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Farmer Preferences for Organic Fertilizer Attributes: A Conjoint Analysis of Okiagaru Agricoop

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Abstract. The use of organic fertilizers in horticultural farming remains limited due to farmers' perceptions regarding effectiveness, practicality, and economic considerations. Understanding farmers' preferences for organic fertilizer attributes is therefore important to support the adoption of sustainable agricultural practices. This study aims to analyze the preferences of Okiagaru Agricoop partner farmers toward organic fertilizer attributes in horticultural cultivation in Cianjur Regency, West Java. This study employed a descriptive quantitative approach using conjoint analysis to evaluate farmers' preferences for different combinations of fertilizer attributes. Data were collected through field observations, questionnaires, and direct interviews with 30 partner farmers selected using purposive sampling. The attributes analyzed included price, quality, effectiveness, and ease of use. The results show that ease of use is the most influential attribute, with the highest importance value (30.397%) and utility estimate (0.542), indicating that farmers strongly prefer fertilizers that are easy to apply in farming activities. This was followed by quality (23.580%), effectiveness (23.093%), and price (22.930%). In addition, most farmers (96.67%) expressed their willingness to process organic waste into organic fertilizer. These findings indicate that practical and functional attributes play a crucial role in farmers' decisions to adopt organic fertilizers. Therefore, the development and dissemination of organic fertilizer technologies should prioritize ease of application, effectiveness, and affordability to encourage wider adoption among horticultural farmers.

Keywords: conjunctive analysis; farmer preferences; horticulture; organic fertilizers; organic waste

1. Introduction

Horticulture is an agricultural subsector strategically supporting food security by providing balanced food sources. Horticulture encompasses a variety of commodities, including vegetables, houseplants, medicinal plants, and fruits. Horticultural crops have the advantage of a relatively short planting period and contribute to improving farmers' welfare through their harvests. In addition, horticultural commodities play an essential role as a source of nutrition that complements staple foods and meets human vitamin and mineral needs (Purnama, 2022). In horticultural cultivation, proper fertilization practices are essential for supporting plant growth and productivity. Previous studies have shown that the use of liquid organic fertilizers can improve plant growth and yield by increasing nutrient availability and supporting balanced plant nutrition (Nendissa et al., 2025)

Farmers who use conventional agricultural systems still do not fully utilize organic fertilizers because they are considered to yield suboptimal results, to be slow to show impact, and to be economically unprofitable, so they have not been used sustainably (Roidah, 2013). The low interest of farmers in organic fertilizers is due to the limited knowledge and skills in processing and using them on agricultural land (Sari *et al.*, 2024). Organic fertilizers have great potential in increasing soil fertility naturally

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and sustainably. This fertilizer comes from natural materials such as plant residues, animal manure, and other organic waste that has gone through an environmentally friendly and safe process (Sutrisno et al., 2020). Household waste is one of the primary materials used to produce abundant, readily available organic fertilizers. Proper management can process the waste into solid or liquid organic fertilizers with economic value (Yetri *et al.*, 2018). In addition, household waste can also be used to support sustainable agriculture by processing it into organic fertilizers (Nur *et al.*, 2016). In addition to benefiting the agricultural sector, household waste treatment also contributes to environmental cleanliness and creates business opportunities in rural areas. Types of household waste can be used as materials for making organic fertilizers such as onion peels, banana peels, mango peels, spinach stems, kale stems, papaya peels, egg shells, tea bags, used banana leaves, carrot peels, and mustard nut humps (Setiawati & Elfarisna, 2021).

In Ciputri Village, Pacet District, Cianjur Regency, household waste is also an important issue. Based on data from the Cianjur Regency Environment Agency in 2024, the average waste generation in Pacet District exceeds 12 tons per day, of which around 60% is organic waste, including food waste, agricultural products, and household kitchen waste. However, only about 35% of the total waste has been successfully handled through the 3R TPS system and available waste banks. The rest is littered, burned, or allowed to accumulate in the environment, causing air and water pollution and becoming a source of disease. The solution is to process the organic waste into organic fertilizer. Most of Okiagaru's partner farmers still buy fertilizer for their cultivation needs. Only a small percentage of farmers obtain fertilizer from partners, produce it themselves, or obtain it from other sources. The following data shows the various sources of fertilizer used by Okiagaru's partner farmers.

