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Adoption behaviour of farmers towards improved mustard cultivation practices in Kakching district of Manipur

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Abstract

The main purpose of the study was to ascertain the adoption behaviour of farmers towards improved mustard cultivation practices in Kakching district of Manipur. The study was conducted in Kakching block of Kakching district in the year 2023-2024. Descriptive research designed was applied for this study. The primary data was collected from 120 respondents by personal interview method using pre-structure interview schedule. Adoption of the farmers was measured by asking 18 questions in respect of mustard cultivation. Finding showed that 40.83 percent of the respondents have medium adoption level of mustard cultivation, followed by 35.00 percent of the respondents having high adoption level of mustard cultivation and 24.17 percent of the respondents having low adoption level of mustard cultivation respectively. It was revealed that out of eleven independent variables, i.e. age, education, occupation, annual income, land holding, farming experience, mass media exposure, sources of agriculture information, risk bearing capacity, scientific orientation and economic motivation are positively and significantly correlate with adoption of farmers towards improved mustard cultivation practices.

Keywords: Mustard, adoption behaviour, improved cultivation practices

Introduction

Rapeseed and Mustard belong to the genus brassica of the family *Brassicaceae* or *Cruciferae*. Brassica species include *B. carinata, B. juncea, B. oleracea, B. napus, B. nigra,* and *B. rapa*. Mustard oil is the mixture of various acids like, linoleic acid and linolenic acid which have beneficial properties.

In India, Rapeseed-mustard crops are grown in diverse agro-climatic conditions ranging from north-eastern/north-western hills to down south under irrigated/rainfed, timely/late sown, saline soils and mixed cropping. Indian mustard (*Brassica juncea*) is cultivated throughout the country in the rabi season. The rapeseed-mustard group broadly includes Indian mustard, yellow sarson, brown sarson and toria crops. Indian mustard (*Brassica juncea*) is predominantly cultivated in Rajasthan, Uttar Pradesh, Haryana, Madhya Pradesh and Gujarat. It is also grown in some non-traditional areas of south India, including Karnataka, Tamil Nadu and Andhra Pradesh. The crop can be raised well under both irrigated and rainfed conditions. The country witnessed the yellow revolution through a phenomenal increase in production and productivity from 2.68 MT and 650 kg/ha in 1985-86 to 6.96 MT and 1022 kg/ha in 1996-97. Shekhawat *et al*., (2012) [4].

In Manipur, M-27, Ragini and Local variety- Yella are the three popular rapeseed and mustard varieties grown in Manipur. Various sowing techniques have been practiced in zero tillage cultivation of rapeseed and mustard in Manipur viz. as relay crop, sowing seeds after burning straw and sowing seeds with straw mulching. The vast area of Manipur has led to the transformation of mono-cropped rice cropping system to double cropped rice-rapeseed and mustard zero tillage system. Monika *et al*., (2014) [1]

In Kakching district, the oil extracted from rapeseed plants are commonly used. Rapeseed mustard is the primary crop grown in Kakching district during the rabi season after paddy, especially in areas where agriculture depends on rainfall.

The cultivation of oilseeds faces several constraints. It includes water scarcity during post monsoon season, lack of irrigation facilities, short time lag after rice harvest for seed sowing and high incidence of pests and diseases in late sown crop. Zero tillage cultivation system of rapeseed mustard in Manipur led to a success in expansion of area in the state. Its popularity is increasing day by day among the farming community in Manipur state. The natural resources are precious and therefore demand an effective and sustainable use. Selection of the suitable varieties for the crop under zero tillage cultivation has become an indispensable step for expanding the crop area and to raise the production. (Sanatomba *et al*., 2020) [3]

The adoption of zero tillage for rapeseed mustard cultivation leads to higher earnings and also helps in increasing the rapeseed yields in the area.

Justification of the study

The findings of the present study will help the adoption behaviour of the farmers that is existing among the Mustard

growers in Kakching district, Manipur. It will enable to investigate its appropriate approach to trace out the constraints in utilization of recommended safe plant protection measures and knowledge for better crop management and enhance productivity regarding improved mustard cultivation.

Objectives

1. To assess the socio-economic profile of the respondents.
2. To find the adoption level of improved mustard cultivation practices by the respondents.
3. To establish the relationship between the selected independent variables with adoption.

Research Methodology

The study was conducted in Kakching district of Manipur. Descriptive research design was followed for the present study as it describes the characteristics or phenomenon that is being studied. Multi stages sampling was followed for the present study for the selection of samples required. Manipur has 16 districts and out of which Kakching district was selected. There are two blocks in Kakching district, out of which Kakching block was selected purposively based on maximum area cover under mustard cultivation. Six villages were selected from Kakching block and a total number of 120 respondents were randomly selected proportionately on the basis of maximum area covered under mustard cultivation.

