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RESPONSE OF PHOSPHORUS ON DIFFERENT VARIETIES OF GROUNDNUT (*Arachis hypogaea* L.)

S. P. S. TOMAR[1] Y. S. CHAUHEN[2] V. K. JAIN and P. C. JAIN[3]

Experiment was conducted at the Central Research Farm, College of Agricultnre, Gwalior (M.P.) to find out the effect of phosphorus on the yield of different varieties of groundnut in *Kharif*, 1981. Results revealed that out of six cultivars tried, only two cultivars *viz.*, S-1 (37.75 q/ha) and TG-17 (36.11 q/ha) yielded significantly higher than others. The maximum yield was recorded with the application of 40 Kg P/ha.

Groundnut (*Arachis hypogaea* L.) occupies the highest position among all the oil seeds cultivated in the country both in regard to acreage and production. Northern region of Madhya Pradesh generally possess sandy soils, which are well drained, suitable for groundnut cultivation. Keeping in view the importance of response of phosphorus and also to fulfil the need of a suitable variety, this investigation was undertaken to evaluate and identify the suitable variety and optimum dose of phosphorus for raising the average yield and stabilizing the production of groundnut under the agroclimatic conditions of the northern parts of M. P.

METERIAL AND METHODS

The experiment was conducted in sandy loam soil (7.6 pH) of medium fertility at the Central Research Farm, College of Agriculture, Gwalior in rainy season *Kharif* of 1981. The trial was laid out in a split plot design with six varieties (Jyoti; A. K. 12-24, Gangapuri; S-1; M-13 and TG-17) as main treatments and five different levels of phosphorus (0, 20, 40, 60 and 80 Kg/ha) as sub treatment replicated four times. The size of each of sub plots was 5m x 2.4 m at harvest. A basal dose of 20 kg. each of N and K/ha. was also applied in all the treatments at sowing.

RESULTS AND DISCUSSION

Effect of Phosphorus

Application of phosphorus did not affect the growth characters of groundnut significantly. However, the maximum height and number of branches (Table-1) were recorded at 40Kg P/ha., while maximum number of leaves/plant was recorded at 60Kg P/ha. though their differeanes were not significant

Yield and its attributes viz., number of kernls/pod, 100 kernel weight and pod yields were significantly affected at 20 Kg P/ha.; whereas number of pods/plant and kernel yield/plant (Table-2) were significantly affected at 40 kg. P/ha over control. A signi-

Department of Agronomy, J. N. K. V. V. Campus College of Agriculture, Gwalior (M.P.)

ficantly increase was also noticed in case of number of pods per plant at 40 kg P/ha. and in others higher treatments. However, the maximum number of pods/plant (13.6) was obtained at 80 kg. P/ha, which was significant over 20 kg P/ha and control (Table-1). These findings are in consonance with Dahatonde and Rahate (1974).

Number of Kernels per pod were also significantly influenced by the application of phosphorus over control, though the maximum number of kernels were recorded at both the levels of phosphorus.

The kernel yield/plant was significantly influenced at 40, 60 and 80 kg P/ha over control. Whereas an application of phosphorus @ 20 Kg p/ha did not influence significantly the yield over control, though it produced more kernel yield/plant. Similarly the application of 20 kg P/ha had yielded at par with 40 and 60 kg P/ha; but gave significantly lower yield of kernel /plant over 80 kg P/ha. The maximum kernel yield/plant was recorded at 80 kg P/ha (Table-2). The application of phosphorus also markedly influenced the weight of 100 kernels over control. The maximum weight of kernels (46.0 g) was recorded at 60 kg P/ha. The increase in kernels weight with phosphorus application may be attributed to the ability of plant type to accumulate more food material within seed. These findings are in agreement with earlierreports by Sharma and Richharia (1962) on gram and Dahatonde and Rahate (1974) in groundnut. The application of phosphorus significantly increased the pod yield/ha over control. The highest pod yield (30.18 q/ha) was recorded at 40 kg p/ha., the response was to the tune of 17.53% over control. Application of phosphorus beyond 40 kg/ha had reduced the pod yield slightly, although the differences were not found to be significant.

