

## Evaluating the Performance of Drip Irrigation in Redgram

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**ABSTRACT:** Modern agriculture should ensure the required quantity of water with optimal rates of nutrients throughout the growth cycle in the most efficient manner and without degrading soil and water resources. This can be achieved through adoption of a drip fertigation system with higher water and fertilizer use efficiency. The main aim of this study was to evaluate the performance of drip irrigation in red gram. The field experiment was conducted during three consecutive years 2016, 2017 & 2018 during Kharif at three locations in farmer's fields which includes Dasarigudem, Elikatte, and Ramannapet villages of erstwhile Nalgonda district. In this on farm trials compared the performance of redgram under drip irrigation with conventional farmer practices. The average yield (990 kg Ac<sup>-1</sup>, 1050 kg Ac<sup>-1</sup>, 1816 kg Ac<sup>-1</sup>), gross returns (75240 Rs. Ac<sup>-1</sup>, 53025 Rs. Ac<sup>-1</sup>, 78451 Rs. Ac<sup>-1</sup>), net returns (62240 Rs. Ac<sup>-1</sup>, 39825 Rs. Ac<sup>-1</sup>, 58611 Rs. Ac<sup>-1</sup>), B:C ratio (5.78, 4.02, 3.95) in all three locations and all three seasons respectively recorded the highest in drip irrigation system than the farmers practice.

**Keywords:** Drip irrigation, Redgram, average yield, conventional farmer, Nalgonda.

### INTRODUCTION

Pigeon pea (*Cajanus cajan* L.) commonly known as red gram, tur or arhar is the fifth prominent legume crop in the world and important crop among pulses which ranks second after chickpea in India in terms of area and production. India has virtual monopoly in pigeon pea production accounting to 90% of world's production. In India area under redgram reported during 2020-21 was 48.24 lakh ha as against 45.45 lakh ha during the same period in 2019-20. In India, major redgram producing states are Karnataka 12.80 lakh ha, Maharashtra 12.46 lakh ha, Telangana 4.28 lakh ha, Madhya Pradesh 4.12 lakh ha and Uttar Pradesh 3.53 lakh ha. According to Government 3<sup>rd</sup> advance estimates, all India redgram production in 2020-21 is at 4.14 million tonnes. In Telangana major redgram growing districts are Vikarabad 41898 ha, Narayanpet 34560 ha, Sangareddy 26831 ha, Adilabad 16228 ha, Mahabubnagar 6659 ha, Yadadri 6070 ha and Rangareddy 2766 ha. According to State Government 3<sup>rd</sup> advance estimates, redgram production in 2020-21 is at 3.33 lakh tonnes with a productivity of 776 Kg/ha (314 Kg/acre) ([www.agri.telangana.gov.in](http://www.agri.telangana.gov.in)). In spite of importance of pulses in our daily diet and soil rejuvenation characters of pulse crop agricultural production, the production of pulses has not yet been increased proportionately as compared to increase in the cereal production. The average national productivity of pulses, at nearly 650 kg ha<sup>-1</sup> is disappointingly low when the potential

productivity is around 1.5 to 3 ton ha<sup>-1</sup> in India Barik. The factors responsible for low productivity are unfavorable weather conditions, non-availability of quality seeds, improper sowing, inadequate intercultural operation, insufficient irrigation and inadequate use of fertilizers and plant protection chemicals, post-harvest techniques and socio economic constraints. As water is a limiting and costly input, its judicious application needs special attention to maximizing pigeon pea yield per unit quantity of applied water. The introduction of micro-irrigation systems like drip irrigation can help to bring more area under irrigation and improve the crop yield substantially (Sathyamoorthy *et al.*, 2022).

### MATERIAL AND METHODS

The experiment was conducted during three consecutive years 2016, 2017 & 2018 during Kharif at three locations in farmer's fields which includes Dasarigudem, Elikatte, and Ramannapet villages of erstwhile Nalgonda district. In field experiment compared the performance of redgram under drip irrigation with conventional farmer practices. In field experiment irrigation has given through the drip. The recommended dose of fertilizers (RDF) N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O @ 50-25-00 kg ha<sup>-1</sup> entire recommended dose of nitrogen and phosphorus was applied in the form of urea and single super phosphate were manually applied uniformly before sowing of pigeon pea crop in all the three years.

## RESULTS AND DISCUSSION

**Comparative yield performance of drip irrigation redgram with conventional practices.** In all the three locations of Nalgonda district drip irrigated field was recorded higher yield compared to the respective locations of farmers practice. In 2015-2016 average yield was about 53.03% higher in drip irrigated field compared to farmers practice. In 2016-2017 average yield was about 48.57% higher in drip irrigated field compared to farmers practice. In 2017-2018 average yield was about 46.80% higher in drip irrigated field compared to farmer practice. Similar findings were also reported by Jadhav *et al.* (2018); Gajera and Ahlawat (2006); Ramulu *et al.* (2006).

