

Original Research Article

Effect of Different Doses of NPK Fertilizers on Growth, Yield and Yield Attributes of Okra (*Abelmoschus esculentus* (L.) Moench.) cv. 'Arka Anamika'

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ABSTRACT

A field experiment entitled "Effect of different doses of NPK fertilizers on growth, yield and yield attributes of okra (*Abelmoschus esculentus* (L.) MOENCH.) cv. 'Arka Anamika' under pilibhit conditions" was conducted at 'Prakash Agriculture farm Pilibhit' during kharif season 2020. The experiment comprising of nine treatment combinations replicated three times, was laid out in Randomized Block design. Half dose of Nitrogen, full doses of Phosphorus and potassium were applied at the time of bed preparation. The remaining half nitrogen was applied 30 days after sowing of Okra seed. The observations were recorded on 9 yield and yield attributing characters viz. plant height (cm), no. of leaves per plant, no. of nodes per plant, no. of days to first flowering, no. of flowers per plant, length of fruit (cm), no. of fruit per plant, weight of fruit per plant (g), fruit yield per plot (kg) and combinations of nitrogen, phosphorous and potash which were used to assess their effect on growth, flowering, yield and quality of Okra.

Keywords

Okra, NPK fertilizers, Effect, Growth, Yield

Introduction

Okra (*Abelmoschus esculentus* (L.) Moench) is one of the most important summer vegetable crops. It belongs to the family Malvaceae and is often cross pollinated in nature. It is quite palatable and liked equally good by the poor and rich in the world. Okra is cultivated throughout India for its immature fruits which are generally cooked as vegetable. Okra soups and stews are also popular dishes. When ripe, the black or brown white eyed seeds are sometimes roasted and used as substitute for coffee. The crop is used for the extraction of fiber and also used for cleaning

of sugarcane juices. It contains valuable food ingredients, which can be successfully utilized to build up and repair the body (Bakhru, 2003; Edet and Etim, 2007).

The nutritional constituents of okra include calcium, protein, oil and carbohydrates; others are iron, magnesium and phosphorus. Okra is recommended for consumption by World Health Organization due to its ability to fight diseases. Okra has been found to be a rich source of vitamins A and C, calcium, thiamine and riboflavin. It is also rich in iron and is used as a medicine in the treatment of the peptic ulcer (Uka *et al.*, 2013).

Now a day, India is one of the main vegetable growing countries of the world. Okra crop is grown over all India. Among the most important states only four Uttar Pradesh., Maharashtra, Madhya Pradesh and Tamil Nadu account three fourth of total area (Schweers and Sims).

Materials and Methods

The present study was carried out at the 'Prakash Agriculture Farm Pilibhit' during the year 2020 under Randomized Block Design with three replications and nine treatments. Seeds of okra (*Abelmoschus esculentus* (L.) Moench.) var. ARKA ANAMIKA were collected from local market and sown in the experimental field.

The field was ploughed, cross ploughed and leveled properly and divided into 27 plots, each measuring 2 × 1 m with 50 cm space between two plots. Each plot contained three rows and every row contained four hills. The spacing between row to row and hill to hill was 60 cm and 45 cm, respectively. Materials for this study were consisted of Okra cultivar's cv. "ARKA ANAMIKA" and the fertilizers used for the crop were Nitrogenous, Phosphorus and Potassium.

Half dose of Nitrogen, full doses of Phosphorus and potassium were applied at the time of bed preparation. The remaining half nitrogen was applied 30 days after sowing of Okra seed.

After germination one uniform seedling was kept in each hill and rests were thinned out. Total number of seedlings per plot was 12. Watering, weeding, mulching and other cultural practices were done as and when required. The length of main stem, number of nodes and leaves and number of branches were recorded at the opening of first flower and continued at 15 days interval till final

harvest. The final data (addition of all counts) were used in the tables. The fruits of okra of all the treatments were harvested at marketable stage. Before harvesting the number of fruits per plant was recorded.

The number of fruits per plant, fresh weight, length, treatment was recorded just immediately after harvest. The yield per plant was calculated by multiplying the number of fruits per plant and fresh weight per fruit.

