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RESEARCH PAPER

Constraints in adoption of improved variety (CSV 29R) and existing varieties of sorghum in Karnataka

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Abstract: The present study was conducted in Vijayapura district of Karnataka to analyse the constraints in adoption of improved *rabi* sorghum variety (CSV29R) in comparison with local check (M35-1) variety. Primary data was collected from 135 sample farmers through personal interview method and Garret ranking technique was utilized to arrive at meaningful results. The results revealed that, on availability of labour during peak period was the major problem followed by non -availability of required quantity of Farm Yard Manure (FYM) and other in production and less remunerative price for produce followed by high price fluctuation and other were constraints in marketing and lack of knowledge on location specific improved varieties of sorghum was major constraint followed by unable to contact extension agencies at the time of necessity and others such as managerial constraint. These constraints shall be overcome by extension agency and mechanization needed to be supported by custom hiring at low price for the laborious operations like sowing, weeding, harvesting and threshing.

Key words : Constraints, Managerial, Marketing, Mechanization, Production

Introduction

Sorghum (*Sorghum bicolor*) also known as great millet, durra, jowari / jowar, or milo, is a grass species cultivated for its grain, which is used for food for humans, animal feed, and ethanol production. It ranks third in the major food grain crops of our country. Besides a major source of staple food for humans, it serves as an important source of cattle feed and fodder. It has potential to compete effectively with crops like maize under good environmental and management conditions. The greatest merit with sorghum is that it has capacity to withstand drought. Its performance is better than maize in marginal lands as most widely grown dry land food grains in India. It does well even in low rainfall areas like Northern dry zone of Karnataka.

Sorghum is a source of calories, protein, and minerals that feeds over 700 million people. High yielding cultivars and hybrids with superior agronomic features have been developed, resulting in surplus production. In India, sorghum is typically consumed in the form of roti (unleavened bread) and sankati (thick porridge). It's also eaten as a parched and popped grain to some extent. Cattle, poultry, and swine are all fed grain. Sorghum grain has a protein content of 10-12 per cent, a fat content of three per cent, and a carbohydrate content of 70 per cent. As a result, it can successfully substitute other grains in the dairy, poultry, and swine feeding programmes.

Rabi sorghum did not receive much emphasis until nineties for crop improvement, and rapid productivity enhancement has not been possible for rabi sorghum unlike kharif sorghum due to lack of success with hybrid technology. As the fodder is as important as grain, the varieties are selected to produce high biomass (grain and fodder) and have high lustrous grain with semi corneous endosperm.

Therefore, focused breeding efforts on *Rabi* Sorghum led to development of several *rabi* sorghum varieties such as CSV 8R, Swati, CSV 14R, CSV 18R, CSV 216R, CSV 22, CSV 29R at national level. Hence, for present study high yielding SPV 2033 (Popular name-CSV 29R) improved variety of *rabi* sorghum developed by regional agricultural research station, Vijayapura released at national level as CSV 29R variety in 2012 was selected for the study.

Material and methods

The main objective of the present research was to analyse constraints in adoption of improved variety and existing varieties of sorghum. For that Vijayapura district was purposively selected for the study as it stands first in area of jowar and fourth in production under jowar cultivation in Karnataka.

In first stage Vijayapura district was selected for the study based on highest area of sorghum and in second stage from Vijayapura district three taluks namely Muddebihal, Basavana Bagewadi and Vijayapura taluk was selected for the study based on highest area under crop sown and in third stage three villages were selected from each taluk.

A multistage random procedure was used for the selection of sample farmers. For this, 90 farmers cultivating CSV 29R variety of Sorghum as rainfed crop in northern dry agro climatic zone (ZONE III) of Karnataka (in Vijayapura) had chosen purposively. For comparison, 45 farmers cultivating corresponding existing variety of sorghum crop was chosen in the same area as counterfactual. In all, 135 farmers were chosen for this study.

Present study was based on primary data. The primary data needed for the study was collected from the farmers by personal interview method using pre-tested schedule prepared during 2020-21. At the time of interview, personal bias of the sample farmers was minimized by convincing them about the genuinely of the purpose for which the data were collected and collected and analysed by below mentioned tool.

Garrett's Ranking Technique

The constraints faced by the sample farmers during adoption of sorghum technologies were ranked by using Garrett's ranking technique. As per this method, respondents were asked constraints that they were faced in adoption of sorghum technologies. Depending upon extent of constraints faced by them rankings was 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 following formula.

per cent position=100* (R_{ij}-0.5) /N_j

Where,

R_{ij} = Rank given for the i^{th} factor by j^{th}respondent.

N_j = 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.

Results and discussion

Constraints in adoption of sorghum varieties are presented in the Table 1 and it has sub-divided into production, marketing and managerial constraints.

From the study it was found that major constraint were non availability of labour ranked first with garret score 64.66 followed by non -availability of required quantity of FYM (54.88), harvesting cost is high (50.30), higher cost of improved seed (48.41), insects are resistance to chemical spray (47.62), higher cost of pesticides (47.13), lack of supply of improved seed (46.76), lack of knowledge about bio fertilizers and bio-pesticides (46.57), non-availability of bio fertilizers and bio-pesticides in time (46.42) and lack of knowledge about seed treatment (44.72).

