GAU Res. J. 1998. 24 (1) : 83-85

Short Communications

Response of Summer Groundnut (*Arachis hypogaea* L.) Var GG-2 to Soil Amendments, Biological and Chemical Source of Nitrogen and Phosphorus Under South Gujarat Condition

J. B. Vaghamshi, H. C. Patel and J. C. Patel

Department of Agronomy, N. M. College of Agriculture, GAU, Navsari Campus, Navsari

A field experiment was conducted during summer season of 1993 at College Farm, Gujarat Agricultural University, Navsari Campus with twenty seven treatment combinations consisting of three levels each of soil amendments (0, FYM @ 10 t/ha, Gypsum @ 1 t/ha), biological and chemical source of nitrogen (0, rhizobium inoculation only and N @ 25 kg/ha) and phosphorus (0, phosphobacteria inoculation and P_2O_5 @ 50 kg/ha) accomodated in a 3^3 factorial partial confounding in Randomized Complete Block Design with two replications. A bunch groundnut GG-2 was sown on February, 5 and harvested on June, 22. The soil of the experimental plot was clayey in texture having higher water holding capacity, deficient in nitrogen (0.050 per cent), medium in available phophorus (30 kg/ha) and sufficient in available potash (372 kg/ha) with pH 7.7.

The growth of crop measured in terms of plant height, number of primary branches/ plant and dry matter production was affected by soil amendments (Table 1). All these growth attributes ultimately reflected in increased yield of haulm by the gypsum @ 1 t/ha followed by FYM @ 10 t/ha. The number of pods/plant was also significantly affected by the soil amendments. Comparatively higher number of pods/plant were recorded with gypsum followed by FYM over control. The maximum pod yield of 22.25 q/ha was recorded with gypsum (@ 1 t/ha) followed by FYM (@ 10 t/ha) over control. These findings are in accordance with those recorded by Sridhar *et al.*, (1985) and Mehta (1993).

Most of the growth chatacters like plant height (cm.), number of primary branches/ plant and dry matter production were significantly increased by N (25 kg/ha) application over control. These resulted into the highest haulm yield of 49.91 q/ha with 25 kg N/ha. In case of rhizobium inoculation, growth characters and haulm yield increased but remained statistically at par with control, various yield attributes like number of pods/ plant and total number of pods/plant were significantly affected by nitrogen (@ 25 kg/ha) application followed by rhizobium inoculation. Consequently maximum pod yield (22.65 q/ha) was recorded with 25 kg N/ha followed by rhizobium inoculation (21.20 q/ha) over control (20.40 q/ha). These findings are in conformation with those reported by Patel and Patel (1987) and Patel *et al.*, (1994).

Growth characters like plant height and dry matter production/plant were increased

TABLE 1

Growth and yield of summer groundnut as influended by soil amendments biological and chemical source of nitrogen and phosphorus.

Treatments	*Plant height at harvest (cm)*	*Primary brranches/ plant at harvest*	*Dry matter producton/ plant at harvest (g)*	*Developed pods/plant*	*Undevelop-ed pods/ plant*	*Total pods/ plant*	*Pod yield (q/ha)*	*Haulm yield (q/ha)*
Soil amendments								
A_0 (Control)	39.19	6.10	31.96	13.70	4.70	18.40	20.00	39.00
A_1 (FYM @ 10 t/ha)	40.29	6.20	35.87	15.82	4.57	20.39	21.99	46.33
A_2 (Gypsum @ 1 t/ha)	40.49	6.23	36.25	16.51	4.55	21.06	22.25	46.75
S. Em. ±	1.52	0.20	0.92	0.22	0.15	0.29	0.27	1.06
C. D. at 5%	NS	NS	2.81	0.65	NS	0.85	0.77	3.11
Bio and chemical Source of nitrogen								
N_0 (Control)	36.89	5.92	32.05	14.52	4.66	19.18	20.40	39.70
N_1 (Rhizo. Inoc.)	40.52	6.00	34.44	15.47	4.63	20.10	21.20	42.47
N_2 (N @ 25 kg/ha)	42.56	6.61	37.59	16.04	4.54	20.58	22.65	49.91
S. Em. ±	1.52	0.20	0.92	0.22	0.15	0.29	0.27	1.06
C. D. at 5%	4.47	0.57	2.81	0.65	NS	0.85	0.77	3.11
Bio and chemical source of phosphorus								
P_0 (Control)	38.38	5.98	32.67	14.50	4.71	19.21	20.37	40.30
P_1 (Phosphobacteria Inoc.)	39.12	6.07	34.08	15.30	4.61	19.91	21.19	42.78
P_2 (P_2O_5 @ 50 kg/ha)	42.47	6.48	37.33	16.23	4.51	20.74	22.68	48.99
S. Em. ±	1.52	0.20	0.92	0.22	0.15	0.29	0.27	1.06
C. D. at 5%	NS	NS	2.81	0.65	NS	0.85	0.77	3.11
C. V. %	16.17	13.53	11.74	6.22	13.90	6.18	4.25	7.03

significantly with phosphorus application. As a result, the highest haulm yield of 48.99 q/ha was recorded with 50 kg P_2O_5/ha. In case of phosphobacteria inoculation, there were improvement in growth characters and ultimately haulm yield but did not reach up to the level of significance. Various yield attributes such as developed pods and total number of pods/plant were significantly influenced due to application of phosphorus followed by phosphobacteria inoculation. Consequently maximum pod yield of 22.68 q/ha was recorded by phosphorus application followed by phosphobacteria inoculation (21.19 q/ha). These results are in akin with those reported by Mehta (1993) and Patel *et al.*, (1994).

(Received on 13th Dec., 1996)

REFERENCES

Patel, B. D. and Patel, P. G. (1987). Response of summer groundnut to Rhizobium inoculation and graded levels of NPK, *GAU Res. J.* **12** (2) : 36 38.

Patel, Z. G.; Solanki, N. P. and Patel, R. S. (1994). Effect of varying levels of seeds, nitrogen and phosphatic fertilizer on the growth and yield of summer groundnut (*Arachis hypogaea* L.) *GAU Res. J.* **20** (1) : 148-150.

Mehta, A. C. (1993). Studies on the response of groundnut to phosphatic biofertilizers, in conjuction with organic and inorganic fertilizers. M. Sc. (Agri.) thesis, submitted to Gujarat Agricultural University, Sardar Krushinagar (Unpublished).

Sridhar, V.; Soundararajan, M. S.; Sudhakara Rao, R. and Sreeramulu, C. (1985). Response of JL-24 groundnut to rates, times and method of gypsum application. *Madras Agric. J.* **72** (1) : 47-53.