THE IMPACT OF FARMERS BEHAVIOR IN APPLYING BIOCONVERSI BIODIVERSITY ON RICE PRODUCTIVITY (CASE IN SUBAK DAUH UMA ULU, BATUAN KALER VILLAGE, SUKAWATI DISTRICT, GIANYAR REGENCY)

I Nengah Surata Adnyana

Faculty Of Agriculture and Business, Dwijendra University, Denpasar
surataadnyana@gmail.com

ABSTRACT

Measurements in rice farming need to be carried out to determine the success of an activity such as measuring farmer behavior. Behavior consists of knowledge, attitudes and skills of farmers in measuring the use of Bioconversion biological fertilizers in paddy rice plants. This research was conducted at the location of rice farming in Subak Dauh Uma Ulu, Batuan Kaler Village, Sukawati District, Gianyar Regency. The population is 44 farmers. The research sample was 18 respondent farmers. The aims of this study were (1) to analyze the knowledge of farmers in applying Bioconversion Biological Fertilizers to the productivity of paddy rice in Subak Dauh Uma Ulu, Batuan Kaler Village, Sukawati District, Gianyar Regency; (2) analyzing the attitude of farmers in applying bioconversion biofertilizers to the productivity of paddy rice in Subak Dauh Uma Ulu, Batuan Kaler Village, Sukawati District, Gianyar Regency; (3) analyzing the skills of farmers in applying Bioconversion Biofertilizers to the productivity of paddy rice in Subak Dauh Uma Ulu, Batuan Kaler Village, Sukawati District, Gianyar Regency. The results showed that (1) farmers' knowledge in applying bioconversion biofertilizers can increase the productivity of paddy rice in Subak Dauh Uma Ulu, Batuan Kaler Village, Sukawati District, Gianyar Regency; (2) the attitude of farmers in applying bio-fertilizers Bioconversion can increase the productivity of paddy rice in Subak Dauh Uma Ulu, Batuan Kaler Village, Sukawati District, Gianyar Regency; (3) farmers' skills in applying bioconversion biofertilizers can increase the productivity of paddy rice in Subak Dauh Uma Ulu, Batuan Kaler Village, Sukawati District, Gianyar Regency. Suggestions that can be given are (1) it is necessary to provide more in-depth knowledge of the application of biological fertilizers such as organic fertilizers that can stimulate root growth, organic fertilizers will be more resistant to pests and diseases, and the need to conduct farming analysis of organic fertilizers to save fertilization costs; (2) the attitudes of farmers who need to be given counseling include the application of biological fertilizers that are more resistant to pests and diseases, and can save farming costs; (3) farmers' skills that need to be improved in the field need to store fertilizer in a dry place and avoid sunlight, dosage, dilution, time of application and administration.

Keywords: *knowledge, attitudes, skills*

1. INTRODUCTION

Sustainable agriculture is very important in doing farming. This is because applying the principles of sustainable agriculture will have many positive impacts on the soil, the environment and the productivity of agricultural products. So far, agricultural organic waste called organic fertilizer has not been able to be utilized optimally by farmers. This organic waste will function as fertilizer if it is managed and processed according to its designation. The cause of the non-management of organic waste is caused by several factors such as the behavior of farmers who still tend to be low, as well as the lack of knowledge of farmers who on average have low formal education knowledge. Behavior is a way of acting that shows a person's behavior and is the result of a combination of anatomical, physiological, and psychological development (Kast and Rosenzweig, 1995). Behavior consists of behavior that is

not visible, such as knowledge (cognitive) and attitudes (effective) and behavior that is visible, such as skills (psycomotoric) and concrete actions (action).

Knowledge is the most basic thing that happens after farmers sense a particular object, the implication will have an impact on the human resources of farmers in having an agribusiness-oriented farming mindset (Notoatmojo, 2007). Attitudes are formed from experience through the learning process (Sarwono, 1997). Attitudes are formed due to human interaction with certain objects (communication) as well as social interactions both within farmer groups and outside farmer groups and contain judgments of agreeing, disagreeing or liking, not liking.

