Plant Archives Vol. 25, Supplement 1, 2025 pp. 2588-2590 e-ISSN:2581-6063 (online), ISSN:0972-5210

Plant Archives

Journal homepage: http://www.plantarchives.org
DOI Url : https://doi.org/10.51470/PLANTARCHIVES.2025.v25.supplement-1.354

IMPACT OF FRONTLINE DEMONSTRATIONS OF CHICKPEA (*CICER ARIETINUM* L.) IMPROVED VARIETY GJG-6 ON YIELD IN PORBANDAR DISTRICT OF GUJARAT INDIA

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(Date of Receiving : 03-10-2024; Date of Acceptance : 26-12-2024)

ABSTRACT

The study was conducted to assess the impact of frontline demonstrations on chickpea crop (variety GJG-6) in the Porbandar district of Gujarat state. Chickpea (*Cicer arietinum* L.) is a highly nutritious legume crop with high remuneration and widely appreciated as food being grown in whole *Ghed* area of the district. Frontline demonstrations of chickpea improved variety GJG-6 were conducted at 150 farmers' fields in the operational villages under cluster approach during the year 2021-22 to 2023-24. The farmers of both the demonstrated and local variety have been followed the improved package of practices of chickpea. The performance of new high yielding variety of chickpea (GJG-6) was assessed in terms of the yield comparing with the local varieties. The improved technologies recorded yields of 18.10, 15.05 and 19.11 q/ha during year 2021-22, 2022-23and 2023-24, respectively which was 12.07, 14.10 and 11.93 percent higher than the local variety. The overall increase in the yield was recorded 12.70 percent with the improved variety. The performance parameters *viz.,* technology gap, extension gap and technology index were also computed which were found to be 9.80 q/ha, 1.95 q/ha and 36.00 percent, respectively. The parameters indicated that the FLDs can be a successful tool to enhance the production and productivity of chickpea crop when adopted. It also improves technological knowledge of farmers on improved variety of chickpea and its cultural practices.
Keywords **:** front line demonstrations (FLDs), chickpea, GJG-6

Introduction

Pulses are good source of protein and commonly called the poor man's meat. It is a good source of protein (18-22%), carbohydrate (52-70%), fat (4-10%), minerals (calcium, phosphorus, iron) and vitamins (Singh *et al.*, 2014). Chickpeas form root nodules that support biological N fixation (BNF) and host symbiotic N-fixing bacteria. It returns a significant amount of residual nitrogen to the soil and adds organic matter, improving soil health and fertility (Unkovichand Pate, 2000). India's total pulse production in year 2022-23 was 27.81 million tonnes. Chickpea accounts for 13.63 million tonnes i.e., nearly 49 % of total production. Average productivity of chickpea in year 2020-21 was 11.92 q/ha (Anon., 2020). It is also one of the major pulses crops being cultivated during *Rabi* season in *Ghed* area the Porbandar district. Frontline demonstrations are essential components of agricultural extension programs, serving as practical platforms for showcasing improved varieties and agricultural technologies to farmers (Desai *et al.*, 2021). Krishi Vigyan Kendra, Junagadh Agricultural University, Porbandar has conducted one hundred fifty front line demonstrations (FLD's) on chickpea from 2021-22 to 2023-24 in the operational villages of Krishi Vigyan Kendra under cluster approach. The present study has been undertaken to exhibit the performance of new high yielding variety of chickpea (GJG-6) and compare the yield of demonstrated variety with the local one.

Material and Method

Krishi Vigyan Kendra, Porbandar of Gujarat state conducted frontline demonstrations on chickpea on farmers' field to assess its performance during *Rabi* seasons of the year 2021-22, 2022-23 and 2023-24 in

Nerana, Moddar, Trakhai, Mahiyari, Devda, Kadachha and Mander villages of Porbandar district. During these three years, FLDs were given in 60 hectares area to demonstrate improved variety of chickpea GJG-6. Before conducting FLDs a list of farmers was prepared from group meeting and specific skill training was imparted to the selected farmers regarding different improved aspect of crop cultivation. Each demonstration of 0.4ha (1 acre) area, comprised of improved variety GJG-6, proper tillage, proper seed rate, line sowing, proper fertilization, seed treatment, conduct intercultural operation, weed management and plant protection measures. In the demonstration one control plot was also kept in which the farmers practices were being followed. The sowing was done during mid of October to November under conservative soil moisture conditions and harvested during last fortnight of March. The yield data as an output were collected from both demonstrated plot as well as farmers' practices. In order to assess the impact of FLDs, the performance parameters, extension gap, technology gap and technology index were worked out (Samui *et al.*, 2000) using following equations:

