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RESEARCH ARTICLE

EFFECT OF INTEGRATED NUTRIENTS MANAGEMENT ON KERNEL YIELD OF CHICKPEA CULTIVARS

*[1]R.A. Singh, [2]R.K. Singh, [1]P.V. Singh, [1]Jitendra Singh, [1]Asha Yadav and [1]Jitendra Singh

[1]C.S. Azad University of Agriculture and Technology, Kanpur-208002
[2]K.V.K., Jalaun (U.P.)

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**Corresponding author:*
Ram Avtar Singh

ABSTRACT

An experiment was carried out during Rabi season of 2002-2003 and 2003-04 at Regional Research Station, Mainpuri, C.S. Azad University of Agriculture and Technology, Kanpur. The experimental soil was sandy loam, having poor fertility status. The two genotypes i.e. Udai and Alok were tested at four levels of nutrients integration (RDF + 15 kg S + 30 kg Ca + 0 q FYM, RDF + 15 kg S + 30 kg Ca + 50 q FYM, RDF + 15 kg S + 30 kg Ca + 100 q FYM and RDF + 15 kg S + 30 kg Ca + 150 q FYM/ha). The integration of FYM @ 50 q/ha, 100 q/ha and 150 q/ha significantly increased the kernel yield of chickpea in comparison to without integration of FYM. The pooled results of two years displayed that both cultivars at different levels of nutrients integration confined the kernel yield beyond 50 q/ha FYM. Thus, application of 25 kg N + 50 kg P_2O_5 + 15 kg S + 30 kg Ca in the integration of 50 q/ha FYM significantly improved the grain yield of cv. Udai by 2.51 q/ha or 21.92% and cv. Alok by 2.99 q/ha or 25.04% over non integration of FYM. The significant response noted between yield of Udai (13.87 q/ha) and Alok (14.43 q/ha) under poor edaphic condition. The growth and yield contributing characters were concordance to the kernel yield of chickpea.

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INTRODUCTION

Chickpea is the oldest pulse crop, cultivated almost all the places of India. The *Sanskrit* name of *chickpea* is *channa* which indicate that this crop has been under cultivation in India longer than any other country. On a global basis *chickpea* is the third most important pulse crop after *Kharif* dry beans (*Phaseolus vulgaris* L.) and *Rabi* dry bean (*Pisium sativum* L.). Although *chickpea* predominantly consumed as pulse. The dry karnels of *chickpea* is also use in preparing a variety of snake food, sweet and condiments. Green fresh *chickpea* is commonly consumed as a vegetable for short period before crop is mature. Nutritionally, *chickpea* is relatively free from various anti nutritional factors has high protein digestibility and in richer in phosphorus and calcium than other pulses. Because of these diversified uses of the crop and its ability to grow better with low inputs under harsh edaphic and moisture stress environments than many other crops. In Uttar Pradesh, *chickpea* cultivation is practically concentrated in the Indo-Gangetic alluvium soil as rainfed crop. The increasing trend in area, production and productivity was found upto 2008-2009, thereafter, reduction was noted due to biotic, abiotic and economic reasons. At present in U.P. about 5.62 lakh ha *chickpea* is grown with total production of 6.25 lakh mt and productivity of 11.15 q/ha (Anonymous, 2017). It has been observed that the farmers are not followed its cultivation on light soils specially on sandy soil due to poor fertility status.

Since the *chickpea* is a legume crop, which fix the atmospheric nitrogen in the soil and improve the fertility status of soil, therefore, for increasing the area, production and productivity, proper integration of nutrients and suitable variety are most essential factors. Singh (2005), Singh *et al.* (2010), Singh *et al.* (2010) and Singh *et al.* (2013) reported from C.S. Azad University of Agriculture and Technology, Kanpur that the expected yield of *chickpea* kernels can be obtained with integration of plant nutrients. Since, the nutrients stress condition in the *chickpea* growing tract of central U.P., therefore, for obtaining better seed yield through better combination of organic manure and inorganic fertilizers and use of improved cultivars, the present investigation was planned and under taken.

