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Gap Analysis in Adoption of Recommended Package of Practices of Paddy Cultivation under Temperate Climatic Conditions of Kashmir

Mushtaq Ahmad Dar[1], Safeer Alam[2], Gurjeet Kaur[3], Sushil Kumar[4] and Jehangir Muzaffar Matto[5]

ABSTRACT

A survey was conducted in Zaingeer Block of Baramulla District of Jammu and Kashmir state with the view to explore the extent of adoption of recommended package of practices for cultivation of paddy and the constraints faced by the farmers. A sample of 60 respondents was selected using random sampling technique. A good number of the farmer followed the recommendations of the scientists either partially or fully in paddy crop. 63.30 percent of farmers used high yielding varieties, 66.7 per cent farmers did not follow proper sowing time. Fifty percent of the farmers had adopted partial spacing, 43.3 per cent of farmers apply basal dose of nitrogen and 40 per cent apply top dressing as per the recommendations. But majority 53.3 per cent and 63.3 per cent of the farmers did not follow the recommendation in the application of DAP and MoP respectively. The major constraints faced by the farmers in adoption of recommended package of practice were lack of skill in seed treatment (90%), lack of technical advice for seed storage (88.33%), irregular visits of Agricultural Officers (86.66%), low rate of Paddy in local market (83.33%), inadequate and untimely disbursement of loans (81.67%), high seed rate (71.67%) and high cost of fertilizers (68.33%) are important factors mainly responsible of low yield of rice.

Keywords: Adoption, gap analysis, package of practices, paddy, temperate climate

INTRODUCTION

India is one of the most important producer as well as consumer of rice, with world's largest area devoted to rice cultivation and is the second largest producer of rice after China. The states like Orissa, West Bengal, Uttar Pradesh *etc*. are contributing to the extreme, among these states Jammu and Kashmir is also a chief contributor to the overall production of rice in India. Jammu and Kashmir is basically an agrarian state with 80 per cent of the people engaged in agriculture for their livelihood. The economy of Jammu & Kashmir is largely agrarian with 70 per cent of the population dependent on it and about 49 per cent of the working populations are engaged in it. Rice production in J&K is predominantly a mono-cropped activity with the productivity of 41.00 quintals/hectare being the highest one in the Country (Kaloo *et al*., 2014).

Shifting of rice production to apple production has caused the food deficiency in J&K and has already touched to 40 percent. As a matter of fact, J&K is not sufficient to feed its own people, as a result, a large quantity of rice on an average of 4.97 lakh tonnes in a year is drawn from central pool to meet the deficient requirement of the state. At the same time under the present scenario, the shift of farming system is taking place from traditional practices of cultivation to the modern technology and sowing of high yielding

[1]Associate Professor (Extn. Edu,), [2&4] Directorate of Extension, [5]Ph.D Scholar, Sher-e-Kashmir University of Agricultural Sciences and Technological of Kashmir, Shalimar Campus, Srinagar, [3]PhD Statistics, MGCGVV Chitrakoot, Satna, M.P., Corresponding Author: safeeralam1@gmail.com

varieties of seeds for assuring good production (Kaloo and Choure, 2015). Assessment of crop yield gaps based on comprising to actual yields suggests grain yields under highly intensified agricultural systems are at or near the maximum yield attainable. However, these estimates can be biased in situations where yields are below full yield potential (Mathew *et al*., 2016). A large technology gap ratio between the sample states of the country ranges between 0.403 and 0.838 and the technology gap plays an important part in explaining the ability of agricultural sector in one state to other states of India (Maity, 2015).

Rice is the main staple food of Kashmir but its production has not increased too much. A lot of efforts have been put on for increasing of rice yield by using newer age technologies generated and disseminated by research stations and development agencies but its production level has not been increased to the potential yields of the respective varieties and up to the expectation of the farmers and other stakeholders of the Kashmir. Hence there is an utmost need to study and find out the gap between level of adoption of recommended technologies and the constraints faced by the farmers in achieving of the potential rice yield; keeping in view the present study was undertaken.

METHODOLOGY

The study was conducted in rice producing Zaingeer block in Baramulla district comprises of 36 villages during the year 2015-16. Out of this, ten potential villages were selected representing the entire block. The soil status of the research area was loamy and sandy loam and the irrigation system available was through canal for whole crop season. A total sample of sixty respondents covering six farmers from each village was selected randomly. To measure the adoption level of the technologies by the farmers, technological gap and the constraints was carried out for assessing the extent of gap between existing practices and recommended practices. A well-structured personal interview schedule was prepared covering package of practices for rice production to find out the gap between recommended technologies and its adoption level for achieving full of respective yield of rice. The data were analyzed using simple descriptive statistical methods.

RESULTS AND DISCUSSION

Land Preparatio

It was observed that more than fifty percent (58.30%) of the respondents were not adopting the recommended land preparation whereas (31.7%) of the respondent were partially adopting and only ten percent of the respondents were adopting the full land preparation practices (Table 1). The farmers cultivating high yielding varieties were fully adopting the recommended practices. The respondents who were partially or not adopting the recommended practices had the constraints of lack of knowledge about the land preparation and non availability of land preparation implements (tractor *etc*.) in their area. In order to fill the gap there is need to create awareness programmers on the importance of land preparation in rice producing areas.

