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Constraints Faced by Sorghum Variety Parbhani Shakti Adopter and Non-adopter in Parbhani District of Maharashtra State

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ABSTRACT: Sorghum (*Sorghum bicolor* [L.] Moench, Poaceaea family) (2n = 20) is the 5th most important cereal crop. It is an important grain and forage crop of semiarid regions due to its high adaptability and suitability to rainfed. Farmers grew sorghum for themselves, using the grain for food and the plant for fodder and many farmers prefer to purchase the meagre amounts of sorghum they now need. There are various reasons for this like shortage of labour at the time of harvesting, high labour cost, high cost of input, weed infestation and yield loss due to climate. Therefore, the present study has been taken up to analyse the constraints from the farmers perspective. The study was conducted in Parbhani district of Maharashtra state and the obtained data were analysed by using Garrett ranking technique. The study revealed that the major constraints perceived by the adopter among all listed constraints were high labour cost, shortage of labour, high cost of input, weed infestation and yield loss due to climate. In addition to this, lack of high-quality improved varieties and lack of knowledge about market information was one of important problem for non-adopter.

Keywords: Constraints, adopter, non-adopter, Garrett ranking.

INTRODUCTION

Cereals have been considered as the principal component of human dietary source as almost half of the daily calorie absorption is derived from its consumption. Sorghum (*Sorghum bicolor* (L). Moench) belong to the family Poaceae is the fifth most important cereal crop following rice, wheat, maize and barley that serves as staple food for in addition 500 million people across the globe and also as a fodder crop. It is deriving in East Central Asia, Ethiopia and its nearby provinces or Sudan because of the realistic diversity of assorted varieties growing in that region.

United States of America ranks first in sorghum production with 8.67 million tonnes followed by Niger (6.66 million tonnes), Ethiopia (5.26 million tonnes), and Mexico 4.3 million tonnes, Sudan produced 3.71 million tonnes, while India produced 3.47 million tonnes, accounting for 15, 11.51, 9.09, 7.52, 6.22, and 6 per cent of the 57.90 million tonnes produced globally in 2019 to 20. According to USDA estimates, there will be 65.21 million tonnes of sorghum produced globally in 2021 to 22, covering 41.97 million hectors (103.70 million acres). The corresponding estimates for India were 4.80 million hectares (11.86 lakh acres) and 4.60 million tonnes. India ranked seventh in production and third in jowar area during 2019 to 2020. (Vaanakalam (Kharif) 2021-2022 pre harvest price for-cast of jowar). Climate change has been realized globally as an ever increasing threat to our planet that is becoming impossible to ignore (Raahalya *et al.*, 2023).

As of 2021, India's area planted with jowar in 2021 to 2022 was 13.64 lakh hectares, down from 14.12 lakh hectares in 2020 to 2021. Rajasthan was the largest state, with 5.88 lakh ha, followed by Uttar Pradesh with 2.06 lakh ha, Maharashtra with 2.04 lakh ha, Madhya Pradesh with 1.53 lakh ha, and Tamil Nadu with 0.87 lakh ha, all of which contributed to 90 per cent of the total area of the nation. Uttar Pradesh also had 2.67 lakh ha, Maharashtra had 2.04 lakh ha, Madhya Pradesh had 1.030 lakh ha, and Tamil Nadu had 0.87 lakh ha. The Government of India's third advance projections for 2020 to 21 show that sorghum output will be 4.80 million tonnes, up from 4.77 million tonnes the year before. (United States Department of Agriculture, 2022) India’s first biofortified sorghum (jowar), with significantly higher iron and zinc than regular sorghum, was. developed by ICRISAT it was released for cultivation by Vasantrao Naik Marathwada Krishi Vidyapeeth (VNMKV), Maharashtra. The improved variety ICSR 14001, released as ‘Parbhani Shakti’ by VNMKV, offers a cost-effective and sustainable

solution to address micronutrient deficiency. An MoU was signed today between ICRISAT and VNMKV for large-scale seed production and dissemination. This improved sorghum variety was developed by ICRISAT under the Harvest Plus sorghum biofortification project and was tested as PVK 1009 in Maharashtra state and in All India Co-ordinated Sorghum Improvement Project (AICSIP) Trials. It was released as a rainy season variety (Kharif) but it can be grown in post-rainy (Rabi) and summer seasons. The yield levels are higher (>5.0 t ha-1) in post-rainy and summer seasons with irrigation. (ICRISAT https://www.icrisat.org/india-gets-its-first-biofortified-sorghum/)

Objective: To examine constraints faced by Parbhani shakti adopter and non-adopter

METHODOLOGY

The present study was conducted in the year 2021-22 with the objective to analyze the major constraints perceived by the Parbhani shakti adopters and non-adopters. The study was carried out in Parbhani district of Maharashtra as it has largest under the Parbhani shakti variety. Multistage sampling technique was employed in the selection of district, tehsils, villages and ultimately Sorghum farmers. Two tehsils, with highest area under Parbhani shakti were selected under the district. three villages were also selected in the same manner under each tehsil. Twenty farmers were selected randomly from selected villages. Which totally constitutes a sample size of 120 farmers. Respondents were asked to rank the listed constraints related to the inputs, production, marketing, finance and technical aspects.