Skill is the ability to carry out farming well. Skills are also skills and self-potential possessed by farmers in mastering skills through training (Mulyati and Yeti, (2016). So far, the mindset of farmers tends to be instant. Farmers have a tendency to get results without regard to future land, this is evidenced by the continuous use of chemical fertilizers which are not balanced with the use of organic fertilizers. Organic fertilizers are very important in improving the physical, chemical and biological properties of soil which have been degraded due to synthetic fertilizers. One of the Liquid Organic Fertilizers (POC) used so far is Bioconversion Biofertilizer as an alternative solution to improving soil fertility to maintain sustainable agriculture.

2. RESEARCH METODOLOGY

Location and Time of Research

This research was conducted at the location of rice farming in Subak Dauh Uma Ulu, Batuan Kaler Village, Sukawati District, Gianyar Regency, Bali Province. The research time starts from June 2022 to September 2022.

Types of Data

The type of data used in this research is quantitative data and qualitative data. Quantitative data is data in the form of numbers or qualitative data that is quantified through a score (Antara, 2012). Qualitative data is data in the form of words, sentences, schemes, and pictures or data that is not in the form of numbers and cannot be counted (Antara, 2012).

Population and Research Sample

The population in this study totaled 44 people, namely farmers who planted paddy rice in the period December 2021 to April 2022. The sampling technique in this study was purposive random sampling. Sampling was determined by taking 40% of the total population, namely 18 farmers.

Data Analysis Methods

Research data were analyzed qualitatively and quantitatively. Qualitative data from the questionnaire results were transformed into numbers (scores), then processed using descriptive statistical methods. All indicators of research variables are measured using an ordinal scale with a value range of 1 to 5. The final results of each variable are classified into five categories as described in Table 1.

Table 1. Category Achievement Score Research Variables

No	Score achievement		Research variable categories	
	(number)	(%)	Knowledge/Skills/Productivity	Attitude
1.	>4,2-5	>84-100	Very high	Strongly agree
2.	>3,4-4,2	>68-84	Tall	Agree
3.	>2,6-3,4	>52-68	Currently	Currently
4.	>1,8-2,6	>36-52	Low	Don't agree
5.	1-1,8	20-36	Very low	Strongly Disagree

3. RESULTS AND DISCUSSION

Knowledge of Farmers in applying Bioconversion Biological Fertilizers

Behavior consists of knowledge, attitudes and skills. Knowledge of the application of bio-fertilizers Bioconversion in paddy rice plants is measured by 11 indicators. Organic fertilizers are quickly absorbed by plants to get a score of 3.05 (61.11%) in the medium category; increasing soil fertility to get an achievement score of 3.50 (70%) in the high category; Providing soil/plant nutrients with a value of 2.61 (52.22%) in the medium category; organic fertilizer can increase microorganisms in the soil with a value of 3.22 (6.44%); stimulate root growth 2.05 (41.11%); organic fertilizer can stimulate plant growth with a value of 3.16 (63.33%); resistant to pests and diseases with a value of 2.11 (42.22%); organic fertilizer can increase the quantity of yields to get an achievement score of 2.77 (55.55%) in the medium category. Improving the quality of yields by applying organic fertilizers obtained a value of 3.55 (71.11%) in the high category. With the high quantity and quality of the rice commodity, it will affect the condition of added selling value which has good implications for the marketing of produce (Adnyana, et.al., 2020 and Adnyana, 2021). The use of biological organic fertilizers will make it safe for the environment 2.55 (51.11%) and organic fertilizers can save fertilization costs included in the relatively low category with an achievement score of 1.94 (38.88%). This is in accordance with the research of Yohana, et.al., (2019) that the application of organic fertilizers can not only increase rice production but will also bring about sustainable agriculture with no degradation of existing nutrients. The average farmer's knowledge of the application of bio-fertilizers in the field is still in the moderate category with an achievement score of 2.77 (55.56%), this is due to the average farmer's formal education, which is still low-educated, old, which will affect adoption. agricultural technology (Adnyana, et.al., 2017). With low farmer education, they will also have less knowledge of environmentally friendly agriculture, farmers only tend to see results that immediately affect sustainable agriculture (Fatmawati, et.al., 2016). Achievement Results Farmers' knowledge in applying bioconversion biofertilizers can be presented in Table 2.