EFFECT OF VARIETIES :

The variations in pod yields due to the different cultivars of groundnut were found to be significant. Maximum pod yield/ha. was recorded by S-1 (Flow runner X Jyoti) (37.11 q/ha) which was at par with the cultivar TG-17 (36.11 q/ea). However, both the cultivars were s gnificantly superior to other cultivars tried viz., M-13 AK 12-24; Gangapuri and Jyoti. M-13 (Punjab) was significantly superior to the remaining types viz., A. K. 12-24; Gangapuri and Jyoti (Table-2). "S-1" had also given significantly the maxmum yield/plant; higher 100 kernel weight and no. of kernels per pod. "S-1" produced significantly lesser no of pods/plant than that of "TG-17" although it was at par with Jyoti and AK 12-24. The highest yield of "S-1" may be attributed to the cumulative effect of all the yield attributes which had pushed the cultivar "S1-1" ahead to all the others.

REFERENCES

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Table 1 Effect of different treatments on various growth and development yield contributing and quality components of groundnut.

Varieties	Height of the plant (cm)	No. of branches/plant.	No. of pods/ plant.	Kernels/ pod.	100 kernel weight (gm)	Dry pod q/ha
Jyoti	57.5	3.5	13.8	1.3	29.8	22.5
AK 12-24	58.8	3.5	13.5	1.3	33.1	25.0
Gangapuri	62 5	3.5	9.3	2.2	36.6	22.6
S-1	41.1	6.5	12.2	1.7	53.2	37.7
M-13	39.6	6 9	8.2	1.6	70.4	28.9
TG-17	40 6	4.4	15.9	1.2	46.4	36.1
C.D. 5%	4.9	0.8	1.8	0.6	1.6	0.57
Level of P_2O_5 (Kg/ha)						
0	48.0	4.6	10.6	1.4	41.8	25.6
20	49.6	4.7	11.5	1.5	43.4	28.3
40	51.4	4.9	12.5	1.6	45.6	30.1
60	50.5	4.5	12.7	1.6	46.0	29.9
80	50.5	4.8	13 6	1 6	45.8	29.9
C.D. at 5%	NS	NS	1 2	0.5	4.9	1.6

Table: 2 Effect of different treatments on yield and yield contributing characters of groundnut.

Treatment	VARIETIES V1	V2	V3	V4	V5	V6	Average
			Number of Kernels/pod				
P0	1.25	1.20	2.15	1.68	1.48	1.13	1.49
P1	1.35	1.43	2·18	1.70	1.50	1.18	1.56
P2	1.38	1.43	2.23	1·73	1.70	1.20	1.60
P3	1.35	1.43	2.23	1.73	1.70	1.23	1.61
P4	1.33	1.38	2.23	1.75	1.7o	1.25	1.61
Average	1.30	1.38	2.29	1.72	1.60	1.20	
			Varieties	P levels			
C. D. at 5%			0.07	0.05			
			Kernel Yield/plant (in g.)				
P0	6.0	5.3	7.0	9.8	8.0	8.8	7.48
P1	6 6	6.7	7.8	10.3	8.3	9.0	8.12
P2	6.9	8.2	7.8	10.8	9.2	9.2	8.68
P3	7.7	7.5	8.3	11.3	8.2	9.3	8.72
P4	7.5	8.0	8.3	12.3	9.5	10.4	9.27
Average	5.9	7.1	7.8	10 0	8.6	9.2	
		Varieties		P levels			
C. D. at 5%		1.04		0.78			
				Pod Yield (q/ha)			
P0	18.4	23.6	19.0	33.2	26.4	33.3	23.6
P1	22.1	23.9	22.9	35.3	28.3	35.3	28.3
P2	23.8	23.8	23.8	38.6	30 9	36.8	30.1
P3	24.1	24.7	23.9	40.7	29.0	37.2	29.9
P4	24.1	24.2	23 4	40 8	29.5	37.7	39.9
Average	22.5	25.0	22.6	37.7	28.9	36.1	
		Varieties		P levels			
C D. at 5%		2.5		1.6			