Table 1. Source of fertilizer used by Okiagaru Agricoop partner farmers

Fertilizer Source	Number of Farmers	Percentage (%)
Buy yourself	24	80
Make your own	3	10
From the other side	2	6.7
From okiagaru partners	1	3.3

Source: Primary Data, processed (2025)

Table 1. Source of fertilizer used by Okiagaru Agricoop partner farmersshows that the level of independence of Okiagaru Agricoop's partner farmers in producing fertilizer is still relatively low. About 80% of farmers prefer to buy fertilizer rather than make fertilizer themselves. Only about 10% of farmers use organic waste to make their own fertilizers, 6.7% obtain fertilizers from other parties, and 3.3% obtain fertilizers directly from Okiagaru Agricoop partners. This condition indicates a high dependence on purchasing the chosen fertilizer because it is more practical. However, this also creates significant opportunities to increase the use of organic waste, especially by processing organic fertilizers independently, which is currently not widely done. This provides an initial overview of farmers' preferences for the attributes of organic fertilizers that influence decisions in horticultural cultivation.

Farmers' preferences in choosing organic fertilizers reflect how they assess and prioritize specific attributes considered most appropriate for their farming conditions. Some farmers prioritize ease of use, especially those with low education

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levels or limited time in the cultivation process. Meanwhile, price is a significant consideration for farmers with limited incomes, as affordability strongly influences purchasing decisions. The quality and effectiveness of fertilizers are essential, especially for farmers seeking to ensure optimal yields, even though fertilizers are produced independently. Therefore, each farmer has different tendencies or combinations of preferences depending on their personal characteristics and farming conditions. Understanding farmers' preferences toward agricultural inputs is essential to developing technologies that are practical, economically feasible, and widely adopted by farming communities (Ulfa et al., 2024).

Based on this description, the purpose of this study is to analyze the characteristics of Okiagaru Agricoop's partner farmer respondents in applying organic fertilizers to horticultural commodities in Cianjur Regency and to analyze the preferences of Okiagaru Agricoop's partner farmers in applying organic fertilizers to horticultural commodities in Cianjur Regency.

2. Materials and Methods

The research was conducted at Okiagaru Agricoop in Ciputri Village, Pacet District, Cianjur Regency, West Java Province. The location was determined purposively based on several considerations relevant to the research objectives. Ciputri Village is known as one of the horticultural production centers in Cianjur Regency, where Okiagaru Agricoop conducts organic farming activities. In addition, organic waste generated from horticultural cultivation activities in the region is generally not managed adequately and is often disposed of without further processing, even though it has great potential as a raw material for organic fertilizer production. The research took place from February to June and involved as many as 30 Okiagaru Agricoop farmer-partner respondents, selected through purposive sampling. The goal is to identify the farmers' preference for using organic fertilizers. The primary data collection technique used was the distribution of questionnaires to Okiagaru's partner farmers. According to Sugiyono (2017), questionnaires are among the most effective methods for obtaining primary data, especially for exploring respondents' views or preferences on a particular issue. The population in this study comprises all Okiagaru Agricoop partner farmers engaged in horticultural cultivation in the Cianjur Regency. The sample was determined using purposive sampling, a respondent selection technique based on specific criteria (Kriyantono, 2016). The main criteria used in this study are farmers who are actively involved in partnerships and who have used or are considering using organic fertilizers. Based on these criteria, 30 farmers were selected as respondents to represent partner farmers involved in horticultural cultivation.

The data collected consisted of primary data obtained directly through questionnaires and secondary data from relevant literature studies. In addition, the researcher also conducted interviews and observations to enrich the understanding of field conditions. Miswar *et al*. (2014) stated that in-depth interviews and observations can strengthen quantitative data by providing contextual and factual behaviors of respondents in the field.

Data analysis was conducted in a quantitative, descriptive manner. At the same time, the first objective was analyzed using a quantitative descriptive approach, namely by presenting data in tabulations, diagrams, and percentage or average values to describe the general profile of farmers. The purpose of this analysis is to provide a comprehensive picture of the background of farmers that can affect farmers' preferences and willingness to use organic fertilizers.

