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Adoption of biodynamic organic agriculture practices on farmer's field of Vidarbha region

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Abstract

The Centre for Organic Agriculture Research and Training (COART), Department of Agronomy, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra, India has conducted Study-cum-Survey project on Biodynamic organic agriculture practices demonstration on farmers' field in six distress districts of Vidarbha region during the year 2015-16 under Convergence of Agriculture in Maharashtra (CAIM) project. University's Organic Agriculture scientists had taken an adoption study on scientific parameters of low cost sustainable Biodynamic technology on farmer's field. Majority of farmers have medium level of knowledge and adoption as well as favourable attitude towards Biodynamic technology. Overall this study enforced that there is great potential to improve soil health and crop yield upon these aspects for greater adoption of technology at grassroots level. Findings have showed the scope of improvement for shifting the sizable number of respondent from medium category to high category.

Keywords: Organic agriculture, biodynamic, B.D. compost, knowledge, adoption

1. Introduction

Biodynamic agriculture is a form of alternative agriculture very similar to organic farming, but it includes various esoteric concepts drawn from the ideas of Rudolf Steiner (1861–1925) [2]. Initially developed in 1924, it was the first of the organic agriculture movements [4]. It treats soil fertility, plant growth, and livestock care as ecologically interrelated tasks, emphasizing spiritual and mystical perspectives [1]. No difference in beneficial outcomes has been scientifically established between certified biodynamic agricultural techniques and similar organic and integrated farming practices. Biodynamic agriculture lacks strong scientific evidence for its efficacy and has been labeled a pseudoscience because of its reliance upon esoteric knowledge and mystical beliefs [3].

Biodynamic technology has propagated by SARG Vikas Samitee in Vidarbha region with conducting training programs of the farmers. Under this training, farmers acknowledged with Biodynamic compost making method, seed treatment with S-9 Biodynamic Poly culture prior to sowing and non-chemical pest/disease control i.e. Biodynamic Pest Control Solution sprays to cotton and soybean crop. The major objectives of the survey are to study the profile of organic farmers in Vidarbha region and the adoption behavior of farmers pertaining to biodynamic technology.

2. Methodology

The Centre for Organic Agriculture Research and Training (COART), Department of Agronomy, Dr. Panjabrao Deshmukh Krishi Vidyapeeth Akola has conducted Study-cum-Survey project on Biodynamic organic agriculture practices demonstration on farmer's field in six distress districts of Vidarbha region during the year 2015-16 under Convergence of Agriculture in Maharashtra (CAIM) project. University Organic Agriculture scientists had taken an impact study on scientific parameters of low cost sustainable Biodynamic technology on farmer's field (Table 1).

Amongst these demonstrations, 116 sample farmers were selected randomly from six districts. The individual interview has been recorded in Table 2 with prescribed questionnaire scientifically designed by Centre for Organic Agriculture Research and Training (COART), Department of Agronomy, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola.

Table 1: Demonstrations conducted in six districts in Vidarbha by CAIM

| Sr. No. | Name of District | Soybean (LEISA) | Cotton (BCI) | Total |
|---------|------------------|-----------------|--------------|-------|
| 1 | Amaravati | 382 | 296 | 678 |
| 2 | Yeotamal | 422 | 239 | 661 |
| 3 | Wardha | 382 | 199 | 581 |
| 4 | Akola | 206 | 135 | 341 |
| 5 | Washim | 224 | 0 | 224 |
| 6 | Buldhana | 328 | 191 | 519 |
| | Total | 1944 | 1060 | 3004 |

Table 2: Number of farmers randomly selected for study in six districts

| Sr. No. | District | Selected farmers |
|---------|-----------|------------------|
| 1 | Amaravati | 11 |
| 2 | Yeotmal | 10 |
| 3 | Wardha | 10 |
| 4 | Akola | 55 |
| 5 | Washim | 13 |
| 6 | Buldhana | 17 |
| | Total | 116 |

3. Result and discussion

The different categories and data of the farmers in this project recorded with prescribed questionnaire scientifically designed by Centre for Organic Agriculture Research and Training, Department of Agronomy, Dr.Panjabrao Deshmukh Krishi Vidyapeeth, Akola by conducting individual interview and presented in the following concerned variable.

