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Evaluation of Profitable Alternate Crops for Chickpea (*Cicer arietinum* L.)

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ABSTRACT

A field experiment was undertaken at Regional Agriculture Research Station, Nandyal, Andhra Pradesh during rabi 2017-18 on vertisols to evaluate alternate crops to chickpea (Cicer arietinum L.). The present investigation was carried out with nine alternate crops to chickpea (jowar, sunflower, foxtail millet, blackgram, mustard, soyabean, safflower, greengram and coriander) sown at recommended plant geometry in randomized block design and replicated thrice. Among the different crops tried alternative to chickpea, green gram (19.93 q/ha), blackgram (16.58 q/ha), sunflower (15.10 q/ha), safflower (14.26 q/ha) and jowar (13.84 q/ha) recorded higher chickpea equivalent yield when compared to chickpea (10.49 q/ha).

Key words: *Chickpea, Alternate crops, Chickpea equivalent yield, Economics.*

INTRODUCTION

Chickpea (*Cicer arietinum* L.) is an important pulse legume cultivated and consumed across the world. India is the largest producer and consumer of chickpea in the world. It is the major pulse crops of the subcontinent grown on an area of about 9.54 mha with a production of 9.08 mt and productivity of 951 kg ha^{-11}. Gopalappa[3], based on his study in Andhra Pradesh, reported that there was scope to increase income through crop diversification. Earlier studies have reported that there are certain constraints in pulses production in India. These constraints include: preference to other more remunerative crops on fertile parcel of lands by farmers, not providing irrigation by farmers at critical stages in case of moisture stress, high production and price risk, inadequate marketing and procurement support, etc.[5,4]. In view of shrinking agricultural land and operational holdings which are attributable to the expansion of urban areas and, high growth rate of population, along with changes in consumer food habits, the farmers are straining to include or substitute additional high value crops in to the cropping system[6]. Alternative crops in the rotation can help reduce disease and insect problems, as well as diversify a farming operation to spread income out more evenly during the year.

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MATERIAL AND METHODS

A field experiment was undertaken at Regional Agriculture Research Station, Nandyal, Andhra Pradesh during rabi 2017-18 on vertisols to evaluate alternate crops to chickpea (*Cicer arietinum* L.).

The present investigation was carried out with nine alternate crops to chickpea (jowar, sunflower, foxtail millet, blackgram, mustard, soyabean, safflower, greengram and coriander) sown at recommended plant geometry in randomized block design and replicated thrice. All the crops were sown on 21-10-17. A meager amount of 124.8 mm rainfall was received in 7 rainy days prior to sowing in October. Only 3.2 mm rainfall was received on 6-11-17. All the recommended package of practices was adopted to raise the crop. Yield comparison among crops was done by chickpea equivalent yield outcome from other crop yield into chickpea yield by prevailing market price of individual crops. Chickpea equivalent yield (CEY) was computed as yield of individual crop multiplied by market price of that crop divided by market price of chickpea[7]. The cost and return analysis i.e total gross return, total variable cost, net return and marginal benefit cost ratio of existing and alternate crops was done from prevailing market price of the produces during the crop period. The results were used to compute net income, benefit cost ratio and chickpea equivalent yield of crops. The data were recorded on soil moisture and chickpea equivalent yield subjected to statistical analysis by adopting Fisher's method of analysis of variance as outlined by Gomez and Gomez[2]. The level of significance used in 'F' test was at 5 per cent.

