J. Farm Sci., 36(3): (280-282) 2023

RESEARCH PAPER

Perception of farmers on varietal traits and constraints in adoption of improved variety (DGGV-2) of greengram

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(Received: November, 2022 ; Accepted: August, 2023)

DOI: 10.61475/JFS.2023.v36i3.10

Abstract: Greengram (*Vigna radiata*) is one of India's most valuable pulse crops. Greengram is a native of India and Central Asia and has grown in these regions since prehistoric times.India contributes more than 70% of world's greengram production, while its cultivation has spread to Africa and America relatively in the recent times. The present study was confined to Dharwad and Gadag districts of North Karnataka during the agriculture year 2021-22. The study aimed to assess the constraints faced by greengram growers in adoption of improved varieties of greengram. A multistage random sampling procedure was used for the selection of samples and data collected through a personal interview method using a pre-tested schedule. Collected data were analyzed by using suitable statistical tools like Garrett's ranking technique and descriptive statistics. The study revealed that the major production and constraints faced by the greengram growing farmers. Non-availability of improved variety seeds and scarcity of labour during peak periods were the major production constraints, whereas, high price fluctuations andlack of storage facilities in villages were major marketing constraints faced by greengram growing farmers in study area. All the adopted farmers opined that improved variety (DGGV-2) is ideal for mechanical harvesting and gave more grain yield than the existing varieties of greengram hence it plays amajor role in increasing the farm income of the greengram cultivars.

Key words: Constraints, Dharwad, Gadag, Greengram, Perceptions

Introduction

Greengram (*Vigna radiata*) is one of India's most valuable pulse crops. Greengram is a native of India and Central Asia and has grown in these regions since prehistoric times. Greengram is widely cultivated throughout Asia, including India, Pakistan, Bangladesh, Sri Lanka, Thailand, Laos, Cambodia, Vietnam, Indonesia, Malaysia, and Formosa.India contributes more than 70% of world's greengram production, while its cultivation has spread to Africa and America relatively in the recent times. Greengram is an annual herb with a height of 45-75 cm that belongs to the Leguminosae family. It is an erect to sub-erect, deep-rooted, heavily branched, and very hairy annual herb. Plants are usually branched, and the cultivated types habits range from erect to sub-erect. The stem is furrowed, squarish, and hairy with green and purple pigmentation, and the root system is an extensive taproot. Nodules on the roots fix atmospheric nitrogen through a symbiotic relationship with the bacterium Rhizobium. When mature, the pod colour ranges from brown to light grey.

Greengram contains high-protein around 24-25 per cent, which is almost three times that of cereals and low-carbohydrate staple food. It meets the protein needs of the country's vegetarian population. Hence greengram is also called as vegetarian meat and it is an essential source of vegetarian nutrition. Greengram is also been used as a cattle feed even husk of the seed can be soaked in water and used as feed for cattle, thus is an important source of animal nutrition. In addition to that greengram helps to maintain soil fertility by enhancing soil physical properties and fixing atmospheric nitrogen. It is a drought-resistant crop that is well-suited to dryland farming.

In India, important of pulses cultivated are Greengram, pigeon pea, chickpea, black gram, lentil, and peas. Pulses are grown on 27.98 million ha, producing 23.02 million tonnes and yielding 823 kg/ha on average. Around 31.15 lakh ha was covered under greengram, while the same was 34.24 lakh ha . The states of Rajasthan (18.30 lakh ha), Maharashtra (3.28 lakh ha) Karnataka (2.69 lakh ha), Madhya Pradesh (1.82 lakh ha), Odisha (1.63 lakh ha) and Telangana 0.70 lakh ha) are the major producers of greengram in India (Anonymous, 2018a).

In Karnataka, major growing district is Gadag stands in first position with the production of 24,170 tonnes and area of 1,40,566 hectares followed by Dharwad with an area of 59,344 hectares with production of 20,800 tonnes and Belagavi district with the production of 30,176 tonnes with an area of 54,955 hectares and Bagalkot district with the production of 8534 tonnes with the area of 40,834 hectares(Anonymous, 2018b).