3.1 Profile of Biodynamic organic farmers

1. Age

Age has been operationally defined as the chronological age of the organic farmer in the completed years at the time of data collection. The completed year of age was considered as score. One score was assigned to each completed year of age. On the basis of age, the respondents were grouped under following categories.

Table 3: Distribution of the farmers according to their age

| Sr. No. | Category | Range% | Frequency | Percent |
|---------|--------------|----------|------------|---------|
| 1 | Young | Upto 35 | 34 | 29.00 |
| 2 | Middle age | 36 to 50 | 60 | 52.00 |
| 3 | Old age | Above 50 | 22 | 19.00 |
| | Total | | 116 | 100.00 |
| | Mean = 46.52 | | SD = 11.01 | |

It is evident from the findings presented in Table 3 that success of any training programme depends upon the age acquired by the trainee and subsequent adoption of skills or technology in actual field condition. It is observed from the table below that 52.00 per cent of the trainee farmers are in middle age group (36 to 50 years), whereas 29.00 per cent and 19.00 per cent trainee farmers are in young and old age group respectively. It is inferred that there is scope to involve farmers trainee in young and middle age group, increases the adoption rate for Biodynamic technology.

2. Education

Education referred to the number of years of formal schooling and was taken as the number of classes passed by the respondent in formal school. A numerical score of one was assigned for each year of the formal schooling of the organic

farmer. Following categories were formed by classifying the respondents on the basis of their education.

Table 4: Distribution of the farmers according to their education

| Sr. No. | Category | Standard | Frequency | Percent |
|---------|----------------|--------------|-----------|---------|
| 1 | Illiterate | No schooling | 13 | 11.00 |
| 2 | Primary school | 1 to 4 | 7 | 06.00 |
| 3 | Middle school | 5 to 7 | 7 | 06.00 |
| 4 | High school | 8 to 10 | 37 | 32.00 |
| 5 | HSSC & above | Above 10 | 52 | 45.00 |
| | Total | | 116 | 100.00 |
| | Mean = 8.14 | | SD = 4.12 | |

It is noticed from the Table4 that amongst the 116 trainee farmers 45.00 per cent completed their education up to college level and 32.00 per cent trainee farmers completed their education up to high school level. It indicates that education is the most important factor for adoption of any technology.

3. Land Holding

Land holding refers to the total land possessed by an individual head of the family for cultivation of crops. The total number of hectares of land possessed by the respondent for cultivation of crops was taken as the individual score.

Table 5: Distribution of the farmers according to their land holding

| Sr. No. | Category | Land holding (ha.) | Frequency | Percent |
|---------|-------------|--------------------|-----------|---------|
| 1 | Marginal | Up to 1.0 | 16 | 14.00 |
| 2 | Small | 1.01 to 2.0 | 54 | 46.00 |
| 3 | Semi-medium | 2.01 to 4.0 | 39 | 34.00 |
| 4 | Medium | 4.01 to 10.0 | 07 | 06.00 |
| 5 | Big | Above 10.0 | 00 | 00.00 |
| | Total | | 116 | 100.00 |
| | Mean = 4.86 | | SD = 4.78 | |

Considering the size of land holding, the respondents were categorised under following groups. It is observed from the Table 5 that amongst 116 farmers, 94.00 per cent farmers having land holding up to 10 acre are very much interested in adopting Biodynamic technology on their farm.

4. Animal possession

In organic agriculture system livestock and other animal are important factor to complete energy cycle. It gives supplementary as well as complementary benefits in different enterprises combination for sustainable agriculture. Manure is the main source of nutrient management in Biodynamic practice.

