

CONSTRAINTS FACED BY THE FARMERS IN ADOPTION OF BIO-FERTILIZERS AND MANURE IN RICE CROP

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Abstract: Being the important crop of Chhattisgarh, rice occupies major share in the rural economy in general and farmers economy in particular. This crop is cultivated here on varied agro-ecological situations. The inputs, particularly nutrients used in cultivating rice are mostly imbalanced with the dominancy of chemical fertilizers causing soil sickness and poor fertility status. Several bio-fertilizers and manures are recommended for inducing as input in rice cultivation but so far the use of these materials is very low and scanty particularly in Chhattisgarh region. Looking to the significance this investigation was conducted in the three villages of Raipur district with 120 respondents. The findings shows that majority of the respondents were belonged to medium-old age group with satisfactory literacy level. The respondents were dominated by the population of other Backward Castes having 5-8 family members. Agriculture with small and marginal size of and holding and poor irrigation availability was common. Medium level of economic motivation and risk orientation was observed. The overall socio economic status of the respondents was mostly low. The knowledge was found quite high but adoption of bio-fertilizers and manures was poor. The important reasons for non adoption of bio fertilizers in rice cropping were poor or non availability, non visibility of results, un-assured quality, lack of knowledge and high cost. Use of compost and FYM were mostly affected by its poor availability in time and required quantity. The suggestions shows that respondents required assured quality and timely availability of bio fertilizers and manures for its higher adoption with credit facility and subsidy.

Keywords: Constraints, Bio fertilizers, Adoption

INTRODUCTION

Rice is the important staple food as well as crop in Chhattisgarh covering more than 70 percent of the cropped area. In Chhattisgarh state the economy of farm families rely mainly on rice because in rainfed areas rice is cultivated as mono-cropping or followed by relay cropping. In case of perennial assured irrigated situations most of the farmers preferred rice after rice. The reasons may be high average rainfall, bunded field situations, diet pattern, experience and buy back guarantee from government on minimum support price. With the modernization penetrates to the rural environment, the use and application of chemicals in agriculture is increasing rapidly, chemical fertilizers occupied major share among such chemical. The scenario of imbalanced and heavy dose of chemical fertilizers used in agriculture reveals unpleasant situations in so called developed areas. The soils of Chhattisgarh bi-enlarge fertile and good enough for farming. Regular cultivation of rice in this region especially in Chhattisgarh plains agro-climatic zone using enough chemical fertilizers causes depleting in the organic matter and fertility status of soils. Rice is known for its heavy nutrient uptake characteristics causing deficit in the available nutrients in the soil. The modernization urbanization and decreasing cattle population in the villages, use of manure in farming is also decreasing drastically. It is worthy here to state that most of the phosphatic, potashic and also nitrogenous fertilizers are manufactured by using raw material from natural resources that too are not or

limited available in our country. Our billions of foreign currency are expended to by these fertilizers from other countries. Now-a-days due to the residual effect of chemicals in the food and fodder, people attracted towards organic farm produces. All these situations and need of the time compel us to move towards increasing use of organic agri-inputs or farming with combination of chemical, bio-fertilizer and manures. A number of bio-fertilizers and kind of manures are available and recommended for inducing as input in rice cultivation. Popular amongst them are Blue Green Algae (BGA), Phosphorus Solubilizing Bacteria (PSB), Green Manuring (GM) and FYM/Compost. Use of these material not only enhance the productivity of rice but also strengthen the soil health and beneficial for second crop as well. Various agencies were recommended for the use of such bio-origin inputs in rice farming but so far the use of these materials is very low and scanty particularly in Chhattisgarh region. Looking to the significance of these products to the farmer, soil and consumers, the present investigation was undertaken with the following specific objectives;

1. To find out the socio-economic profile of rice growers.
2. To study the level of knowledge and adoption of various bio-fertilizers and manure in rice crop.
3. To find out major constraints in adoption of selected bio-fertilizer and manure in rice crop.
4. To obtain the farmer's suggestion for enhancing the use of bio-fertilizers and manure in rice crop.

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METHODOLOGY

This investigation was conducted in the selected IVLP villages viz. Tarra, Chatoud and Donde of Raipur district. From the list of farmers, 40 farmers were selected randomly from each of the selected village. In this way the data were collected from 120 respondents using semi-structured interview schedule. Proper care was observed while selection of respondents so that the farmers included for the intervention on bio-fertilizers under IVLP should be considered as respondent of this study.

