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Research Article

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Demonstration of Chickpea Variety NBeG 49 in Rainfed Areas of Prakasam Dist

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ABSTRACT

A new variety of chickpea NBeG 49, released by ANGRAU in the year 2017 was introduced in the district by KVK Darsi, which can tolerate wilt and moisture stredd. KVK, Darsi, demonstrated the performance of NBeG 49 over JG 11 in FLDs in 4.0 ha each from 2016-17 to 2018-19. NBeG 49 has shown advantage over JG 11 in terms of yield attributes, yield and wilt tolerance. Yield of NBeG 49 was 13.4 q ha^{-1} with net returns and C: B ratio of 29966.7 Rs ha^{-1} and 1:1.8, respectively. Whereas, JG 11 recorded yield of 10.6 q ha^{-1} with net returns and C: B ratio of 14033.3 Rs ha^{-1} and 1:1.4, respectively.

Keywords: *Chickpea, Yield, Wilt, 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 (Basha et al., 2018). Chickpea is a major *Rabi* crop in Andhra Pradesh. It is grown in an area of 4.0-5.0 lakh ha. In prakasam district chickpea is the major *Rabi* crop. During 2018-19 chickpea was grown in an area of 109222 with production and productivity of 74489 MT and 682 kg/ha, respectively. Locally farmers grow JG 11 variety of chickpea which is susceptible to wilt and moisture stress. As prakasam district is drought prone area crops are suffering with terminal moisture stress which leads to reduction in yields and returns. During 2018-19 58% deficit rainfall was observed. Drought is deleterious for plant growth, yield and mineral nutrition. (Garg et al., 2004, Samarah et al., 2004) and is one of the largest limiting factors in agriculture (Reddy et al., 2004). Seed yield is most affected by drought occurring in the flowering and early pod development stages. Thus, there is an urgent need to introduce the variety which will tolerate wilt and gives higher yields and suitable for prakasam district.

MATERIALS AND METHODS

1. Place of study: Pannuru, Marripudi mandal (2016-17), Bodhanampadu, Kurichedu mandal (2017-18), NSP agraharam (Kanigiri mandal) and Kurichedu (Kurichedu mandal) (2018-19).

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2. Area: 4.0 ha each year

3. No. of farmers: 10 farmers each year

4. Design: Cluster Front Line Demonstrations in farmers fields

5. Treatments:

T1:

NBeG 49

Seed treatment with rhizobium @ 10 ml/kg before sowing

Spraying of azadirachtin 300 ppm @ 1.0 l/ac at flower bud initiation stage

Erection of pheromone traps for monitoring @ 4/ac

Spraying of potassium nitrate-2.0 kg/ac during moisture stress conditions

Spraying of chlorantraniliprole 18.5% SC @ 40 ml/ac – need based

T2: JG 11

6. Data recorded:

1. Plant height
2. Number of branches/plant
3. Number of pods/plant
4. Number of seeds/pod
5. 100 seed weight
5. Yield

Economics was calculated as shown below:

Cost of cultivation (Rs. **ha^{-1})**

Cost of cultivation (₹ ha^{-1}) was calculated considering the prevailing charges of agricultural operations and market price of inputs involved.

Gross returns (Rs. **ha^{-1})**

Gross returns were obtained by converting the harvest into monetary terms at the prevailing market rate during the course of studies.

Gross return (₹ ha^{-1}) = (Seed yield x price)

Net returns (Rs.ha^{-1})

Net returns were obtained by deducting cost of cultivation from gross return.

Net returns (₹ ha^{-1}) = Gross return (₹ ha^{-1}) - Cost of cultivation (₹ ha^{-1})

Cost: benefit ratio

The benefit: cost ratio was calculated by dividing gross returns by cost of cultivation.

$$\text{Cost: benefit ratio} = \frac{\text{Gross returns (₹ ha}^{-1}\text{)}}{\text{cost of cultivation (₹ ha}^{-1}\text{)}}$$

Table 1: Salient features of NBeG 49 and JG 11

Variety	Duration (days)	Yield (q ha^{-1})	Characteristics
NBeG 49	90-105	17.5-20 (rainfed) 25-30 (one or two irrigations)	Tolerant to wilt. Seeds are very attractive
JG 11	90-95	17.5-20 (rainfed) 25-32.5 (one or two irrigations)	Tolerant to fusarium wilt

RESULTS AND DISCUSSION

Yield attributes: Perusal of the data presented in the table 2 revealed that in demo plot, yield attributes were significantly higher than in control (farmers practice) during all the years. Mean higher number of branches/plant were recorded in NBeG 49 with 14.5. Whereas, check variety recorded 14.1 mean number of branches/plant. On an average 35.2 pods/plant were obtained in NBeG 49. Whereas, in JG 11 41 it was 30.0. Number of seeds/pod was 1-2 on mean basis in both varieties. Mean 100 seed weight was higher in NBeG 49 with 25.1 g. In check, mean 100 seed weight was 22.2 g.

