

Knowledge and Attitude of Farmers towards Biofertilizers and Bioagents

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ABSTRACT

The present study entitled “Adoption Behavior of farmers towards Biofertilizers and Bioagents” was carried out in Nagpur district of Nagpur division in Vidarbha region of Maharashtra. An exploratory social research design was used. The data was collected from 10 villages from two tahsils namely; Kalmeshwar and Katol of Nagpur district. From each tahsil, five villages were selected and from each village 12 farmers who were using Biofertilizers and Bioagents were selected purposively and were interviewed with the help of structured interview schedule. Thus this investigation was confined to a sample of 120 farmers.

It was observed that, majority of the respondent farmers i.e. 80.00 per cent farmers were having knowledge about Azatobacter and also it is found that 77.5 per cent farmers were having adoption of Azatobacter. As regards Phosphate Solubilizing Bacteria (PSB), it is evident that, a significant number, i.e. 88.33 per cent farmers were having knowledge about it while 84.17 per cent farmers were having adoption of PSB. Majority of respondents had full and partial knowledge of application of Trichoderma for recommended dose for seed treatment (54.17 % and 23.33 %), application of Trichoderma for recommended dose for seedling treatment (52.50 % and 21.67%) however 25.83 per cent had no knowledge about it, also majority of respondents had no knowledge about recommended dose of Azolla for soil application (97.50 %).

It was observed from the findings that majority of respondents strongly agreed followed by agreed for the attitude statements that, use of biofertilizer makes soil fertile and productive (59.1% and 34.1 %), The use of biofertilizer help in increase the crop yield (55.8 % and 37.5 %).

Key words: Knowledge, Adoption, Attitude, Farmers, Biofertilisers, Bioagents

INTODUCATION

Agriculture extension services include transferring knowledge to the farmers and educating them in their decision making and implementing the decisions towards agriculture development.

Agriculture production depends on availability, use of quality and quantity of farm inputs. Chemical fertilizers is an essential input for boosting up agricultural production. It has played a significant role boosting up agricultural production in the country as we witnessed in the past. It is observed that, continuous use of chemical fertilizers had deteriorated soil microbial activities, soil fertility and productivity. It is also observed that,

due to the indiscriminate and unscientific use of chemical fertilizers, it disturbed the environmental and ecological balance.

In the present scenario, Biofertilizers are believed to be the potential alternative to the chemical fertilizers in improvement of soil fertility for sustainable crop production that too without having any side effects on soil and environment. Biofertilizers are assuming greater significance as a compliment or supplement to the chemical fertilizers because of significant change in crop production system, reasonable cost and environmental soundness. They are helpful for proliferation and survival of beneficial microorganisms in the soil. They are affordable to

the farmers because of low costs and economically they are very significant in making available plant nutrient like Nitrogen and Phosphorus.

The use of bio-fertilizer is the recent attempt in increasing yield of different crops. Bio-fertilizers not only fix atmospheric nitrogen or solubilise phosphate in soil, but also help to maintain soil fertility, improve soil structure, texture and water holding capacity. In view of increasing of demand for plant nutrient, efforts are made to explore different sources. The use of bio-fertilizer are carrier based product containing fertility adding microbes, play as important role as supplementary renewable and non polluter sources of nutrients. The application of bio-fertilizer increases crop productivity as well as fertility by way of fixing atmospheric nitrogen and solubilizing insoluble phosphate present in the soil biologically along with production of growth hormone and vitamin. (Talape *et al.*, 2011). Although there are many benefits of biofertilizer use, it is observed that many farmers are still unaware about the benefits of Biofertilizers. This project was undertaken with the objective to assess

the adoption behaviour of farmers towards Biofertilizers in Nagpur district.

METHODOLOGY

The present investigation was conducted in Kalmeshwar and Katol tahsils in Nagpur district, where the farmers were using Biofertilizers. Exploratory design of social research was used to conduct research. For the present study ten villages from two tahsils namely; Kalmeshwar and Katol were taken up for study. From each tahsil, five villages were taken up for study constituting total ten villages from these two tahsils. From each village 12 farmers using Biofertilizers were selected purposively. Thus a total sample of 120 respondents were selected for the study.