RESULTS AND DISCUSSION

Significantly no change in soil moisture was observed at 30 DAS and 60 DAS (Table 1). At 30 DAS soil moisture ranges from 20.5 to 25.3 per cent whereas at 60 DAS it ranges from 14.1 to 18.2 per cent. Among the different crops tried alternative to chickpea, green gram (19.93 q/ha), blackgram (16.58 q/ha), sunflower (15.10 q/ha), safflower (14.26 q/ha) and jowar (13.84 q/ha) recorded higher chickpea grain equivalent yield when compared to chickpea (10.49 q/ha) (Table 1 and Fig 1). Higher net returns and benefit cost ratio was reported in green gram (Rs 67,703/ha and 4.39), blackgram (Rs 52,956/ha and 3.65), safflower (Rs 42,757/ha and 3.14), sunflower (Rs 41,461/ha and 2.66), and jowar (Rs 35,877/ha and 2.44) when compared to chickpea (Rs 16,166/ha and 1.54) due to variation in market price and cost of cultivation. The extremely wide suggestions of a particular crop / intercrop to be grown under rainfed conditions for maximum profitability owe to a range of fluctuations in the productivity of the component crops governed by variability in rainfall distribution pattern, choice of varieties and their inherent competitive or complementary influence, the variable cost of cultivation from place to place and fluctuating market prices among the commodities. From cost and return data showed superiority of greengram, blackgram, sunflower, safflower and jowar over chickpea.

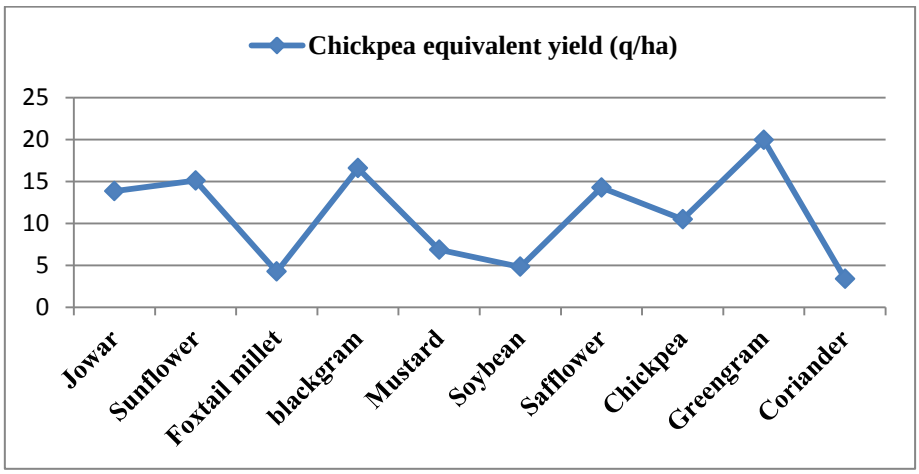

Fig. 1: Chickpea equivalent yield as influenced by different alternate crops

Table 1: Soil moisture and chickpea equivalent yield as influenced by different alternate crops

Treatments	Soil moisture (%)		Grain yield (q/ha)	Rate (Rs) per quintal	Chickpea equivalent yield (q/ha)	Gross returns (Rs/ha)	Net returns (Rs/ha)	Benefit cost ratio
	30 DAS	60 DAS						
Jowar	21.2	15.2	35.81	1700	13.84	60877	35877	2.44
Sunflower	22.1	15.7	16.21	4100	15.10	66461	41461	2.66
Foxtail millet	24.0	16.4	9.34	2000	4.25	18687	-1313	0.93
Blackgram	24.6	16.5	13.51	5400	16.58	72956	52956	3.65
Mustard	25.0	17.2	7.54	4000	6.86	30167	10167	1.51
Soybean	25.3	18.2	6.84	3100	4.82	21214	1214	1.06
Safflower	20.5	14.1	15.31	4100	14.26	62757	42757	3.14
Chickpea	20.9	14.8	10.49	4400	10.49	46166	16166	1.54
Greengram	22.3	15.9	15.95	5500	19.93	87703	67703	4.39
Coriander	22.4	15.6	2.48	6000	3.39	14897	-5103	0.74
S.Em±	1.41	1.30			64			
CD (P=0.05)	NS	NS			191			

CONCLUSION

Greengram, blackgram, safflower, sunflower and jowar could be alternate crops to chickpea for higher net monitory returns during the situation of dwindling market price or any other warrant situation under rainfed condition in vertisols of Andhra Pradesh.

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