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Bridging knowledge and practice: Constraints and solutions in mustard technology adoption

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Abstract

Mustard (*Brassica juncea* L.) is a vital oilseed crop in India, contributing significantly to the edible oil economy. Despite the availability of improved technologies, the adoption rate among mustard growers remains suboptimal. The present study was conducted to analyze the constraints faced by mustard growers in adopting production technologies and to document their suggestions for overcoming these barriers. Data were collected from 120 randomly selected mustard growers through a structured interview schedule. Results revealed that major constraints included non-availability of improved varieties, adverse climatic conditions, lack of knowledge about balanced fertilizer use, and inadequate market and storage facilities. Farmers suggested timely availability of improved seeds, organization of crop-specific training, establishment of modern storage facilities, and assurance of remunerative prices as critical measures. The findings emphasize the need for integrated extension efforts, policy support, and institutional linkages to bridge the gap between research recommendations and field-level adoption.

Keywords: Mustard growers, adoption, constraints, suggestions, technology, oilseed

Introduction

Oilseeds play a vital role in Indian agriculture, with mustard occupying a prominent place due to its adaptability, multipurpose uses, and significant contribution to edible oil production (Singh *et al.*, 2022) ^[5]. Although various improved technologies such as high-yielding varieties, integrated nutrient management, and pest control measures have been developed, their adoption by farmers remains uneven and often limited (Kumar & Chauhan, 2021) ^[1].

Adoption of agricultural technology is influenced by multiple constraints, including production, marketing, and socio-psychological barriers. At the same time, suggestions offered by farmers provide practical insights into addressing these challenges. Understanding these perspectives is essential for designing effective extension interventions (Rathore *et al.*, 2020) ^[3].

Therefore, the present investigation was undertaken to identify the major constraints faced by mustard growers in adopting recommended technologies and to document farmer-driven suggestions for enhancing adoption.

Methodology

The study was conducted in selected mustard-growing villages of [insert district/state, e.g., Madhya Pradesh/Arunachal Pradesh depending on your study area]. A total of 120 respondents were selected through random sampling. A well-structured interview schedule was

prepared, pre-tested, and administered personally.

Constraints and suggestions were measured using a three-point continuum: Most Important (MI = 3), Important (I = 2), and Not Important (NI = 1). Scores were aggregated to obtain Total Score (TS), Mean Score, and Rank. Data were analyzed using frequency, percentage, mean, and ranking techniques.

Results and Discussion

• Constraints in Adoption of Mustard Production Technology

Table 1 presents the category-wise constraints. The major crop production-related constraints included non-availability of improved mustard varieties (Mean = 2.58, Rank I) and adverse climatic conditions (Mean = 2.50, Rank II). Market-related issues such as lack of timely information about improved technologies (Mean = 2.70, Rank I) and non-remunerative prices (Mean = 2.56, Rank II) were also significant. Storage constraints, particularly the lack of scientific storage facilities (Mean = 2.51), further discouraged adoption. Among social and psychological constraints, inadequate training and exposure visits (Mean = 2.53) and low motivation among farmers (Mean = 2.50) were reported prominently.

These findings are consistent with earlier studies (Meena *et al.*, 2019; Singh & Kaur, 2020) ^[2, 4], which reported similar production and market-related bottlenecks in oilseed

cultivation.

• Suggestions for Overcoming Constraints

Suggestions offered by mustard growers are summarized in Table 2. Key crop production-related suggestions were timely availability of improved varieties (Mean = 2.72, Rank I) and organization of training and demonstrations (Mean = 2.63, Rank II). Market-related measures included assurance of remunerative prices (Mean = 2.75, Rank I) and provision of timely market information (Mean = 2.65, Rank II). Farmers also recommended establishment of modern storage structures (Mean = 2.62) and training on scientific storage. At the social level, regular farmer training and motivational programs were emphasized.

These farmer-driven suggestions align with extension strategies proposed by Kumar *et al.* (2021) ^[1], highlighting the importance of farmer participation in technology dissemination and decision-making.

Discussion

The juxtaposition of constraints and suggestions reveals that farmer-identified solutions directly address the challenges they face. For instance, the non-availability of improved varieties (constraint) corresponds to timely seed availability (suggestion), while the lack of scientific storage facilities (constraint) aligns with the establishment of modern storage structures (suggestion). Such coherence between constraints and farmer-suggested interventions highlights the relevance and practicality of farmer perspectives in extension planning.

Moreover, market-related constraints underscore the need for institutional support such as Minimum Support Price (MSP) assurance and strengthened cooperative marketing. Similarly, training and exposure visits are critical to enhance farmer confidence and skill in adopting modern technologies.