RESULTS AND DISCUSSION

Knowledge and Adoption:

The Knowledge and Adoption of farmers about various practices concerned with use of biofertilizers/bioagents was ascertained. The practice wise distribution has been given in Table 1.

Table 1
Distribution of respondents according to knowledge and adoption about use of biofertilizer

Sl. No.	Name of biofertilizer/bioagent	Knowledge		Adoption	
		Yes	No	Yes	No
1.	Azotobacter	96 (80.00)	24 (20.00)	93 (77.5)	27 (22.5)
2.	Phosphate Solubilizing Bacteria (PSB)	106 (88.33)	14 (11.67)	101 (84.17)	19 (15.83)
3	Blue Green Algae (BGA)	3 (2.5)	117 (97.5)	0 (0.00)	120 (100.00)
4	Mycorrhiza	51 (42.5)	69 (57.5)	0 (0.00)	120 (100.00)
5	Azolla	7 (5.83)	113 (94.17)	0 (0.00)	120 (100.00)
6	Trichoderma	110 (91.67)	10 (8.33)	104 (86.67)	16 (13.33)
7	Azospirillum	7 (5.83)	113 (94.17)	0 (0.00)	120 (100.00)
8	Rhizobium	99 (82.5)	21 (17.5)	94 (78.33)	26 (21.67)

It is observed from Table 1 that, majority of the respondent farmers i.e. 80.00 per cent farmers were having knowledge about Azotobacter and also it is found that 77.5 per cent farmers were having

adoption of Azotobacter. As regards Phosphate Solubilizing Bacteria (PSB), it is evident that, a significant number, i.e. 88.33 per cent farmers were having knowledge about it while 84.17 per cent

farmers were having adoption of PSB. As regards BGA, Mycorrhiza and Azolla it is observed from this table that, only 2.5 per cent farmers were having knowledge about BGA with adoption of 0.00 per cent. As far as Mycorrhiza is concerned, 42.5 farmers were having knowledge while it was observed that there was 0.00 per cent adoption. In case of Azolla it was observed that only 5.83 per cent farmers were having knowledge while 0.00 per cent adoption was observed. It may be due to the fact that these Biofertilizers may not be useful for this cropping area.

It is observed from this table that, as far as Trichoderma is concerned, a significant number of farmers having good knowledge, i.e. 91.67 percent and also a good adoption, i.e. 86.67 per cent. As far as Rhizobium is concerned, it is evident that 82.5 per cent farmers were having knowledge with a 78.33 per cent adoption. As far as Azospirillum is concerned, it is found that the farmers were having almost negligible amount of knowledge with no adoption.

Table 2
Distribution of respondents according to practice wise knowledge about use of Biofertilizers

Sl. No.	Biofertilizer practices	Knowledge		
		FK	PK	NK
1	Application of Azotobacter (seed treatment / soil application)			
	Recommended dose of Azotobacter for seed treatment	41 (34.17)	47 (39.17)	32 (26.67)
	Recommended dose of Azotobacter for soil application	33 (27.50)	35 (29.17)	52 (43.33)
2	Application of Phosphobacteria (PSB) (Seed treatment/ seedling application/ soil application)			
	Recommended dose of PSB for seed treatment	47 (39.17)	44 (36.67)	29 (24.17)
	Recommended dose of PSB for seedling treatment	45 (37.50)	41 (34.17)	34 (28.33)
	Recommended dose of PSB for soil application	41 (34.17)	38 (31.67)	41 (34.17)
3	Application of Blue Green Algae (BGA) (Soil application)			
	Recommended dose of BGA for soil application	7 (5.83)	20 (16.67)	93 (77.50)
4	Application of Mycorrhiza (Seed treatment/Soil application)			
	Recommended dose of Mycorrhiza for seed treatment	4 (3.33)	3 (2.50)	113 (94.17)
	Recommended dose of Mycorrhiza for Soil application	3 (2.50)	3 (2.50)	114 (95.00)
5	Application of Azolla (Soil application)			
	Recommended dose of Azolla for soil application	2 (1.67)	1 (0.83)	117 (97.50)
6	Application of Trichoderma (Seed treatment/seedling treatment /soil application)			
	Recommended dose of Trichoderma for seed treatment	65 (54.17)	28 (23.33)	27 (22.50)
	Recommended dose of Trichoderma for seedling treatment	63 (52.50)	26 (21.67)	31 (25.83)
	Recommended dose of Trichoderma for soil application	61 (50.83)	24 (20.00)	35 (29.17)

