

EFFECT OF N LEVELS ON YIELD AND NITROGEN CONTENT OF OKRA PLANT (*HIBISCUS ESCULENTUS* L.)

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Two commercially important cultivars 'Poosa green' and 'T₁₃' were compared for yield at different nitrogen rates (control, 112, 168 and 224 kg ha⁻¹) as urea. Variety 'T₁₃' produced higher yield kg⁻¹ application of nitrogen at all the nitrogen rates compared to 'Poosa green'. Similarly, its pod nitrogen and protein concentrations were higher than that of 'Poosa green'.

INTRODUCTION

Average yield ha⁻¹ of okra in our country is very low compared to other countries that is why to boost up its production, chemical sources of nutrients are used. Nitrogen being deficient in our soils is applied through nitrogenous fertilizers. An alternative and systematic research is, therefore, urgently needed to increase okra yield so that we may meet the rising demands of this crop in this region. Higher yields will also bring good returns to the farmers motivating them for its cultivation on larger areas. The present study was undertaken to study the effect of different doses of nitrogen on growth performance of okra plant.

MATERIALS AND METHODS

The present investigations were conducted in the Experimental Vegetable Farm, Department of Horticulture, University of Agriculture, Faisalabad. Four doses of nitrogen (0, 112, 168 and 224 kg ha⁻¹) as urea were applied to 'Poosa green' and 'T₁₃' okra cultivars.

Cultivars were sown in main plots while the different doses of nitrogen were applied in sub-plots according to split plot design.

The dimension of subplots was 7.40 x 2.44 m. Calculated amount of urea was applied, i.e. half at the time of the appearance of flowers and remaining half after three pickings. At harvest, data on yield of okra plant, plant height, N and protein in okra pods were recorded.

Oven-dried samples at 60°C were ground and nitrogen was estimated by micro-Kjeldhal method. Protein concentrations were calculated by multiplying the nitrogen concentration with 6.25 (Jackson, 1962).

RESULTS AND DISCUSSION

All the N doses enhanced the pod yield of both the okra varieties except the application @ 224 kg ha⁻¹ (Table 1). Ibrahim and Assi (1979) also observed a significant effect of nitrogen application on okra fruit yield. Since N @ 168 kg ha⁻¹ produced maximum pods in both the varieties, this dose appears optimum one. The results are in agreement with those of Chuhan and Gupta (1973). Higher pod yield and plant height of 'T₁₃' at all the fertilizer doses compared to 'Poosa green' was obtained. However, maximum plant height of both the cultivars was obtained with N @ 224 kg ha⁻¹.

Table 1. Effect of N doses on plant height and pod yield of okra plant

N (kg ha ⁻¹)	Plant height (cm)			Pod yield (kg ha ⁻¹)		
	Poosa green	T ₁₃	mean	Poosa green	T ₁₃	Mean
0 (Control)	98.4	100.3	99.4 d	6210	6290	6250 d
112	109.2	113.5	111.4 c	8710	9380	9045 b
168	117.4	126.7	122.1 b	10220	10810	10515 a
224	128.0	133.4	130.7 a	7940	8320	8130 c
Mean	113.2 b	118.5 a		8270 b	8700 a	

Means in rows or columns sharing the same letter(s) are not statistically different at P = 5%.

Table 2. Effect of N doses on nitrogen status and protein concentration of okra plant

N (kg ha ⁻¹)	Nitrogen (%)			Protein (%)		
	Poosa green	T ₁₃	mean	Poosa green	T ₁₃	Mean
0 (Control)	2.14	2.11	2.13 b	13.36	13.17	13.27 b
112	2.72	3.12	2.92 a	17.00	19.47	18.24 a
168	3.21	3.33	3.27 a	20.03	20.81	20.42 a
224	3.20	3.97	3.59 a	20.00	21.65	20.83 a
Mean	2.82	3.13		17.60	18.78	

Means in rows or columns sharing the same letter(s) are not statistically different at P = 5%.

Table 3. Effect of N doses on okra pod yield unit⁻¹ N application

N (kg ha ⁻¹)	Yield due to nutrients (kg ha ⁻¹)		Yield to nutrient ratio		Superiority of T ₁₃ over Poosa green
	Poosa green	T ₁₃	Poosa green	T ₁₃	
0 (Control)	-	-	-	-	-
112	2500	3090	22.32	27.59	5.27
168	4010	4520	23.87	26.90	3.03
224	1730	2030	7.72	9.10	1.38

Nitrogen concentration of 'T₁₃' pods increased progressively with an increase in nitrogen application rate (Table 2). Leela *et al.* (1975) obtained similar findings in okra crop. The protein concentration in pods of 'Poosa green' though increased with an increase in nitrogen dose, yet were statistically similar for 168 and 224 kg N ha⁻¹ applications. Sharma and Prasad (1973) concluded that an increase in nitrogen concentration in plant could ultimately be associated with an increase in crude protein concentration. But in case of variety 'T₁₃' nitrogen concentration was increased with an increase in nitrogen dose. This variety not only contained maximum proteins at 224 kg N ha⁻¹ but these were also higher at all the application rates compared to 'Poosa green'.

Data (Table 3) clearly indicated superiority of 'T₁₃' over 'Poosa green' for utilization of nitrogen and pod nutrient ratio because it produced more pods at all the N rates. So, 'T₁₃' proved itself an economical variety from nutrient and production points of view, supporting its commercial adaptation.

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