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Effect of organic and inorganic fertilizers on growth and fruit yield of okra

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Abstract **:** An experiment was carried out to study the effect of organic and inorganic fertilizers on growth and fruit yield of okra [*Abelmoschus esculentus* (L.) Moench] during the summer season of 2004-2005 at Vegetable Research Station, Junagadh Agricultural University, Junagadh. The result indicated that most of growth and yield attributes remained unaffected due to different treatments. However, significantly the highest no. of branches per plant was produced by the application of vijay grrowmin @ 625 kg ha^{-1} along with 50 per cent recommended dose of fertilizer (RDF)(100 kg N + 50 kg P_2O_5 + 50kg K_2O ha^{-1}). Where as, the highest fruit girth was recorded with the application of vijay grrowmin @ 375 kg ha^{-1} + RDF and with the application of biovita @ 40 kg ha^{-1} + RDF. In case of fruit yield, the maximum fruit yield of 166.7 q ha^{-1} was recorded by the application of vijay grrowmin @ 500 kg ha^{-1} + 75 per cent RDF. However, statically, it was at par with application of vijay grrowmin @ 375 kg ha^{-1} + RDF, vijay grrowmin @ 375 kg ha^{-1} + 75 per cent RDF, vijay grrowmin @ 500 kg ha^{-1} + RDF and vijay grrowmin @ 625 kg ha^{-1} + RDF.

Key words **:** Okra crop, Organic, Inorganic fertilizer, Growth and yield parameter, Fruit

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Okra [*Abelmoschus esculentus* (L.) Moench] is an important vegetable crop grown throughout India in *Kharif* as well summer season for its different types of use, nutritive value and increasing export potential.With the increase in population, the demand for the crop has significantly increased, as a result growers are forced to make heavy use of inorganic sources of plant nutrients. Escalating costs of inorganic fertilizers are hampering the way to increase the productivity per unit area. Hence, there is a need to adopt some eco friendly nutrient management system to sustain the soil and soil resources, crop yield and quality and to ensure environmental and human health security (Bhat *et al*.,2007). Therefore, efforts are being made in this regard to integrate chemical fertilizers with organic manure which are renewable and eco friendly to achieve sustainable productivity with minimum deterious effects of chemical fertilizers on soil health and environment. Keeping this in view, the present investigation was undertaken to find out the best combination of organic and inorganic fertilizers for obtaining the maximum fruit yield of okra crop.

RESEARCH ME.THODS

A field experiment was conducted during the summer season of the year 2004-2005 to study the effect of organic and inorganic fertilizers on growth and fruit yield of okra at Vegetable Research Station, Junagadh Agricultural University, Junagadh. Soil of the experimental area was medium black in texture, low in available nitrogen, high in available phosphorus and medium in available potash. The treatments comprised of total twelve treatment combinations of organic manures *viz*., vijay grrowmin, biovita and FYM and different rate of chemical fertilizer dose were tested in Randomized Block Design with three replication. The treatment details are as below.

Seeds were sown at 60 cm x 30 cm spacing on February 15, 2005.The full dose of phosphorus, potash and half dose of nitrogen as per treatments was applied as basal dose, while reaming half dose of nitrogen as per treatments was applied as top dressing at flowering stage. The sources of nitrogen, phosphorus and potash were urea, diammonium phosphate and murate of potash , respectively. Where as, full doe of vijay grrowmin, biovita and FYM was applied as basal dose. All the

Tr. No.	Treatments
T_1	Vijay grrowmin@375 kg ha^{-1} + 100-50-50 NPK kg ha^{-1} (Recommended dose of fertilizer)(RDF)
T_2	Vijay grrowmin@500 kg ha^{-1} + RDF
T_3	Vijay grrowmin@625 kg ha^{-1} + RDF
T_4	Vijay grrowmin@375 kg ha^{-1} + 75% RDF
T_5	Vijay grrowmin@500 kg ha^{-1} + 75 % RDF
T_6	Vijay grrowmin@625 kg ha^{-1} + 75 % RDF
T_7	Vijay grrowmin@375 kg ha^{-1} + 50 % RDF
T_8	Vijay grrowmin@500 kg ha^{-1} + 50 % RDF
T_9	Vijay grrowmin@625 kg ha^{-1} + 50 % RDF
T_{10}	100-50-50 NPK kg ha^{-1} (RDF) + biovita@40 kg ha^{-1}
T_{11}	100-50-50 NPK kg ha^{-1} (RDF) + FYM@10 t ha^{-1}
T_{12}	100-50-50 NPK kg ha^{-1} (RDF)

cultural operations were followed to raise a good crop of okra var. Gujarat Okra-2. The data were recorded for yield on net plot basis and then converted on hectare basis and subjected to statistical analysis.