7	Application of Azospirillum (Seed treatment /seedling treatment /soil application)			
	Recommended dose of Azospirillum for seed treatment	1 (0.83)	12 (10.00)	107 (89.17)
	Recommended dose of Azospirillum for seedling treatment	0 (0.00)	8 (6.67)	112 (93.33)
	Recommended dose of Azospirillum for soil application	1 (0.83)	2 (1.67)	117 (97.50)
8	Recommended dose of Biodecomposer (both fungal and bacterial)	8 (6.67)	9 (7.50)	103 (85.83)
9	Storage of biofertilizer (cool and dry place)	22 (18.33)	34 (28.33)	64 (53.33)
10	Validity of biofertilizer (6 months)	30 (25.00)	34 (28.33)	56 (46.67)

FK – Full Knowledge, PK – Partial Knowledge, NK- No Knowledge

Table 2 reveals that majority of respondents had full and partial knowledge of application of Trichoderma for recommended dose for seed treatment (54.17 % and 23.33 %), application of Trichoderma for recommended dose for seedling treatment (52.50 % and 21.67%) how ever 25.83 per cent had no knowledge about it, also majority of respondents had no knowledge about recommended dose of Azolla for soil application

(97.50 %), Recommended dose of Azospirillum for soil application (97.50 %), Recommended dose of Mycorrhiza for Soil application (95%), Recommended dose of Mycorrhiza for seed treatment (94.17%) followed by Recommended dose of Azospirillum for seedling treatment (93.33 %), Recommended dose of Azospirillum for seed treatment (89.17%).

Table 3
Distribution of respondents according to their level of knowledge about biofertilizer

Sl. No.	Knowledge Index	Respondents (n=120)	
		Frequency	Percentage
1	Low (upto 33.33)	19	15.83
2	Medium(33.34 to 66.66)	89	74.17
3	High(above 66.66)	12	10.00
	Total	120	100.00

Mean = 48.31

Table 3 reveals that, majority of respondents (74.17 %) belonged to the medium level knowledge about Biofertilizers, followed by (15.83 %) who have occupied low level of knowledge about Biofertilizers while only 10.00 per cent respondents belonged to high level of knowledge about Biofertilizers. These findings are similar with the findings of Talape *et al.* (2011), Rahangdale *et al.* (2011) and Kesharam *et al* (2015).

From the above observations, it is concluded that, majority of respondents had medium level of knowledge about Biofertilizers. In general the respondents were found to be

possessing a low level of knowledge about Biofertilizers and other related practices. The results thus indicate that, there is a need to improve the knowledge of farmers about Biofertilizers and their use.

Attitude of farmers towards adoption of Biofertilizers:

Attitude influences the action of an individual towards adoption. This study was framed to know attitude of farmers towards adoption of Biofertilizers and is presented in the following tables.

