

## Studies on Nitrogen and Phosphorous Needs of Chilli

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Studies on nitrogen and phosphorus needs of irrigated chilli revealed that there was linear yield increase upto 150 kg of N application in the soil of low nitrogen status, without basal application of farm yard manure. With medium level of N in the soil and application of bulky organic manure the crop did not respond to applied N. There was no response for applied P in soil of high initial P status and P application could be dispensed with in such soils. Closer spacing (45 X 30 cm) gave higher yield than wider spacings (45 X 45 and 45 X 60 cm)

Chilli as an intensively cultivated spice crop needs judicious manuring for higher yields. Generally bulky organic manures or combination of organic manures and fertilizers are applied to the crop. Ramanathan (1965) reported that 88 kg N, 77 kg P<sub>2</sub>O<sub>5</sub> and 77 kg K<sub>2</sub>O over a basal dose of 25t of farm yard manure/ha were optimum for chilli, variety KI. In India, use of fertilizer for chilli varies from 10.0 to 30.0 kg for N, from 7.5 to 20.0 kg for P<sub>2</sub>O<sub>5</sub> and from 7.5 to 45.0 kg for K<sub>2</sub>O/ha (Iruthayaraj, 1970). It has been reported that 40 kg N, 60kg P<sub>2</sub>O<sub>5</sub> and 60 kg K<sub>2</sub>O gave the highest yield with higher net profit (Iruthayaraj and Kulandaivelu, 1973). Rajagopal *et al.* (1976) reported that 50 kg N, 25 kg P<sub>2</sub>O<sub>5</sub> and 25 kg K<sub>2</sub>O/ha were required for chilli over a basal dose of 25 t/ha of farm yard manure in soils of low available N, high available P and K. There was response upto 150 kg N/ha and a closer spacing of 30 x 30 cm was found to be optimum for higher yields in chilli (1) (Rajagopal *et al.*, 1976).

### MATERIAL AND METHODS

Field experiments were conducted at Tamil Nadu Agricultural University farm from 1973 to 1975. The soil selected was loamy to clay loam with low available N and high available P<sub>2</sub>O<sub>5</sub> and K<sub>2</sub>O.

Fertilizer treatment included 12 NP combinations as shown in the Table I in which N levels were 0, 50, 100, 150 Kg/ha and P<sub>2</sub>O<sub>5</sub> levels were 0, 60, 120 Kg/ha. There spacings included were 45 x 30, 45 x 45 and 45 x 60 cm. Split plot design was adopted with spacings in the main plot and NP combinations to the sub-plots with three replications. In summer 1974 only two replications were given. During summer, 1973 there was a basal application of 25t farm yard manure/ha and it was deleted in the subsequent years. Potash was applied as a common basal dose at 35 Kg K<sub>2</sub>O/ha. Regular package of practices were adopted.

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RESULTS AND DISCUSSION

The results on the yield of red ripe pods for summer, 1973 (Table) showed that there was difference due to spacing. The closer spacing of 45x30cm recorded significantly higher yield of 5914 kg/ha as compared to 4925 kg/ha for 45 x 45 cm and 4194 kg/ha for 45 x 60 cm. The increased yield in closer spacing is due to higher plant population resulting in efficient utilization of solar radiation and other resources. Selvaraj *et al.* (1975) and Rajagopal *et al.* (1976) reported that the optimum spacing for K. 1 chilli was 30 x 30 cm

at Bhavanisagar and 30 x 30 cm at Coimbatore conditions respectively. The N and P combinations did not show any yield variation. This may be attributed to medium availability of N (360 kg/ha) and the contribution of N through farm yard manure applied at 25 t/ha.

During 1974 and 1975 farm yard manure was not applied. Data for these two years were pooled and results discussed. The data on the yield of red ripe pods revealed that there were significant differences due to spacing and NP combinations. The closer spacing of 45 x 30 cm recorded an yield of 3941

TABLE. Yield of red ripe pods (kg/ha)

Summer, 1973

	Spacings								
	45 x 30 cm			45 x 45 cm			45 x 60 cm		
	P0	P60	P120	P0	P60	P120	P0	P60	P120
N0	5273	5491	5032	4785	4558	4227	4207	4153	3378
N50	6188	5457	5126	4474	5541	4677	3635	3857	3778
N100	6089	5635	6148	4449	5101	5570	4686	4923	4232
N150	6696	6919	6909	4998	5342	5378	4410	4286	4715

Spacings  
SE : 91  
CD (0.05) : 380

NP Combinations  
SE : 215  
CD (0.05) : N. S.

Summer, 1974 and 1976 (Pooled data)

	Spacings								
	45 x 30 cm			45 x 45 cm			45 x 60 cm		
	P0	P60	P120	P0	P60	P120	P0	P60	P120
N0	2485	3186	2343	2332	2226	1142	2477	1110	1759
N50	3606	3751	3574	3038	2172	3378	2140	2656	3181
N100	3767	4758	4504	3416	3698	3843	2326	2706	3154
N150	5399	5509	4401	4096	4383	3527	2640	2953	3910

Spacings  
SE : 11  
CD (0.05) : 37

NP Combinations  
SE : 24  
CD (0.05) : 69

kg/ha followed by 45 x 45 cm (3036 Kg/ha) and 45 x 60 cm (2584 Kg/ha). The consistent increase in yield due to closer spacing confirms the earlier findings of Selvaraj *et al.* (1975) and Rajagopal *et al.* (1976).

Higher level of 150 Kg N/ha gave significantly higher yield of 4090 Kg/ha followed by 100 Kg N/ha (3573 Kg/ha) and 50 Kg N/ha (3054 Kg/ha). Control recorded significantly lower yield (2026 Kg/ha). The response for applied N and consequently higher yield is attributed to low available status of N (220 Kg/ha) in the soil. There was no difference in yield due to P application. The 60 and 120 Kg P<sub>2</sub>O<sub>5</sub>/ha levels were on par with control. Lack of response to P application might be due to high P available status of the soil. These findings are in agreement with the earlier findings of Rajagopal *et al.* (1976) in that there was a linear increase in yield upto 150 Kg N/ha for five chilli varieties including K.1. The present investigation brought out the need for judicious fertilization of chilli with N upto 150 Kg when the soil is low with regard to available N and when no organic manure is applied.

In the case of application of bulky organic manures, proportionate reduction of N application should be done P application can be dispensed with in soils of high available P status and with the application of farm yard manure.

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