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KNOWLEDGE AND ADOPTION LEVEL OF FARMERS WITH RESPECT TO PACKAGE OF PRACTICES OF BASMATI RICE CULTIVATION

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ABSTRACT

The present study was conducted to find out the knowledge level of basmati rice growers in Shahjahanpur district of Uttar Pradesh. The data was collected through personal interview schedule from the basmati rice growers for the investigation based on their knowledge of package of practices in basmati rice cultivation. The study reported that majority (77.50%) of basmati rice growers were having high knowledge about land preparation, (65.00%) use of green manuring, (56.66%) basmati rice growers were having high knowledge of harvesting of basmati rice and the majority (84.17%) basmati rice growers were having medium knowledge about transplanting and (81.66%) selection of improved basmati rice varieties for basmati rice cultivation. The study also reported that the majority (77.50%) of rice growers were having low knowledge about soil treatment and (45.83%) use of balanced fertilizers in basmati rice cultivation. The study further reported that the majority (87.50%) of the basmati rice growers were fully using sandy loam and loamy soil for basmati rice cultivationand the majority (87.50%) of the basmati rice growers were fully adopted proper field preparation practices for basmati rice cultivation in the study area. The study also reported that the majority (80.83%) of the basmati rice growers were fully adopted harvesting time of basmati rice.

Keywords : *basmati rice, knowledge level, adoption level, package of practices*

INTRODUCTION

Basmati rice is one of the most important varieties of rice production in the country. Basmati, which means "queen of fragrance," is a long grain rice variety known for its fragrance and delicate flavor. It is usually assumed that the Hindi word"Bas" means "aroma" and "Mati" means "full of," therefore the word "Basmati" means "full of aroma." It has been farmed for millennia in a tiny geographical region of the Indian subcontinent, having a documented history of over 200 years. Basmati rice, a long-grained, non-glutinous rice with a beautiful fragrance, is a lovely compliment to any meal. The aroma and elongation after cooling distinguish this rice from other rice kinds. This unique combination of characteristics can't be found in any other rice. Basmati rice has become a delicacy due to its post-cooking extension of more than twice its original length, scent, and sweet taste. Basmati rice is cultivated largely in India and Pakistan. The best basmati varietals are produced in the Himalayan foothills. Rice Tec Corporation of the United States attempted to patent its aromatic rice variety known as 'Basmati'. The Indian government later withdrew its willingness to engage due to intense patent competition. The "Geographical Indication of Goods (Registration and Protection) Act, 1999" (approved by the WTO) protects rice grown in India and prevents anyone from outside India and the Gangetic area from obtaining a patent for basmati protection. Because of the high demand for basmati rice on foreign markets, it is exported. In India, over two-thirds of the basmati rice produced is exported. India produces more than 70% of the total world basmati rice production and the rest is produced by Pakistan. The production of basmati rice in India is 8.7 million tons from 2.1 million hectares during 2018-19 crop year. India exported 4.4 million metric tons of basmati rice from April 2018 to March 2019 and worth of Rs. 31,025.91 crores duringthe year 2019-20. (APEDA, 2019) Basmati rice was originated in India and Pakistan; however, India is the world's top producer and exporter of Basmati Rice, accounting for over 70% of global supply. Up to 2015, there were 23 types of basmati rice authorized under the Seeds Act of 1966. Haryana has the most Basmatipaddy acreages, accounting for 44 percent of basmati acreages, followed by Punjab (28 percent) and Uttar Pradesh (24 percent).

OBJECTIVE

To assess the knowledge and adoption level of farmers with respect to package of practices of basmati rice cultivation

METHODOLOGY

The current research was carried out in Uttar Pradesh's Western Zone. There are 23 districts in Western Uttar Pradesh out of which Shahjahanpur district was purposively selected for the investigation based on basmati rice production. The two blocks, Dadraul and Tilhar, of the districts were purposively selected for the investigation based on higher basmati rice area and production. From each block four villages were selected purposively; thus, the total 8 village was selected for the investigation. After this prepared a list of basmati rice growers of all selected villages and 15 basmati rice growers were selected randomly from each village for the investigation. Thus, the total sample size of 120 rice growers for the investigation. The investigator himself collected the data from the respondents with the help of pre-tested interview schedule. The collected data were analyzed by using appropriate statistical tools procedures to determine the frequency, percentage, mean, mean average, mean percentage score, standard deviation and rank order. Followed the standard methodology as followed by Vegad et al. (2021).