Table 4
Distribution of respondents according to their attitude about Biofertilizers towards adoption of biofertilizers

Sl. No	Statement	SA	A	UD	DA	SDA
1	Use of biofertilizer makes soil fertile and productive	77 (59.1)	41 (34.1)	6 (5.00)	1 (0.83)	1 (0.83)
2	The use of biofertilizer help in increase the crop yield	67 (55.8)	45 (37.5)	5 (4.17)	2 (1.67)	1 (0.83)
3	Biofertilizer helps to grow the plant healthier	59 (49.1)	51 (42.5)	4 (3.33)	4 (3.33)	2 (1.67)
4	Application of biofertilizer requires more labour, hence expensive	4 (3.33)	2 (1.67)	9 (7.50)	56 (46.6)	49 (40.8)
5	The use of biofertilizer increases the crop produce which fetch the more price in market	55 (45.8)	59 (49.1)	3 (2.50)	1 (0.83)	2 (1.67)
6	Use of biofertilizer is more profitable in relation to cost involved	49 (40.8)	53 (44.1)	9 (7.50)	4 (3.33)	5 (4.17)
7	I am not confident that biofertilizer will give the expected returns	3 (2.50)	3 (2.50)	5 (4.17)	52 (43.3)	57 (47.5)
8	The use of biofertilizer helps to maintains the quality of crop	61 (50.8)	49 (40.8)	7 (5.83)	1 (0.83)	2 (1.67)
9	The use of biofertilizer in crop production helps in better human health benefit	54 (45.0)	48 (40.0)	11 (9.17)	3 (2.50)	4 (3.33)
10	The crop treated with biofertilizer becomes more resistance to disease	49 (40.8)	53 (44.1)	12 (10.0)	4 (3.33)	2 (1.67)
11	Biofertilizer is good, but very difficult to adopt than the chemical fertilizer	1 (0.83)	1 (0.83)	3 (2.50)	56 (46.6)	59 (49.1)
12	The use of biofertilizer in crop production helps in better human health benefit	56 (46.6)	54 (45.0)	3 (2.50)	4 (3.33)	3 (2.50)

It is observed from table 4 that majority of respondents strongly agreed followed by agreed for the attitude statements that, use of biofertilizer makes soil fertile and productive (59.1% and 34.1 %), The use of biofertilizer help in increase the crop yield (55.8 % and 37.5 %), The use of biofertilizer helps to maintain the quality of crop (50.8 % and 40.8%), Biofertilizer helps to grow the plant healthier (49.1% and 42.5 %), The use of biofertilizer in crop production helps in better human health benefit (46.6 % and 45.0 %) respectively.

Respondents were also found to be disagree followed by strongly disagree towards the statements that; Application of biofertilizer requires more labour, hence expensive (46.6 % and 40.8 %), Biofertilizer is good, but very difficult to adopt than the chemical fertilizer (46.6 % and 49.1 %), I am not confident that biofertilizer will give the expected returns (43.3 5 and 47.5 %) respectively. While very few farmers found to be undecided.

Table 5
Distribution of respondents according to their level of attitude about biofertilizers

Sl. No	Attitude	Respondents (n=120)	
		Frequency	Percentage
1.	Less favourable	0	0
2.	Moderately favourable	29	24.17
3.	Highly favourable	91	75.83
	Total	120	100.00
		Mean= 83.31	S. D. = 9.54

Table 5 indicated that, majority of respondents (75.83 %) had highly favourable attitude towards adoption of biofertilizers followed by 24.17 per cent farmers were found to be moderately favourable. Bhole and Borkar (2002), Gawai et al. (2013) and Kesharam et al. (2015).

From the above findings it could be concluded that, attitude of large number of farmers towards biofertilizer use were highly favourable (75.83 %) it seems that they are quite convinced about the benefits of Biofertilizers in agriculture, the efforts should be intensified so that moderate attitude (24.17 %) could be brought under highly favourable attitude by giving them guidance and through conducting demonstrations etc.

CONCLUSIONS

It was observed that, majority of the respondent farmers i.e. 80.00 per cent farmers were having knowledge about Azotobacter and also it is found that 77.5 per cent farmers were having adoption of Azotobacter. As regards Phosphate

Solubilizing Bacteria (PSB), it is evident that, a significant number, i.e. 88.33 per cent farmers were having knowledge about it while 84.17 per cent farmers were having adoption of PSB.

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