



# Effect of GA<sub>3</sub> and NAA on Yield and Quality of Okra (*Abelmoschus esculentus* L)

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## ABSTRACT

A field experiment was conducted at Horticulture Instructional Farm, Sardarkrushinagar Dantiwada Agricultural University, Sardarkrushinagar during the *kharif* season 2012 to study the effect of GA<sub>3</sub> and NAA on yield and quality of Okra. Yield parameters like number of fingers harvested per plant, average weight of finger, yield per plant, yield per plot and yield per hectare and quality parameters like total number of pickings, thickness of finger and length of finger were analyzed. The experiment consisted of 16 treatments combination involving two growth regulators with four levels each (0, 25, 50 and 75 ppm). GA<sub>3</sub> and NAA (75 ppm) was found to be the most effective in increasing more number of fingers harvested per plant (15.10), total number of pickings (9.33) and thickness of finger (1.54 cm). Treatment combinations of (GA<sub>3</sub> 75 and NAA 50 ppm) increased average weight of finger (16.28 g) and yield per plant (0.232 g). Maximum length of finger (15.82 cm) was found treatment combinations of (GA<sub>3</sub> and NAA 50 ppm each).

**Key Words-** GA<sub>3</sub>, NAA, Okra, Quality, Yield

## INTRODUCTION

Okra (*Abelmoschus esculentus* L) is an annual vegetable crop belongs to family Malvaceae and is grown throughout the year for its tender green fruits. Being a vegetable, it also has medicinal and industrial important. Role of plant growth regulators in crop production is well known phenomenon. Its use promotes growth along the longitudinal area, increase number of branches, early flower initiation; fruit set and subsequently contributes towards higher production when applied at various concentrations. Due to this it is possible to achieve the desirable standards and norms in term of quality for exportable production. Therefore, present investigation was carried out to find out suitable plant growth regulator and its effect on growth and flowering parameters of okra.

## MATERIALS AND METHODS

An experiment was carried out during the year 2012 at the Horticulture Instructional Farm, Sardarkrushinagar Dantiwada Agricultural

University, Sardarkrushinagar. The design followed was Factorial Randomized Block Design with three replications. The treatments consisted of different concentration of plant growth regulators viz. GA<sub>3</sub> (0 ppm – g<sub>0</sub>, 25 ppm– g<sub>1</sub>, 50 ppm – g<sub>2</sub>, and 75 ppm – g<sub>3</sub>) and NAA (0 ppm – n<sub>0</sub>, 25 ppm– n<sub>1</sub>, 50 ppm – n<sub>2</sub>, and 75 ppm – n<sub>3</sub>) were applied as foliar spray at 25 days after sowing. Distilled water was sprayed as control.

The recommended dose of fertilizers @ 50:50:50 kg NPK/ha were applied at the time of sowing and remaining half dose of N (50 kg) was applied in the form of urea (top dressing) one month after sowing and other standard cultural practices recommended for okra were uniformly followed for all the treatments. The seeds were dibbled at the spacing of 45 x 30 cm. The observations regarding growth viz. plant height, stem thickness, average length of interned, number of nodes per plant and leaf area per plant and flowering viz. days taken for initiation of first flower, days taken for flower initiation to edible maturity, days taken for sowing

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to first picking and days taken for sowing to last picking of okra were taken and the data subjected to statistical analysis.

## RESULTS AND DISCUSSION

Data revealed that interaction effect of GA<sub>3</sub> and NAA significantly influenced the yield and quality of okra. Application of GA<sub>3</sub> and NAA 75 ppm were recorded significantly maximum number of fingers harvested per plant (15.10), total number of pickings (9.33) and thickness of finger (1.54 cm) (Table 1). Whereas, minimum fingers harvested per plant (12.50), total number of pickings (7.00) and thickness of finger (1.42 cm) were found control and G<sub>3</sub>N<sub>1</sub> treatments. Plant growth regulators were found to have non-significant effect on yield per plot and yield per hectare.

Combined application of GA<sub>3</sub> and NAA also significantly influenced the yield and quality of okra. Maximum average weight of finger (16.28

g) and yield per plant (0.232 g) was recorded with treatment GA<sub>3</sub> 75 ppm + NAA 50 ppm. Whereas, minimum average weight of finger (12.27 g) and yield per plant (0.159 g) was recorded with g<sub>0</sub>n<sub>1</sub> and control treatment. The significantly maximum length of finger (15.82 cm) was observed with treatment GA<sub>3</sub> 50 ppm + NAA 50 ppm and it was statistically at par with treatment combination of g<sub>3</sub>n<sub>3</sub>. While, minimum length of finger (12.78 cm) was recorded with control treatment.

The improvement in growth as a result of GA<sub>3</sub> and NAA might be attributed to their function in stimulation of metabolic activities and hormonal regulation. GA<sub>3</sub> and NAA stimulate the growth of plant tissues there by enhancement in cell multiplication and cell elongation resulting increased growth and flowering of plant. Present results are in close agreement with those of Tyagi *et al* (2008), Patil and Patel (2010), Dhage *et al* (2011) and Jaymala *et al* (2012).

**Table 1. Effect of GA<sub>3</sub> and NAA on yield and quality of okra cv. Gujarat Okra-2.**

Treatment	No. of fingers harvested per plant	Average weight of finger (g)	Yield per plant (g)	Yield per plot (kg)	Yield per hectare (q)	Total number of pickings	Thickness of finger (cm)	Length of finger (cm)	
T1	g0n0	12.50	12.76	0.159	2.581	119.51	7.00	1.44	12.78
T2	g0n1	13.88	12.49	0.173	2.807	129.97	7.67	1.50	14.18
T3	g0n2	14.74	12.27	0.176	2.897	134.12	8.13	1.48	13.00
T4	g0n3	13.75	13.25	0.179	2.989	138.35	9.08	1.52	13.17
T5	g1n0	14.21	13.06	0.182	3.092	143.16	7.83	1.48	14.00
T6	g1n1	13.71	13.41	0.181	3.226	149.36	8.83	1.49	14.54
T7	g1n2	14.46	14.54	0.199	3.436	159.09	8.29	1.51	13.67
T8	g1n3	14.28	15.83	0.226	3.698	171.23	8.04	1.45	13.28
T9	g2n0	12.59	15.22	0.187	3.086	142.88	7.01	1.50	12.54
T10	g2n1	14.42	14.61	0.201	3.405	157.65	8.33	1.50	14.16
T11	g2n2	14.38	15.24	0.219	3.717	172.10	9.17	1.49	15.82
T12	g2n3	15.00	14.80	0.205	3.762	174.15	8.92	1.52	14.20
T13	g3n0	14.88	12.43	0.183	3.174	146.95	8.92	1.47	14.21
T14	g3n1	14.92	14.88	0.221	3.578	165.67	8.71	1.42	14.26
T15	g3n2	14.22	16.28	0.232	3.723	172.36	8.58	1.48	13.69
T16	g3n3	15.10	14.79	0.223	3.774	174.70	9.33	1.54	14.97
S.Em±		0.38	0.65	0.007	0.139	6.41	0.37	0.02	0.38
C.D.@ 5%		1.08	1.86	0.021	NS	NS	1.06	0.05	1.11

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### CONCLUSION

The study revealed that combined application of GA<sub>3</sub> and NAA significantly influenced the yield and quality of okra. The improvement in growth as a result of GA<sub>3</sub> and NAA might be attributed to their function in stimulation of metabolic activities and hormonal regulation.

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