

Evaluation of Growth and Yield Parameters of Okra (*Abelmoschus esculentus* L. Moench) Genotypes

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Received: 14.06.2018 | Revised: 21.07.2018 | Accepted: 28.07.2018

ABSTRACT

The present investigation was carried out at Department of Horticulture, Lovely Professional University, Phagwara during 2017-18 with an aim to evaluate okra genotypes for growth and yield parameter under Punjab condition. Various morphological parameters viz., days to germination, plant height at different intervals (cm), number of branches per plant, number of pods per plant, days required for first flowering, days required for 50% flowering, fruit length (cm), fruit weight (g) and yield per plant (g) were recorded. Among all genotypes, Hari Kranti took minimum days for germination whereas genotype F₁ Farid took maximum days for germination. Genotype OH 2324 was rated as superior genotype for plant height, number of branches per plant, number of fruits per plant, fruit yield per plant and fruit weight. Result obtained from present study provided useful information on variability among various morphological traits of okra genotypes which can be used in future breeding programmes. From the present investigation it can be concluded that okra genotype OH 2324 performed well for various growth and yield traits under Punjab condition.

Key words: Okra, Genotype, Growth, Yield, Morphological traits

INTRODUCTION

Okra (*Abelmoschus esculentus* L. Moench) also known as lady's finger or bhindi belongs to family Malvaceae, having highest chromosome number among vegetables (2n=130). It is native to Africa and grown in tropical and subtropical parts of the world. India is the largest producer of okra in the world and it is cultivated extensively round the year for its immature fruits¹. Tender fruits are used as vegetables or in culinary preparations as sliced or dried pieces. Mature fruits and

stem containing crude fibre and are used in paper industry. Its fruits have high nutritive, medicinal and industrial value and export potential. Its fruits are rich in vitamins, calcium, potassium and other mineral matters². Okra contains highest amount of iodine which prevents from goitre disease and often recommended by nutritionists because it control cholesterol level and weight reduction programmes³. Okra is very effective in frightening against ulcers, physiological conditions and depressions.

Cite this article: Singla, R., Kumari, P. and Thaneshwari, Evaluation of growth and yield parameters of okra (*Abelmoschus esculentus* L. Moench) genotypes, *Int. J. Pure App. Biosci.* 6(5): 84-89 (2018). doi: <http://dx.doi.org/10.18782/2320-7051.6612>

The antioxidant activity of this crop is due to presence of vitamin A, B and C that prevents the oxidative damages by free radicals also helps in lowering down the aging process⁴.

Okra production and productivity is seriously affected by the use of low yielding local varieties, sub optimal plant density, heavy attack of insect pests, diseases and weeds etc. One of major problem in okra cultivation is the selection of low yielding varieties due to which productivity in India is less as compared to other countries leading to heavy yield losses. Higher production of this crop is possible by the cultivation of varieties or genotypes which show remarkable enhanced returns, compared to other cultivars grown at same climatic conditions and inputs applied. However, productivity could be improved through careful evaluation and selection of proper okra varieties based on location⁵. Keeping these considerations in view, the present investigation was carried out with an objective to evaluate the growth and yield parameters of okra genotypes.

MATERIAL AND METHODS

The present investigation was carried out at Agriculture Farm, Department of Horticulture, Lovely Professional University, Phagwara during 2017-18. Experimental material comprised 10 okra genotypes (Table 1). All genotypes were evaluated in a randomized block design with five replications. Cultural and agronomic practices were followed as per the standard recommendations and need based plant protection measures were taken up to maintain healthy crop stand. Observations were recorded on five competitive plants excluding border plants in each replication in each genotype for days to germination, plant height (cm), number of branches per plant, number of pods per plant, days required for first flowering, days required for 50% flowering, fruit length (cm), fruit weight (g) and yield per plant (g). The data obtained in respect of all the characters has been subjected to statistical analysis by using OPSTAT available at site of Hisar Agriculture University.

Table 1: Okra genotypes used in present investigation

Sl. No.	Genotypes	Source
1	Mahyco Hybrid no.10	Mahyco, Sangrur
2	Mahyco Bhindi no. 777	Mahyco, Sangrur
3	OH 2324	Syngenta, Sangrur
4	F ₁ Hybrid Chhaya	Farid Seeds, Mansa
5	F ₁ Farid	Farid Seeds, Mansa
6	F ₁ Nirogi	Farid Seeds, Mansa
7	Rakshya	Clause, Mansa
8	Super Pratik	AR Enterprises, Mansa
9	Raj Rani	Shatabdi, Sangrur
10	Hari Kranti	Suttin Seeds, Sangrur

RESULTS AND DISCUSSION

Okra genotypes exhibit variability with respect to various growth and yield traits (Figure 1 and Table 2). Days required for germination ranged from 6.36 to 8.26 (Table 2). The genotype F₁ Farid took maximum days to germination (8.26) followed by OH 2324 (7.9) and Super Pratik (7.90). Minimum days to germination were observed in Hari Kranti (6.36) followed by Mahyco777 (6.93). The quick germination in variety Hari Kranti may

be due to soft seed coat and good ability of the seed to adapt in the soil conditions and the other reason may be due to hard seed coat characteristic of other varieties except Hari Kranti. The result from present investigation is in confirmation with the findings of Falusi *et al.*⁶ and Falodun *et al.*⁷.