Table 1: Constraints faced by mustard growers in adoption of mustard production technology (n = 120)

S. No.	Constraints	MI	I	NI	TS	Mean	Rank
Crop Production Related Constraints							
1	Non-availability of improved mustard varieties	80	30	10	310	2.58	I
2	Adverse climatic conditions affecting mustard growth	74	32	14	300	2.50	II
3	Limited knowledge about balanced fertilizer use	67	34	19	288	2.40	III
4	Lack of awareness about pest and disease management	64	37	19	285	2.38	IV
5	Insufficient knowledge of pesticide and fertilizer doses	56	46	18	278	2.32	V
6	Soil erosion affecting productivity	39	52	29	249	2.07	VI
Market Related Constraints							
1	Lack of timely information about improved technologies	88	28	04	324	2.70	I
2	Non-remunerative price for mustard	75	37	08	307	2.56	II
3	High cost of fertilizers, pesticides, and weedicides	71	32	17	293	2.44	III
4	Lack of adequate transportation facilities	69	29	22	287	2.39	IV
5	Involvement of middlemen in marketing	66	32	22	286	2.38	V
6	Distant markets and low price realization	60	30	30	270	2.25	VI
7	Lack of finance for input purchase	54	28	38	256	2.13	VII
Storage Related Constraints							
1	Lack of scientific storage facilities	76	29	15	301	2.51	I
2	Lack of training on construction of local storage structures	69	32	19	289	2.41	II
3	Poor maintenance of produce in warehouses	63	30	27	276	2.30	III
4	Non-availability of credit against stored produce	50	31	39	251	2.09	IV
Social and Psychological Constraints							
1	Lack of adequate training and exposure visits	71	43	06	303	2.53	I
2	Low motivation among farmers	72	36	12	300	2.50	II
3	Weak leadership among local leaders	59	36	25	274	2.28	III
4	Unskilled practices of innovative farmers	57	32	31	268	2.23	IV
5	Poor coordination among farmers	54	34	32	262	2.18	V

MI= Most important, I= Important, NI= Not important, TS= Total score

Table 2: Suggestions Provided by Mustard Growers for Improving Adoption of Mustard Production Technology (n = 120)

S. No.	Suggestions	MI	I	NI	TS	Mean	Rank
Crop Production Related Suggestions							
1	Timely availability of improved and high-yielding mustard varieties	84	29	07	326	2.72	I
2	Organization of crop-specific training and demonstrations	77	33	10	316	2.63	II
3	Promotion of climate-resilient production practices	72	34	14	307	2.56	III
4	Provision of soil testing facilities and fertilizer use guidance	68	36	16	298	2.48	IV
5	Timely supply of agrochemicals at reasonable rates	65	38	17	292	2.42	V
Market Related Suggestions							
1	Ensuring remunerative prices through MSP/procurement	90	25	05	330	2.75	I
2	Provision of timely and reliable market information	82	30	08	318	2.65	II
3	Reduction in role of middlemen via cooperatives/FPOs	74	34	12	310	2.58	III
4	Development of better transportation facilities	70	36	14	296	2.47	IV
5	Easy access to agricultural credit for input purchase	66	34	20	287	2.39	V
6	Subsidy on fertilizers, pesticides, and weedicides	64	32	24	280	2.33	VI

Storage Related Suggestions							
1	Establishment of modern storage structures at local level	78	33	09	314	2.62	I
2	Training on scientific storage and handling techniques	72	35	13	301	2.51	II
3	Improvement of existing warehouse facilities	65	36	19	288	2.40	III
4	Availability of credit against stored produce	60	32	28	278	2.32	IV
Social and Psychological Suggestions							
1	Regular farmer training and exposure visits	82	30	08	319	2.66	I
2	Motivational and awareness programs for farmers	76	33	11	310	2.58	II
3	Strengthening of local leadership and farmer groups	69	35	16	293	2.44	III
4	Recognition and support for innovative farmers	63	36	21	287	2.38	IV
5	Promotion of farmer cooperatives and FPOs for coordination	61	34	25	276	2.30	V

MI= Most important, I= Important, NI= Not important, TS= Total score

Conclusion

The study concludes that mustard growers face multifaceted constraints related to crop production, marketing, storage, and socio-psychological aspects. Farmers' suggestions reflect a pragmatic approach to overcoming these barriers, emphasizing timely availability of inputs, remunerative prices, improved storage, and capacity-building measures. Policymakers, extension agencies, and researchers must collaborate to implement these farmer-driven solutions. Strengthening Farmer Producer Organizations (FPOs), developing climate-resilient technologies, and expanding training programs can significantly enhance adoption and productivity in mustard cultivation.

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