Methods used for data collection

A pre-tested structured interview schedule focused towards the objectives of the study was developed for data collection. Survey method of data collection with the help of a pre-structured interview schedule was used. The collected data were classified, tabulated and analyzed in light of the objectives.

Data statistical analysis

The data collected from the respondents was converted to 3 point score (Likert Scale) and tabulated. The evaluation of the data and the relationship between the independent and dependent variables was done using Mean, Frequency, Percentage and Correlation.

Results and Discussion

Socio Economic Characteristics of the Respondents

Table 1: Characteristics of the respondents

(N=120)

S. No	Attributes	Characteristics	Frequency	Percentage
1	Age	Young (Below 30 years)	26	21.67
		Middle (31-50 years)	38	31.67
		Old (Above 50 years)	56	46.66
2	Education	Illiterate	9	7.50
		Can read and write	13	10.83
		Primary School	15	12.50
		Junior High School	26	21.67
		Intermediate	41	34.17
		Graduate and above	16	13.33
3	Occupation	Agriculture + Business	14	11.67
		Agriculture + Service	9	7.50
		Agriculture + Labour	38	31.67
		Agriculture only	59	49.16
4	Annual income	Upto Rs. 70,000	24	20.00
		Rs. 70,001-Rs. 1,00,000	41	34.17
		Above Rs. 1,00,000	55	45.83
5	Land holding	1-2 acre	28	23.33
		3-4 acre	39	32.50
		Above 4 acre	53	44.17
6	Farming experiences	Upto 5 years	6	5.00
		6-10 years	11	9.17
		11-15 years	38	31.67
		Above 15 years	65	54.16
7	Mass media exposure	Low	33	27.50
		Medium	63	52.50
		High	24	20.00
8	Sources of agriculture information	Low	38	31.67
		Medium	56	46.67
		High	26	21.66
9	Risk bearing capacity	Low	19	15.83
		Medium	30	25.00
		High	71	59.17
10	Scientific orientation	Low	24	20.00
		Medium	35	29.17
		High	61	50.83
11	Economic motivation	Low	39	32.50
		Medium	48	40.00
		High	33	27.50

The data presented in Table 1 revealed that 46.66 percent of the respondents are old age (above 50 years) followed by 31.67 percent middle age (31-50 years) and 21.67 percent of the respondents are of young age (below 30 years). It also indicated that 34.17 percent of the respondents were educated up-to Intermediate level of education, 21.67 percent of the respondents had Junior High School education, 13.33 percent of the respondents had Graduate and Above education, 12.50 percent of the respondents had Primary School education, followed by 10.83 percent of the respondents that can read and write without any formal education and 7.50 percent of the respondents were illiterate. It was revealed that 49.16 percent of the respondents were engaged in agriculture only, 31.67 percent of the respondents were engaged in agriculture and labour, followed by 11.67 percent of the respondents were engaged in agriculture and business, and 7.50 percent of the respondents were doing service beside agriculture. It was found that 45.83 percent of the respondents have income above 1 lakh rupees followed by 34.17 percent of the respondents has income between 70,001 to 1 lakh and 20.00 percent of the respondents has income upto 70,000 rupees. It was revealed that 44.17 percent of the respondents have land holding above 4 acre, followed by 32.50 percent of the respondents has land holding between 3-4 acre and 23.33 percent of the respondents has land holding of 1-2 acre. It was revealed that majority (54.16%) of the respondents have >15 years of farming experience, 31.67 percent of the respondents have 11-15 years of farming experience, followed by 9.17 percent of the respondents who have 6-10 years of farming experience and 5.00 percent of the respondents have upto 5 years of farming experience. It was found that majority (52.50%) of the respondents have medium level of mass media exposure, followed by 27.50 percent of the respondents having low level of mass media exposure and 20.00 percent of the respondents have high level of mass media exposure. It was revealed that 46.67% percent of the respondents have medium level of sources of agriculture information, followed by 31.67 percent of the respondents having low level of sources of agriculture information and 21.66 percent of the respondents have high level of sources of agriculture information. Majority (59.17%) of the respondents have high level of risk bearing capacity, followed by 25.00 percent of the respondents having medium level of risk bearing capacity and 15.83 percent of the respondents have low level of risk bearing capacity. Majority (50.83%) of the respondents have high level of scientific orientation, followed by 29.17 percent of the respondents having medium level of scientific orientation and 20.00 percent of the respondents have low level of scientific orientation. It was revealed that 40.00 percent of the respondents have medium level of economic motivation, followed by 32.50 percent of the respondents having low level of economic motivation and 27.50 percent of the respondents have high level of economic motivation.