Variety

The table-1 shows that a majority of the respondents (63.3%) were adopting recommended varieties followed by 20.0 percent respondents adopting partially. Only 16.7 per cent of the respondents were not adopting the recommended paddy varieties. The farmers who were not adopting the recommended varieties are dependent on the traditional varieties. The reason being non-availability of seed in time and lack of information about procurement of seed material.

Seed rate

A majority of the respondents (48.3%) were adopting recommended seed rate partially whereas 36.7 percent were fully adopting and only 15 percent of the respondents were not adopting the recommended seed rate (Table-1). The partial adopters were using more seed rate than the recommended. The reason for partial and non adoption of recommended seed rate was due to lack of knowledge

Table 1: Extent of adoption of recommended package of practices

Recommended practices	Adoption					
	Full		Partial		Nil	
	No. of farmers	Percentage	No. of farmers	Percentage	No. of farmers	Percentage
Land preparation	06	10.0	19	31.7	35	58.3
Variety	38	63.3	12	20.0	10	16.7
Seed rate	22	36.7	29	48.3	09	15.0
Sowing time	40	66.7	15	25.0	05	8.3
Spacing	17	28.3	30	50.0	13	21.7
Seed treatment	09	15.0	13	21.7	38	63.3
Organic manure	-	-	40	66.7	20	33.3
Basal dose (N_2)	26	43.3	18	30.0	16	26.7
DAP	12	20.0	16	26.7	32	53.3
MoP	-	-	22	36.7	38	63.3
Top dressing of urea	24	40.0	13	21.7	23	38.3
Weed control (Weedicide)	36	60.0	24	40.0	-	-

about seed rate and fear of low germination. The farmers should be educated through awareness camps and training programme about the importance of correct seed rate.

Sowing time

More than fifty percent (66.7%) of the respondents adopted the recommended sowing time whereas twenty five percent were partially adopting and only 8.3 per cent of the farmers were not adopting the recommended sowing time. The reason for not adopting the recommended sowing time was due to non-availability of seed at the time of sowing and lack of knowledge about the sowing time. Only those farmers using high yielding varieties were adopting recommended sowing time.

Spacing

Fifty percent of the respondents adopted proper spacing in paddy, whereas 28.3 percent adopted partially and only 21.7 per cent of the respondents did not adopt proper spacing in paddy. The partial and non adoption of proper spacing was due to lack of knowledge about spacing, non-availability of skilled labour in time. Lack of skilled labour leads to partial adoption despite of being aware of the importance of spacing. The Gap can be narrowed by conducting exposure visits, demonstration and imparting skill oriented training programmes at village levels.

Seed treatment

A majority (63.3%) of the farmers did not adopt the practice of seed treatment while 21.7 per cent of the respondents had adopted partially and only 15 percent had fully adopted the practices of seed treatment. The non adoption of seed treatment was due to lack of know-how about treatment, non-availability of chemicals/ pesticides and their high cost. To bridge the gap, demonstration should be organized to highlight the importance of seed treatment and the loss is being caused by soil and seed-borne disease.

Organic manure

It was observed that 66.7 per cent of the farmers applied organic manure partially and 33.3 per cent did not apply organic manure, whereas none of the farmers had applied organic manure as per the recommendations. The main reason for not applying organic manure reported by the farmers was that they did not have the knowledge and skill of preparing the FYM. In order to reduce the gap demonstration for preparing the compost/FYM and its benefits must be explained to farmers at village level.

Application of fertilizers

In case of application of basal dose of nitrogen, it was observed that 43.33 percent of the farmers applied full dose while 30.00 percent applied partial dose and 26.71 percent did not apply basal dose as per the recommendations, whereas in the application of top dressing of nitrogen 40.00 percent applied full dose, 38.30 percent did not apply and only 21.72 percent applied as top dressing of Urea partially. The reason for not applying urea as basal dose or top dressing, due to lack of knowledge, non-availability of urea on time, high rate of urea and also believes that urea increases incidence of pest and diseases.

In case of phosphorous fertilizers, majority of (53.31%) farmers did not apply, 26.70 percent applied partially and only 20.00 percent applied fully as per the recommendations. Whereas in case of potash 63.32 percent of the farmers had not applied potash in paddy fields while 36.71 percent applied partially whereas none of farmers applied potash as per the recommendations. To reduce the gap, awareness camps, demonstrations and training programme may be organized for the importance and method of application of fertilizers and arrange exposure visit of farmers to the research stations/KVKs showing the advantages of using the recommendations of fertilizers.

Weed control

Control of weed in paddy fields is fully adopted by majority (60.00%) of the farmers and only (40%) the farmers adopted partially. The reason for partial adoption may be due to lack of knowledge, high rate of weedicide and non-availability of weedicide and false belief that weedicides reduce the yield. The awareness about the importance of weedicides and the losses caused by the weeds has to be extended to bridge the gap.