Plant height was recorded 30, 45, 60, 75 days after sowing (DAS) and at the time of harvesting stage (Figure 1). The Plant height of okra genotypes at harvesting stage varied

from 90 to 122.4 cm (Figure 1). The maximum plant height at harvesting stage was recorded in OH 2324 (122.4 cm) followed by Rakshya (120.4cm). However, minimum plant height was observed in Hari Kranti (90 cm) followed by Raj Rani (90.33 cm). This may be because of the variety OH 2324 capability in tolerance for yellow vein mosaic virus. However other varieties were affected by yellow vein mosaic virus and thus the plant parameters such as plant height was affected. Similar findings were reported by Chadha *et al.*⁸ and Singh *et al.*⁹.

Optimum number of branches per plant with upright behaviour is considered as desirable trait in okra. Number of branches per plant varied from 1.90 to 5.56 (Table 2). Among the 10 genotypes, maximum number of branches per plant were reported in genotype OH 2324 (5.56) followed by Rakshya (4.83) and Mahyco Bhindi 777 (4.43). The minimum number of branches per plant were observed in Raj Rani and Hari Kranti. This variation in number of branches per plant might be due to variation in plant height as well as photosynthetic ability of the each genotype. The result from present study are in confirmation with the findings of Nwangburuka *et al.*¹⁰, Singh and Jain¹¹ and Reddy *et al.*¹².

Days to first flowering ranged from 38.23 days to 46.40 days. The maximum days to first flowering was recorded in F₁ Farid (46.40 days) followed by F₁ Chhaya (46.10 days). Minimum days were taken by Mahyco Hybrid 10 (38.23 days) followed by Super Pratik (39.83 days) (Table 2). The variation might be due to its varietal make up of short vegetative phase which enhance its early flowering. The result from the present investigation are supported by Aminu *et al.*¹⁴ and Pandey *et al.*¹³

Days to 50% flowering varied from 42.63 to 51.66. The maximum days to 50% flowering were recorded in F₁ Farid (51.66 days) followed by F₁ Chhaya (50.23 days). Minimum days were taken by Mahyco10 (42.63 days) followed by Super Pratik (44.26 days) (Table 2). The variation might be due

inherit genetic makeup and characteristic feature of hybrid genotype. The result from present investigation are in agreement with the findings of Mishra *et al.*¹⁶ and Kishor *et al.*¹⁵.

Number of fruits per plant varied from 28.40 to 44.60. The maximum number of fruits per plant were recorded in genotype OH 2324 (44.60) followed by Rakshya (43.00), whereas minimum number of fruits per plant were observed in Hari Kranti (28.40) followed by Raj Rani (29.40) (Table 2). This shows that when number of branches increased number of fruits also increased. Similar results were observed by Sachan¹⁷ and Saha *et al.*¹⁸.

Fruit length at marketable stage ranged from 6.40 cm to 12.93 cm (Table 2). The maximum fruit length at marketable stage was recorded in Mahyco Hybrid 10 (12.93 cm) followed by Hari Kranti (11.16 cm). Minimum fruit length at marketable stage was observed in F₁ Chhaya (6.40 cm) followed by OH 2324 (6.83 cm). The variation in fruit length may be due to the varietal character of genotypes and also influenced by disease and insect pest attack. The results from present investigation are supported by Muhammad¹⁹, Saifullah and Rabbani,²⁰.

Fruit weight varied from 5.76 g to 10.20 g (Table 2). The maximum fruit weight was observed in OH 2324(10.20) followed by Rakshya (9.73). The minimum fruit weight was recorded in Hari Kranti (5.76) followed by Raj Rani (6.43). This variation might be due to differences in the vegetative growth of genotypes which leads to variation in photosynthesis and ultimately fruit weight. The yield of fruit per plant is directly related with high number of branches consisting of high number of nodes. Similar results were reported by Mahapatra *et al.*²¹ and Simon *et al.*²².