Adoption of Improved Mustard Cultivation Practices

Table 2: Distribution of respondents based on adoption level towards improved mustard cultivation practices

(N=120)

Sl. No	Statement	Response					
		Fully adopted		Partially adopted		Not adopted	
		f	%	f	%	f	%
1	Adopted improved varieties of mustard	75	62.50	41	34.17	4	3.33
2	Sown or plant in a suitable soil	81	67.50	39	32.50	0	0
3	Perform tillage operations for land preparation for the cultivation	8	6.66	47	39.17	65	54.17
4	Perform any soil testing before land preparation to ensure optimal nutrient level	24	20.00	41	34.17	55	45.83
5	Recommended seed rate	61	50.83	44	36.67	15	12.50
6	Recommended spacing between plant to plant	39	32.50	62	51.67	19	15.83
7	Seed treatment before sowing	55	45.84	43	35.83	22	18.33
8	Suitable time of sowing is from MidOctober to late November	51	42.50	69	57.50	0	0
9	Recommended dose of NPK	54	45.00	36	30.00	30	25.00
10	Utilize any modern irrigation techniques	7	5.83	44	36.67	69	57.50
11	Applied irrigation during flowering and grain formation stage	57	47.50	56	46.67	7	5.83
12	Perform recommended weeding and other cultural operations	43	35.83	63	52.50	14	11.67
13	Used any specific tools and techniques for weeding	71	59.17	41	34.17	8	6.66
14	Applied recommended dose of organic or inorganic pesticides to protect the plants from pest and diseases	13	10.83	66	55.00	41	34.17
15	Utilized any modern mechanical equipment for harvesting or follow traditional hand harvesting methods	30	25.00	90	75.00	0	0
16	Stored the harvested seeds for replanting or purchase improved seeds every season	50	41.67	70	58.33	0	0
17	Practise inter-cropping with other crops	16	13.33	31	25.83	73	60.84
18	Stored the products after harvest to sell them at the right time when the market conditions are favourable	64	53.33	30	25.00	26	21.67

The data presented in Table 2 revealed that majority (62.50%) of the respondents fully adopt the improved varieties of mustard, 34.17 percent of the respondents partially adopt and 3.33 percent of the respondents do not adopt. Majority (67.50%) of the respondents fully sowed or plant the mustard in a suitable soil and 32.50 percent of the respondents partially sowed. Majority (54.17%) of the respondents do not perform tillage operations for land preparation for the cultivation, 39.17 percent of the respondents partially performed and 6.66 percent of the respondents fully performed. It was revealed that 45.83 percent of the respondents do not perform any soil testing before land preparation to ensure optimal nutrient level followed by 34.17 percent of the respondents partially performed and 20.00 percent of the respondents fully performed. Majority (50.83%) of the respondents fully adopt the recommended seed rate followed by 36.67 percent of the respondents partially adopt and 12.50 percent of the respondents do not adopt the recommended seed rate. Majority (51.67%) of the respondents partially adopt the recommended spacing between plant to plant, 32.50 percent of the respondents fully adopt and 15.83 percent does not adopt. It was observed that 45.84 percent of the respondents fully treat the mustard seeds before sowing followed by 35.83 percent of the respondents partially treat and 18.33 percent of the respondents do not treat. Majority (57.50%) of the respondents partially sow or plant the mustard seeds from Mid-October to late November and 42.50 percent of the respondents fully sow or plant the mustard seeds from Mid-October to late November. It was revealed that 45.00 percent of the respondents fully adopt the recommended dose of NPK, 30.00 percent of the respondent partially adopts and 25.00 percent of the respondents does not adopt. Majority (57.50%) of the respondents do not utilize any modern irrigation techniques for mustard cultivation, 36.67 percent of the respondents partially utilized and 5.83 percent of the respondents fully utilized. It was revealed that 47.50 percent of the respondents fully apply irrigation during flowering and grain formation stage of mustard, 46.67 percent of the respondents partially applied and 5.83 percent of the respondents do not apply. It shows that the majority (52.50%) of the respondents partially performed weeding and other cultural operations in mustard cultivation as recommended, 35.83 percent of the respondents fully performed and 11.67 percent of the respondents does not perform. Majority (59.17%) of the respondents fully adopts specific tools and techniques for weeding in mustard cultivation, 34.17 percent of the respondents partially adopt and 6.66 percent of the respondents do not adopt. Majority (55.00%) of the respondents partially apply the recommended dose of organic or inorganic pesticides to protect the mustard plants from pest and diseases, 34.17 percent of the respondents do not apply and 10.83 percent of the respondents fully applied. Majority (75.00%) of the respondents partially adopted the traditional hand harvesting methods and modern mechanical equipment for harvesting and 25.00 percent of the respondents fully adopts the modern mechanical equipment for harvesting. Majority (58.33%) of the respondents partially adopted the purchased improved seeds for every season, and 41.67 percent of the respondents fully adopted the storage of harvested seeds for replanting. Majority (60.84%) of the respondents do not adopt inter cropping with other crop, 25.83 percent of the respondents partially adopt and 13.33 percent of the respondents fully adopt inter cropping. Majority (53.33%) of the respondents fully adopt the storage of the products after harvest to sell them at the right time when the market conditions are favourable, 25.00 percent of the respondents partially adopt and 21.67 percent of the respondents do not adopt.