RESULTS AND DISCUSSION

Knowledge level of basmati rice growers regarding package of practices of basmati rice cultivation

Table 1: Distribution of basmati rice growers according to their knowledge level (n=120)

Sr. No.	Particular	Low knowledge		Medium knowledge		High knowledge		Mean value	MPS (%)	Rank order
		F	P	F	P	F	P			
1	**Use of green manures**	22	18.33	20	16.67	78	65.00	2.46	82.22	II
2	**Soil treatment**	93	77.50	18	15.00	09	07.50	1.30	43.33	XIV
3	**Recommended soil**	31	25.83	57	47.53	32	26.64	2.00	66.94	VIII
4	**Land Preparation**	12	10.00	15	12.50	93	77.50	2.67	89.16	I
5	**Nursery Preparation**	29	24.16	81	67.50	10	08.33	1.81	61.38	XI
6	**Selection of improved basmati ricevarieties**	14	11.67	98	81.67	08	06.66	1.95	65.00	X
7	**Seed rate**	24	20.00	68	56.67	28	23.33	2.03	67.77	VII
8	**Seed treatment**	90	75.00	19	15.84	11	09.16	1.34	44.72	XIII
9	**Seedling transplanting**	10	08.33	101	84.17	9	07.50	1.99	66.38	IX
10	**Use of balanced fertilizers**	55	45.83	45	37.50	20	16.67	1.02	34.16	XV
11	**Method of application**	37	30.83	40	33.33	43	35.84	2.05	68.33	VI
12	**Inter cultivation practices**	08	06.66	87	72.50	25	20.83	2.14	71.38	V
13	**Irrigation**	07	05.83	74	61.67	39	32.50	2.26	75.55	IV
14	**Pest and disease control**	50	41.66	55	45.83	15	12.50	1.70	56.94	XII
15	**Harvesting**	18	15.00	34	28.34	68	56.66	2.41	80.55	III

F = Frequency, P = Percentage, MSP = Mean Percentage Score

(1) Use of green manures

The data presented in table-1, reported that the majority (65.00%) respondents were having high knowledge about green manure preparation and using, followed by 18.33 per cent were having low knowledge about preparation of green manure and using and the remaining 16.67 per cent respondents had medium knowledge about preparation of green manures and use in basmati rice cultivation.

(2) Soil treatment

The data presented in the table-1, indicated that the majority (77.50%) basmati rice growers were having low knowledge about soil treatment for basmati rice cultivation, followed by 15.00 per cent farmers were having medium knowledge and the remaining 7.50 per cent had highly knowledge about soil treatment for basmati rice cultivation.

(3) Recommended soil

The data presented in table-1, reported that the majority (47.53%) basmati rice growers were having medium knowledge about recommended soil, followed by 26.64 per cent basmati rice growers were having highly knowledge and the remaining 25.83 per cent were having low knowledge about recommended soil for basmati rice cultivation

(4) Land preparation

Reported that the majority (77.50%) basmati rice growers were having high knowledge about land preparation for basmati rice cultivation, followed by 12.50 per cent

basmati rice growers were having medium knowledge and the remaining 10.00 per cent were had low knowledge about land preparation for basmati rice cultivation,the data presented in parameter 4. In table-1, the mean value was found 2.67 with the mean percentage score of 89.16 and ranking order was of first place.

(5) Nursery preparation

The data presented in table-1, show that the majority (67.50%) basmati rice growers were having medium knowledge about nursery preparation, followed by 24.16 per cent respondents were having low knowledge and the remaining 08.33 per cent respondents had high knowledge about nursery preparation for basmati rice cultivation. It mean value was found 1.81 and mean percentage score 61.38 and ranking order was eleventh place.

(6) Selection of improved basmati rice varieties

The data presented in table-1, obvious that the majority (81.67%) basmati growers were having medium level of knowledge about selection of improved basmati rice varieties for cultivation followed by 11.67 per cent respondents werehaving low knowledge and the remaining 06.66 per cent had high knowledge about selection of improved basmati rice varieties. Its mean value was found 1.95 and mean percentage score 65.00 per cent and ranking order was of tenth place.

(7) Seed rate

The data presented in table observed that the majority (56.67%) basmati rice growers were having medium level of knowledge about recommended seed rate of basmati rice cultivation, followed by 23.33 per cent farmers were having high knowledge and the remaining 20.00 per cent respondents were having low knowledge about recommended seed rate of basmati rice cultivation. Its mean value was found 2.03 and mean percentage score 67.77 per cent and ranking was of seventh rank. The similar findings (51.00%) respondents had knowledge about seed rate in basmati rice cultivation reported by Netrapal and Rathi (2020).

