

FARMERS' AWARENESS OF SUGARCANE CROPPING PRACTICES AND THEIR USE OF INFORMATION SOURCES FOR SUGARCANE PRODUCTION AMONG GROWERS IN PUNJAB, PAKISTAN

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ABSTRACT

The current study assessed farmers' awareness of sugarcane cropping practices and their use of information sources for sugarcane production among growers in the Tehsil Jhang, Punjab, Pakistan. A purposive sampling method was used to collect data from 120 respondents from two villages located in Tehsil Jhang. Findings of the study revealed that most farmers received information from fellow farmers and have high awareness of care of crop ratoons. It is suggested that agricultural extension and the Ministry of Agriculture should take serious action to initiate educational programs to educate farmers about advanced online applications to obtain modern agricultural information. Tehsil Jhang has suitable soil for sugarcane cultivation. Therefore, sugar mills are also responsible for educating farmers to increase crop production that may fill existing production gaps and improve living standards of farmers. The active involvement of the Ministry of Agriculture, Extension Department, and sugar mills could produce high-yield seed varieties through research and development programs.

Keywords: Sugarcane, Cropping system, Farming, Technology, Adoption, Extension.

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1. INTRODUCTION

Sugarcane belongs to family Poaceae (Gramineae). Modern cultivars dates back to the hybridization of formerly cultivated *S. officinarum*, *S. barberi* and wild *S. spontaneum* followed by the backcrossing of *S. officinarum*. It were originated 100 years ago (Pompidor et al., 2021). Approximately, 160 Mt sugar produce with 23 kg per capita consumption annually. In China and India, its production is gradually increasing by 1.5% annually (Biancardi et al., 2010). Around 1/4 of the global sugar produces from beets (*Beta vulgaris*) and the remaining from sugarcane (*Saccharum officinarum*) (Taspinar et al., 2019).

Sugarcane is considered as a major cash crop and source of employment for local communities in Pakistan (Solangi, 2025). It is a greater source of raw materials for sugar mills, chipboards, paper industries. It contributes 3% and 0.5% to agricultural value added Gross Domestic Product (GDP) of Pakistan respectively (GOP, 2019). In 2019, the amount of sugarcane cropping area increased by 12% and 22% production increased against 66.380 million tons. In 2020, 1.165 million hectares of land was covered by sugarcane crops and reported 81.009 million tons of production. In 2020, cultivators achieved an average yield of 69.57 kg ha⁻¹ (Farooq and Khan, 2019; Khan et al., 2022; Raza et al., 2022; Khan et al., 2023). The existing production of sugarcane is not satisfactory. There are several reasons that reduce crop production such as reduction of arable land, increase in competitive crops including rice and cotton and the international imbalance of payments discourage sugarcane cultivation (Haq et al., 2016; GOP, 2022).

A study conducted in Naushahro Feroze district revealed that the low awareness of sugarcane cropping practices identified due to low education, poor extension services, lack of training and workshops, low adoption of innovative technology, low awareness of agricultural inputs and lack of information sources leads to low production of sugarcane. Keeping in view, the current study assessed farmers' awareness of sugarcane cropping practices and their use of information sources for sugarcane production among growers in the tehsil Jhang Punjab, Pakistan. The current study would provide a deep insight into real situation of sugarcane farmers in the study area. Findings of the would help in designing policy and educational and extension programs and implementation of various sources of information for sugarcane farmers that may increase their awareness and crop production.

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2. MATERIAL AND METHOD

Description of the Study Area

District Jhang is located in central Punjab. According to the map, it lies between 30.37–31.59 degrees North latitude and 71.37–73.13 degrees East longitude. It covers an area of 6,612 km². It shares its boundaries with Faisalabad, Toba Tek Singh, Chiniot, and Khanewal to the east, northeast, and south, respectively. Its northern and southern borders coincide with Khushab, Bhakkar, and Layyah. The desert area is situated in the south, starting in the north and ending in the south. A large part of District Jhang is plain and rich in river water, making it suitable for diverse agricultural activities. The current study was conducted in Tehsil Jhang (Fig. 1).

