



E-ISSN: 2278-4136

P-ISSN: 2349-8234

[www.phytojournal.com](http://www.phytojournal.com)

JPP 2020; 9(5): 211-212

Received: 01-07-2020

Accepted: 03-08-2020

**Dr. G Ramesh**Scientist, Crop Production,  
DAATTC, Darsi, Andhra  
Pradesh, India**Dr. Ch Varapasada Rao**Senior Scientist, Plant  
Protection, DAATTC, Darsi,  
Darsi, Andhra Pradesh, India**Dr. GMV Prasada Rao**Programme Coordinator, Krishi  
Vigyan Kendra, Darsi, Andhra  
Pradesh, India

## Response of chickpea to drip irrigation under clay loam soils of Prakasam district of Andhra Pradesh

**Dr. G Ramesh, Dr. Ch Varapasada Rao and Dr. GMV Prasada Rao**

**Abstract**

An on-farm demonstration was conducted during *rabi* 2017-18 and 2018-19 at Medaramitla of Korisapadu mandal and Chandaluru of J.Pangaluru mandal to study the effect of drip irrigation on growth and yield of chickpea in medium and deep black soils of Prakasam district of Andhra Pradesh. The test treatments were drip irrigation at 30DAS and 50DAS in contrast to farmers practice (rain fed) The supplemental irrigation with drip at 30DAS and 50DAS recorded higher seed yield (2312 kg ha<sup>-1</sup>) by 46.14 per cent compared to farmers practice (1582 kg ha<sup>-1</sup>). In improved technology increased yields at both villages compared to farmers practice. Irrigation with drip system recorded higher net returns (Rs.53842) and B: C ratio (1:2.24) compared to farmers practice in both villages.

**Keywords:** Drip irrigation, chickpea, yield and economics

**Introduction**

Chickpea, being a major *rabi* pulse crop of India, occupies 31 per cent of total area under pulses contributing to about 37.9 per cent of total pulse production in 2016-17. Chickpea is cultivated in an area of 9.58 million hectares in India with an annual production of 9.33 million tonnes as against the world area and production of 13.9 million ha and 13.73 million tonnes, respectively (2016-17). Average productivity of chickpea in India is 973 kg ha<sup>-1</sup>, and contributes to 25.72 per cent of chickpea production of the world. In Andhra Pradesh, it is grown in an area of 4.40 lakh hectares producing of 4.2 lakh tones with a productivity of 1053 kg ha<sup>-1</sup> (Directorate of Economics and statistics, 2016-17).

The reason for low productivity of chickpea in Prakasam district may be due to lack of moisture during flowering and pod development stage, balance nutrition, weed management etc. Among various factors affecting, proper scheduling of irrigation is the key factor for enhancing productivity of crop, particularly through drip because water is a scare commodity, is key natural resource for any crop production particularly in arid and semi arid regions, where availability of irrigation water poses a serious threat to the sustainability of crop production therefore it is considered as liquid gold. In drip irrigation method, water is applied to the soil from the dripper without any pressure or at extremely low pressure. It is well suited to areas of acute water shortage. Deep percolation, surface runoff and evaporation losses can be minimized. As the water in the soil is maintained at near field capacity all through, plants take water with ease and never subjected to moisture stress.

Recently high yielding varieties responsive to higher levels of irrigation and nutrients are evolved and therefore, better irrigation and nutrient management has prime importance in chickpea production. Drip irrigation at critical stages offer great promise for exploiting the yield potential of chickpea. Keeping this in view, the on-farm demonstration was planned to study the judicious use of irrigation water through drip in chickpea.

**Material and Methods**

A survey was conducted on chickpea cultivation in different mandals of Praksam district. Based on the information collected, the major constraints identified were moisture stress during vegetative phase i.e., 30 days after sowing (DAS) and pod development stage i.e., 50 days after sowing. Because of these constraints farmers are getting low yields. Based on these constraints, on farm demonstration was conducted during *rabi*, 2017-18 and 2018-19 in two respective villages viz., Medaramitla of Korisapadu mandal (V1) and Chandaluru of J.Pangaluru (V2) in Prakasam District. On-farm demonstration was conducted in an area of 0.4 ha each. The gram cv. JG-11 was sown at 30 x 10 cm spacing. The drip irrigation system was laid out at lateral spacing of 90 cm with dripper spacing of 60 cm and operated at pressure of

**Corresponding Author:****Dr. G Ramesh**Scientist, Crop Production,  
DAATTC, Darsi, Andhra  
Pradesh, India

1.2 kg cm<sup>-2</sup> with 4 LPH discharge rate. The scheduling of irrigation was done at 30 DAS and 50 DAS. A common dose of 20 kg nitrogen and 50 kg P<sub>2</sub>O<sub>5</sub> ha<sup>-1</sup> were applied before sowing the crop. All the other package of practices were followed during the crop period as per recommendation made for the crop. The supplemental irrigation with drip was evaluated with farmer's practices. The soils of on farm demonstration plots were medium black soils and deep black soils respectively. The soils are low in nitrogen and high of phosphorous and potassium.

