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Effect of different sources of nitrogen on reproductive growth, yield and quality of okra [*Abelmoschus esculentus* (L.) Moench] cv. ARKA ANAMIKA

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SUMMARY

The reproductive growth parameters *viz.*, days to flowering initiation, days to 50% flowering, number of days required from fruit set to harvesting of fruits and number of fruits per plant have been significantly influenced by different sources of nitrogen. The okra plant given with the treatment 100% N through neem cake recorded significantly earlier initiation of flowering and 50% flowering (46.34 days and 48.00 days), respectively also recorded significantly lowest number of days (4.34 days) in treatment 100% N through neem cake from fruit set to harvesting of fruit. The maximum number of pods per plant (13.28) was observed in application of 100% N through neem cake. As regards to the yield parameters, the treatment 100% N through neem cake recorded significantly maximum weight and length (17.55 g and 17.68 cm, respectively) of okra fruit. The yield per plant (217.09 g) and highest yield (126.57 q/ha) was maximum with treatment 100% N through neem cake. The quality parameters like determination of vitamin C, keeping quality at room temperature and dry matter accumulation. The significantly highest Vit. C (16.23 mg/100 g) was recorded in treatment 100% N through neem cake which was significantly superior than all other treatments. The maximum dry matter and keeping quality in days was recorded in treatment 100% N through poultry manure (90.32 g and 11.32 days), respectively.

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Amongst the different vegetables, okra [*Abelmoschus esculentus* (L.) Moench] has a prominent position due to its wide adaptability and high nutritive as well as medicinal value. It is a good source of vitamin A, B and also contain vitamin C. It is rich in protein, iodine, calcium, potassium and other mineral matters. Okra is said to be very useful against genitourinary disorders, spermatorrhoea and chronic dysentery (Nadkarni, 1972). Continuous and unbalanced use of chemical fertilizers are leading to decrease in nutrient uptake efficiency of plants resulting in decrease in crop yield (Maurya and Beniwal, 2003). It also leads to decrease in soil fertility, biological activity, changes in physical structure of soil. Warade *et al.*, 1995 stated that continuous application of inorganic fertilizers deteriorate the soil and cause the soil problems. Mineral fertilizers decrease both the biological activity and aggregate stability. Continuous application of high amount of only inorganic fertilizers had deliterous effects leading to decline in productivity due to limitation of one or more micronutrients (Nambiar and Abrol, 1989). Cost of chemical fertilizers are hampering our way to produce more per unit area, more over their excessive use has also resulted in serious damage to soil and human health too. Therefore, the present studies were undertaken, to decide proper combination of organic manure and inorganic fertilizers for better yield and quality of okra variety Arka Anamika.

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MATERIALS AND METHODS

The field experiment was conducted at Department of Horticulture, Marathwada Agricultural University, Parbhani with variety Arka Anamika in monsoon 2008-09. The experiment was laid out in simple Randomized Block Design with three replications and seven treatments. In this investigation the crop was applied with following nutrient sources T_1 (100% N through RDF), T_2 (100% N through sheep manure), T_3 (100% N through FYM), T_4 (100% N through vermicompost), T_5 (100% N through poultry manure), T_6 (100% N through neem cake), T_7 (control- without any fertilizer). Observations were recorded and statistically analyzed as per method given by Panse and Sukhatme (1967).

RESULTS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been presented under following heads :

Effect on reproductive growth:

The data regarding the effect of different sources of nitrogen through chemical fertilizers and organic manures on flowering and fruiting characters such as number of days required for flower initiation, days to 50% flowering, number of days required for fruit set to harvesting of fruits and number of pods per plant are presented in Table 1.

Days to flower initiation and 50 per cent flowering:

The okra plant given with the treatment 100% N through neem cake recorded significantly earlier initiation of flowering (46.34 days) as compared to all other treatments. The next best treatment 100% nitrogen through RDF proved significantly superior over studied treatments and the maximum number of days (52.39 days) was recorded in control. Similar trend was obtained in relation to 50% flowering (48.00 day) which was significantly superior over all other treatments. The next best treatment 100% N through RDF was significantly superior over rest of the treatments. The treatment control required maximum days (54.67) to hasten the 50% flowering. Early vigorous plant growth including root growth might have helped to synthesize more cytokinin by these plants. Similarly, better stem girth attained might have helped in the translocation of these synthesized cytokinin as well as more quantity of available phosphorus through xylem vessels and the accumulation of cytokinin and phosphorus in these axillary buds which might have favoured the plants to enter into reproductive phase earlier (Nathkumar and Veeraragavathatham, 1999). Similar results were reported by Kumaran *et al*. (1988) and Darley *et al*. (1988) in tomato and brinjal, respectively.The results obtained in present study are in conformity to those obtained by earlier workers Darley *et al*., 1988 in brinjal Raut, 1998 in okra and Kumaran *et al*., 1998 in tomato.

Days required from fruit set to harvesting of fruits:

The data recorded significantly lowest number of days (4.34 days) in treatment 100% N through neem cake from fruit set to harvesting of fruit and the highest number of days (6.15 days) required from fruit set to harvesting was recorded in treatment control. These results are supported by findings observed by Sonwane (2003) who reported that application of 50 % RDF + 50% N through neem cake required less number of days from fruit set to harvest than that of control in okra.

Average number of fruits per plant:

The maximum number of pods per plant (13.28) was observed in treatment 100% N through neem cake which was significantly superior over all other treatments while the minimum number of pods (11.04) observed in treatment control. It may be due to increase in height of plant, more number of leaves, higher fruit set as well as earliness in the production of fruits. The production efficiency *viz.*, the increased allocation of photosynthesis towards the economic part due to increased spread of plant might have been resulted in the nourishment of more number of fruits per plant. Abusaleha and Shanmugavelu (1988) also found more number of fruits per plant in okra.

Effect on yield parameters:

The various attributes on yield *viz.*, weight and length of fruit, yield per plant and yield per hectare were significantly influenced due to different treatments (Table 2).

Table 1: Effect of different sources of nitrogen on reproductive growth of okra [*Abelmoschus esculentus* (L.) Monech]

Sr. No.	Treatments	Days required to flower initiation	Days required to 50 % flowering	Days required from fruit set to harvesting of fruits	Number of pods per plant
T_1	100% N through RDF	47.51	49.34	4.68	12.48
T_2	100 % N through sheep manure	48.92	50.67	5.30	12.23
T_3	100 % N through FYM	51.18	53.72	5.72	12.00
T_4	100% N through vermicompost	50.52	52.68	5.38	12.19
T_5	100% N through poultry manure	48.58	50.34	5.11	12.37
T_6	100% N through neem cake	46.34	48.00	4.34	13.28
T_7	Control	52.39	54.67	6.15	11.04
	S.E. $\pm$	0.26	0.12	0.063	0.032
	C.D. (P=0.05)	0.81	0.39	0.19	0.099