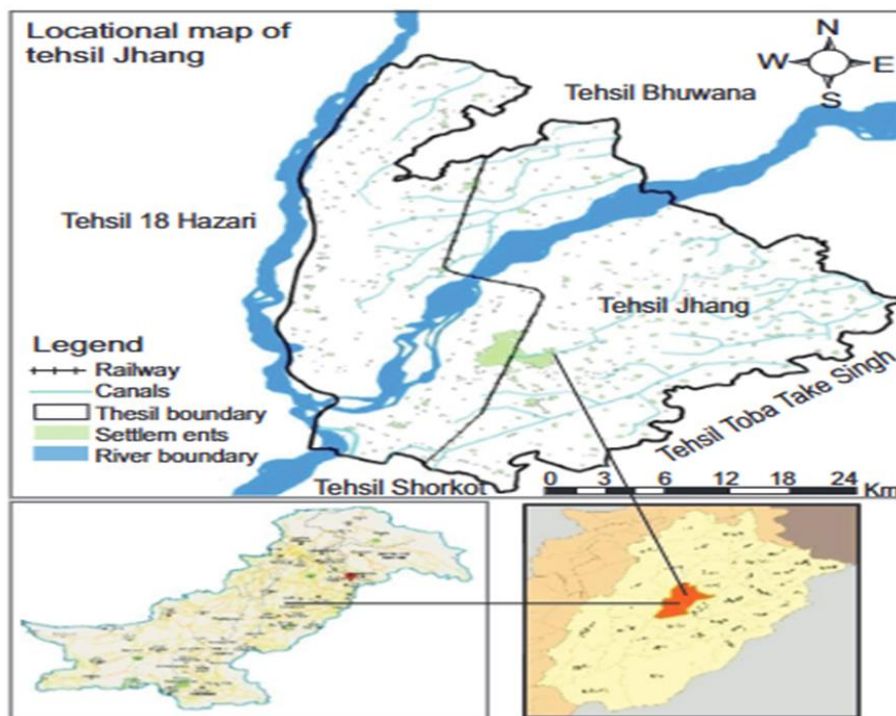


Fig. 1: Map of the study area.

Data Collection

A purposive sampling technique was used for data collection. The target population consisted of sugarcane growers from two villages, Adda Khoe and Moza Maghiana. A paper-based structured questionnaire was designed in their local language to obtain accurate information. The questionnaire was distributed to 200 growers, and 120 growers returned completed questionnaires (response rate = 60%).

Instrumentation

The questionnaire used for the study consisted of different sections. The first section included demographic characteristics of the respondents (age, education, landholding, and tenancy status). The second section covered sources of information helpful for better sugarcane cultivation, measured using a five-point Likert scale (1 = very low; 2 = low; 3 = moderate; 4 = high; 5 = very high). The third section assessed farmers' awareness of sugarcane cropping practices, also measured using a five-point Likert scale (1 = very low; 2 = low; 3 = moderate; 4 = high; 5 = very high).

Validity and Reliability

A pilot study was conducted to measure the internal consistency, reliability, and validity of the instrument. Data were collected from 30 respondents, and Cronbach's alpha was estimated to be 0.8, which is considered good for further research procedures.

Statistical Analysis

The Statistical Package for the Social Sciences (SPSS) was used for data analysis. Descriptive statistics, including percentage, frequency, mean, and standard deviation, were calculated. Additionally, all results were ranked according to mean score.

3. RESULTS

Fig. 2 shows that the majority of the respondents belonged to middle age group (31-50 years) a1. The majority of respondents possess owner cum tenant a2. Regarding education, the majority of respondents have up to matriculation a3. The majority of respondents owned 13-25 acres of land a4.