Greengram is a major pulse crop in North Karnataka (NEK) region. The University of Agricultural Sciences, Dharwad (UASD), has played a significant role in developing various technologies related to greengram production. Numerous improved varieties, specifically tailored for the Northern Dry Zone of Karnataka, have been released by the university. Considering these advancements, the study on farmers' perception of varietal traits and constraints in the adoption

of the improved variety (DGGV-2) and existing greengram varieties was purposively chosen.

Material and methods

Study area

The present study was conducted in Karnataka state with a focus on the North Karnataka. In First stage Dharwad and Gadag districts were selected for the study based on the highest area under greengram production and in second stage two taluks were selected from each selected district based on the highest area under greengram and in third stage from each selected taluks two villages were selected for the study

Sampling procedure and source of data

A multistage random sampling procedure was used for the selection of sample farmers. A total of 128 farmers were chosen for the study, out of which 64 farmers cultivating improved greengram variety (DGGV-2) and 64 farmers cultivating corresponding other existing varieties of greengram crop were chosen in the same areas as counter factual. The primary data needed for the study was collected from the farmers by a personal interview method using a pre-tested schedule.

Analytical tools and techniques used

1. Descriptive Statistics: Descriptive statistics such as frequency and percentage were used to analyze the perception of farmers on varietal traits

2. Garrett's Ranking Technique: The constraints faced by the sample farmers during adoption of greengram varieties were ranked by using Garrett's ranking technique. As per this method, respondents were asked constraints that they were faced in the adoption of greengram varieties. Depending upon the extent of constraints faced by them, the rankings were assigned separately to each constraint. Likewise, ranks were assigned to different frequency of various factors/parameters. The results of such rankings were converted into score value by using the following formula.

Per cent position = 100* (Rij-0.5) /Nj

Where,

Rij = Rank given for the i^{th} factor by j^{th} respondent

Nj = Number of factors ranked by the j^{th} respondent.

The per cent position of each rank was converted to scores by referring to tables given by Garret and Woodworth (1969). Then for each factor, the scores of individual respondents were summed up and divided by the total number of respondents for whom scores were gathered. The mean scores for all the factors were ranked.

Table 1. Constraints in adoption of improved and existing varieties of greengram in study area.

Constraints	Mean Garrett score	Rank
Production constraints		
Non-availability of required improved variety (DGGV-2) Seeds	76.23	I
Scarcity of Labour during peak periods	66.85	II
Lack of timely availability of chemical fertilizers	59.96	III
Incidence of Pest and Diseases	51.88	IV
High cost of plant protection chemicals	46.83	V
Not aware about the DGGV-2 variety	39.96	VI
Poor extension-farmer contacts	32.02	VII
Difficulty in hiring of implements	25.27	VIII
Marketing constraints		
High Price fluctuations	76.49	I
Lack of storage facilities in villages	67.23	II
Lack of timely market information availability	59.81	III
Untimely Payment of sale proceeds	53.12	IV
Long Distance to Market	46.50	V
Lack of Grading	40.89	VI
Lack of processing units locally	31.99	VII
High cost of transportation	22.97	VIII

Results and discussion

Constraints in adoption of improved variety and existing varieties of greengram.

The Garrett's ranking techniques was used to find out the constraints faced by the farmers in adopting improved and existing varieties of greengram and are presented in Table 1. The ranks are given for the constraints based on the opinion survey conducted by using a pre tested schedule in the study area. Further constraints are divided into two sub-categories like production and marketing constraints.