**Economic performance of drip irrigated redgram with conventional practices.** In 2015-2016 cost of cultivation was higher in drip irrigated field (Rs. 13,000 per Ac) than the farmers practice (Rs. 11,000 per Ac) and also gross returns, net returns and B:C ratio

recorded higher in drip irrigated field (Rs. 75,240 per Ac, Rs. 62,240 per Ac, 5.78) than the farmers practice (Rs. 39,900 per Ac, Rs. 28,900 per Ac, 3.6). In 2016-2017 cost of cultivation was higher in drip irrigated field (Rs. 13,200 per Ac) than the farmers practice (Rs. 11,100 per Ac) and also gross returns, net returns and B:C ratio recorded higher in drip irrigated field (Rs. 53,025 per Ac, Rs. 39,825 per Ac, 4.02) than the farmers practice (Rs. 25,755 per Ac, Rs. 14,655 per Ac, 2.32). In 2017-2018 cost of cultivation was higher in drip irrigated field (Rs. 19,840 per Ac) than the farmers practice (Rs. 17,400 per Ac) and also gross returns, net returns and B:C ratio recorded higher in drip irrigated field (Rs. 78,451.2 per Ac, Rs. 58,611 per Ac, 3.95) than the farmers practice (Rs. 36,720 per Ac, Rs. 19,230 per Ac, 2.11). Similar findings were also reported by Harcini *et al.* (2020); Kakade *et al.* (2017); Pramod *et al.* (2010).

**Table 1: Comparative yield and economic performance of drip irrigated redgram with conventional practices.**

Season	Kharif 2015-16		Kharif 16-17		Kharif 17-18	
	Trial Yield (kg/Ac.)	FP Yield (kg/Ac.)	Trial Yield (kg/Ac.)	FP Yield (kg/Ac.)	Trial Yield (kg/Ac.)	FP Yield (kg/Ac.)
Location 01	1050	615	989	525	1832	920
Location 02	925	440	1084	486	1766	785
Location 03	995	520	1077	519	1850	845
<b>Average Yield</b>	<b>990</b>	<b>525</b>	<b>1050</b>	<b>510</b>	<b>1816</b>	<b>850</b>
Cost of cultivation	13000	11000	13200	11100	19,840	17400
Gross returns	75240	39900	53025	25755	78,451.2	36,720
Net returns	62240	28900	39825	14655	58611.00	19320.00
<b>BC Ratio</b>	<b>5.78:1</b>	<b>3.6:1</b>	<b>4.02:1</b>	<b>2.32:1</b>	<b>3.95:1</b>	<b>2.11:1</b>
Price (Rs/qlt)	7600/qlt		5050/qlt		4320/qlt	

## CONCLUSION

In this farmers field study at erstwhile Nalgonda district in three locations on drip irrigation in redgram concluded that the trail field *i.e.*, the recommended practices have higher yield, cost of cultivation, gross returns, net returns and B: C ratio than the farmer practices.

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**Conflict of Interest.** None.

## REFERENCES

- Department of Agriculture (2021). <https://agri.telangana.gov.in/>.
- Gajera, M. S. and Ahlawat, R. P. S. (2006). Optimization of irrigation and evaluation of consumptive water use efficiency for rabi pigeon pea (*Cajanus cajan* L) Millsp). *Legume Research*, 29(2), 140-142.
- Harcini, K. S., Gurusamy, A., Subramanian, E. and Amudha, R. (2020). Effect of drip fertigation levels and plant growth regulators on growth and yield of transplanted redgram (*Cajanus cajan*). *International Journal of Chemical Studies*, 8(6), 2181-2183.
- Jadhav, K. T., Chavan, A. S., Raskar, S. K. and Lahase, R. U. (2018). Influence of spacing and drip irrigation on

yield attributes, productivity and economics of pigeonpea (*Cajanus cajan* L.). *International Journal of Current Microbiology and Applied Sciences*, 7(2), 2319-7706.

- Kakade, S. U., Mohurle, L. A., Deshmukh, J. P. and Chorey, A. B. (2017). Effect of drip fertigation on growth, yield and economics of pigeonpea. *International Journal of Pure Applied Bioscience*, 5(5), 1092-1098.
- Pramod, G., Pujari, B. T., Basavaraja, M. K., Vijay, M. and Venkate, G. (2010). Yield, yield parameters and economics of pigeonpea (*Cajanus cajan* L.) Millsp) as influenced by genotypes, planting geometry and protective irrigation. *International Journal of Agricultural Sciences*, 6(2), 422-425.
- Ramulu, V., Suresh, K. and Balaguravaiah, D. (2006). Effect of irrigation Schedules and sowing methods on rabi red gram (*Cajanus cajan*) in NSP left Canal Common of A.P. *Journal of Water Management*, 14(2), 125-127.
- Sathyamoorthy, N. K., Krishnasamy, S., Swaminathan, C., Prabhakaran, J., Ramanathan, S. P., Anbarasu, M., Senthilraja and Kand Guhan, V. (2022). Evaluating the Irrigation Regimes and Fertigation Schedule of Red Gram (Co (Rg)-7) under Drip Irrigation System. *International Journal of Environment and Climate Change*, 12(10), 1330-1336.

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