Table 6: Distribution of the farmers according to their animal possession

| Sr. No. | Category | score | Frequency | Percent |
|---------|----------------------------|-------|-----------|---------|
| 1 | None | 1 | 6 | 05.00 |
| 2 | One animal | 2 | 1 | 01.00 |
| 3 | Two farm animals | 3 | 7 | 06.00 |
| 4 | Three farm animals | 4 | 13 | 11.00 |
| 5 | Four farm animals | 5 | 20 | 17.00 |
| 6 | Five to ten farm animals | 6 | 58 | 50.00 |
| 7 | More than ten farm animals | 7 | 11 | 10.00 |
| | Total | | 116 | 100.00 |
| | Mean = 4.0 | | SD = 2.16 | |

It is observed from the Table 6 that amongst the 116 trainee farmers 50.00 per cent have five to ten animals and 17.00 per cent have four farm animals and remaining farmers' possess one to three animals. It indicates that more than 90.00 per cent farmers having animals. Farmers having more than five farm animals are more interested in Biodynamic technology.

5. Knowledge of Farmers about Biodynamic Technology

To evaluate the impact on Knowledge of Farmers about Biodynamic Technology, 17 questions were asked to them. On the basis of their reply the result is analysed and reported in Table 7.

Table 7: Distribution of the farmers according to their knowledge

| Sl. No. | Category | Range | Frequency | Percent |
|--------------|----------|----------|------------|---------|
| 1 | Low | ≤ 69 | 16 | 14.00 |
| 2 | Medium | 70 to 91 | 81 | 70.00 |
| 3 | High | ≥ 92 | 19 | 16.00 |
| Total | | | 116 | 100.00 |
| Mean = 80.54 | | | SD = 11.35 | |

It was reviewed from the data that majority of the more farmers' undergone training on Biodynamic technology possessed medium to high level of knowledge i.e. 70 and 16 per cent respectively. However, less number of farmers are scattered in low level of knowledge (14.00%).

6. Attitude of farmers towards Biodynamic Technology

Table 8: Distribution of the farmers according to their attitude

| Sl. No. | Category | Range | Frequency | Percent |
|--------------|-------------------|----------|------------|---------|
| 1 | Unfavourable | ≤ 77 | 17 | 15.00 |
| 2 | Favourable | 78 to 96 | 88 | 76.00 |
| 3 | Highly Favourable | ≥ 97 | 11 | 09.00 |
| Total | | | 116 | 100.00 |
| Mean = 87.32 | | | SD = 09.94 | |

The attitude of farmers is assessed towards Biodynamic Technology after attending the training, 14 questions were asked to them. It is noticed from Table 8 that nearly three fourth of farmers (76.00%) and nine per cent bears highly favourable attitude towards the Biodynamic technology whereas meagre percentage of respondents recorded unfavourable attitude towards this technology (15.00%).

7. Adoption behaviour of farmers regarding Biodynamic Technology

Success of any training programme and technology adoption depends upon the skills acquired by the trainees and subsequent adoption of skill or technology in actual field situation. Six questions were asked to respondents after Biodynamic trainings to know about their adoption of technology on their farms.

Table 9: Distribution of the farmers according to their adoption

| Sl. No. | Category | Range | Frequency | Percent |
|--------------|----------|----------|------------|---------|
| 1 | Low | ≤ 54 | 18 | 16.00 |
| 2 | Medium | 54 to 80 | 82 | 71.00 |
| 3 | High | ≥ 81 | 16 | 14.00 |
| Total | | | 116 | 100.00 |
| Mean = 67.43 | | | SD = 13.60 | |

The data presented in Table 9 represent the adoption of biodynamic technology by the trainee farmers after the training

is over. The figure in table indicates that majority of trainee farmers are scattered in medium category of adoption (71.00%). A small percentage of respondents are scattered in low and high category of adoption 16 and 14 per cent, respectively. It is inferred that there is wide scope to improve the adoption status of respondents from medium to high category of adoption by giving them more exposure to the improved technologies.

4. Conclusion

Majority of farmers have medium level of knowledge and adoption as well as favourable attitude towards Biodynamic technology. Overall this study enforced that there is great potential to improve soil health and crop yield upon these aspects for greater adoption of technology at grassroots level. Findings have showed the scope of improvement for shifting the sizable number of respondent from medium category to high category. Based on the one year study undertaken on farmers' field, it can be enforced that the Biodynamic farming a part of organic farming has potential to improve soil health and crop productivity. Further, to come on conclusion, there is need to continue study for two more years so as to popularise this technology among the farmers.

5. References

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