RESEARCH FINDINGS AND DISCUSSION

The data on growth and yield attributes as well as fruit yield as influenced due to organic and inorganic fertilizers are presented in Table 1.

Effect on growth and yield attributes :

The result indicated that most of growth and yield attributes remained unaffected due to different treatments. However, significantly the highest no. of branches per plant (1.7) was produced by the application of vijay grrowmin @625 kg ha^{-1}alongwith 50 per cent recommended dose of fertilizer (RDF). Where as the highest fruit girth(6.0cm) was recorded with the application of vijay grrowmin@375 kg ha^{-1} + RDF and with the application of biovita@40 kg ha^{-1} + RDF. These findings are in agreement with those of Parmasivan *et al.* (2005) and Panda *et al*. (2008).

Effect on fruit yield :

Application of organic and inorganic fertilizers remarkably influenced the fruit yield of okra. The maximum fruit yield of 166.7 q ha^{-1} was recorded by the application of vijay grrowmin@500 kg ha^{-1} along with 75 per cent recommended dose of fertilizer(RDF).However, statically it was at par with application of vijay grrowmin@375 kg ha^{-1} + RDF, vijay grrowmin@375 kg ha^{-1} along with 75 per cent RDF, vijay grrowmin@500 kg ha^{-1} + RDF and vijay grrowmin@625 kg ha^{-1} along with RDF. The observed variation in yield might be due to the integration of organic and inorganic nutrients resulting in good supply of all essential nutrients and ultimately better translocation of nutrients leading to readily availability of nutrients, which increased photosynthetic activity and leaf area of crop inducing the better vegetative growth and reproductive behaviour of the crop and ultimately increased the fruit yield. Tripathy and Maity(2008) reported that application of chemical fertilizer along with organic fertilizer increased fruit yield of okra. These findings are also in agreement with those of Bairwa *et al*. (2009) and Jadhav *et al*. (2009).

It can be concluded that application of chemical fertilizer along with organic fertilizer (vijay grrowmin) were found

Table 1 : Effect of organic and inorganic fertilizers on growth and yield attributes as well as on fruit yield of okra

Tr. No.	Yield (q ha^{-1})	Fruit/ plant (No.)	Days to first picking	% YVMV	Days to last picking	Plant height (cm)	Branch/ plant (No.)	Inter node length (cm)	Fruit length (cm)	Fruit girth (cm)	Ten fruit wt. (g)
T_1	165.3	15.0	53.3	25.6	99	124.7	1.0	5.7	16.3	6.0	170.0
T_2	146.2	12.0	53.3	24.9	99	146.7	0.4	5.8	14.2	5.8	163.0
T_3	144.8	14.2	51.0	28.4	99	124.3	0.8	6.0	15.2	5.9	153.7
T_4	147.6	13.4	54.7	29.1	99	118.3	0.5	6.1	14.9	5.7	145.0
T_5	166.7	14.9	54.3	20.1	99	120.7	0.9	5.8	12.2	5.2	150.3
T_6	142.7	13.5	55.7	24.3	99	125.0	0.8	6.1	14.5	5.6	153.0
T_7	99.7	11.3	54.7	26.3	99	111.7	0.5	6.0	13.6	5.6	155.3
T_8	107.6	10.5	57.0	29.8	99	108.3	0.4	5.8	14.1	5.5	152.7
T_9	118.1	15.7	55.7	27.7	99	118.3	1.7	5.6	14.6	5.8	156.0
T_{10}	136.5	13.4	55.7	25.7	99	122.0	1.0	5.4	15.9	6.0	172.3
T_{11}	142.4	14.3	53.3	22.9	99	120.7	1.3	5.8	14.6	5.7	160.0
T_{12}	134.0	12.5	55.7	23.6	99	118.7	0.9	5.8	15.5	5.8	161.3
C.D. (P =0.05)	22.1	NS	NS	NS	--	NS	0.75	NS	NS	0.36	NS
CV %	9.5	20.6	5.25	28.7	--	14.3	15.80	5.8	10.4	3.7	13.3

NS=Non-significant

superior for obtaining maximum fruit yield of okra under South Saurashtra conditions of Gujarat.

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