(8) Seed treatment

The data presented in table-1, reveals that the majority (75.00%) basmati rice growers were having low level of knowledge about seed treatment in basmati rice cultivation, followed by 15.84 per cent farmers were having medium knowledge and the remaining 09.16 per cent respondents had high knowledge about seed treatment in basmati rice cultivation. Its mean value was found 1.34 and mean percentage score 44.72 and ranking was of thirteen places.

(9) Seedling transplanting

The data presented in table-1, observed that the majority (84.17%) basmati rice growers were having medium level of knowledge about transplanting of seedling per hill, time and spacing between plant to plant and row to row in basmati rice cultivation, followed by 08.33 per cent farmers were having low knowledge and the remaining 07.50% per cent respondents had high knowledge about transplanting of seedling per hill, time and spacing between plant to plant and row to row in basmati rice cultivation. Its mean value was found 1.99 with mean percentage score 66.38 and ranking order was of ninth place. The similar findings (41.00%) respondents had knowledge about seedling transplanting in the main field of basmati rice cultivation reported by Netrapal and Rathi (2020).

(10) Use of balance fertilizers

The data presented in table-1 reveal that the majority (45.83%) basmati rice growers were having low level of knowledge about using balanced fertilizers and nutrients management in basmati rice cultivation, followed by 37.50 per cent respondents were having medium knowledge and the remaining 16.67 per cent had high knowledge about using balanced fertilizers and nutrients management in basmati rice cultivation. Its mean value was found 1.02 and mean percentage score 34.16 and ranking fourteenth place.

(11) Method of application

The data presented in table-1, reveal that the majority (35.84%) basmati rice growers were having high level of knowledge about method of applicationof fertilizers and pesticides in basmati rice cultivation, followed by 33.33 per cent respondents were having medium knowledge and the remaining 30.83 per cent respondents had low knowledge about method of application of fertilizers and pesticides in basmati rice cultivation. Its mean vale was found 2.05 with mean percentage score 68.33 and ranking order was of fourth place.

(12) Inter-cultural practices

The data presented in table-1, shows that the majority (72.50%) basmati rice growers were having medium level of knowledge about inter cultural practices in basmati rice cultivation, followed by 20.83% per cent respondents were having high knowledge and the remaining 6.66 per cent respondents had low knowledge about inter - cultural practices in basmati rice cultivation. Its mean value was found 2.14 with mean percentage score 71.38 per cent and ranking order was of fifth place.

(13) Irrigation

The data presented in table-1, obvious that the majority (61.67%) basmati rice growers were having medium level of knowledge about irrigation in basmatirice cultivation, followed by 32.50 per cent respondents were having high knowledge and the remaining 05.83 per cent respondents had low knowledge about irrigation andirrigation phases of basmati rice cultivation. Its mean value was found 2.26 with mean percentage score of 75.55 and ranking order was found of fourth place. The similar findings (56.00%) respondents had knowledge about water management in basmati rice cultivation reported by Netrapal and Rathi (2020)

(14) Pest and Disease control

The data presented in table-1, indicated that the majority (45.83%) of the basmati rice growers were having medium level of knowledge about pest and disease control in basmati rice cultivation, followed by 41.66 per cent respondents were having low knowledge and the remaining 12.50 per cent respondents had high knowledge about pest and disease control in basmati rice cultivation. Its mean value was found 1.70 with mean percentage score of 56.94 and ranking order was found twelfth place.

(15) Harvesting

The data presented in table -1, reported that the majority (56.66%) basmati rice growers were having high level of knowledge about harvesting of basmati rice, followed by 28.34 per cent responding were having medium knowledge and the remaining 15.00 per cent respondents had low knowledge about harvesting in basmati rice. Its mean value was found 2.41 with mean percent score of 80.55 and ranking order was of third place.

Adoption level of growers with respect to package of practices of basmati rice cultivation

The adoption of basmati rice cultivation practices varies from individual to individual. An attempt has been made in the present study to find out the adoption level of basmati rice cultivation. The findings are presented in the following sub heads:

Table 2: Distribution of basmati rice growers according to their adoption level (n=120)

