

## STUDIES ON THE EFFECT OF NPK FERTILIZERS ON THE YIELD OF CHILLI IN THE RED LOAM SOILS OF KERALA\*

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Chilli (*Capsicum annuum* L.) being an exhaustive crop, plant nutrition is of vital importance in growing it successfully. Positive responses of chilli to nitrogen were reported by Joachim and Paul (1938), Vaidyanathan (1955), Relwani (1963) and Dhulappanavar (1965). The phosphorus requirements of the crop under different conditions were pointed out by Purewal (1954), Relwani (1963) and Mehrotra *et al* (1968). While Joachim and Paul (1938) and Arora *et al* (1965) could not get any response to potash fertilization, Mehrotra *et al* (1968) reported adverse effects in the absence of potash. Balanced NPK fertilization was recommended for chilli by Murty and Murty (1963), Dhulappanavar (1965) and Ramanathan (1965).

The present studies were undertaken to fix the optimum doses of the NPK fertilizers for chilli in the red loam soils of Kerala.

### Material and Methods

The experiment was conducted at the Agricultural College, Vellayani, during 1967-'68 using three levels of nitrogen (25, 50 and 75 kg N/ha), three levels of phosphoric acid (20, 40 and 60 kg  $P_2O_5$ /ha) and three levels of potash (20, 40 and 60 kg  $K_2O$ /ha). The soil contained 0.031 percent total nitrogen, 0.002 percent available phosphoric acid and 0.0009 percent available potash. The "South Malabar" variety of chilli was used in the trial. The design adopted was a  $3^3$  partially confounded factorial experiment in randomised block design with two replications. Plot size was 4.9m x 4.9m. Each plot was supplied with lime at 1200 kg/ha and cattle manure at 10 tons/ha at the time of preparatory cultivation. Thirtyone-day-old seedlings were planted in pits in the plots spaced at 70 cm both ways. The entire dose of super phosphate and muriate of potash and half the dose of ammonium sulphate were applied as basal dressing. The remaining dose of ammonium sulphate was applied as top dressing 5 weeks after transplanting. Weeding, watering and hoeings were done when required.

Results were assessed in terms of the yield of pods plucked at intervals of 8-10 days.

### Results and Discussion

Table 1 gives the results. It may be seen that graded doses of nitrogen gave significant increases in the yield of chilli pods. The mean yields of dry chillies under

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the three levels of 25, 50 and 75 kg nitrogen per hectare were 717.22, 944.65 and 1483.67 kg respectively. The influence of nitrogen in increasing the yield of chillies observed in the present experiment agrees with the results of similar studies referred to above. The linear nature of the response of nitrogen even at the highest level tried in this investigation indicates that the yield can still further be increased by adding higher doses. Ramanathan (1965) had reported earlier that chilli could give economically high yields upto 120 lb nitrogen per acre under irrigated conditions.

Phosphate fertilization also enhanced the yields of pods significantly. But the magnitude of response in this case was much lower than that of nitrogen. There was a linear increase in yield from 20 kg level to 60 kg level which was statistically significant.

Potash had no significant effect in increasing the yield of chilli pods. Though the differences were not significant, an increase in the yield due to application of graded doses of potash was in evidence.

**Table 1**

Mean yield of dry chilli pods in kg/ha under different manurial treatments.

Nitrogen (kg/ha)	25		75	Mean
$P_2O_5$ (kg/ha)				
20	626.53	844.90	1346.20	939.18
40	732.39	942.86	1456.41	1045.55
60	787.76	1046.29	1648.33	1160.73
$K_2O$ (kg/ha)				
20	685.71	914.29	1442.20	1014.04
40	706.12	948.98	1455.10	1036.73
60	759.84	970.78	1553.71	1094.78
Mean	717.22	944.65	1483.67	...
$P_2O_5$ (kg/ha)	20	40	60	Mean
$K_2O$ (kg/ha)				
20	956.49	1000.65	1084.98	1014.04
40	900.65	1051.02	1158.58	1036.73
60	960.57	1085.06	1238.78	1094.78
Mean	939.18	1045.55	1160.73	...
C. D. (5%) for comparison between marginal means				130.6P
C. D. (5%) for comparison between combinations				226.37

Increase in pod yield in relation to the combined application of nutrients was not significant. However, the highest yield of 1824.49 kg dry pod per hectare had been recorded in the treatment receiving 75 kg nitrogen, 60 kg phosphoric acid and 60 kg potash per hectare.

### Summary

A field experiment to study the effects of graded doses of nitrogen (25, 50 and 75 kg/ha), phosphorus (20, 40 and 60 kg  $P_2O_5$ /ha) and potash (20, 40, 60 kg  $K_2O$ /ha) on the growth and yield of chilli in red loam soils was conducted at the Agricultural College, Vellayani, Kerala. Yield of dry pods increased significantly by the application of increased doses of nitrogen and phosphorus. Potash had no influence on the yield of pods to any significant extent. Application of nitrogen at higher levels was found to be highly profitable and economical.

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