Results and Discussion

The maximum height of plant was performed by T₇(103.81 cm) followed by T₈(102.93 cm) and T₉ (102.93 cm) over control (T₀) (85.39 cm). The maximum number of leaves per plant were recorded in treatment T₇ (12.35) followed by T₅ (15.84). While, minimum number of leaves were recorded in control (T₀) (7.46). The maximum number of nodes per plant were reported in treatment T₇ (12.35) followed by T₉ (10.31) and minimum were observed in control (T₀) (6.20).

Observation recorded on different yield and yield attributing characters (Table 1) revealed that application of Nitrogen increased the height of plant significantly at final observation with increasing level during experimentation.

The earliest flowering was recorded in T₇ (43.32 days) followed by T₆ (43.68 days). It is clear from the mean value presented in Table 1 that increasing levels of N₂, P₂O₅ and K₂O increased the number of flowers significantly. The maximum number of flowers per plant was noted in treatment T₆ (12.23) followed by T₈ (11.33). Similar results were also observed by Randhawa and Punnum (1970), Ginindza *et al.*, (2015) for the factor. The maximum length of finger (fruit) was recorded in treatment T₇ (14.31 cm) followed by T₅ (12.93 cm).

Table.1 Effect of NPK fertilizers on growth of okra

| Treatment | Plant height (cm) | No.of leaves/plant | No. of nodes/plant | No.of day taken to flower | No.of flower/plant |
|-----------|-------------------|--------------------|--------------------|---------------------------|--------------------|
| T0 | 85.39 | 7.46 | 6.20 | 45.68 | 7.10 |
| T1 | 89.98 | 12.10 | 7.03 | 46.30 | 8.83 |
| T2 | 90.13 | 14.69 | 7.63 | 44.83 | 8.69 |
| T3 | 92.83 | 16.14 | 8.09 | 45.67 | 9.53 |
| T4 | 98.94 | 13.33 | 8.32 | 45.91 | 10.43 |
| T5 | 99.99 | 15.84 | 9.35 | 47.84 | 10.21 |
| T6 | 101.01 | 16.37 | 10.22 | 43.68 | 12.23 |
| T7 | 103.81 | 17.89 | 11.35 | 43.32 | 10.30 |
| T8 | 102.93 | 15.12 | 9.68 | 46.25 | 11.33 |
| T9 | 101.38 | 15.63 | 10.31 | 45.89 | 10.98 |

Table.2 Effect of N P K fertilizers on yield of okra

| Treatment | No.of fruit/plant | Length of fruit (cm) | Weight of fruit/plant (g) | Fruit yield/plot(kg) |
|----------------|-------------------|----------------------|---------------------------|----------------------|
| T ₀ | 7.63 | 6.08 | 137.01 | 2.13 |
| T ₁ | 7.88 | 6.90 | 143.10 | 2.33 |
| T ₂ | 9.63 | 9.21 | 158.11 | 2.23 |
| T ₃ | 9.49 | 10.43 | 153.02 | 2.18 |
| T ₄ | 9.27 | 11.82 | 162.81 | 2.48 |
| T ₅ | 9.33 | 12.93 | 165.03 | 2.21 |
| T ₆ | 10.82 | 12.85 | 143.33 | 2.63 |
| T ₇ | 10.25 | 14.31 | 159.22 | 2.89 |
| T ₈ | 11.32 | 11.05 | 161.01 | 2.65 |
| T ₉ | 11.90 | 11.98 | 160.11 | 2.49 |

The maximum number of fruit per plant were noted in treatment T₉ (11.90) followed by treatment T₈ (11.32) while minimum length of finger (fruit) was recorded in control (T₀) (7.63) (Table 2). The maximum weight of fruit per plant was reported in treatment T₅ (165.03g) followed by T₄ (162.81g). The least weight of finger (fruit) per plant was recorded in Control (T₀) (137.01g). The maximum yield of fruit per plot was found in treatment T₇ (2.89 kg) followed by T₈ (2.65 kg). While minimum yield was found in control (T₀) (2.33 kg). Results are in line with findings of Omotoso and Shittu (2007), Randhawa and Punnum (1970). According to

overall performance under present investigation, it may be concluded that the application of recommended dose of NPK (120:90:60 kg/ha) resulted the higher yield of okra in respect of various quantitative and qualitative characters.

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