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Farmers' perceptions of risk, profitability, and resource constraints for replacing paddy with maize in Haryana

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Abstract

The study was carried out during 2024 to determine the constraints in maize cultivation instead of paddy in kharif season in Kurukshetra and Yamunanagar districts. The experiment was conducted by surveying of 80 farmers selected from two districts i.e. Kurukshetra and Yamunanagar (40 from each district). The study included those farmers who were growing maize and paddy crops by personally interacted to extract the relevant information. Henry Garrett's (1969) ranking technique was used to identify the most important constraints in cultivation of maize in replacement of paddy in the study area. The analysis indicated that problems like bird and wild animal attack, absence of dryers and dehuskers, watch poor market access and price realization were key constraints in both Kurukshetra and Yamunanagar districts of Haryana.

Keywords: Maize, paddy and farmers

Introduction

Paddy dominates the cropping pattern of the state in kharif season brought farming in critical juncture, resulting in various ecological, environmental and soil-related problems. Agro-processed products are also essential for increasing farm income, increasing export prospects and guaranteeing the sustainable use of soil and water resources. By adding value to raw agricultural produce, farmers can achieve better profitability while promoting resource conservation. Underlying the importance of diversified agriculture, it has been observed that the Haryana state has large potential for cultivation of a variety of high-value crops as well as related enterprises. Recently, Haryana government has implemented scheme for crop diversification for the cultivation of other crops like Maize. Under the crop diversification program, the area under paddy and sugarcane in a state is selected on the basis of more than 50 thousand hectares. Keeping in view the above parameters, 10 districts (Ambala, Yamunanagar, Kurukshetra, Karnal, Panipat, Sonapat, Kaithal, Jind, Fatehabad and Sirsa) have been identified under crop diversification program in the state. The promise of maize as Haryana's future crop, which is the best substitute for paddy, is reflected in the agricultural strategy. The state's maize output is expected to rise from 0.5 million tonnes to 2 million tonnes as a result of the increase (NABARD, 2022). The growth of the maize crop in Haryana state has been negatively impacted by specific limitations on the state's maize production. It has been demonstrated that even if maize growing is less expensive in the state than rice farming, maize production is still below

that of rice. Hence the present study is aimed to find out the constraints in adoption of maize as a replacement crop for paddy in Haryana.

Methodology

The present study was carried out in Kurukshetra and Yamunanagar district of Haryana. From both districts, two blocks were purposively selected. Ten farmers were randomly selected for each crop from every selected block. Data on constraints faced by farmers were collected by survey method through personal interview, a total of 80 sample farmers were interviewed for the investigation with the help of schedule designed for the study. Henry Garrett ranking technique was used for identifying the constraints in adoption or cultivation of maize in the study area.

Garret Ranking Method

This is another technique to extract the most important problem that influences the maize production. The responses of the sample maizegrowers with respect to various problems were assessed by assigning rank score. In this method, the farmers were asked to rank the given problem from 1 to 11 according to the severity of the problem i.e. 1 for most important problem and 11 for least important problem. The orders of merit given by the respondents were converted into ranks by using the following formula:

$$\text{Percentage Position} = \frac{100 (R_{ij} - 0.5)}{N_j}$$

Where,

R_{ij} = Rank given for i^{th} item j^{th} individual

N_j = Number of items ranked by j^{th} individual

The percentage position of each rank thus obtained was converted into scores by referring to the table given by Henry Garret. Then for each factor the scores of individual respondents were added together and divided by the total number of respondents for whom the scores were added. The mean scores for all the factors were arranged in the order of their ranks and inferences were drawn.

Results and Discussion

The analysis of the constraints in adoption of maize in Kurukshetra district was done by Garrett ranking technique. The result of the study was depicted in Table 1. From the results, it is clear that it is clear that the non-availability of the dryers for the maize produce ranked first among the constraints with an average score of 56.8 percent and the non-availability of the dehusking machine second with an average score of 56.5 percent. And another important constraint most of the respondents are facing was the lower harvest price than the MSP price available, this constraint ranked 3rd with an average score of 55.8 percent, which means the buyers are not buying the produce at the government MSP price. The next constraint respondents ranked was attack by birds and animals; about 52.3 percent of the respondents. Non-availability of quality seed of recommended maize hybrids at 5th rank with an average score of 50.7 percent. Incidence of insect pests and diseases, high cost of hybrid seed, non-availability of an assured market for paddy, Higher nutrients uptake by maize than paddy from soil and a smaller number of buyers in the market ranked 6th, 7th, 8th and 10th, respectively, with average scores of 49.2, 48.7, 47.1, 46.6 and 44.7. Labor scarcity during peak harvest time ranked 11th with an average score of 40.8 percent.