In production constraints, the respondents expressed that a majority of the farmer respondents were facing the problem of non-availability of required improved variety of seeds (DGGV-2), which ranked first with highest mean Garrett score of 76.23, the next most important constraint was the scarcity of labour during peak periods of cultivation with score of 66.85, followed by lack of availability of chemical fertilizers with a score of 59.96, incidence of pest and diseases (Garrett score of 51.88), high cost of plant protection chemicals (Garrett score of 46.83), lack of awareness about the DGGV-2 variety with score of 39.96, poor extension-farmer contacts (Garrett score of 32.02), and the difficulty in hiring implements (Garrett score of 25.27).These results were in parallel with the study conducted by Jat *et al*. (2017) and Hadimani *et al*. (2019).

Marketing constraints faced by farmers who are growing improved varieties were as fallows. Majority of farmers opined that there is high price fluctuation. While, marketing and was

Table 2. Specific constraints faced by farmers in adoption of DGGV-2 variety

Constraints	Mean Garrett score	Rank
Non -availability of required improved variety (DGGV-2) Seeds	76.23	I
Lack of timely availability of chemical fertilizers	59.96	II
Unawareness about the DGGV-2 variety	39.96	III
Poor extension-farmer contacts	32.02	IV

Table 3. Perception about variety traits among the sample farmers

Traits	DGGV-2	
	Frequency	Per cent
Higher yield (10-13q/ha)	64	100.00
Tolerance to yellow mosaic virus	40	62.50
Tolerance to pod shattering	58	90.62
Ideal for machine harvesting	64	100
Tolerance to lodging	45	70.31
Long size pods	55	85.93
Tolerance to Apion beetle	50	78.12

ranked first rank(Garrett score of 76.49), followed by lack of storage facilities in villages assigned second rank (Garrett score of 67.23), lack of timely market information availability related to price prevailing in market (Garrett score of 59.81), untimely payment of sale proceeds (Garrett score of 53.12), long distance to market (Garrett score of 46.50), lack of grading (Garrett score of 40.89), lack of processing units locally (Garrett score of 31.99) and high cost of transportation (Garrett score of 22.97) were the other constraints in marketing of the produce. The results are in line with the study conducted by Salunkhe *et al* (2020), and Shasani *et al*. (2020).

Specific constraints faced by farmers in adoption of improved variety (DGGV-2) of greengram

The specific constraints faced by farmers in adoption of improved variety DGGV-2 are shown in Table 2. By observing to the results can concluded thatnon - availability of required improved variety (DGGV-2) seeds to the farmers at right time with required quantities was the major constraint with maximum (Garrett score of 76.23), followed by lack of timely availability of chemical fertilizers during the onset of season to farmers (especially for small farmers) was second major specific constraint (Garrett score of 59.96), not aware about the DGGV-2 variety seeds (Garrett mean score of 39.96) and at last poor extension and the farmer contacts (Garrett score of 32.02).

The perception of farmers on varietal traits

The results of the farmer's perception on varietal traits are presented in Table 3. All the respondent farmerswere perceived that DGGV-2 (improved variety) give higher yield (10-13q/ha) and ideal for machine harvesting as expressed by all sample respondents. About 90.62 per cent farmers agreed that DGGV-2 was resistant to pod shattering and having longer pod length 85.93 per cent, with respect to Apion beetle resistance, 78.12 per cent farmers opined of it resistance to Apion beetle and considered to be tolerant to yellow mosaic (62.5%) disease. These results gain support by the findings obtained by the study of Parmar *et al*. (2019).

Conclusion

Greengram growers face significant production constraints, including non-availability of improved variety (DGGV-2) seeds, labor shortages during peak periods, and untimely access to chemical fertilizers. Marketing challenges include price fluctuations and inadequate storage facilities in villages. Farmers acknowledge that DGGV-2 offers higher grain yields than existing varieties. To address these issues, we must ensure a timely and sufficient supply of DGGV-2 seeds through Raith Samparaka Kendras (RSKs) and National Seed Corporation (NSC). Furthermore, state agricultural departments should conduct frontline demonstrations to promote the beneficial traits of DGGV-2. These measures will enhance greengram production and marketing, benefiting farmers in the process.

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