Sr. No.	Particular	Never adoption		Partially adoption		Fully adoption		Mean value	MPS (%)	Rank order
		F	P	F	P	F	P			
1	**Use of green manures**	69	57.51	22	18.33	29	24.16	0.66	22.22	XIII
2	**Soil treatment**	92	76.67	15	12.50	13	10.83	0.34	11.38	XIV
3	**Recommended soil**	05	04.17	10	08.33	105	87.50	1.88	62.66	I
4	**Land Preparation**	00	00	15	12.50	105	87.50	1.87	62.50	II
5	**Nursery Preparation**	05	04.17	45	37.50	70	58.33	1.54	51.38	VIII
6	**Selection of improved basmati ricevarieties**	07	05.84	50	41.66	63	52.50	1.46	48.88	IX
7	**Seed rate**	05	04.17	34	28.33	81	67.50	1.63	54.44	V
8	**Seed treatment**	97	80.83	18	15.00	05	04.16	0.23	07.77	XV
9	**Seedling transplanting**	09	07.50	29	24.17	82	68.33	1.60	53.61	VI
10	**Use of balanced fertilizers**	37	30.84	76	63.33	07	05.83	0.75	25.00	XII
11	**Method of application**	44	36.68	29	24.16	47	39.16	1.02	34.16	X
12	**Inter cultivation practices**	13	10.84	22	18.33	85	70.83	1.60	53.33	VII
13	**Irrigation**	06	05.00	05	04.16	109	90.83	1.85	61.94	III
14	**Pest and disease control**	45	37.50	53	44.16	22	18.33	0.80	26.94	XI
15	**Harvesting**	07	05.54	16	13.33	97	80.83	1.75	58.33	IV

F= Frequency, P= Percentage, MPS= Mean Percentage Score

(1) Use of green manure

The data presented in parameter 1, table 2, indicated that the majority (57.51%) respondents were not adopted green manures in basmati rice cultivation in the study area, followed by 24.16 per cent respondents were fully adopted green manures and the remaining 18.33 per cent respondents were partially adopted green manures in basmati rice cultivation. Its mean value was found 0.66 with the mean percentage score of 22.22 and ranking order was of thirteenth place.

(2) Soil treatment

The data presented in parameter 2, table 2 reveals that the majority (76.67%) respondents were not adopted soil

treatment practices of basmati rice cultivation in the study area, followed by 12.50 per cent respondents were partially adopted practices of soil treatment and the remaining 10.83 per cent respondents were fully adopted soil treatment practices in basmati rice cultivation. Its mean value was found 0.34 with the mean percentage score of 11.38 and ranking order was fourteenth place.

(3) Recommended soil

The data presented in parameter 3, indicated that the majority (87.50%) basmati rice growers were fully using sandy loam and loamy soil for basmati rice cultivation in the study area, followed by 08.33 per cent respondents were partially using recommended soil for basmati rice cultivation and the remaining 04.17 per cent basmati rice growers were not adopted recommended soil for basmati rice cultivation. Its mean value was found 1.88 with the mean percentage score of 62.66 and ranking order was first place.

(4) Land preparation

The data presented in parameter 4, table 2 reveals that the majority (87.50%) basmati rice growers were fully adopted proper field preparation practices for basmati rice cultivation in the study area, followed by 12.50 per cent respondents were partially adopted field preparation practices for basmati rice cultivation and there were not any respondents in the category of not adoption. Its mean value was found 1.87 with the mean percentage score of 62.5 and ranking order was of second place.

(5) Nursery preparation

The data presented in parameter 5, table 2 obvious that the majority (58.33%) basmati rice growers were fully adopted proper nursery management practices of basmati rice cultivation in the study area, followed by 37.50 per cent respondents were partially adopted proper nursery management practices and the remaining 04.17 per cent respondents were not adopted proper nursery management practices in basmati rice cultivation. Its meanvalue was found 1.54 and mean percentage score 51.38 and ranking order was eight places.

(6) Selection of improved basmati rice varieties

The data presented in parameter 6, table 2 obvious that the majority (52.50%) respondents were fully adopted improved varieties of basmati rice in the study area, followed by 41.66 per cent respondents were partially adopted improved varieties of basmati rice and the remaining 5.84 per cent respondents were not adopted improved varieties of basmati rice. Its mean value was found 1.46 and mean percentage score 48.88 per cent andranking order was of nineth place.

(7) Seed rate

The data presented in parameter 7, table 2 observe that the majority (67.50%) respondents were fully adopted recommended seed rate for basmati rice cultivation in the research area, followed by 28.33 per cent were partially adopted recommended seed rate for basmati rice crop and the remaining 4.17 per cent respondents were not adopted recommended seed rate in basmati rice cultivation. Its mean value was found 1.63 with mean percentage score 54.44 per cent and ranking was of fifth rank.

(8) Seed treatment

The data presented in parameter 8, table 2 it reveals that the majority (80.83%) respondents were not adopted seed treatment practices of basmati rice cultivation in the study area, followed by 15.00 per cent respondents were partially adopted practices of seed treatment and the remaining 04.17 per cent respondents were fully adopted seed treatment practices in basmati rice cultivation. Its mean value was found 0.23 and mean percentage score 7.77 per cent and ranking was of fifteenth place.