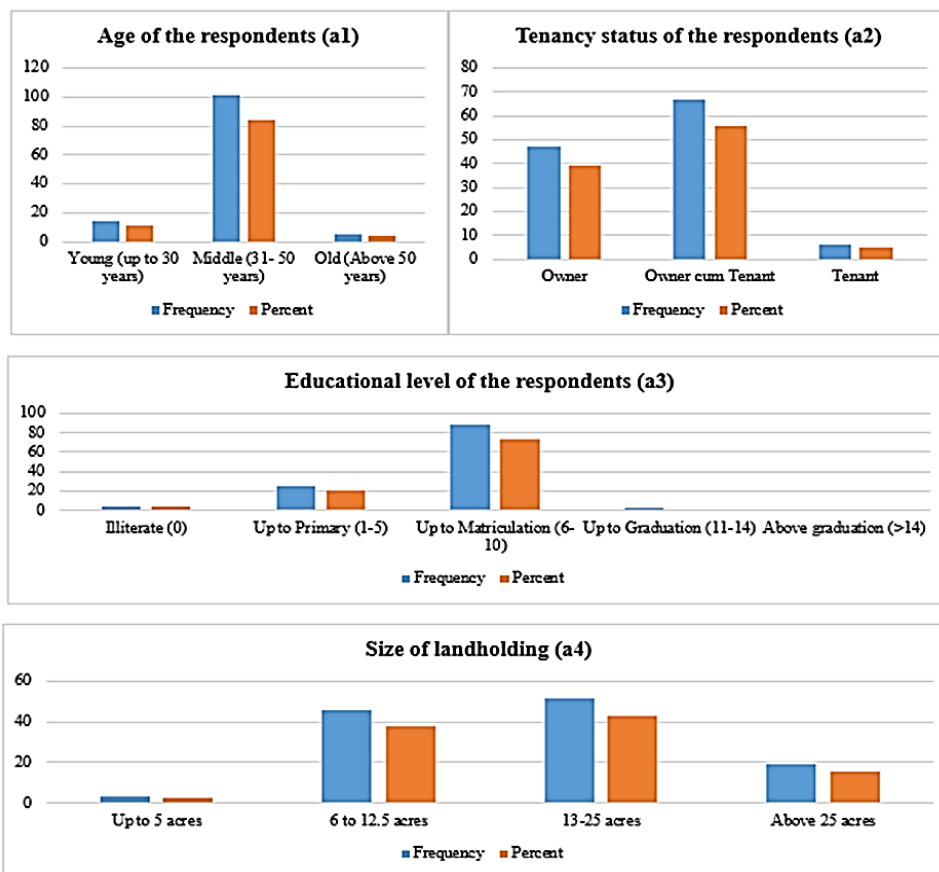


Fig. 2: Demographic characteristics of the respondents.

Table 1 shows sources of information for sugarcane cultivation. More than 80% of respondents got information from fellow farmers, village leaders, electronic media and sugar mills. More than 70% of respondents received information from agricultural helpline, research and extension stations. Farmers demonstrated that all these seven sources of information helped them most in cultivation of sugarcane.

Table 1: Distribution of respondents according to their response regarding various sources of information helpful for better sugarcane cultivation

Information sources	Very low	Low	Moderate	High	Very high
	%	%	%	%	%
Print media	1.7	0.8	9.2	25.8	62.5
Electronic media	0.0	0.0	0.0	16.7	83.3
Extension department	0.0	0.0	0.0	26.7	73.3
Research stations	0.0	0.0	5.0	20.0	75.0
Pesticide companies	0.0	0.8	10.8	36.7	51.7
Fertilizer companies	0.0	0.8	11.7	31.7	55.8
Sugar mills	0.0	0.0	1.7	18.3	80.0
Fellow farmers	0.0	0.0	0.0	11.7	88.3
Village leaders	0.0	0.0	0.8	14.2	85.0
Libraries & information centers	1.7	5.8	16.7	35.0	40.8
Agricultural helpline	0.0	0.8	4.2	20.0	75.0

The data presented in Table 2 indicates the various sources of information helpful for better sugarcane cultivation. Different information sources were enlisted on the basis of mean score, ranging from 4.88 to 4.11. The information from fellow farmers ranked 1st with the mean score of 4.88. Whereas Libraries and information centers ranked last with mean score of 4.11.

