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SEED PRODUCTION CAPABILITIES OF SOME EXOTIC CULTIVARS OF TURNIP

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Six exotic cultivars of turnip were evaluated for their capabilities of seed production i.e number of days to flowering, seed maturity, number of pods per plant, number of seeds per pod and per gram, 1000-seed weight and yield per plant, at National Agricultural Research Centre, Islamabad. The differences of means were highly significant for cultivars. The cultivar 'Golden Ball' produced the maximum number of seeds per pod (23.3) and gave significantly higher seed yield of 11.8 g plant^{-1} than rest of the cultivars. It was followed by, Milan Red Top which gave seed yield of 9.5 g plant^{-1} with average number of 20.5 seeds pod.$^{-1}$

INTRODUCTION

Turnip is one of the highly remunerative vegetable crops which has great economic incentive for the growers. To provide better quality turnip and to ensure their availability to the consumers over a longer period of time, new cultivars have to be produced and evaluated for their performance with regards to their capabilities for seed production. The healthy, viable and true to type seed is the basic factor for having the best crop. Seed of improved varieties can be used time after time to boost production Studies have shown that the productivity in vegetables depends upon plant growth to a greater exent and finally on the yield components. Although varieties of a crop may exist elsewhere, differences in climate, soil and other agronomic factors may reduce their yield potential locally.

It is therefore a combination of various characters which makes a particular cultivar desirable for commercial purposes. Varieties may have to be tested for specific local growing conditions.

Studies conducted by Novak (1985) have shown that seed yield in variety 'Abina' of turnip sown on the flat and furrows ranged from 0.78-1.39 and 0.96-1.45 t ha^{-1}, respectively. He further observed that the 1000 seed weight varied from 1.83 to 2.12 g. Singh and Saimbhi (1985) observed the effect of plant spacings on seed yield in turnip cultivar 'L-1'. They reported that the spacings at 75 x 30 cm and 75 x 60 cm gave the highest and lowest seed yield of 471 t ha^{-1} and 250 t ha^{-1}, respectively. Chakrabarti (1983) observed the effect of nitrogen and phosphorus on turnip seed crop. He reported the highest seed yield of 1707 kg ha^{-1} from plants receiving the highest nitrogen and phosphorus rates.

Studies conducted by Khan and Shafi (1966) have shown that seed crop of Japanese variety of radish 'Yakohama' produced 648.00-871.25 pods per plant depending upon the spacing ranging from 0.9 m x 0.9 m to 0.9 m x 0.6 m per plant. Their studies also revealed 137.50-164.00 seeds g^{-1} of produce depending upon different varieties. Bhatti *et al.* (1982) in seed production trial with radish cultivars reported that cultivar 'Round Red' took the maximum time of 67.5 days to bloom after transplanting whereas 'Shaomai' took the minimum time of 24.50 days to bloom. They also recorded 183-105 pods per plant in various cultivars They further reported 4.8 to 36.8 g seed yield per plant in respect of different varieties.

Limited research work has been conducted with regard to seed production capabilities of the exotic cultivars of turnip, therefore the present study was initiated. Such information might reveal areas in which selection could bring about further improvements in seed yield.

MATERIALS AND METHODS

Six cultivars of turnip namely, Golden Ball, Purple Top, Vertus Marteau, Milan Red Top, Early Red Top and Milan

purple Top were evaluated for their performance at the National Agricultural Research Centre, Islamabad. The varieties were sown on November 10, 1986. Fully developed healthy plants were selected during the season and their stecklings containing 2/3 top portion and parts of the roots were transplanted in a Randomized Complete Block Design with four replications on February 20, 1987. Each variety was planted in plots consisting of four rows 5 m long with 45 cm row spacing and 30 cm plant to plant distance.

Data on the Following characters were recorded:

I) Number of days to flowring:- The observations were recorded at the time when 50 percent of plants flowered in a plot.

II) Number of days for seed maturity:- The observations were made when pods turned brown.

III) Number of pods per plant:- Five plants per ridge were taken at rendom to count their pods.

IV) Number of seeds per Pod:- It was recorded by counting the seeds of pods from randomly selected plants and average number of seeds per pod calculated.