Farmers followed the recommendations of the scientists either partially or fully in paddy crop. A majority (63.3%) of farmers use high yielding varieties and followed proper sowing time (66.7%). Fifty percent of the farmers had adopted partial spacing, (43.3%) of farmers apply basal dose of nitrogen and (40%) apply top dressing as per the recommendations. But majority (53.3%) and (63.3%) of the farmers did not follow the recommendation in the application of DAP and MoP respectively. Whereas, all the farmers adopted the recommendations of weed control either fully and partially. These observations are similar to the statement of Kareem and Manohar (2001) but were contradictory to the observation of Bhate and Barve (1984).

Constraints faced by the farmers in adoption of recommended practices

Economic Constraints

A close examination of Table 2 revealed that among the economic constraints, majority of the farmers experienced the constraints of high rate of interest on loans (81.67%) ranking at number I, high rate of seeds (71.67%) ranking at number II and inadequacy of capital for purchase of seeds and fertilizers (70.00%) ranking at number III followed by high cost of fertilizers (68.33%) and high charges of labour (58.33%) ranking at number IV and V respectively. Similar results were reported by Thanh and Singh, 2006 and Alarima *et al*., 2011.

Supply Constraints

Table 2 reveals that majority of farmers (61.67%) face the problem of inadequate and untimely supply of loans to farmers followed by non-availability of proper irrigation facilities (41.67%) ranking at number I and II respectively. Forty per cent of the farmers face the problem of non-availability of fertilizers at the time of sowing ranking at number III followed by non-availability of labour at the time of transplanting and harvesting (38.33%) and non-availability of seeds at the time of sowing in nearby area (36.67%) ranking at number IV and V respectively. Similar results were reported by Matanmi *et al*., 2011 and Atanda *et al*., 1978.

Marketing Constraints

Table 2 indicates that among the marketing constraints, the majority of the farmers (83.33%)

Table 2: Constraints faced by the farmers in adoption of recommended practices

Constraints	Frequency	Percentage	Rank
Economic Constraints			
Inadequacy of capital for purchase of seeds and fertilizers	42	70.00	III
High rate of seeds	43	71.67	II
High rate of interest on loans	49	81.67	I
High cost of fertilizers	41	68.33	IV
High charges of labour	35	58.33	V
Supply Constraints			
Non-availability of seeds at the time of sowing in nearby area	22	36.67	V
Non-availability of fertilizers at the time of sowing	24	40.00	III
Non-availability of labour at the time of transplanting and harvesting	23	38.33	IV
Non-availability of proper irrigation facilities	25	41.67	II
Inadequate and untimely supply of loans to farmers	37	61.67	I
Marketing Constraints			
Low rate of Paddy in the local market	50	83.33	I
Lack of co-operative societies for the purchase of produce	43	71.67	III
Non-availability of stores in nearby area	47	78.33	II
Delay in payments of purchase	17	28.33	V
Poor transport facility in rural areas	18	30.00	IV
Technical Constraints			
Irregular visits of Agriculture Officers	52	86.66	III
Lack of knowledge about improved seeds	49	81.66	IV
Lack of skill in seed treatment	54	90.00	I
Seeds available are of sub-standard	24	40.00	V
Lack of technical advice for seed storage	53	88.33	II

expressed that the main constraint faced by them was low rate of Paddy in the local market ranking at number I followed by non-availability of stores in nearby areas (78.33%) ranking at number II. The other marketing constraints expressed by the farmers were lack of co-operative societies for the purchase of produce (71.67%), poor transport facility in rural areas (30.00%) and delay in payment of purchase (28.33%) ranking at number III, IV and V respectively. Similar results were reported by Namdev *et al*., 2011.

Technical Constraints

The data in Table 2 also provides information regarding the technical constraints faced by the farmers in adoption of Paddy Production Practices. Among the farmers, a large majority (90.00%) faced the problem of lack of skill in seed treatment ranking at number I, followed by 88.33 per cent of the farmers having lack of technical advice for seed storage ranking at number II. Irregular visits of extension functionaries (86.66%), lack of knowledge about improved seeds (81.66%) and availability of seeds of sub-standard (40.00%) were other technical constraints faced by the farmers ranking at number III, IV and V respectively. The similar results were reported by Sawant and Nirban (1992).

Conclusion

Rice producing farmers followed the recommendations of the SKUAST-Kashmir, either partially or fully in cultivation of paddy crop. A good number of farmers used high yielding varieties and followed proper sowing time, spacing, apply basal dose of nitrogen and top dressing as per the

recommendations. Majority of the farmers did not follow the recommendations of application of DAP and MoP respectively, whereas, farmers adopted weed control either fully and partially. This clearly indicates that farmers might be convinced with the land preparation, seed rate, spacing and doses of fertilizers which will help in confidence building among the farmers to increase the rice yield. Most of the farmers lack the skills in seed treatment and seed storage. Most of the farmers faced the problems of irregular visits of extension personnel, poor price of Paddy in local market and inadequate & untimely crop loans. Hence, it can be concluded that farmers may be trained and make aware about the recommended package of practices, timely crop loan disbursal and inputs availability, proper market facility and transportation, regular visits of extension personnel and advisory services will surely help in improving rice yield at farmers' fields.

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