Technology gap

= Pi (Potential yield) – Di (Demonstration yield)

Extension gap

= Di (Demonstration yield) – Fi (Farmers Yield)

Technology index (%)

= (Technology gap / Potential yield) × 100

Results and Discussion

Yield Performance

The yield data was presented in Table-1 revealed that the GJG-6 variety of chickpea performed better during evaluation period as compare to local variety adopted by farmers. The GJG-6 variety recorded 18.10q/ha yields in the year of 2021-22 and 15.05 q/ha yields in the year of 2022-23 while in the year 2023-24, it was recorded 19.11q/ha. The average yield of three years was recorded 17.42q/ha as compared to farmers' practice (15.47 q/ha). The percent increase in yield was found to be 12.07, 14.10 and 11.93during the year 2021-22, 2022-23 and 2023-24 respectively (Table-1). Similar yield enhancement in different crops in frontline demonstration has been documented by Savaliya *et al.* (2024), Prajapati *et al.* (2019), Undhad *et al*. (2019), Raj *et al.* (2013) and Poonia and Pithia (2011) in the FLDs. It is evident from the results that the yield of improved variety along with package of practices was found better than the farmers' adopted verities under same environmental conditions. Farmers were motivated by results and performance of the demonstrated variety under FLDs and it is anticipated that they would adopt the improved variety along with the package of practices in future chickpea cultivation.

Technology gap

Technological gap has been defined as the proportion of gap in the adoption of practices recommended and it is expressed in percentage. Here, the technology gap shows the difference between demonstration yield and potential yield. The technology gap was recorded 9.12, 12.17 and 8.11 q/ha for the year 2021-22, 2022-23 and 2023-24, respectively. These were somewhat higher may be due to conducting demonstrations in non-irrigated conditions. The technology gap may also be attributed to the dissimilarity in the soil fertility status and weather conditions (Mitra and Samajdar, 2010).

Extension gap

The extension gap measured from the difference between demonstration variety yield and Local variety yield. The extension gap was recorded 1.95 q/ha, 1.86 and 2.03 in the year 2021-22, 2022-23 and 2023-24 respectively. This emphasized the need to educate the farmers through various means for the adoption of improved agricultural production technologies to reverse this trend of wide extension gap. More and more use of latest production technologies with high yielding variety will subsequently change this alarming trend of galloping extension gap. The new technologies will eventually lead to the farmers to discontinue the old technology and to adopt new technology. This finding is found in corroboration with the findings of Ali and Singh (2021) in green gram and Hiremath and Nagaraju (2010) in chilli.

Technology index

The technology index shows the feasibility of the technology at the farmers' field. The lower the value of technology index more is the feasibility. The average technology index was 36.00percent, while it was 33.50, 44.71 and 29.79 percent during 2021-22, 2022-23 and 2023-24 respectively. These findings correspond with the findings of Mokidue *et al.,* (2011) and Jeengar *et al.* (2006).

Conclusion

The study revealed a significant gap in chickpea yield between demonstration plots and farmers' local variety in Porbandar district, due to technology and extension gaps. The improved GJG 6 variety of chickpea showed a 12.70 percent increase in yield compared to the local variety. This indicates that the GJG-6 variety is effective in enhancing chickpea yield.

Table 1 : Performance of chickpea variety GJG-6

Crop season	Variety Demonstrated	No. of Demonstration	Area (ha)	Yield (q/ha)		% Increase in Yield	Technology gap (q/ha)	Extension gap (q/ha)	Technology index (%)
				GJG-6	Local Check				
Rabi-2021-22	GJG-6	50	20	18.10	16.15	12.07	9.12	1.95	33.50
Rabi-2022-23	GJG-6	50	20	15.05	13.19	14.10	12.17	1.86	44.71
Rabi-2023-24	GJG-6	50	20	19.11	17.08	11.93	8.11	2.03	29.79
Average				17.42	15.47	12.70	9.80	1.95	36.00

Plate 1 : Chickpea variety GJG-6 plant

Plate 2 : Chickpea variety GJG-6 field

Acknowledgement

I am honestly grateful to all the farmers on whose field frontline demonstration were conducted. The financial assistance provided by Indian Council for Agricultural Research, New Delhi and Junagadh Agricultural University; Junagadh is highly acknowledged. I am also grateful to all the staff members who helped me conduct successful frontline demonstrations.

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