Table 2. Knowledge Achievement of Farmers in Applying Bioconversion Biological Fertilizers

No.	Farmer knowledge	Amount score	Score achievement		
			(Number)	(%)	Category
1.	Quickly absorbed by plants	55	3,05	61,11	Currently
2	Increase soil fertility	63	3,50	70,00	Tall
3	Provides soil/plant nutrition	47	2,61	52,22	Currently
4	Increase microorganisms in the soil	58	3,22	64,44	Currently
5	Stimulates root growth	37	2,05	41,11	Low
6	Stimulates plant growth	57	3,16	63,33	Currently
7	Resistant to pests and diseases	38	2,11	42,22	Low
8	Increase the quantity of crops	50	2,77	55,55	Currently
9	Improve the quality of crops	64	3,55	71,11	Tall
10	Safe for the environment	46	2,55	51,11	Currently
11	Save on fertilization costs	35	1,94	38,88	Low
	Average	50	2,77	55,56	Currently

Attitudes of farmers in applying bioconversion biological fertilizers

The attitude of farmers is formed from experience through the learning process. Attitude is a form of feeling reaction or the tendency of farmers to accept or reject the application of biological fertilizers in the field. The attitude of farmers that bioconversion biofertilizers can be absorbed by plants quickly with the agreed category with an achievement score of 3.77 (75.55%) is because the application in liquid form will be absorbed more quickly by plants when compared to solid form. The attitude of farmers that biological fertilizers can increase soil fertility is still less

relevant for farmers compared to the use of inorganic fertilizers, which results can be seen quickly; but included in the category that agreed with a value of 3.50 (70.00%). Biological fertilizers can provide soil and plant nutrients with an achievement score of 4.11 (82.22%) in the agree category. Soil micro-organisms are a reference for farmers in determining land fertility for farmers with a value of 4.22 (84.44%) in the strongly agree category, with the application of organic fertilizers it will be able to increase the presence of local microorganisms in the soil so that the percentage of flowers forming into fruit will be more (Patang, et.al., 2017).

Table 3. Achievements of Farmers' Attitudes in Applying Bioconversion Biological Fertilizers

No.	Farmers' Attitudes	Amount score	Score achievement		
			(Number)	(%)	Categori
1	Quickly absorbed by plants	68	3,77	75,55	Agree
2	Increase soil fertility	63	3,50	70,00	Agree
3	Provides soil/plant nutrition	74	4,11	82,22	Agree
4	Increase microorganisms in the soil	76	4,22	84,44	Strongly agree
5	Stimulates root growth	87	4,83	96,66	Strongly agree
6	Stimulates plant growth	75	4,16	83,33	Agree
7	Resistant to pests and diseases	45	2,50	50,00	Disagree
8	Increase the quantity of crops	78	4,33	86,66	Strongly agree
9	Improve the quality of crops	75	4,16	83,33	Agree
10	Safe for the environment	80	4,44	88,88	Strongly agree
11	Save on fertilization costs	44	2,44	48,88	Don't agree
	Average	69,54	3,86	77,27	Agree

The average attitude of farmers in the application of bioconversion biofertilizers in the field obtained an achievement score of 3.86 (77.27%) in the agree category. This attitude of farmers can be further improved if good counseling is carried out, informal education of farmers through training, and the desire of farmers to maintain soil fertility towards environmentally friendly and sustainable agriculture (Adnyana, 2021). The results of Farmers' Attitudes in applying Bioconversion Biological Fertilizers can be presented in Table 3.

Farmers' skills in applying bioconversion biological fertilizers

Skills are the abilities possessed by lowland rice farmers in applying biological fertilizers. The skill of farmers in storing fertilizer in a dry place at a temperature of 25-30OC has a score of 2.38 (47.77%) in the low category. The skill of farmers to shake fertilizer before use has a value of 4.00 (80.00%) in the high category. The skill of diluting fertilizer 1 liter/50 liters of water with a value of 2.55 (51.11%), when applying fertilizer gets a value of 2.44 (48.88%) which is still in the low category. This is due to the reluctance of farmers to dilute according to the correct dosage and time of application, farmers do not understand how important the timing of fertilizer application is for plant growth. The average farmer's skill in applying bioconversion biofertilizers obtained an achievement score of 3.04 (60.83%) in the medium category. The results of Farmers' Skills in Applying Bioconversion Biological Fertilizers can be presented in Table 4.

