



Varietal replacement in chickpea with STCR based nutrient management for productivity enhancement under CFLD in Sagar

Mamta Singh¹ and KS Yadav²

¹Scientist-Plant Breeding and Genetics, Krishi Vigyan Kendra, Sagar, MP

²Senior Scientist and Head, Krishi Vigyan Kendra, Sagar, MP

Abstract

Chickpea is an important pulse crop widely consumed and leading producers in India. Chickpea crop besides being rich in protein and some of the essential amino acids, enrich the soil fertility through biological nitrogen fixation (BNF) from atmosphere and thus play a vital role in furthering sustainable agriculture. The present study was conducted on yield gaps between improved package and practices of chickpea crop under real farming situation in district Sagar of Madhya Pradesh. To replace the technological gap constraints, Krishi Vigyan Kendra, Sagar, Madhya Pradesh had conducted 90 front line demonstrations (FLDs) on chickpea during 2015-16 to 2017-18 in different villages. Krishi Vigyan Kendra (KVK) technocrats also continuously focused time to time trainings on improved package and practices, field days and integrated pest management practices on chickpea to popularization in the district. Farmers were fully convinced with HYV of chickpea and use in their cultivation practices and use of Trichoderma as soil treatment and balanced use of fertilizer for higher yield.

Introduction

Chickpea (*Cicer arietinum* Linn.) is an important winter-season food legume having extensive geographical distribution? It is a good source of energy, protein (18-22%), carbohydrate (52-70%), fat (4-10%), minerals (calcium, phosphorus, iron) and Vitamins (especially Vitamins B). It is an excellent animal feed. Its straw also had good forage value. It is an important legume widely consumed in India. It also plays an important role in sustainable agriculture enriching the soil through biological nitrogen-fixation and the crop meets up to 80 per cent of the soil nitrogen needs from symbiotic biological nitrogen fixation, so farmers have to apply less nitrogenous fertilizer than they do for other non-legume crops. Chickpea is major pulse crop of rabi season. India is the world's leading producers of chickpea accounting for 10.13 million tons from the 9.44 million hectares with a productivity of 1073 kg/ha in

2018-19 (Agricultural Statistics at a Glance, 2019). In India, it is grown throughout the country excepting on high altitude of northern and north eastern regions and coastal peninsula. Madhya Pradesh (4.60 million tons), Maharashtra (1.78 million tons), Rajasthan (1.67 million tons), Karnataka (0.72 million tons), Andhra Pradesh (0.59 million tons), Uttar Pradesh (0.58 million tons), Gujarat (0.37 million tons), Chattisgarh (0.32 million tons), Jharkhand (0.29 million tons) and others (0.32 million tons) are the major chickpea producing states sharing over 95% area (Agricultural Statistics at a Glance, 2019). In Madhya Pradesh, chickpea crop is cultivated over an area of 3.43 million hectare with an annual production of 4.61 million tones and productivity of 1344 kg/ha (Agricultural Statistics at a Glance, 2019). It is grown during 2018-19 in an area of about 168477 ha with a production of 196444 thousand tones in Sagar district of M.P., however its average productivity is 1170 kg/ha (DES, 2020). Due to unavailability of quality seed, use of old variety, imbalanced use of fertilizers and wilt disease are responsible for low yield of chickpea. The present reasons regarding low yield of chickpea are in agreement with the findings of Singh *et al.* (2020).

Plan Implement and Support

KVK Sagar tries to make the farmers aware regarding scientific cultivation of chickpea production through high yielding variety, seed treatment with fungicide carboxin + thiram @ 2gm/kg of seed, seed inoculation with PSB, Rhizobium and Trichoderma, soil treatment with Trichoderma @ 2.5 kg/ha, fertilizer application on STCR based and IPM practices.

Output

KVK Sagar introduced high yielding wilt resistant variety JG-63 in 225 farmers field in a 90 ha area (30 ha in each year) from 2015-16 to 2017-18 in different villages of Jaisinagar, Rahli and Rahatgarh block of Sagar and continuously focused through demonstrations, trainings and field days to popularization in the district. ON the basis of pooled data of three years the average yield was 15.37 q/ha as compare to existing practices 9.92 q/ha and thereby recorded yield enhancement 55.27 percent more over farmers practices. The economic analysis revealed that the average gross returns Rs. 71204/ha was recorded under trials as compared to farmers practices Rs. 47627.67/ha and net returns of Rs. 56937.37/ha recorded with the use of full package and practices as compare to farmers practices i.e., Rs. 33627.67/ha. The overall result shows that the chickpea variety JG-63 have more potential to produce higher yield.

Outcome

KVK Sagar conducted 225 demonstrations from 2015-16 to 2017-18 in 10 villages in an area of 90 ha at 0.4 ha in each farmer's field using high yielding wilt resistant variety JG-63 with STCR based fertilizer application and full package & practices. The outcome of this demonstration motivated the farming communities to replace the old varieties. Farmers were fully convinced with HYV of chickpea and use in their cultivation practices and use of Trichoderma as soil treatment and balanced use of fertilizer for higher yield.

Impact

Innovative farmers started seed production at their own level. Yield increased up to 55 percent and technology spread in neighboring villages. The successful farmers were Shri Munna Lal Choubey Vill.- Channua Block Rahli in 2015-16, Shri Kripal Singh Vill- Dhagraniya Block- Rahatgarh in 2016-17 and Smt Manorama Thakur Vill.- Semragopalman Block -Jaisinagar got highest yield and fully convinced with this technology.

Table- Yield and economic performance of chickpea on three-year pooled data.

Year	No. of De mo.	Area (ha)	Average Yield (q/ha)		% increase	Cost of Cultivation (Rs)		Gross Returns (Rs)		Net returns (Rs)		B:C ratio	
			Dem o.	FP		Demo.	FP	Dem o.	FP	Demo.	FP	Dem o.	FP
2015-16	75	30	12.5	8.72	43.34	14000	11000	49800	34880	35800	23880	3.56	3.17
2016-17	75	30	14.44	8.53	69.28	13000	13000	79420	46915	66420	35415	6.11	4.08
2017-18	75	30	19.18	12.52	53.19	15800	13500	84392	55088	68592	41588	5.34	4.08
Total/ Average	225	90	15.37	9.92	55.27	14267	12000	71204	45628	56937	33628	5.00	3.78

Demo.: Demonstration; FP: Farmers' practice

A view of chickpea demonstrations and discussion of farmers with KVK Scientist's





References

- Agricultural Statistics at a Glance (2019). Directorate of Economics and Statistics, Government of India, Ministry of Agriculture, Department of Agriculture and Cooperation, New Delhi, 2019.
- DES. Directorate of Economics and Statistics (2020), Department of Agriculture Cooperation and Welfare, Ministry of Agriculture, Government of India, New Delhi, 2020.
- Singh RP, Singh, AK, Upadhayay, SP and Singh RK (2020). An approach for site-specific assessment of pod borer management in chickpea. *Journal of Entomology and Zoology Studies*, 8 (2): 726-728.