Rank one meant most important and last rank meant least important constraint. The study employed Garrett's ranking method to find out the major constraints faced by the respondents during the production and marketing. The rank assigned to each constraint by each individual farmer was converted into percent position by using the following formula.

Per cent position $\frac{100\ X\ Rij-0.5}{Nj}$

Where,

Rij = Rank given for the i^{th} variable by j^{th} respondants

Nj = Number of variables ranked by j^{th} respondants

With the help of Garrett's table, given by Garett and Woodworth the estimated percent positions were converted into scores. The mean values of scores were estimated. The constraint having highest mean value is considered to be the most pressing problem for cotton growers (Hosmath *et al*., 2012).

RESULTS AND DISCUSSIONS

Constraints faced by Parbhani shakti adopter. The results presented in the Table 1 highlight that the high labour cost which increases cost of production found to be the first major problem with the mean score of 56.13. Similar findings were also observed by Singh *et al.* (2022). Shortage of labour at the time of harvesting was ranked as second major constraint with the mean score of 55.66. Third ranks were given to constraints, high cost of inputs with the mean score 54.66, pest infestation during storage ranked forth with the mean score 48.33. Among all constraints weed infestation ranked fifth with the mean score 43.28. Remaining constraints like yield loss due to climate change, lack of knowledge about improved varieties and Lack of knowledge about market information ranked 6^{th}, 7^{th} and 8^{th} constraints respectively. The above results were in conformity with the results obtained by Rimal *et al.* (2015) reported high cost of chemical inputs and labour scarcity and high labour charges as the major problems during the cultivation of sorghum. the major constraints expressed by farmers in adoption of improved varieties was low awareness of the new varieties, lack of knowledge about market information.

Table 1: Constraints faced by Parbhani shakti adopter and non-adopter.

Sr. No.	Constraints	Adopter		Non-adopter	
		Mean Score	Rank	Mean Score	Rank
1.	Shortage of labour at the time of harvesting	55.66	II	42.68	V
2.	High cost of inputs	54.66	III	57	I
3.	Weed Infestation	43.28	V	43.36	IV
4.	High Labour cost	56.23	I	40.85	VI
5.	Yield loss due to climate Change	43.05	VI	39.41	VII
6.	Pest infestation during storage	48.33	IV	38.68	VIII
7.	Lack of knowledge about market information	28.98	VIII	55.65	II
8.	Lack of knowledge about improved varieties	34.08	VII	46.35	III

Constraints faced by Parbhani shakti non-adopter. The results related to the constraints faced by the non-adopter are reproduced in the Table 1. It can be noticed that high cost of input was ranked as top most constraint with the mean score of 57 followed by the lack of knowledge about marker information with the mean score of 55.65. Lack of knowledge about improved variety was ranked as third major problem with the mean score of 46.35. Among listed constraints weed infestation was found in fourth place with mean score 43.36 striga infestation is a major concern for farmer as significantly reduces sorghum yields. The next important constraint was shortage of labour ranked fifth with the mean score 42.68. Shortage of labour at the time of harvesting was significant challenge for farmers, especially for crops that require manual harvesting. High labour cost (40.85), yield loss due to climate change (39.41) and pest infestation during storage (38.08). The above results were in conformity with the results obtained by Shwetha *et al.* (2022)

reported high cost of chemical inputs and labour scarcity and high labour charges as the major problems during the cultivation.

CONCLUSIONS

Constraints were reported by the adopter and non-adopter farmers, in which high labour cost, shortage of labour, high cost of input, weed infestation and yield loss due to climate were the major constraints noted by adopter. In addition to this, lack of high-quality improved varieties and lack of knowledge about market information was one of important problem for non-adopter. High labour cost and shortage of labour was found the major constraints faced by farmers often leading to policies aimed at mechanization, automation, and the adoption of agricultural technologies. Governments might provide subsidies or incentives for farmers to invest in machinery, promote the use of advanced farming techniques like precision agriculture, and support research into labour-saving innovations.

FUTURE SCOPE

An analysis of the constraints faced in the farmers perspective would be highly useful to know the present status, constrains, inadequacies, requirements, and in turn would help to work out a viable strategy for remunerative sorghum production. The study would also give necessary feed back to the sorghum researchers. Further the researcher would be benefited by this study in the sense that the research would bring out.

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Conflict of Interest. None.

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