MATERIALS AND METHODS

An experiment was laid out during *Rabi* season of 2002-2003 and 2003-04 at Regional Research Station, Manipuri, C.S. Azad University of Agriculture and Technology, Kanpur. The experimental soil was sandy loam having pH 8.5, organic carbon 0.45%, total nitrogen 0.04%, available phosphorus 10 kg/ha and available potassium 278 kg/ha, thus, the nutrients of experimental soil were analyzed low in organic carbon, total nitrogen, available phosphorus and high in available potassium. The pH was determined by Electrometric glass electrode method (Piper, 1950), while organic carbon was determined by Colorimetric method (Datta, *et al.,* 1962). Total nitrogen was analyzed by Kjendahl's method as discussed by Piper (1950). The available phosphorus and potassium were determined by Olsen's method (Olsen *et al.,* 1954) and Flame photometric method (Singh, 1971), respectively. The two *chickpea* cultivars i.e. *Udai* and *Alok* were tested under four level of nutrients integration (RDF + 15 kg S + 30 kg Ca + 0 q FYM, RDF + 15 kg S + 30 kg Ca + 50 q FYM, RDF + 15 kg S + 30 kg Ca + 100 q FYM and RDF + 15 kg S + 30 kg Ca + 150 q FYM/ha). The *chickpea* varieties were planted on 10th November and harvested 9th March after 120 days of sowing during both experimental seasonal as per suggestion of Singh (2005).

yield attributes recorded under this study. The integration of 150 q FYM with RDF, sulphur and calcium was responsible for increasing the yield attributes because it improved the edaphic condition of soil. Therefore, FYM combination improved better environment for pods and kernels development. These findings are in agreement with those reported by Singh *et al.* (2018). The *Alok* cultivar displayed the superiority in the production of all yield attributes over the genotype *Udai* at all level of combination. This was due to genetical variation. This support to the earlier findings of Singh *et al.* (2010).

Table 1. Growth parameters, yield traits and kernel yield of chickpea as influenced by different treatments (pooled data of two years)

S. N.	Treatment	Branches/ plant	Pods/ plant	Pod weight/ plant (g)	Grains/pod	Grain weight/ plant (g)	100-seed weight (g)	Yield (q/ha)		
								1st year	2nd year	Pooled
	Udai									
1.	RDF + 15 kg S + 30 kg Ca + 0 q FYM	13.05	20.16	9.37	1.66	7.49	20.66	10.97	11.94	11.45
2.	RDF + 15 kg S + 30 kg Ca + 50 q FYM	14.11	21.27	9.62	1.83	7.83	21.38	13.75	14.17	13.96
3.	RDF + 15 kg S + 30 kg Ca +100 q FYM	15.11	22.55	10.49	2.00	8.16	21.88	13.75	15.56	14.65
4.	RDF + 15 kg S + 30 kg Ca +150 q FYM	15.83	23.55	10.95	2.00	8.49	22.33	14.73	16.12	15.42
	Mean	14.52	21.88	10.10	1.87	7.99	21.53	13.30	14.44	13.87
	Alok									
1.	RDF + 15 kg S + 30 kg Ca + 0 q FYM	14.22	20.49	9.55	1.83	7.66	20.83	11.39	12.50	11.94
2.	RDF + 15 kg S + 30 kg Ca + 50 q FYM	14.33	21.33	9.90	1.83	7.99	21.66	14.72	15.14	14.93
3.	RDF + 15 kg S + 30 kg Ca +100 q FYM	15.11	22.83	10.62	2.00	8.49	22.33	14.59	15.84	15.21
4.	RDF + 15 kg S + 30 kg Ca +150 q FYM	15.83	23.66	11.00	2.00	8.66	22.41	14.86	16.40	15.63
	Mean	14.87	22.07	10.26	1.91	8.20	21.80	13.89	14.97	14.43
	S.E. (m±)Variety	0.15	0.27	0.12	0.02	0.10	0.10	0.15	0.12	-
	Fertility	0.21	0.38	0.17	0.03	0.14	0.15	0.21	0.18	-
	C.D. 5%Variety	0.43	N.S.	N.S.	N.S.	0.20	0.20	0.45	0.36	-
	Fertility	0.60	0.78	0.35	0.06	0.29	0.30	0.63	0.54	-

The recommended agronomical practices were followed. The crop was irrigated at initiation of flowers, pod formation and pod filling stages as suggested by Singh (2005) for light soil. The experiment was conducted in FRBD with three replication. The experimental data were statistically analyzed as suggested by Gomez and Gomez (1984).

RESULTS AND DISCUSSION

The experimental findings as influenced by different parameters are discussed below:

Growth parameters: The different doses of integrated nutrients did not much differed for production of branches/plant under both tested varieties of crop, however, different levels of nutrients management significantly increased up to highest tested dose. The significant improvement was found in branches/plant, under *Alok* over *Udai* in pooled results of two years. The better branching at RDF + 15 kg S + 30 kg Ca + 150 q FYM/ha may be attributed due to excellent combination of different nutrients. This is in agreement with the findings of Singh (2005) and Singh *et al.* (2010). The more branches/plant in cultivar *Alok* was due to favourable climatic condition. These results confirm the findings of Arvadia and Patel (1988) and Singh *et al.* (2010).