Table 3: Overall adoption level of the respondents towards improved mustard cultivation

Sl. No.	Adoption level	Response	
		Frequency	Percentage
1	Low (31-35)	29	24.17
2	Medium (36-40)	49	40.83
3	High (41-46)	42	35.00
Total		120	100.00

The data presented in Table 3 revealed that majority (40.83%) of the respondents have medium adoption level, 35.00% of the respondents have high level of adoption and 24.17% of the respondents have low adoption level. Similar finding was also reported by Nigam *et al*. (2024) [2].

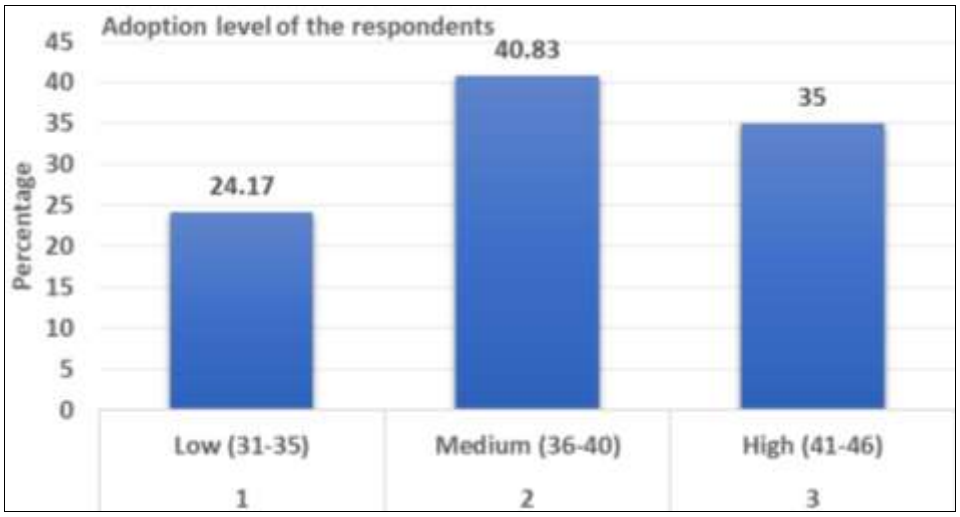

Fig 1: Overall distribution of respondents based on the adoption level of improved Mustard cultivation practices.

Association between Selected Independent Variables with the Adoption of the Respondents towards Improved Mustard Cultivation Practices

Table 4: Association between selected independent variables and adoption

Sl. No.	Variables	Pearson's correlation coefficient
1	Age	0.5481**
2	Education	0.6776**
3	Occupation	0.5639**
4	Annual income	0.6823**
5	Land holding	0.5858**
6	Farming experience	0.5835**
7	Mass media exposure	0.6079**
8	Sources of agriculture information	0.4502**
9	Risk bearing capacity	0.3649*
10	Scientific orientation	0.4485**
11	Economic motivation	0.4502**

* = Significant at p = 0.05%, **= Significant at p = 0.01%, NS= Non-Significant

The data presented in Table 4 revealed that out of eleven independent variables, i.e. age, education, occupation, annual income, land holding, farming experience, mass media exposure, sources of agriculture information, risk bearing capacity, scientific orientation and economic motivation are positively and significantly correlated with adoption of farmers towards improved Mustard cultivation practices.

Conclusion

It was concluded that most of the respondents were old age (Above 50 years). Most of the respondents were educated up-to Intermediate level of education. Majority of the respondents have >15 years of farming experience. Most of the respondents were engaged in agriculture only. Most of the respondent land holdings are above 4 acres. Majority of the respondents have medium level of mass media exposure. Majority of the respondents have high level of risk bearing capacity. Majority of the respondents have high level of scientific orientation. Majority of the respondents had medium level of adoption, followed by high level of adoption and low level of adoption respectively. Subsequently, all of the selected independent variables, i.e. age, education, occupation, annual income, land holding, farming experience, mass media exposure, sources of agriculture information, risk bearing capacity, scientific orientation and economic motivation variables were positively significant with the adoption of the farmers towards improved mustard cultivation practices. Proper training related to pest and diseases and extension strategies to be followed for maximum adoption of improved mustard crop in the research area.

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