RESULT AND DISCUSSION

Socio-economic characteristics: Before obtaining the constraints, some important characteristics of respondents were studied (Table 1). The findings shows that majority of the respondents were belonged to medium-old age group of 41 to 60 years. Only about 11 per cent of the respondents were below 40 years of age. It shows that youngsters were having less involvement in agricultural operations and most of the farm activities were executed by the middle to old people, which is not supposed to be a good sign for future agriculture. The educational status of farmers was found quite satisfactory because most of them were literate to various levels. As usual, the respondents were dominated by the population of other Backward Castes. Some of them were belonged to general castes and scheduled caste. Still in the villages of Chhattisgarh joint family

system prevails which reveals from the table the most of the families of respondents were having 5-8 members. About 22 per cent of the families of respondents were small in size. Agriculture was found as the major occupation, respondents were also involved in different kind of labour activities for sustaining their livelihood. The situation may be because of small and marginal size of land holding amongst most of the respondents. Less than 10 per cent of the respondents were having more than 4 ha of cultivable land. The scenario of irrigation availability is also found poor because more than 57 per cent of the respondents were practicing agriculture without agriculture and only about 12 per cent of them had assured irrigation availability. The findings further reveals that 55 per cent of the respondents were belonged to medium level of economic motivation. Rest of the respondents distributed to high (29%) and low (17%) level of economic motivation. Regarding the risk orientation about 43 and 39 per cent of the respondents belonged to medium and low category, respectively. The overall socio economic status of the respondents shows that 52.5 per cent of them were belonged to low socio-economic status. About 33 and 15 per cent of the respondents were obtained medium and high level of socio economic status, respectively. These features show that bi-enlarge the respondents were economically poor or medium which influence the means and ways of investment in their main occupation i.e. agriculture.

Table 1. Socio-economic profile of the respondents.

		N=120	
S. No.	Characteristics	Freq.	%
1.	Age		
	UP to 40 yrs	13	10.83
	41 to 50 yrs	51	42.50
	51 to 0 yrs	52	43.33
	Above 60 yrs	04	03.34
2.	Educational status		
	Illiterate	08	06.67
	Up to Primary School	56	46.67
	Up to Secondary School	38	31.66
	UP to Hr. Sec. School	15	12.50
	College educated	03	02.50
3.	Caste		
	Scheduled Tribes	02	01.67
	Scheduled Castes	17	14.16
	Other Backward Castes	80	66.67
	General Castes	21	17.50
4.	Family size		
	Up to 4 members	26	21.67
	5 to 6 members	41	34.16
	6 to 8 members	33	27.50
	Above 8 members	20	16.67
5.	Involvement in occupation		
	Agriculture alone	32	26.67

	Agriculture+business	16	13.33
	Agriculture+caste occupation	14	11.67
	Agriculture+service	04	03.33
	Agriculture+labour	36	30.00
	Agriculture+other	18	15.00
6.	Land holding		
	Up to 1 ha	34	28.33
	1.1 to 2 ha	46	38.33
	2.1 to 4 ha	29	24.17
	Above 4 ha	11	09.17
7.	Irrigation availability		
	Nil	69	57.50
	Partially	37	30.83
	Assured (Perennial)	14	11.67
8.	Economic motivation		
	Low	19	15.83
	Medium	66	55.00
	High	35	29.17
9.	Risk orientation		
	Low	47	39.17
	Medium	51	42.50
	High	22	18.33
10.	Socio-economic status		
	Low	63	52.50
	Medium	39	32.50
	High	18	15.00

Knowledge and adoption level about selected bio-fertilizers/ manures: The detailed findings compiled in table 2 shows the figures of knowledge and adoption prevails for bio-fertilizers and manures amongst the respondents. Regarding knowledge, the table shows that respondents were having good knowledge about the application of compost/FYM, while fair knowledge was recorded about BGA and Green Manure (GM). Less than 40 per cent knowledge was obtained about the use of Phosphorus Solubilizing Bacteria (PSB) in rice crop. Accordingly the distribution of respondents is presented in different category shown in the table. In this way the total knowledge about bio fertilizers and manure used in rice cultivation was found about 61 per cent. This increase in overall knowledge level amongst the respondents was highly influenced by the knowledge of FYM/ compost which is a traditional practice in

this region hence farmers are well aware about its use in rice cropping.

The findings related to level of adoption about bio fertilizers and manure is given in the same table. It is clear from the table that the cumulative adoption level (28.47%) of different bio fertilizers and manure was quite low amongst the respondents in rice cropping. Adoption of FYM/manure was recorded 50.83 per cent. The other important bio fertilizers were accounted about 28, 21 and 14 per cent adoption of BGA, GM and PSB, respectively. About 48 per cent of the respondents reported not adopting the bio fertilizers and manures in rice farming, this feature dominated by the non adoption of PSB and GM and BGA by the respondents. The high level of adoption of bio fertilizers and manure was done by only 6.45 per cent of the respondents.

