Agric. Res. J. Kerala 1987, 25 (?.) 285—287

RESPONSE OF CHICKPEA (*CICETARIETIRUM* L.) TO SOIL AND FOLIAR APPLICATION OF DIAMMONIUM PHOSPHATE

The potential usefulness of phosphate manuring on the growth and yield of pulse crop is universally accepted whereas there is no unanimity regarding the application of nitrogen. However, it has been reported that a starter dose of nitrogen will favourably influence the absorption of phosphorus and thereby the growth and yield of pulses. (Mishra and Ram, 1971). During flowering and fruit development stages of m my crops, the supply of phosphorus is inadequate in many soils and this may seriously reduce the crop yield (Skinner and Purvis, 1941). Hence, it is imperative to study how far a complex fertilizer of nitrogen and phosphorus like diammonium phosphate can help in boosting the yield of chickpea which is a major pulse crop in India.

The experiment was conducted in the Agricultural College Farm, Indore, M. P., during the rabi season 1977-78. The soil was typical black cotton with pH of 7.7 and medium in available nitrogen and phosphorus and high in potassium. The trial was laid out in a split plot design where the main plot treatments were four levels of nitrogen (0, 40, 80 and 120 kg N/ha) given to the preceding crop of fodder sorghum with four replications and the subplot treatments were:

d_0 No DAP

d_1 Foliar application of 33.3 kg DAP/ha at branching

d_2 Foliar application of 66 6 kg DAP/ha in two equal doses viz , at branching and flowering

d_3 Foliar application of 99 9 kg DAP/ha in three equal doses viz., at branching, flowering and pod formation

d_4 Soil application of 100 kg DAP/ha as basal

d_5 Application of 100 kg DAP/ha, half as basal through soil and remaining in two equal split at branching and flowering as foliar spray.

Diammonium phosphate of 18:46 grade was used in the experiment and the concentration of spray solution was 5 per cent. Before foliar application the pH of the filtered DAP solution was adjusted to 6.0 by calcium hydroxide. Teepol, a surfactant was mixed at the rate of 1 ml/l of spray solution. Water sprays were given to other plots corresponding to DAP sprays of treatments receiving foliar application of DAP. The test variety Ujjain 21 was sown at a spacing of 20 cm x 15 cm with a seed rate of 50 kg/ha.

Results revealed significant differences between the subplot treatments in respect of height of plants, numbers of branches per plant, pods per plant and thousand seed weight, which could also be reflected in the ultimate grain yield. (Table 1). The highest grain yield of 2470 kg/ha was obtained when DAP at the rate of 100 kg/ha was applied as half basal through soil and half as two foliar

Table 1

Effect of soil and foliar application of diammonium phosphate on the growth and yield of chick pea and its economics

Treat-ment	Height of plant (cm)	No. of branches per plant	No. of pods per plant	1000 seed weight (g)	Bhusa yield kg/ha	Grain yield kg/ha	Cost of cultivation Rs/ha*	Gross return Rs/ha	Cost benefit ratio
do	41.4	8.5	39.8	162.5	3460	1070*	2550	3808	1:1.49
d^1	51.1	13.8	41.1	176.3	4400	1820	2688	6105	1:2.27
d^2	52.9	16.6	41.3	181.3	4560	2020	2826	6695	1:2.37
d_3	51.9	18.7	44.7	183.8	4500	2120	2965	6955	1:2:35
d_4	52.6	21.6	49 5	188.1	4120	2240	2785	7190	1:2.58
d_5	50.7	22.8	52.7	203.8	4070	2470	2905	7810	1:2.69
SEm±	0.68	0.33	0.49	1.7	119	49	—	—	—
CD (0.05)	1.92	0.93	1.39	4.8	337	139	—	—	—

* Out of the total expenses, Rs. 2550 was incurred as common expenses and remaining as the cost of treatment. Price of grain Rs 275/kg, bhusa Rs 0.25/kg, cost of DAP Rs 2.35/kg, cost of foliar application Rs. 60/application.

sprays at branching and flowering (d_5). This treatment recorded an yield increase of 10.2 and 16.5 per cent respectively over the same quantity of DAP applied as either basal (d_4) or foliar sprays alone (d_3). Neema (1976) had also reported similar trend of responses of chickpea to DAP. The foliar application of DAP at branching alone recorded a significant yield increase of 69.7% over no application of DAP. Unlike grain yield, bhusa yield differed in its response to soil and foliar applications of DAP.

In terms of economics, d_5 was the best treatment registering a cost benefit ratio of 1:2.69 and it was followed by d_4 (1:2.58) and d_2 (1:2.37). The control plot recorded a cost benefit ratio of 1:1.49.

College of Agriculture
Indore 452 001, MP, India

Kuruvilla Varughese[1]
S. S. Pathak

References

Mishra, S. S. and Ram, K. 1971. Tilth, nitrogen and method of phosphate application in relation to grain yield. *Fert. News* **16** (10): 65

Neema, V. P. 1976. *Annual Report.* All India Co-ordinated Pulse Improvement Project, J. N. K. V. V. Jabalpur.

Skinner, J. J. and Purvis, E. R. 1941. *Hunger Signs in Crops.* American Society of Agronomy and National Fertilizer Association.

[1]Present address: College of Agriculture, Vellayani 695 522, Kerala, India