1983).

The roots of cultivars Round Red, Lanquette, Sexa Nova and Cherry Belle took almost the same average time to reach edible maturity i.e. 44.25 to 44.75 days. Similar results have been reported by Banga (1953) and Bhatti *et al.* (1983). The roots of Novi Red cultivar matured earlier which took 39.75 days.

Table 1. *Comparative performance of some early maturing radish cultivars under Islamabad conditions during 1984-85*

Cultivar	Time taken by roots to attain edible size (days)	Weight of root (g)	Length of root (cm)	Breadth of root (cm)	Root yield t/ha
Novired	39.75 d	23.00 bc	2.55 g	2.89 c	2.38 d
Flevo	42.75 c	28.25 b	3.83 d	3.97 a	6.15 b
Sexa Nova	44.25 b	25.75 bc	3.80 d	3.22 b	2.21 de
Round Red	44.75 b	21.75 c	3.40 e	2.75 cd	2.00 e
Cherry Belle	44.25 b	23.00 bc	3.10 f	3.24 b	2.40 d
Middle East Giants	47.00 a	40.00 a	4.30 c	3.88 a	6.33 b
Lanquette	44.75 b	21.75 c	5.55 b	2.45 d	2.85 c
Ijskegel	47.00 a	42.00 a	7.00 a	2.92 bc	7.16 a

Means not followed by the same letter are significantly different at 5 % probability

The cultivars Ijskegel and Middle East Giants took the maximum time of 47.00 days each to attain edible size. The difference in maturity can be attributed to difference in cultivars.

The cultivar Ijskegel attained the maximum root length of 7.00 cm followed by Lanquette (5.55 cm), Middle East Giants (4.30 cm) Sexa Nova (3.80 cm) Flevo (3.83 cm), Round Red (3.40 cm) and Cherry Belle (3.10 cm). The minimum root length was attained by Novired which was 2.55 cm. These results are slightly different than those obtained by Bhatti *et al.* (1983). The difference can be attributed to difference in cultivars and ecological conditions.

The breadth of root is also a factor which contributes towards total yield per unit area. The cultivar lanquette attained the minimum root breadth of 2.45 cm followed by Round Red (2.75 cm), Novired (2.89 cm) and Ijskegel (2.92 cm). These results confirm the findings of Bhatti *et al.* (1983). The cultivar Flevo attained the maximum breadth of 3.97 cm followed by Middle East Giants (3.88). It was significantly different from other cultivars.

As far as the weight gained by roots was concerned, the cultivars Lanquette and Round Red exhibited the minimum root weight of 21.75 g each at the time

of edible maturity. These results tally with the findings of Bhatti *et al.* (1983) who reported average weight of 24.375 g per root for an exotic variety Round Red. The cultivar Ijskegel (42.00 g) was leading among the list and was followed by Middle East Giants (40.00 g).

Yield is supposed to be the reflection of the yield components. Therefore, the cultivars with distinctly high yield components have shown their superiority in terms of yield per unit area. Maximum root yield of 7.16 t/ha was exhibited by the cultivar Ijskegel followed by Middle East Giants yielding 6.33 t/ha. Flevo ranked 3rd by yielding 6.15 t/ha. Minimum root yield (2.00 t/ha) was obtained from the cultivar Round Red. Other cultivars Lanquette, Cherry Belle, Novired and Sexa Nova yielded 2.85, 2.40, 2.38 and 2.21 t/ha respectively. These results are in conformity with those reported by Bhatti *et al.* (1983).

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