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Studies on the Varietal Response to Nitrogen in Chilli

A. RAJAGOPAL[1], C. R. MUTHUKRISHNAN[2] and M. KADER MOHIDEEN[3]

Field experiments were laid out with chilli varieties namely K. 1, B. 24-A2, 618-14, C63-A5 and Local Gundu, with graded doses of nitrogen, ie; 30, 60, 90, 120 and 150 kg per ha with control. Phosphorus and potash were kept constant at the level of 35 kg in each. Nitrogen was applied in two split doses on 30th and 60th day after transplanting The pooled analysis showed that not much difference was found among the varieties except Local Gundu. The interaction between season and variety showed that B. 24-A2 was high yielding in summer season. Local Gundu has recorded significantly lower yields. There was progressive increase of yield of dry pods with increase in nitrogen level. The treatment receiving 150 kg N recorded an yield of 1749 kg dry pods per ha which works out a monetary return of Rs. 5865/- per ha compared to Rs. 885/- in the control.

Chilli is an important spice crop. The manurial schedule includes the exclusive application of bulky organic manures or combination of bulky manures and inorganics. Cattle and sheep penning are also practised in certain parts of Tamil Nadu. Relwani (1963) found that 88 kg N, and 88 kg P_2O_5, over a basal dose of 49.4 tons of farm yard manure per ha were optimum. Ramanathan (1965) found that for irrigated chilli 88 kg of N, 77 kg of P_2O_5 and 77 kg of K_2O per ha were optimum for Tamil Nadu. In chilli, use of fertilizers varied from State to State (Iruthayaraj, 1970). It was reported that 40 kg N, 60 kg P_2O_5 and 60 kg K_2O per ha gave the highest yield with higher net profit (Iruthayaraj and Kulandaivel 1973) while Rajagopal *et al.* (1975) found that 50-25-25 kg of N, P_2O_5 and K_2O per ha were optimum for chilli over a basal dose of 25 tonnes of farm yard manure per ha in soils analysing low nitrogen status. Varietal response of five chilli varieties to nitrogen is discussed in the present paper.

MATERIALS AND METHODS

Field experiments were laid out in the farm of Agricultural College and Research Institute, Coimbatore for three years. The soils selected were loam, clay and clay loam. The results of preliminary soil analysis are furnished in Table I.

Five Chilli varieties, viz; K.1, B. 24-A2, 618-14, C 63-A5 and Local Gundu were studied with five nitrogen levels 30, 60, 90, 120 and 150 kg per ha. besides the control. Phosphorus and Potash were applied as common doses at 35 kg P_2O_5 and 35 kg K_2O per ha respectively without bulky organic manures (with bulky organic manure in July, monsoon1971.) The varieties were allot-

1 - 3 : Department of Horticulture, Tamil Nadu Agricultural University, Coimbatore-641 003.

TABLE I. Preliminary soil analysis

	loam (July 1971)	Clay (February 1973)	Clay loam (July 1973)
pH	7.2	7.8	8.4
E. C. (millimhos/cm)	0.6	0.6	0.6
Available N (kg/ha)	507.5 (high)	220.0 (low)	232.5 (low)
Available P (kg/ha)	18.3 (medium)	50.0 (high)	15.5 (medium)
Available K (kg/ha)	465.0 (high)	1125.0 (high)	918.0 (high)
Lime	Copious	Copious	Copious
Texture	(Red / Loam)	Clay	Clay loam

ted to the main plots and the nitrogen levels to the sub-plots in a split-plot design with three replications. The spacing adopted was 30x30 cm in beds. Nitrogen was applied as top dressing on 30th and 60th days in equal splits to all the treatments. Data were collected on duration to first flowering, plant height and yield of dry pods.

RESULTS AND DISCUSSION

The data on yield and other attributes during monsoon, 1971 were not significant, either for varieties or treatments due to high status of nitrogen (507.5 kg/ha), and hence deleted form comparison. The data for the rest of the two seasons are discussed. The data on mean duration from sowing to first flowering revealed that the variety 'Local Gundu' had significantly longer duration compared to K. 1 by 14 days. K. 1 had a duration of 100 days. Local Gundu as such was found late in flowering due to prolonged vegetative phase. With reference to the nitrogen levels, the treatment receiving 150 kg N registered significantly longer duration of nine days compared to control, whereas the levels of 120 and 90 kg were on a par and 30 kg was on a par with control. This indicates the influence of N to increase the duration to flowering due to prolonged vegetative phase.