Yield attributes: Application of RDF + 15 kg S + 30 kg Ca + 150 q FYM/ha increased the pods/plant, pod weight/plant, grains/pod, grain weight/plant and 100-grain weight in comparison to other tested combination of nutrients. RDF + 15 kg S + 30 kg Ca + 0 q FYM/ha displayed the lowest values of

Grain yield: Application of FYM @ 50 q/ha, 100 q/ha and 150 q/ha significantly increased kernel yield of *chickpea* during the both experimental years and pooled results of two years over non used of FYM through integration with RDF + 15 kg S + 30 kg Ca /ha. The overall mean of two variety at different levels of nutrients integration displayed that application of FYM beyond 50 q/ha confined the kernel yield of chickpea. Thus, RDF (25 kg N + 50 kg P_2O_5) + 15 kg S + 30 kg Ca in the integration of 50 q/ha FYM significantly improved the grain yield of cv. *Udai* by 2.51 q/ha or 21.92% and cv. *Alok* by 2.99 q/ha or 25.04% over non integration of FYM. The significant response noted between yield of *Udai* and *Alok* under poor edaphic condition. The considerable improvement in growth and yield contributing parameters was responsible for higher kernel yield of *chickpea* with integration of different doses of FYM. These results are similar to the finding of Singh *et al*. (2018). In case of varieties the yield difference was due to genetical variation. Singh *et al*. (2010) have also reported the similar results.

Conclusion

On the basis of 2 year findings 25 kg N + 50 kg P_2O_5 + 15 kg S + 30 kg Ca in combination of 50 q/ha FYM may be suggested to the farmers for application to chickpea under groundnut-chickpea cropping system.

REFERENCES

Anonymous 2017. Rabi Phaslon Kee Saghan Patatiyan. Publication of Department of Agriculture, U.P. Lucknow, p. 110.

Arvadia, M.K. and Patel, Z.G. 1988. Influence of date of sowing on the growth and yield of gram under different fertility level. *Gujarat Agric. Univ. Res. J.*, 13 : 65-66.

Datta, N.P., Khera, M.S. and Saini, T.R. 1962. A rapid colorimetric procedure for the determination of organic carbon in soils. *Journal of Indian Society of Soil Sciences,* 10: 67-74.

Gomez, K.A. and Gomez, A.A. 1984. Statistical procedures for agricultural research. *Johnwiley and Sons,* New York.

Olsen, S.R., Cole, C.V., Watanable, F.S. and Dean, L.A. 1954. Estimation of available phosphorus in soils by extraction with sodium bicarbonate. *U.S.D.A. Circ. 939* (Washington) : 19 .

Piper, C.S. 1950. Soil and Plant Analysis. *Univ. Adelaide* Aust.

Singh, R.A. 2005. Response of fertilizers application on yield of chickpea under groundnut-chickpea cropping system. *Farm Science Journal*. 14(1) : 16-18.

Singh, R.A., Sharma, V.K. and Pal, S.B. 2013. Watershed based front line demonstration is a path of prosperity of Bundelkhand farm families. *Agriculture Update*, **8**(1&2) : 42-44.

Singh, R.A., Singh, H.K., Pal, S.B., Singh, P.V. and Singh, J. 2018. Advent of peanut-vegetable pea cropping system for higher production through use of vermicompost- is a path of prosperity. *Research in Environment and Life Sciences*, 11(02) : 53-55.

Singh, R.A., Singh, I.P. and Haider, E. 2010. Balance nutrition of chickpea in groundnut-chickpea cropping system. *International Journal of Agricultural Sciences*, 6(2) : 590-591.

Singh, R.A., Singh, I.P. and Sharma V.K. 2010. Screening of chickpea (*Cicer arietinum* L.) varieties for augmenting the grain yield in groundnut-chickpea cropping system. *Advance Research Journal of Crop Improvement*, 1(2) : 103-105.

Singh, R.A., Singh, I.P., Rai, R., Singh, P.V. and Verma, M.C. 2018. Groundnut (*Arachis hypogaeae* L.) genotypes for summer season under changing climate. *Research in Environment and Life Sciences*, 10 (07) : 201-203.

Singh, T.A. 1971. A Laboratory manual for soil fertility and fertilizer, *U.P. Agri. Univ. Pantnagar* (*Nainital*) p. 71-74.

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