(9) Seedling transplanting

The data presented in parameter 9, table 2, it observes that the majority (68.33%) basmati rice growers were fully adopted transplanting of seedling per hill, time and spacing between plant to plant and row to row in basmati rice cultivation, followed by 24.17per cent farmers were partially adopted and the remaining 07.50 per cent respondents were not adopted recommended transplanting of seedling per hill, time and spacing between plant to plant and row to row in basmati rice cultivation. Its mean value was found 1.60 with mean percentage score 53.61 and ranking order was of sixth place.

(10) Use of balance fertilizers

The data presented in parameter 10, table 2 obvious that the majority (63.33%) basmati rice growers were partially adopted balance fertilizers and nutrients management in basmati rice cultivation, followed by 30.84 per cent respondents were not adopted balanced fertilizers and nutrients management and the remaining 05.83 per cent respondents were fully adopted balanced fertilizers and nutrients management in basmati rice cultivation. Its mean value was found 0.75 with mean percentage score 25.00 and ranking order was of twelfth place.

(11) Method of application

The data presented in parameter 11, table 2 reveals that the majority (39.16%) of the basmati rice growers

were fully adopted method of application of fertilizers and pesticides in basmati rice cultivation, followed by 36.68 per cent respondents were not adopted method of application of fertilizers and pesticides and the remaining 24.16 per cent respondents were partially adopted recommended method of application of fertilizers and pesticides in basmati rice cultivation. Its mean vale was found 1.02 with mean percentage score 34.16 and ranking order was of tenth place

(12) Inter- cultural practices

The data presented in parameter 12, table 2 shows that the majority (70.83%) of the basmati rice growers were fully adopted inter- cultural practices in basmati rice cultivation, followed by 18.33 per cent respondents were partially adopted and the remaining 10.84 per cent respondents were not adopted recommended inter - cultural practices in basmati rice cultivation. Its mean value was found 1.60 with mean percentage score 53.33 per cent and ranking order was of seventh place.

(13) Irrigation

The data presented in parameter 13, table 2 observe that the majority (90.83%) basmati farmers were fully adopted all phases of irrigation in basmati rice cultivation, followed by 04.17 per cent respondents were partially adopted and the remaining 05.00 percent respondents were never adopted all irrigation phases in basmati rice cultivation. Its mean value was found 1.85 with mean percentage score of 61.94 per cent and ranking orderwas found of third place.

(14) Pest and Disease management

The data presented in parameter 14, table 2 indicated that the majority (44.16%) basmati rice farmers were not adopted recommended pest and disease and management practices in basmati rice cultivation, followed by 37.50 per cent respondents were partially adopted and the remaining 18.33 per cent respondents were fully adopted pestand disease management practices in basmati rice cultivation. Its mean value was found 0.80with mean percentage score of 26.94 per cent and ranking order was found eleventh place. The similar findings (25.46) basmati rice farmers were not adopted recommended pest and disease and management practices in basmati rice cultivation reported by Varma *et. al***.** (2018).

(15) Harvesting

The data presented in parameter 15, table 2 indicated that the majority (80.83%) basmati rice growers were fully adopted harvesting time in basmati rice cultivation, followed by 13.33 per cent respondents were partially adopted and the remaining 05.84 per cent respondents were not adopted time of harvesting in basmati rice cultivation. Its mean valuewas found 1.75 with mean percent score of 58.33 and ranking order was of fourth place. The similar findings (43.64%) respondents were fully adopted the harvesting time in basmati rice cultivation reported by Biradar et al. (2013), Varma *et. al***.** (2018) and Kamani et al. (2021).

CONCLUSION

It may be concluded that most of respondents of the basmati rice growers were having high knowledge about land preparation, use of green manure and harvesting time in basmati rice cultivation. The majority of the respondents were having medium knowledge about seedling transplanting, selection of improved basmati rice varieties, inter cultural practices, nursery preparation and irrigation phases in basmati rice cultivation. It may be also concluded that the most of the respondents were fully adopted recommended soil, land preparation, irrigation, harvesting, inter cultivation practices, nursery preparation, seed rate and selection of basmati rice varieties for cultivation. The respondents were having partially adoption in balance fertilizers, and nutrients, and pest and disease management practices and some of the basmati rice growers were not adopted seed treatment, soil testing, use of green manures practices in basmati rice cultivation.

CONFLICT OF INTEREST

All authors declare that they have no conflict of interest

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