



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(11): 490-492
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www.thepharmajournal.com

Received: 20-08-2022
Accepted: 25-09-2022

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Impact of apical pinching and fruit picking on seed quality parameters of okra (*Abelmoschus esculentus* (L.) Moench)

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Abstract

The present investigation entitled “Impact of apical pinching and fruit picking on seed quality parameters of okra (*Abelmoschus esculentus* (L.) Moench)” was carried out in *Kharif* 2020 at the Seed Testing Laboratory, Department of Seed Science and Technology, College of Agriculture, Junagadh Agricultural University, Junagadh. Different apical pinching (P₀: no pinching, P₁: pinching at 20 days after sowing and P₂: pinching at 30 days after sowing) and fruit picking (F₀: no fruit picking, F₁: one fruit picking, F₂: two fruit picking, F₃: three fruit picking and F₄: four fruit picking) treatments were evaluated for GO-6 variety for seed quality parameters. Apical pinching done at 20 days after sowing (P₁) coupled with two green fruit picking (F₂) recorded the maximum seed germination (%), seedling length (cm), seedling vigour index I and seedling vigour index II.

Keywords: Okra, apical pinching, fruit picking, seed quality

Introduction

In the human diet, vegetables are essential because they offer less expensive sources of nutrients including carbohydrates, minerals, vitamins, proteins, and dietary fibres. Okra's green tender fruits are a highly nutritious vegetable, including 66 mg of calcium and 0.2 mg of iodine per 100 g of edible section, as well as a good amount of vitamins A, B, and C. Okra seeds have recently received attention as a source of protein (approximately 20% of dry matter) and vegetable oil (14% of dry matter). The seeds are sometimes roasted and used as a coffee substitute. It is a potential export earner, accounting for 60% of fresh vegetable exports (Sharma and Arora, 1993) [8]. Aside from its nutritional value, the fruit's stem and husk are utilised in the production of paper since they contain more crude fibre.

Detopping is defined as the removal of a plant's apex. Most plant species have dormant axillary buds due to the inhibitory effect of primary shoot apex growth, a phenomenon known as apical dominance (Cline, 1991) [2]. Apical bud detopping disrupts apical dominance and promotes the development of lateral branches, altering plant architecture and increasing potential pod bearing area (Gujar and Srivastava, 1972) [5].

Okra is a crop that grows quickly, therefore the length of time between pickings can also affect the output. Early harvesting reduces yields due to low fruit weight, whereas delayed harvesting reduces marketable yields because of over-aged fruits becoming fibrous. According to Maurya *et al.* (2013) [6], the okra yields gradually reduced with longer picking intervals. Short picking intervals stimulated the plant to produce more fruits per plant, and long picking intervals increased fruit size and weight, which in turn produced the highest fruit output per plant and per hectare.

Material and Methods

The experiment was conducted in laboratory condition during *Kharif* 2020 at Seed Testing Laboratory, Department of Seed Science and Technology, College of Agriculture, Junagadh Agricultural University, Junagadh, and were analyzed using completely randomized design with factorial concept as per the statistical procedure suggested by Cochran and Cox (1957) [3]. Different apical pinching (P₀: no pinching, P₁: pinching at 20 days after sowing and P₂: pinching at 30 days after sowing) and fruit picking (F₀: no fruit picking, F₁: one fruit picking, F₂: two fruit picking, F₃: three fruit picking and F₄: four fruit picking) treatments were evaluated for GO-6 variety for seed quality parameters *viz.*, seed germination (%), seedling length (cm), seedling vigour index I and seedling vigour index II.

Results and Discussion

Apical pinching influenced seed germination significantly. Treatment P₁ (pinching at 20 DAS) had the highest seed germination rate (85.53%), followed by treatment P₂ (pinching at 30 DAS) (84.47%). Treatment P₀ had the lowest seed germination rate (83.47%) (no pinching). Fruit picking has a significant impact on seed germination. Treatment F₂ (two fruit picking) had the highest seed germination rate (88.22%), followed by treatment F₁ (one fruit picking) (86.89%). Treatment F₄ had the lowest seed germination rate (81.33%) (four fruit picking). The interaction effects between apical pinching and fruit picking were determined to be non-significant for this trait.

Apical pinching had a significant effect on seedling length. P₁ (pinching at 20 DAS) produced the longest seedlings (19.62 cm), which were then followed by P₂ (pinching at 30 DAS) (19.21 cm). Treatment P₀ had the shortest seedling length (18.43 cm) (no pinching). Fruit picking had a considerable effect on seedling length as well. Treatment F₂ (two fruit picking) had the longest seedling length (22.35 cm), followed by treatment F₁ (one fruit picking) (20.81 cm). Treatment F₄ had the shortest seedling length (17.07 cm) (four fruit picking). For seedling length, the interaction effects of apical pinching and fruit picking were significant. P₁F₂ (23.25 cm) noted the longest seedling length, followed by P₂F₂ (22.53 cm), with P₀F₄ producing the shortest seedling length (16.86 cm).

