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Effect of Rhizobium Inoculation and Graded Levels of NPK on Nodulation and Oil Content of Groundnut in Summer Season

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Inoculation with *Rhizobium* strain and application of NPK in groundnut have been reported to increase the nodulation and affect quality i.e. oil content.

A field experiment was conducted during the summer season of 1982 at Campus Farm of Gujarat Agricultural University, Navsari. The soil of the field was clayey with PH-7.8, total nitrogen 0.047% available phosphorus 27.3 kg and available potash 436 kg/ha.

Twenty four treatment combinations consisting of two levels of nitrogen viz. 0 and 25 kg N/ha, three levels of phosphorus viz. 0.25 and 50 kg P_2O_5/ha and two levels of potash viz. 0 and 50 kg K_2O/ha and two levels of *Rhizobium* inoculation without and with inoculated @ 10 g. culture/kg. Kernel, were tried in a randomised block design with three replications. Furrows were opened at 45 cm apart in dry condition. The full dose of N, P and K application according to the treatment was applied before sowing the seeds in previously opened furrows at a depth of about 6 cm. The sources of nitrogen, phosphorus and potash were urea, single super phosphate and murate of potash respectively. Tht seeds (treated and untreated) as per treatment were dibbled manualy in the forrows of each plot keeping the distance of 10 cm within row using 100 kg seed rate|ha. First irrigation was given just after sowing. In all seven irrigations were applied as and when required. The experiment was sown with groundnut variety "GAU-1" on 10-2-1982 and harvesting was done on 3-6-1982.

Dry weight of nodules

The data of dry weight of nodules recorded on 45 and 90 days after sowing (Table-1) revealed that differences in dry weight on nodules due to nitrogen levels were not significant on 45 days sampling. However on 90 days, dry weight of nodules decreased significantly by application of 25 kg N|ha. The reduction in dry weight of nodules was to the tune of 38.33 mg per plant by application of 25 kg N|ha over control. Similar results were also reported by Martinz (1980). Phosphorus application had significant influence on dry weight of nodules per plant at both the sampling days. Application of phosphorus @ 50 kg and 25 kg|ha recorded 16.71 and 9.50 mg at 45 days and 55.84 and 27.88 mg higher dry weight of nodules per plant at 90 days than no phosphorus application respectively. These results are in accordance with those obtained by Balasubramanium *et al.* (1980). Potash application had no significant influence on dry weight of

TABLE 1

Effect of *Rhizobium* inoculation and graded level of NPK on nodulation and oil content of groundnut in summer season.

Treatment	*Dry weight of nodules per plant (mg)*		*Oil content (%) in kernel*
	45 days	*90 days*	
Nitrogen levels			
0 kg/ha (N_0)	150.58	224.36	50.51
25 kg/ha (N_1)	145.81	186.03	49.49
S. Em.	2.59	9.22	0.05
C. D. at 5%	NS	26.26	0.13
Phosphorus levels			
0 kg/ha (P_0)	139.46	177.29	49.54
25 kg/ha (P_1)	148.96	205.17	49.79
50 kg/ha (P_2)	156.17	233.13	50.67
S. Em.	3.17	11.29	0.06
C. D. at 5%	9.03	32.17	0.17
Potash levels			
0 kg/ha (K_0)	146.08	204.11	49.99
50 kg/ha (K_1)	150.31	206.28	50.01
S. Em.	2.59	9.22	0.05
C. D. at 5%	NS	NS	NS
Inoculation			
Uninoculated (I_0)	146.58	188.67	49.94
Inoculated (I_1)	149.81	221.72	50.06
S. Em.	2.59	2.22	0.05
C. D. at 5%	NS	16.26	NS
C. V. %	28.6	25.8	0.57

nodules per plant at both the sampling days. *Rhizobium* inoculation had no significant influence on dry weight of nodules per plant at 45 days sampling but rhizobium inoculation treatment had significant influence on dry weight of nodules per plant at 90 days sampling. The increase in the dry weight of nodules at 90 days sampling was to the tune of 33.05 mg|plant.

Oil content (%)

Oil content % in kernels was significantly decreased by the application of nitrogen. The oil content in kernel decreased up to 1.02 per cent due to application of 25 kg N|ha over no nitrogen application. Similar depressing effects of nitrogen application on the oil content in kernels were also reported by Puntamkar and Bathakal (1967). The oil content in kernels progressively increase with the increase in the level of phosphorus. Application of 50 kg P_2O_5|ha was significantly superior to 25 kg P_2O_5|ha and control. This results are in confirmity with Jadhav and Inarkede (1980). Application of potash as well as Rhizobium inoculation had no significant influence on oil content in kernels.

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