Table 2: Ranking of various sources of information helpful for better sugarcane cultivation

Information sources	Rank	Mean	SD
Fellow farmers	1	4.88	0.32
Village leaders	2	4.84	0.38
Electronic Media	3	4.83	0.37
Sugar mills	4	4.78	0.45
Extension Department	5	4.73	0.44
Research Stations	6	4.70	0.55
Agricultural Helpline	7	4.69	0.5
Print media	8	4.50	0.722
Fertilizer Companies	9	4.43	0.70
Pesticide Companies	10	4.40	0.69
Libraries and information centers	11	4.11	0.90

Table 3: Distribution of respondents according to their awareness level regarding various sugarcane practices

Sugarcane practices	Very low	Low	Moderate	High	Very high
	%	%	%	%	%
Land preparation	0.0	0.0	4.1	31.7	64.2
Selection of seed	0.0	1.7	2.5	37.5	58.3
Seed treatment	0.0	0.0	10.8	25.0	64.2
Sowing time	0.0	0.0	4.1	29.2	66.7
Sowing method	0.0	0.0	7.5	27.5	65.0
Irrigation method	0.0	0.0	4.2	35.8	60.0
Intercultural practices	0.0	0.0	5.0	38.3	56.7
Use of pesticides	0.0	1.7	8.3	31.7	58.3
Use of fertilizers	0.0	0.8	12.5	34.2	52.5
Harvesting	0.0	0.0	6.7	28.3	65.0
Marketing	0.0	0.0	3.4	28.3	68.3
Care of ratoon crop	0.0	0.0	5.8	22.5	71.7

This section was related to the awareness level of the respondents regarding different sugarcane practices. The respondents were asked about their awareness level regarding various sugarcane practices. Findings showed that more than 70% of respondents have very high awareness of crop ratoons. More than 60% of respondents have very high awareness of land preparation, seed treatment, sowing time, sowing and irrigation methods, harvesting and marketing (Table 3).

The data presented in Table 4 indicates the farmers' awareness of sugarcane cropping practices. The awareness of sugarcane cropping practices was listed on the basis of mean score, ranging from 4.66 to 4.38. The awareness of crop ratoon ranked 1st with the mean score of 4.66. Whereas the awareness of the use of fertilizer ranked last with mean score of 4.38.

Table 4: Ranking of respondents regarding their awareness level regarding various sugarcane practices

Sugarcane practices	Rank	Mean	SD
Care of ratoon crop	1	4.66	0.587
Marketing	2	4.65	0.545
Sowing time	3	4.62	0.566
Land preparation	4	4.60	0.571
Sowing method	5	4.58	0.631
Harvesting	6	4.57	0.644
Irrigation method	7	4.56	0.577
Seed treatment	8	4.53	0.685
Selection of seed	9	4.52	0.673
Intercultural practices	9	4.52	0.594
Use of pesticides	10	4.47	0.721
Use of fertilizers	11	4.38	0.735

4. DISCUSSION

The current study assessed farmers' awareness of sugarcane cropping practices and their use of information sources for sugarcane production among growers in Tehsil Jhang, Punjab, Pakistan. The findings showed that most farmers received information from their fellow farmers. They may trust indigenous knowledge, believe their peers achieve higher yields, or have little interest in visiting the extension department. They might also prefer face-to-face interaction for obtaining information, as access to fellow farmers appears easy (Khan et al., 2016; Farooq et al., 2026). These findings are consistent with those of Dlamini and Ngulube (2024), who reported that most sugarcane growers in Switzerland obtained information from various sources such as extension officers, farmer groups, and mobile phones. They indicated that farmers required face-to-face interaction. This suggests that face-to-face interaction also plays a vital role in information dissemination. According to the researchers' observations, socio-

cultural values in Tehsil Jhang permit farmers to interact face-to-face with their peers. Anunobi and Anunobi (2018) confirmed that Information and Communication Technology (ICT) may be used on a large scale, but farmers still receive information through face-to-face interaction. Face-to-face interaction can take many forms, such as video calls, Zoom meetings, and Facebook. However, in the study area, researchers observed that farmers most frequently interact directly with their fellow farmers.