Fruit yield per plant varied from 299.13 g to 496.70 g (Table 2). The maximum fruit yield per plant was recorded in OH 2324 (496.70 g) followed by Rakshya (483.43 g). Minimum fruit yield per plant was observed in Hari Kranti (299.13 g) followed by Raj Rani (351.86 g). This might be due to high accumulation of photosynthates in fruits which

is responsible for higher weight. The yield of fruit per plant is directly related with high number of branches consisting of high number

of nodes. Similar results were obtained by Mihretu *et al.*²³ and Prasad *et al.*²⁴.

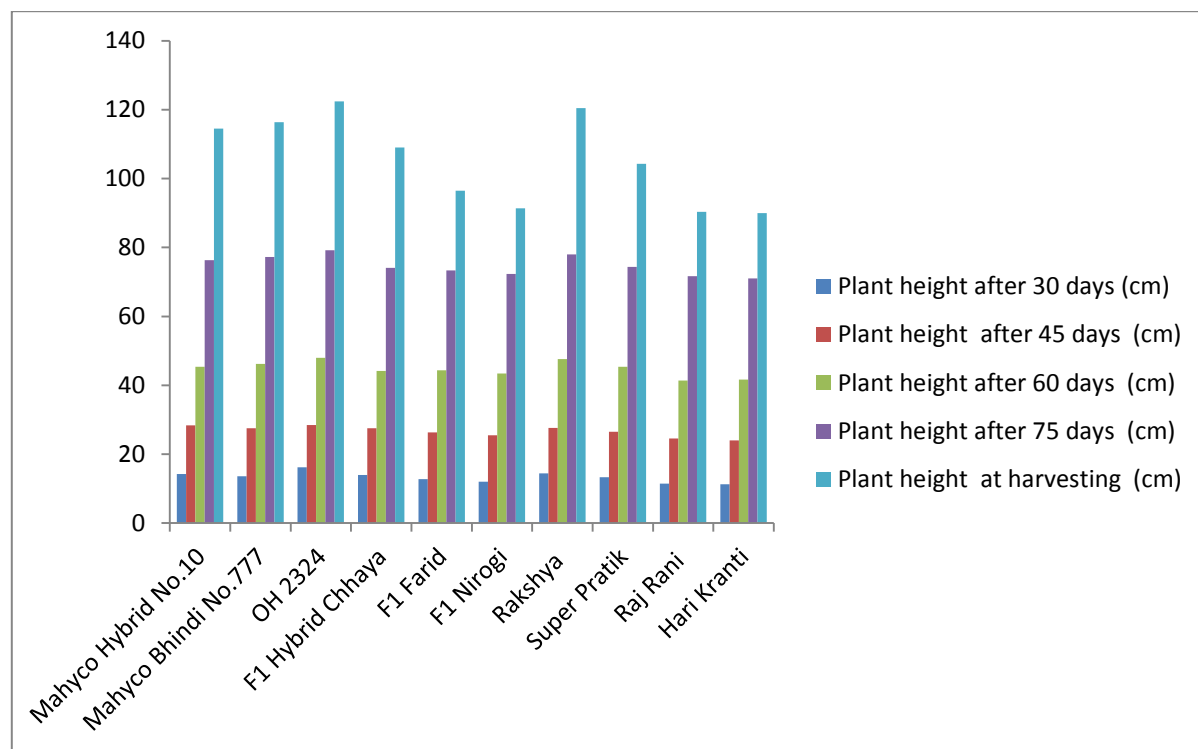


Figure1: Plant height of various orka genotypes at different days intervals

Table2. Performance of okra genotypes for various growth and yield traits

Genotypes	Days required for germination	Days required for first flowering	Days required for 50% flowering	Number of branches per plant	Number of fruits per plant	Fruit length (cm)	Fruit weight (g)	Yield per plant (g)
MAHYCO No.10	7.26	38.23	42.63	4.23	37.66	12.93	7.90	466.63
MAHYCO No 777	6.93	43.3	48.1	4.43	41.23	8.7	8.86	476.20
OH2324	7.9	42.4	46.63	5.56	44.60	6.83	10.20	496.70
F ₁ Chhaya	7.86	46.1	50.23	3.53	35.46	6.4	7.36	461.53
F ₁ Farid	8.3	46.4	51.66	2.36	32.56	7.16	6.86	446.86
F ₁ Nirogi	7.167	42.1	47.1	2.03	31.53	10.13	6.53	387.46
Rakshya	7.033	44.6	48.46	4.83	43.00	9.73	9.73	483.43
Super Pratik	7.9	39.83	44.26	3.13	33.43	8.1	7.23	452.33
Raj Rani	7.033	43.73	48.23	1.90	29.40	9.033	6.43	351.86
Hari Kranti	6.4	41.6	46.56	1.90	28.40	11.16	5.76	299.13
C.D	1.12	0.70	1.20	0.6	1.64	1.10	0.63	2.75
C.V	8.82	0.94	1.46	10.13	2.7	7.05	4.78	0.36

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