In case of marketing constraints, less remunerative price for the produce was major constraint with garret score 65.80 and high price fluctuation stand second rank with garret score 65.16 fallowed by high transportation cost for market (53.44), lack of processing facility (50.18), lack of marketing information (50.04), high rate of interest for non-institutional credit (47.22), lack of cooperative marketing organization (44.87), non-acceptance of sorghum varieties by the traders during initial period (44.82) and regulated market is far away from the village and lack of storage facility (40).

Major managerial constraint were lack of knowledge on location specific improved varieties of sorghum rank first with garret score 79 and further in second place unable to contact extension agencies at the time of necessity with score 66 fallowed by unable to plan well in advance about the incidence of pest and diseases (57), lack of knowledge regarding

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

Constraints	Garret score	Rank
Production constraints		
Non-availability of labour	64.66	I
Non -availability of required quantity of FYM	54.88	II
Harvesting cost is high	50.30	III
Higher cost of improved seed	48.41	IV
Insects are resistance to chemical spray	47.62	V
Higher cost of pesticides	47.13	VI
Lack of supply of improved seed	46.76	VII
Lack of knowledge about bio fertilizers and bio- pesticides	46.57	VIII
Non-availability of bio fertilizers and bio-pesticides at peak period	46.42	IX
Lack of knowledge about seed treatment	44.72	X
Marketing Constraints		
Less remunerative price for produce	65.8	I
High Price fluctuation	65.16	II
High transportation cost for market	53.44	III
Lack of processing facility	50.18	IV
Lack of marketing information	50.04	V
High rate of interest for non-institutional credit	47.22	VI
Lack of cooperative marketing organization	44.87	VII
Non acceptance of sorghum varieties by the traders during initial period	44.82	VII
Regulated market is far away from the village	40.00	IX
Lack of storage facility	37.24	X
Managerial Constraints		
Lack of knowledge on location specific improved varieties of sorghum	79.00	I
Unable to contact extension agencies at the time of necessity	66.00	II
Unable to plan well in advance about the incidence of pest and disease	57.00	III
Lack of knowledge regarding improved agrochemical practices of Sorghum	50.00	IV
Lack of awareness about demonstrations & training programmes	43.00	V
Lack of knowledge about insect pest & disease control	34.00	VI
Mislead the selected farmers regarding plant protection chemicals by input dealers	21.00	VII

improved agrochemical practices of sorghum (50), lack of awareness demonstrations & training programmes (43), lack of knowledge about insect pest & disease control (34) and mislead the selected farmers regarding plant protection chemicals by input dealers (21).

From production constraints, non-availability of labour was stated as major constraint faced by responded farmers followed by non -availability of required quantity of FYM and harvesting cost is high, little bit high cost of improved seed, resistance of insect against insecticides, and other constraints which has minimal effect. These findings are in line with findings of Tamilzhaki *et al*. (2020) which indicated that high cost of improved seeds, disease incidence and pest incidence were the major constraints faced by the farmers.

Less remunerative price for the produce was major constraint faced by respondent farmers followed by high Price fluctuation, high transportation cost for market, lack of processing facility, lack of marketing information, high rate of interest for non-institutional credit and so on were the marketing constraints faced by the farmers. Similar results were found in the study of Kumar *et al.* (2018) in which it can be found that lack of processing facilities, high fluctuations in market price and lack of technical guidance were the major constraints faced by the farmers.

With respect to managerial constraints, lack of knowledge on location specific improved varieties of sorghum ranks first shadowed by not able to contact extension agencies at the time of necessity, couldn't plan in advance about the incidence of pest and diseases, lack of knowledge regarding improved agrochemical practices of sorghum, inability to attend demonstrations and other constraints were faced by respondent farmers. These results are parallel to the results of study made by Raghuwanshi *et al.* (2019) which stated that lack of technical guidance, lack of knowledge about improved varieties and lack of frequent extension contact were the major problems faced by the farmers. Hence, the hypothesis as there are fewer constraints in adoption of selected sorghum variety is rejected.

Conclusion

The major production constraints in adoption of sorghum was non-availability of labour fallowed by non -availability of required quantity of FYM, harvesting cost is high, little bit high cost of improved seed and insects are resistance to chemical spray etc. These results were in line with the study conducted by Oinam and Sudhakar (2014). In case of marketing major constraints faced by farmers were less remunerative price for produce fallowed by high price fluctuation, high transportation cost for market, lack of processing facility and lack of marketing information etc.These results were in parallel with the study conducted by Chandra (2012) and Beke (2011).

In case of managerial constrains, major constraints faced by farmers were lack of knowledge on location specific improved varieties of sorghum fallowed by unable to contact extension agencies at the time of necessity, unable to plan well in advance about the incidence of pest and disease, lack of knowledge regarding improved agrochemical practices of sorghum, inability to attend demonstrations & training programmes, lack of knowledge about insect pest & disease control and mislead the selected farmers regarding plant protection chemicals by input dealers.

Major constrains faced by sorghum growing farmers were non availability of labour at peak season (64.66 garret score) and high labour cost (50.30 garret score).These results were supported by the study of Ahirwar *et al*. (2014). Therefore, to overcome from these constraints mechanization needed to be supported by custom hiring at low price for the laborious operations like sowing, weeding, harvesting and threshing.

Farmers were facing less remunerative price for sorghum produce and high price fluctuation are the major problems. Hence, farmers are needed to be educated about market price and knowledge on location specific improved varieties by extension activities and use of digital technology.

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