Apical pinching had a significant effect on seedling vigour index I. P₁ (pinching at 20 DAS) had the highest seedling vigour index I (1684.69), which was followed by P₂ (pinching at 30 DAS) (1628.07). Treatment P₀ had the lowest seedling vigour index I (1542.78) (no pinching). Fruit picking had a significant effect on seedling vigour index I. Treatment F₂ (two fruit picking) had the highest seedling vigour index I (1973.07), followed by treatment F₁ (one fruit picking) (1808.38). Treatment F₄ had the lowest seedling vigour index I (1388.42) (four fruit picking). The interaction effects between apical pinching and fruit picking were determined to be non-significant for this trait.

Apical pinching had a significant effect on seedling vigour index II. P₁ (pinching at 20 DAS) had the highest seedling vigour index II (2052.56), which was followed by P₂ (pinching at 30 DAS) (1932.30). Treatment P₀ had the lowest seedling vigour index II (1884.22) (no pinching). Fruit picking had a significant effect on seedling vigour index II. Treatment F₂ (two fruit picking) had the greatest seedling vigour index II (2210.88), followed by treatment F₁ (one fruit picking) (2105.89). Treatment F₄ had the lowest seedling vigour index II (1693.22) (four fruit picking). The interaction effects between apical pinching and fruit picking were determined to be non-significant for this trait.

All the above findings are in conformity with findings of El Balla *et al.* (2011), Mohammadi *et al.* (2011) and Begum and Ayub (2020) [4, 7, 11].

Table 1: Effect of apical pinching and fruit picking on seed germination (%), seedling length (cm), seedling vigour index I and seedling vigour index II in okra

Treatments	Seed germination (%)	Seedling length (cm)	Seedling vigour index I	Seedling vigour index II
Apical pinching (P)				
P ₀	83.47	18.43	1542.78	1884.22
P ₁	85.53	19.62	1684.69	2052.56
P ₂	84.47	19.21	1628.07	1932.30
S.Em±	0.50	0.10	13.06	20.53
C.D. at 5%	1.43	0.31	37.74	59.30
Fruit picking (F)				
F ₀	84.00	17.78	1493.90	1966.52
F ₁	86.89	20.81	1808.38	2105.89
F ₂	88.22	22.35	1973.07	2210.88
F ₃	82.00	17.42	1428.82	1805.30
F ₄	81.33	17.07	1388.42	1693.22
S.Em±	0.64	0.14	16.87	26.51
C.D. at 5%	1.84	0.40	48.73	76.56
Apical pinching (P) x Fruit picking (F)				
P ₀ F ₀	82.67	17.32	1431.95	1910.60
P ₀ F ₁	86.00	19.50	1677.31	2026.11
P ₀ F ₂	87.33	21.29	1858.99	2097.47
P ₀ F ₃	81.33	17.17	1396.95	1768.01
P ₀ F ₄	80.00	16.86	1348.73	1618.92
P ₁ F ₀	85.00	18.04	1533.12	2015.92
P ₁ F ₁	88.00	21.72	1910.71	2246.92
P ₁ F ₂	89.67	23.25	2084.75	2373.58
P ₁ F ₃	82.67	17.84	1474.67	1834.05
P ₁ F ₄	82.33	17.25	1420.21	1792.36
P ₂ F ₀	84.33	17.99	1516.62	1973.07
P ₂ F ₁	86.67	21.20	1837.14	2044.63
P ₂ F ₂	87.67	22.53	1975.47	2161.60
P ₂ F ₃	82.00	17.25	1414.84	1813.83
P ₂ F ₄	81.67	17.10	1396.31	1668.38
S.Em±	1.11	0.24	29.22	45.91
C.D. at 5%	NS	0.70	NS	NS
CV %	2.27	2.20	3.12	4.06

Conclusions

Pinching at 20 days after sowing (P₁) recorded highest seed germination (85.53%), seedling length ((19.62 cm), seedling vigour index I (1684.69) and seedling vigour index II (2052.56). The maximum germination percentage (88.22%), root length (6.91 cm), seedling length (22.35 cm), seedling vigour index-I (1973.07) and seedling vigour index-II (2210.88) were found at two fruit picking (F₂). It can be concluded that apical pinching done at 20 days after sowing with two green fruit picking is preferable.

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