V) Seed yield per plant:- Five plants from each row were selected at random and average yield per plant was recorded.

VI) 1000 seed weight:- It was recorded by weighing 1000 seeds from each variety and used as the test weight of the varieties.

VII) Number of seeds in one gram:- Number of seeds was calculated by counting one gram seed from each variety.

The data were analysed by the analysis of variance and the test of significance was applied following Duncan's Multiple Rande Test.

RESULTS AND DISCUSSION

The results regarding days to flowering and seed maturity, number of seeds per gram and weight of 1000 seeds are discussed in the ensuing lines.

The data indicated that the cultivar Early Red Top took the maximum time of 56. days to flowering after transplanting whereas Purple Top took the minimum time of 30.5 days to bloom (Table 1). The time taken to flowering by Early Red Top was significantly higher than rest of the cultivars. The differences of means were non-significant for Golden Ball Purple Top and Vertus Marteau. The cultivars Milan Red Top and Milan Purple Top were also statistically at par with each other. The differences in flowering period may be attributed to genetic and climatic factors.

The early flowering cultivars were also quick naturing. The maximum time taken to seed maturity was by Early Red Top which was 86.5 days; whereas the cultivar Purple Top took 74.7 days only (Table 1). Difference between the earliest and the latest seed maturing cultivars was 11.7 days. This variation may also be due to the genetic factors.

Number of pods per plant is a very important factor and has an impact on yield. Cultivar Milan Purple Top produced the maximum number of pods (380) while Vertus Marteau produced the minimum number of pods (168) per plant (Table 1). The other cultivars produced from 194. to 375 pods per plant. The mean number of pods per plant for 'Milan Purple Top' and Milan Red Top was significantly higher than rest of the cultivars.

'Golden Ball' produced the maximum number of seeds per pod (23.3) followed by Milan Red Top (20.5) which were statistically at par with each other (Table 1). The minimum number of seeds per pod were obtained by the cultivar Milan Purple Top (14.5). Milan Purple Top and Early Red Top did not differ significantly from each other.

The data revealed that the cultivar 'Milan Purple Top' exhibited the maximum number of seeds per gram (586) followed by Purple Top (583) Early Red Top (578) and Milan Red Top' (543) (Table 1). The results of these varieties did not differ significantly from one another but produced significantly greater number of seeds than Golden Ball and Vertus Marteau which showed 456 and 488 number of seeds per gram, respectively.

Table 1. *Comparative performance of six turnip cultivars for seed production capability.*

(Values are average of 4 replictions

Cultivar	Time taken to flowering (days)	Time taken for seed maturity (days)	Pod No per plant	Seed No. per pod	Seed Yield per plant(g)	1000-Seed weight (g)	Seed No. per gram
Golden Ball	30.8 c	75.0 d	211 b	23.3 a	11.83 a	2.20 a	456 b
Purple Top	30.5 c	74.8 d	208 b	16.5 bc	6.25 c	1.72 b	583 a
Vertus Marteau	31.0 c	77.3 c	167 c	19.8 ab	7.03 c	2.06 a	486 b
Milan Red Top	45.8 b	81.5 b	375 a	20.5 a	9.45 b	1.84.b	543 a
Early Red Top	56.8 a	86.5 a	194 bc	15.8 c	4.26 d	1.73 b	578 a
Milan Purple Top	46.3 b	81.5 b	380 a	14.5 c	6.46 c	1.71 b	586 a

Means not followed by the same letter differ significantly at one percent probality level.

For 1000 seed weight the order of ranking was 'Golden Ball' > 'Vertus Marteau > Milan Red Top > Early Red TOp > 'Purple Top > Milan Purple Top (Table 1). The minimum and maximum range of 1000 seed weight in respect of these cultivars was 1.71 to 2.20 g. Similar results have been reported by Novak(1985).

Maximum seed yield of 11.83 g per plant was obtained from the cultivar Golden Ball and the minimum of 4.26 g by Early Red Top (Table 1). The other cultivars Milan Red Top, Vertus Marteau, Milan Purple Top and Purple Top produced the seed yield of 9.45, 7.03, 6.46 and 6.25 g per plant, respectively. The cultivar Golden Ball produced significantly higher seed yield per plant than rest of the cultivars.

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