Farmers in the study area stated that knowledge sharing improved awareness of cropping practices and sharing information among peers from the same background made it easier to understand (Bakhtawer and Afsheen, 2021; Khan et al., 2023). Meyer (2009) reported that information sharing becomes more understandable when the sender and receiver belong to the same background. It is understandable that sharing the same socio-cultural values makes it easier and more comfortable for the sender and receiver to deliver information. Therefore, it can be expected that having the same background might motivate farmers to receive information from fellow farmers in the study area. The findings of this study contradicted those of Dlamini and Dlamini (2012), who revealed that sugarcane growers mostly relied on extension agents and millers. In Nigeria, more than 60% of farmers obtained agricultural information from extension services (Galadima, 2014). Moreover, the findings of this study are consistent with those of Abbas et al. (2003), who reported that sugarcane growers received information from fellow and progressive farmers. In a similar context, Al Musawi (2013) reported that farmers agreed to use familiar sources of information or depend on sources used by their neighbors.

The findings showed that most farmers have a high level of awareness regarding the care of ratoon crops. These results are consistent with those of Noor and Dian (2023), who found that farmers in East Java preferred to grow sugarcane by caring for ratoon crops or performing stitching activities, and only replaced damaged seed to establish a new population. Sustainable agricultural practices are crucial for agricultural development in both developed and developing countries. Farmers in this study may have greater knowledge of sustainable agriculture, as Chen and Lu (2020) and Krishna and Naik (2020) reported that information and knowledge are major drivers of agricultural sustainability in both developed and developing countries. High awareness among farmers might be due to their preference for various sources of information, as Msoffe and Ngulube (2016) reported that farmers in Tanzania preferred sources such as family, friends, neighbors, extension officers, researchers, and radio. In several countries, after harvesting, the underground lower part of stalk produces sugarcane crops for next season, which is known as ratoon crop. Ratooning shared 50% of overall cultivated area. It may reach more than 70% in some regions. But in subtropical and tropical areas average percentage is approximately 40-45% and 50-55% respectively (Gomathi et al., 2013). Sugarcane ratooning is major planting system of many countries the care of crop ratoon is crucial to reduce input costs. In Pakistan, sugarcane ratooning is very common for many years because of high input cost. But the selection of proper strains for ratoon crops is important because low yielding of ratoon crops creates difficulties for producers to meet agricultural input costs (Muhammad et al., 2024). The ratooning reduces costs, improves quality, enhances energy use and crop yield (Rauf et al., 2024; Xu et al., 2021). The ratoon crop has multiple benefits over fresh sugarcane crops such as speedy growth, early maturity and cost efficacy. Compared with newly planted cane, crop ratoon builds strong root system and increases source of energy and carbon for early development of plant (Pissolato et al., 2021). More than 50% of sugarcane crop in Punjab province of Pakistan kept for ratoon. But cultivate 25-30% less production than fresh crops due to improper crop management and selection of unsuitable cultivar (Rehman and Ullah, 2008; Arain et al., 2011; Memon et al., 2024). The poor management might be due to the lack of awareness and low access to information sources.

Conclusion

The current study assessed farmers' awareness of sugarcane cropping practices and their use of information sources for sugarcane production among growers in the Tehsil Jhang, Punjab, Pakistan. Findings of the study revealed that most farmers received information from fellow farmers and have high awareness of care for crop ratoons. These findings have several implications: the extension department, the Ministry of Agriculture and sugar mills should collaborate to take serious action to initiate educational programs to educate farmers about advanced online applications to obtain modern agricultural information. The active involvement of the Ministry of Agriculture, Extension Department, and sugar mills could increase farmers' awareness of crop production practice through research and development programs. Note that the current study was limited to two villages of District Jhang. The findings cannot be generalized to other villages. In future, a new study should be conducted to address the challenges faced by sugarcane growers.

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