Table 2. Distribution of respondents according to their knowledge and adoption of selected bio-fertilizers/manure. n=120

[illegible]

Total	48	10.00	135	28.13	148	30.83	149	31.04	60.97
BGA	64	53.33	21	17.50	26	21.67	9	7.50	27.78
PSB	85	70.83	20	16.67	13	10.83	2	1.67	14.44
GM	71	59.17	27	22.50	18	15.00	4	3.33	20.83
FYM/	10	08.33	53	44.17	41	34.17	16	13.33	50.83
Compost	230	47.92	121	25.21	98	20.42	31	6.45	28.47

Constraints related to adoption of bio-fertilizers and manure: Various constraints reported by the respondents regarding adoption of selected bio fertilizers and manure is presented in table 3. The important reason for non adoption of BGA was the poor and non availability as reported by about 42 per cent of the respondents. Other important constraints for non or low adoption as reported by about 42 per cent of the respondents. Other important constraints for no or low adoption of BGA were un-assured quality, lack of knowledge and confidence, poor suitability to Alfisols, Inceptisols and requirement of stagnant water as reported by about 22,18, 17 and 15 per cent of the respondents, respectively. About half of the respondents reported that they were not having adequate knowledge about use of PSB in rice cultivation. Non visibility of results, un-assured quality and poor availability of PSB were reported to be the other important constraints being faced by

about 32, 25 and 22 per cent of the respondents, respectively. Green manuring is one of the important non chemical sources of plant nutrients in rice production. The adoption of GM by the farmers was mostly affected by the high cost and poor availability of GM seed as reported by 37 and 26 per cent of the respondents, respectively. Some of the respondents perceived that green manuring is suitable exclusively for transplanted and irrigated situations due to which they were reluctant in adopting this technology in their rice production procedure. Use of other manures and FYM were mostly inadequate due to its poor availability in time and required quantity. About 43 per cent of the respondents reported that they were not having enough raw materials for preparation of FYM/compost in required quantity. These findings clearly indicate that availability with quality is the key for the adoption of manures and bio-fertilizers particularly in rice crop production.

Table 3. Distribution of respondents according to the constraints faced by them related to adoption of bio-fertilizers and manure. N=120

BGA	Particulars	Freq.	Percent	Rank
BGA	1.Lack of knowledge and confidence	22	18.33	III
	2. Poor/non availability	50	41.67	I
	3. Un-assured quality	26	21.67	II
	4. Required stagnant water	18	15.00	V
	5. Non suitable for Alfisols/Inceptisols	21	17.50	IV
	6. Lack of experienced labour	7	5.83	VII
	7. Create confusion with green algee	11	9.17	VI
PSB	1.Lack of adequate knowledge	59	49.17	I
	2. Poor/non availability	26	21.67	IV
	3. Un-assured quality/supply of poor quality	30	25.00	III
	4. Effect/results are not visible	38	31.67	II
	5. Not common in village	14	11.67	VI
	6. Poor coverage by media/RAEO	16	13.33	V
GM	1.Poor availability of GM seed	31	25.83	II
	2. High cost of GM seed	44	36.67	I
	3. Suitable for irrigated situation only	23	19.17	IV
	4. Poor knowledge of use	16	13.33	VI
	5.Suitable for transplanted rice	27	22.50	III
	6. Required tractor for puddling	19	15.83	V
	7. Time bound operations required	11	9.17	VII
FYM/compost	1. Poor availability of raw material for preparation of FYM/compost in required quantity	51	42.50	II
	2. High cost of transportation/spreading	28	23.33	III
	3. Poor availability of FYM/compost in time and required quantity	72	60.00	I

Table 4. Suggestions of respondents for enhancing the use of bio-fertilizers/ manure N=120

S. No.	Suggestions	Freq.	Percent	Rank
1.	The availability of bio-fertilizers should be timely and assured.	45	37.50	I
2.	Credibility and use of bio-fertilizers can be increased through assured quality.	31	25.83	IV
3.	Training/Demonstrations need to be organized for the effective use of bio-fertilizers.	13	10.83	VI
4.	The information should be communicated through various media prior to time of application	20	16.67	V
5.	These should be made available to the farmers on no cost/low cost at least for trial purpose.	32	26.67	III
6.	Appropriate credit facility should be available for the purchase	38	31.67	II

Suggestions of respondents for enhancing the use of bio-fertilizers/ manure: The suggestions pertaining to adoption of bio fertilizers and manures in rice cropping perceived from the respondents are recorded in table 4. It shows that about 38 per cent of the respondents perceived that assured quality and timely availability of bio fertilizers and manures is required for its higher adoption. Availability of credit facility, subsidy and quality measures were having high concern amongst 32, 27 and 26 per cent of the respondents, respectively. Some of the respondents suggested for timely communication involving farmer friendly media. Requirement of training and demonstrations on bio fertilizer were also required by 11 per cent of the respondents.

CONCLUSION

The findings concluded that most of the respondents were medium to low socio economic status. The farmers of the region were having adequate knowledge about various bio fertilizers and manures particularly FYM/compost used in rice crop production but its adoption was found quite low due to various reasons. Poor and untimely availability

and improper quality of bio fertilizers were the important constraints which could be overcome by enhancing the quality and timely supply of these items may be on subsidy basis.

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