The data on plant height at the final stage showed that it was not influenced by the varieties. Nitrogen levels increased the plant height progressively. There was significant increase in the mean height of the plants 78.8 and 77.1 cm in the treatments receiving 150 and 120 kg respectively compared to control (56.5 cm). The mean plant height was 74.2 cm for N 90, 67.1 cm for N 60 and 62.1 cm for N 30.

The results on the yield of dry pods showed that there was significant difference due to varieties raised in February 1973 whereas the same trend was not found in the July season. From the pooled analysis the variety Local Gundu was found to be lower yielding (928 kg) and no significant variations were seen among other varieties. However, there was season x variety interaction. The variety B. 24-A2 was higher yielder (1597kg) in February (Summer) 1973 and was on a par with other varieties

TABLE II. Effect of nitrogen on duration, plant height and dry pod yield of chilli varieties

(Mean for two years)

Varieties	N levels (kg/ha) 0	30	60	90	120	150	Mean
Duration from sowing to first flowering (days)							
K. 1	95	95	99	99	103	106	100
B. 24-A...	100	100	99	104	106	108	103
618-14	100	99	101	102	105	108	103
C. 63-A5	100	100	102	103	106	108	103
Local Gundu	109	112	112	114	115	120	114
Mean	101	101	103	104	107	110	
	Varieties			N levels			
Statistical significance :			Yes	Yes			
CD			2.815	1.215			
Plant height at the final stage (cm)							
K. 1	63.5	59.0	62.3	72.5	77.8	77.6	68.8
B. 24-A2	56.0	62.0	70.8	75.5	84.0	87.1	72.6
618-14	58.3	64.5	70.5	75.4	74.4	77.0	70.0
C. 63-A5	53.8	64.0	63.4	68.8	71.0	73.5	65.8
Local Gundu	51.1	61.1	68.5	78.8	78.6	78.9	69.5
Mean	56.5	62.1	67.1	74.2	77.1	78.8	
	Varieties			N levels			
Statistical significance :			No	Yes			
CD			—	4.485			
Dry pod yield (kg/ha)							
K. 1	646	1212	1231	1560	1430	1609	1285
B. 24-A2	781	1237	1580	1944	1579	1848	1495
618-14	659	1143	1340	1288	1478	1804	1286
C. 63-A5	694	1121	1253	1429	1536	1923	1326
Local Gundu	388	774	767	792	1287	1558	928
Mean	634	1097	1284	1402	1465	1749	
	Varieties		N levels				
Statistical significance :		Yes	Yes				
CD		237.8	170.6				

Season x Variety interaction

	Monsoon, 1973	Summer, 1973	
K. 1	1330	1239	1285
B. 24-A2	1392	1597	1495
618-14	1429	1144	1286
C. 63-A5	1566	1085	1326
Local Gundu	1218	637	928
Mean	1387	1140	
Statistical significance :	Yes		
CD	336		

in July season (monsoon) 1973. As such this variety merits attention to evaluate the yield potential especially for February (summer) season. Nitrogen levels increased the yield of chilli in both the seasons. The pooled analysis clearly showed the progressive increment of yield of dry pods with nitrogen levels. The treatment receiving150kg N recorded a mean yield of 1749 kg dry pods per ha which was statistically significant over other treatments. The treatment of 120 kg N gave a mean yield of 1465kg and on a par with 90kg N (1402 kg) and significant over 60 kg N (1234 kg). The treatment receiving 60 kg N with mean yield of 1284 kg was on a par with 30 kg N (1097 kg). The yield in the control was significantly lower (634 kg) than the rest of the treatments. The present finding has brought out the fact that there was response upto 150 kg N without the basal dose of bulky organic manures in soils having low status of nitrogen (220.0 to 252.5 kg of available N/ha). Interestingly normal yields were maintained at 35 kg in each of P_2O_5, K_2O per ha and no compensation was made for the P and K to be contributed by the bulky organic manures. The net profit worked out for different levels of N are as follows: 150 kg : Rs. 5865; 120 kg : Rs. 4570; 90 kg : Rs. 4435; 60 kg : Rs. 3750; 30 kg : Rs. 3085 and control : Rs. 885/-.

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