

magnitude of heterosis in the segregating generations. A very high magnitude of heterosis in F_1 coupled with a drastic reduction in heterosis in F_2 and F_3 observed in Indian \times Exotic crosses confirm that these F_1 s were heterozygous for larger number of genes as compared to the Indian \times Indian crosses. Thus, it is evident that the Indian parents are

genetically close among themselves while they are genetically distant from the exotic parents used in the study. The values of specific combining ability effects in F_1 generation are in conformity with the magnitude of heterosis in F_1 and extent of reduction in the heterosis in subsequent generations of both Indian \times Indian and Indian \times Exotic crosses.

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Influence of Levels of NPK and Split Application of N on N Uptake and Protein and Oil Contents of Bunch Groundnut in Vertisols Under Irrigation*

Protein and oil are the two essential components of our diet, the production of which needs to be improved to meet at least the minimum nutritional standards. Groundnut being one of the major sources of oil and protein of the large portion of vegetarians, needs to

be adequately fertilized especially on vertisols wherein the yield levels are low at present due to problems like soil aeration, phosphorus fixation, low symbiotic nitrogen fixation, iron chlorosis and low soil organic matter. Therefore, a field experiment was con-

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Table 1. Influence of levels of NPK and time of N application on the quality, N uptake, kernel and oil yields at harvest

Treatments		Nitrogen percentage of				Total N uptake (kg/ha)	Protein %	Oil %	Kernel yield (q/ha)	Oil yield (q/ha)
N	P ₂ O ₅ (kg/ha)	K ₂ O	Leaf	Stem	Hull					
1.	0	0	0.84	0.84	0.65	4.07	25.45	40.75	13.99	5.69
2.	20	20	1.05	0.91	0.68	4.73	29.58	42.68	16.83	7.18
3.	40	40	1.26	0.96	0.72	5.15	32.17	46.15	20.37	9.38
4.	(20+20)*	40	1.25	0.98	0.75	5.17	32.31	45.55	21.00	9.54
5.	60	40	1.33	1.03	0.70	5.22	32.61	45.33	21.86	9.91
6.	(30+30)*	40	1.35	0.98	0.77	5.26	32.89	45.55	22.04	10.03
7.	80	40	1.28	0.91	0.70	5.12	32.67	44.50	19.57	8.71
8.	(40+40)*	40	1.31	0.96	0.68	5.09	31.80	43.25	19.62	8.49
Mean			1.21	0.95	0.71	4.98	31.11	44.22	19.41	8.62

S. Em±

C. D. at 5%

* Split application of Nitrogen

NS = Not significant

ducted to study the effect of three levels of nitrogen (40, 60 and 80 kg/ha) applied in single as well as in two equal splits (at sowing and 45 days after sowing) along with two levels of phosphorus (40 and 80 kg P_2O_5 /ha) and two levels of potash (20 and 40 kg K_2O /ha) on the nitrogen uptake, nitrogen and oil contents of seed and oil yield of irrigated groundnut (DH 3-30) on deep vertisols (63.9% clay, 0.032, 0.002, 0.027 and 0.44 per cents total N, available P_2O_5 , K_2O and organic carbon, respectively) of Water Management Research Station, Navalgund during Kharif, 1981.

Results (Table 1) revealed that nitrogen uptake (154.37 kg/ha) and its accumulation in leaf (1.26%), stem (0.96%) and kernel (5.15%) at harvest increased significantly with increase in the application of fertilizer upto 40 : 80 : 40 ; N : P_2O_5 : K_2O kg/ha. Further increase in nitrogen level along with 80 kg P_2O_5 and 40 kg K_2O per ha did not increase nitrogen uptake and its accumulation in leaf, stem and kernel. Consequently, basal application of 40 : 80 : 40, N : P_2O_5 : K_2O kg per ha recorded 6.72 per cent

higher protein, 5.4 per cent higher oil content and 3.69 q per ha higher oil yield over control (No fertilizer). Split application of nitrogen did not have significant effect on nitrogen uptake, its distribution in different plant parts, seed protein and oil content and oil yield. Lack of response to higher levels of nitrogen and their splits may be attributed to reduction in symbiotically fixed atmospheric nitrogen and its substitution by applied nitrogen as reported by Reddy and Tanner (1980). Increased oil yield with higher doses of fertilizer (40 : 80 : 40, N : P_2O_5 : K_2O kg / ha) was partly attributed to increased oil per cent in kernels and kernel yields. Increased oil per cent and oil yields could be attributed to the role played by phosphorus and potash in the synthesis of carbohydrates and fats (Mayer and Anderson, 1952 and Bhuiya and Chaudhary, 1974).

The results clearly indicate that a fertilizer dose of 40 : 80 : 40, N : P_2O_5 : K_2O kg per ha is optimum for irrigated groundnut in vertisols. Higher doses of nitrogen beyond 40 kg and their split application are not beneficial.

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