Table 4. Achievement of Farmers' Skills in applying Bioconversion Biological Fertilizers

No.	Farmer Skills	Amount score	Score achievement (Number)	(%)	Category
1	Store in a dry place at 25-300C	43	2,38	47,77	Low
2	Shake it before use	72	4,00	80,00	Tall
3	The application dose is 20 liters/ha	44	2,44	48,88	Low
4	Fertilizer dilution 1 liter/50 liters of water	46	2,55	51,11	Low
5	Time to give 8 Hst 4 liters, 15 Hst 4 liters, 35 Hst 8 liters, and 60 Hst 4 liters	44	2,44	48,88	Low
6	No mixing allowed	75	4,16	83,33	Tall
7	Sprayed on the stems and leaves / leaked on the soil surface around the plants	70	3,88	77,77	Tall
8	The application is carried out 3-5 days before or after the application of chemical fertilizers	44	2,44	48,88	Low
	Average	54,75	3,04	60,83	Currently

Productivity is the result of the activities of a commodity. Productivity will produce well if it is supported by good commodity maintenance. Results The productivity of the application of biological fertilizers to paddy rice yields an average yield productivity of 7,930 tonnes/ha in the high category. Productivity of 6.50 – 6.940 tons/ha was achieved by 1 (5.55%) farmer in a very low category. Productivity > 6,940 – 7,350 tons/ha (16.66) achieved by 3 farmers in the low category. Productivity > 7,350 – 7,760 tonnes/ha (22.22%) achieved by 4 farmers in the medium category. Productivity > 7,760 – 8.17 tonnes/ha (38.88%) achieved by 7 farmers in the high category. While yield productivity > 8,170 – 8,580 kw/ha (16.66%) is owned by 3 farmers with a very high category. The high average productivity of paddy rice was achieved due to the application of organic fertilizers combined with inorganic fertilizers (Urea and NPK). Lowland Rice Productivity Achievements can be presented in Table 5.

Table 5. Lowland Rice Productivity Achievements

Productivity	Provity Interval (Ton/ha)	Number of respon Person dents (Person)	Percentage of respondents (%)	Category
	6.530 - 6.940	1	5,55	Very low
Rice	> 6.940 – 7.350	3	16,66	Low
Productivity	>7.350 – 77.60	4	22,22	Currently
	>7.760 – 8.17	7	38,88	Tall
	>8.170 – 8.580	3	16,66	Very high
Average	7.930	18		Tall

4. CONCLUSION

Based on the results of the analysis and discussion it can be concluded as follows.

1. Farmers' knowledge in applying bio-fertilizers Bioconversion can increase the productivity of paddy rice in Subak Dauh Uma Ulu, Batuan Kaler Village, Sukawati District, Gianyar Regency.

2. Farmers' attitude in applying bio-fertilizers Bioconversion can increase the productivity of paddy rice in Subak Dauh Uma Ulu, Batuan Kaler Village, Sukawati District, Gianyar Regency.
3. Farmers' skills in applying bio-fertilizers Bioconversion can increase the productivity of paddy rice in Subak Dauh Uma Ulu, Batuan Kaler Village, Sukawati District, Gianyar Regency.

Suggestions that can be given in this study are as follows.

1. It is necessary to provide more in-depth knowledge of the application of biological fertilizers such as organic fertilizers that can stimulate root growth, organic fertilizers will be more resistant to pests and diseases, and the need to carry out farming analysis of organic fertilizers can save fertilization costs.
2. The attitude of farmers who need to be given counseling includes the application of biological fertilizers that are more resistant to pests and diseases, and can save farming costs.
3. Farmers' skills that need to be improved in the field need to store fertilizer in a dry place and avoid sunlight, dosage, dilution, time of application and administration.

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