## Results and Discussion

Effect of drip irrigation on yield attributes and yield of chickpea was higher (Table-1). Crop irrigated at 30 DAS and 50 DAS recorded higher number of pods per plant (40.65). The minimum value of yield attributing characters were recorded when crop was under rainfed situation i.e farmers practice. Seed yield (2312 kg ha<sup>-1</sup>) of chickpea was recorded higher by drip irrigation at 30 DAS and 50 DAS (Table-1). In supplemental irrigation with drip system at branching (30DAS) and pod development stage (50DAS) recorded higher seed yield of 2375 and 2250 kg/ha compared to 1625 and 1550 kg/ha with farmers practice at Medaramitla of Korisapadu mandal (V1) and Chandaluru of J.Pangaluru (V2) in Prakasam District respectively. Per cent increase in chickpea seed under drip irrigation at 30 DAS and 50 DAS was to the tune of 46.15 and 45.16 % over to farmers practice at Medaramitla of Korisapadu mandal (V1) and Chandaluru of J.Pangaluru (V2) in Prakasam District, respectively. Muniratanam and Sangita (2006) [6] also reported that significant increase in seed yield of chickpea with one sprinkler irrigation at 30 DAS than the no irrigation. Dixit et al., (1993) [2] also reported similar results in chickpea and observed that chickpea produced higher yield under 0.8 and

0.6 IW/CPE ratio. Application of adequate amount of water in root zone as per need of crop during crop growth period ensure free flow of nutrients and improve plant growth, which ultimately reflected in yield improvement. Deolankar and Derad (1999) [3] reported significantly higher chickpea grain yield, saving of 51.33% water and higher WUE in drip method of irrigation over surface method of irrigation. Same results were also reported by Patel. et al., (2012) [7] in fennel that irrigating the fennel through drip at 0.8 IW/CPE ratio gave significantly higher seed and stover yields.

Net returns of Rs.55875 ha<sup>-1</sup> and Rs.51850 ha<sup>-1</sup> were recorded with drip irrigation at 30 DAS and 50 DAS compared to Rs.31875 ha<sup>-1</sup> and Rs. 26700 ha<sup>-1</sup> with farmers practice at Medaramitla of Korisapadu mandal and Chandaluru of J.Pangaluru mandal, respectively. Hasan and Sarkar (1999) [4] also reported that depending upon the rainfall and soil moisture condition, single time irrigation is sufficient to get additional net returns. Solanki. et al., (2012) [8] reported significantly higher gross returns and net returns in drip method of irrigation over surface method of irrigation.

The B:C ratio was 1:2.27 and 1:2.21 with drip irrigation compared to 1:1.87 and 1:1.69 with farmers practice at Medaramitla of Korisapadu mandal and Chandaluru of J.Pangaluru mandal, respectively. The introduction of drip irrigation at 30DAS and 50 DAS found to be most profitable practice in chickpea Mustafa et al., (2008) [5] reported that the highest seed yield (702 kg ha<sup>-1</sup>), net returns (Rs.7937 ha<sup>-1</sup>) and B: C ratio (2.65) was recorded when chickpea crop was irrigated at sowing, pod filling, branching and flowering.

## Conclusion

This study has shown that chickpea performed equally better with drip irrigation at 30 DAS and 50 DAS with regard to yield and economics than the farmers practice.

**Table 1:** Yield attributes, yield and economics of chickpea as influenced by drip irrigation

| Parameters                            | Drip irrigation at 30 DAS and 50 DAS |        |        | Farmers practice(Rainfed) |        |        |
|---------------------------------------|--------------------------------------|--------|--------|---------------------------|--------|--------|
|                                       | V1                                   | V2     | Mean   | V1                        | V2     | Mean   |
| No. of pods per pant                  | 42.5                                 | 38.8   | 40.65  | 34.4                      | 32.8   | 33.6   |
| Yield (kg/ha)                         | 2375                                 | 2250   | 2312   | 1625                      | 1550   | 1582   |
| Gross returns (Rs. ha <sup>-1</sup> ) | 99750                                | 94500  | 97104  | 68250                     | 65100  | 66675  |
| Net returns (Rs. ha <sup>-1</sup> )   | 55875                                | 51850  | 53842  | 31875                     | 26700  | 29288  |
| B:C ratio                             | 1:2.27                               | 1:2.21 | 1:2.24 | 1:1.87                    | 1:1.69 | 1:1.78 |

## References

1. Anonymous. All India area, production and yield of chickpea, 2016-17. Agricultural statistics at a glance. 2017a, 109-111.
2. Dixit JP, Pillai PVA, Namdeo KN. Response of chickpea (*Cicer arietinum*) to planting date and irrigation schedule. Indian J. of Agronomy. 1993; 38(1):121-123.
3. Deolankar KP, Derad SM. Effect of fertigation on growth, yield and water use efficiency of chickpea (*Cicer arietinum*). Indian J. of Agronomy. 1999; 44(3):581-583.
4. Hasan AA, Sarkar AA. Thai Journal Agricultural Sciences, 1999; 32(3):349-354.
5. Mustafa MN, Karuna Sagra G, Chandrika V, Reddy PM. Growth and yield of chickpea as influenced by irrigation and nutrient Management. Legume research. 2008; 31(3):221-223
6. Muniratanam P, Sangita MS. Influence of sowing dates and irrigation on growth and yield of chickpea. Legume Research. 2006; 32(3):209-211.
7. Patel SP, Patel SG, Amin AU, Patel PK. Feasibility of drip irrigation in fennel (*Foeniculum vulgare* Millor). GAU Research J. 2012; 37(1):10-12
8. Solanki RM, Sagarka BM, Dabhi MA, Gholi BS. Response of chickpea to drip irrigation and integrated nutrient management under saurashtra Region of Gujarat. Agriculture: Towards a New paradigm of sustainability, 2012, 187-19.