Table 2: Yield attributes of improved variety NBEG 49 and check variety JG 11

Year	Plant height (cm)		No. of branches/plant		No. of pods/plant		No. of seeds/pod		100 seed weight (g)	
	Demo	Check	Demo	Check	Demo	Check	Demo	Check	Demo	Check
2016-17	31.6	33.6	14.0	13.2	38.0	32.5	1-2	1-2	25.7	22.9
2017-18	33.5	35.2	16.3	15.0	37.5	34.0	1-2	1-2	27.8	23.9
2018-19	34.0	34.3	13.2	14.2	30.0	23.4	1-2	1-2	21.9	19.7
Mean	33.0	34.4	14.5	14.1	35.2	30.0	1-2	1-2	25.1	23.5

Yield:

Perusal of the data presented in the table 3 and fig.1 revealed that in demo plot, yield was found to be significantly higher than in control (farmers practice) during all the years (2016-17 to 2018-19). NBEG 49 recorded mean yield of 13.4 q ha^{-1}. Whereas, JG 11 recorded mean yield of 10.6 q ha^{-1}. The higher yield resulted due to more number of branches, pods per plant and test weight as it is one of the important yields attributing character. These results are supported with the findings of Rama Rao & Rajamani (2018). Per cent increase in yield over control was 42.9, 22.9 and 12.5 during 2016-17, 2017-18 and 2018-19, respectively with mean of 26.1.

Economics:

Perusal of the data presented in the table 3 revealed that gross returns, net returns and C: B ratio were substantially higher in demo plot (NBeG 49) compared to farmers practice-check variety (JG 11). Mean gross returns of NBeG 49 were 67166.7 Rs ha^{-1}. Whereas, in check plot, mean gross returns were 52833.3 Rs ha^{-1}. Mean net returns of NBeG 49 were 29966.7 Rs ha^{-1}. Mean C: B ratio of NBeG 49 was 1:1.8. Mean net returns in control plot were 14033.3 Rs ha^{-1} and C: B ratio was 1:1.4. Higher net returns and C: B ration in NBeG 49 was due to higher grain yields.

Table 3: Yield and economics of improved variety NBeG 49 and check variety JG 11

Year	Yield (q ha^{-1})		Per cent increase in yield over check	Cost of cultivation (Rs ha^{-1})		Gross returns (Rs ha^{-1})		Net returns (Rs ha^{-1})		C: B ratio	
	Demo	Check		Demo	Check	Demo	Check	Demo	Check	Demo	Check
2016-17	15.0	10.5	42.9	37000	38500	75000	52500	38000	14000	1:2.0	1:1.4
2017-18	17.2	14.0	22.9	37100	38900	86000	70000	48900	31100	1:2.3	1:1.8
2018-19	8.1	7.2	12.5	37500	39000	40500	36000	3000	-3000	1:1.1	1:0.9
Mean	**13.4**	**10.6**	**26.1**	**37200**	**38800**	**67166.7**	**52833.3**	**29966.7**	**14033.3**	**1:1.8**	**1:1.4**

*During 2018-19 failure of North East monsoon was occurred with 61.2 per cent deficit rainfall.

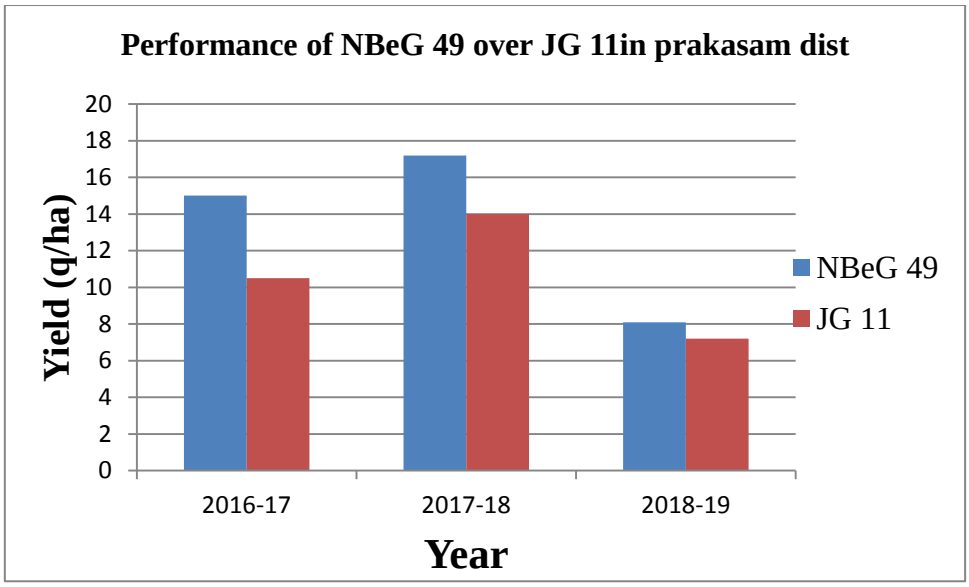

Fig. 1: Performance of NBeG 49 over JG 11in prakasam dist

JG 11 seed

NBeG 49 seed

CONCLUSION

NBeG 49 performed well even under moisture stress conditions and gave higher yield, net returns and C: B ratio under rainfed conditions over JG 11.

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