The analysis of the constraints in adoption of maize in Yamunanagar district was done by Henry Garrett ranking technique. The results indicated that the most serious problem faced by the farmers in the adoption or cultivation of maize in the study area was attack of birds or wild animals, followed by the non-availability of dryers for maize produce, with average scores of 75.2 and 56.7, respectively. On the other hand, non-availability of quality seed of recommended maize hybrids and the non-availability of a dehusking machine ranked 3rd and 4th, respectively, with an average score of 55.5 and 54.7 respectively. The other important constraints in the adoption of maize in the Yamunanagar were non-availability of an

assured market, labour scarcity during peak harvesting time, a smaller number of buyers in the market for maize, a high cost of hybrid seed and Higher nutrients uptake by maize than paddy from soil. less harvest price than MSP with the average scores of 50.5, 40.8, 38.5, 33.1, 30.3 and 29.5 per cent respectively. And incidence of insect pests and diseases ranked 11th with an average score of 23.08 per cent.

An overall analysis of the constraints faced by the farmers in the cultivation or production of maize was done to find out the main constraints or problems that are faced by the farmers in adopting the cultivation or production of the maize in the study area. The results showed that attacks by birds or wild animals are the main constraints faced by the farmers in maize production; with an average score of 63.75, it ranked first. On the other hand, non-availability of dryers for maize produce ranked second, with an average score of 56.75 percent. Non-availability of a deshushing machine ranked 3rd with a 55.59 average score; non-availability of quality seed of recommended maize hybrids ranked 4th with an average score of 53.11 percent. Other constraints in the overall study area are non-availability of assured market, less harvest price than MSP, a smaller number of buyers in the market for maize, high cost of hybrid seed and labour scarcity during peak harvesting time, with the average scores of 48.81, 42.65, 41.61, 40.9 and 40.84 respectively. Higher nutrients uptake by maize than paddy from soil and incidence of insect pests and disease ranked 10th and 11th with average scores of 38.45 and 36.16 percent.

Overall, the constraints identified in this study reflect a combination of agronomic, infrastructural and economic factors. These issues must be addressed through an integrated strategy involving technological interventions (such as mechanization and pest control), institutional support (like MSP-based procurement and drying facilities) and farmer education. Without addressing these constraints holistically, the adoption of maize as a sustainable alternative to paddy in Haryana may remain limited.

Pawar *et al.* (2019) [6] have also reported similar kind of outcomes in their study conducted in Karnal and Yamunanagar districts of Haryana where need for constant vigilance to protect the crop from stray animals, limited access to suitable threshing machines for maize, a shortage of maize dryers and inadequate availability of quality seeds for recommended maize hybrids. Similarly, Kumar *et al.* (2024) [4] also observed bird and wild animal damage to standing crops, the lack of a maize drier, the higher cost of seed were the major constraints in maize crop. Further the results of the present study are in conformity with findings of Khuvung *et al.* (2022) [2] and Krishna *et al.* (2018) [3].

Table 1: Constraints faced by maize growers in Kurukshetra and Yamunanagar district of Haryana

Sr. No.	Particulars	Kurukshetra		Yamunanagar		Haryana	
		Avg score	Rank	Avg score	Rank	Avg score	Rank
1	High cost of hybrid seed	48.7	7	33.1	8	40.9	8
2	Incidence of insect pest and disease (stem borer/army worm/ other)	49.25	6	23.08	11	36.16	11
3	Damage by birds or animals (parrots/nilgai/monkey/wild pig/other)	52.3	4	75.2	1	63.75	1
4	Non-availability of quality seed of recommended maize hybrids	50.7	5	55.53	3	53.11	4
5	Labour scarcity during peak harvesting time	40.85	11	40.83	6	40.84	9
6	Non-availability of deshushing machine	56.46	2	54.7	4	55.59	3
7	Non-availability of dryers for maize produce (Cob)	56.78	1	56.73	2	56.75	2
8	Less number of buyers in market for maize	47.1	10	38.55	7	41.61	7
9	less harvest price than MSP	55.83	3	29.48	10	42.65	6
10	Non-availability of assured market	44.68	8	50.53	5	48.81	5
11	Higher nutrients uptake by maize than paddy from soil	46.6	9	30.3	9	38.45	10

Conclusion

From the above results and discussion, it is concluded that the key constraints in cultivation of maize include attacks by birds and animals, lack of dryers and dehusking machines, low market prices and absence of assured procurement. Labour shortages, high seed costs and greater nutrient extraction also limit adoption. These constraints are common in both Kurukshetra and Yamunanagar districts. Addressing these constraints is essential for promoting maize as a viable alternative to paddy.

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