The second objective of this study is to measure the *utility of different combinations of product attributes and to understand partner farmer respondents' preferences for* each combination. Conjoint analysis was

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chosen because it can measure the utility of different combinations of product attributes and assess respondents' preferences for each combination (Hair *et al.*, 2021). Conjoint analysis was used to assess the preferences of Okiagaru Agricoop partner farmers. The conjoint analysis model is formulated as follows:

$$y_{ijklm} = \mu + \beta_{1i} + \beta_{2j} + \beta_{3k} + \beta_{4l} + \varepsilon_{ijkl} \dots\dots\dots\dots\dots (1)$$

Which is a statement of preferences of Okiagaru Agricoop partner farmers in applying organic fertilizers to horticultural commodities, at the first level related to price, the second level associated with quality, the k level related to effectiveness, and the l level related to use. It is every element of a constant and the error. Where $y_{ijklm} \mu \varepsilon_{ijkl}$

$$\Sigma\beta_{1i} = \Sigma\beta_{2j} = \Sigma\beta_{3k} = \Sigma\beta_{4l} = 0 \;\dots\dots(2)$$

In this study, four attributes are used to analyze the preferences of Okiagaru Agricoop partner farmers in applying organic fertilizers to horticultural commodities. In detail, it is presented in Table 2.

Table 2. Attributes and levels examined in farmer preferences

Attribute	Level
Price	Affordable
	Expensive
Quality	Tall
	Low
Effectiveness	Effective
	Less effective
Use	Easy
	Difficult

Source: Primary Data, processed (2025)

Data analysis was carried out using SPSS Statistics 29. The four primary attributes analyzed in this study include: price, quality, effectiveness, and ease of use of fertilizers. Price attributes refer to the costs farmers must incur to obtain organic fertilizers, which are categorized as affordable and expensive based on farmers' economic capabilities. Quality attributes refer to farmers' perceptions of the fertilizer's nutrient content and its ability to improve soil fertility and plant growth. Effectiveness attributes refer to organic fertilizers' ability to produce tangible results in plant growth and productivity.

Meanwhile, use attributes relate to the practicality of fertilizers in the field application process, both in terms of preparation and use in daily cultivation activities. These attributes are arranged as scenarios (stimuli) that respondents select, following the conjoint analysis method described by Green and Srinivasan (1990), which aims to identify which attributes have the greatest weight in influencing respondents' preferences for a product. Combining four attributes with two levels each results in 16 full-profile combinations with a calculation of 4 main attributes 2x2x2x2 = 16. However, to avoid respondent fatigue and to practice fractional factorial design in conjunctive analysis, only eight combinations (stimuli) were used, representing optimal variations based on an orthogonal design. These stimuli were presented to the respondents as profiles of organic fertilizer products. Each profile depicts a unique combination of the above attributes. Respondents were asked to rate each profile based on the level of farmers' preference, using a ranking scale or rating. This design selection refers to the approach suggested by Green and Srinivasan (1990), in which conjoint analysis is used to evaluate product attributes simultaneously in realistic situations, such as consumer or farmer decision-making.

3. Results and Discussion

Characteristics of Okiagaru Agricoop Partner Farmer Respondents in Applying Organic Fertilizers to Horticultural Commodities in Cianjur Regency, West Java

The characteristics of the respondents are an essential factor that can affect farmers' preferences in using organic

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fertilizers. Information on the gender, age, education, land ownership status, and income of Okiagaru Agricoop partner farmers provides an overview of the socio-economic conditions behind decision-making. In detail, it is presented in Table 3.

Table 3. Characteristics of Okiagaru Mitra Farmers

Respondent Characteristics	Category	Sum	Percentage (%)
Gender	Man	28	93.33
	Woman	2	6.67
Age	21-30 years old	5	16.67
	31-40 years old	16	53.33
	41-50 years old	8	26.67
	51-60 years old	1	3.33
Education	SD	21	70
	SMP	3	10
	SMA	5	16.67
	Bachelor	1	3.33
Land Ownership Status	Landowners	22	73.33
	Labor farmers	8	26.67
Land	0-2000 m	29	96.67
	2001-5000 m	-	-
	5001-8000 m	1	3.33
Farming Experience	< 5 years	4	13.33
	5 - 10 years	9	30
	> 10 years	17	56.67
Income	<IDR1,000,000	4	13.33
	IDR1,000,000 - IDR3,000,000	15	50
	IDR 3,000,001 - IDR 5,000,000	8	26.67
	>IDR 5,000,000	3	10

Source: Primary Data, processed (2025)

The characteristics of farmers by gender show that the 30 farmers who partner with Okiagaru Agricoop in Cianjur Regency are predominantly male, 28, accounting for 93.33%. Meanwhile, female farmers amounted to 2 people with a percentage (6.67%). This finding aligns with Wahono's (2019) research, in which most mustard green farmers in the Smart Harapan Farmers Group are men, at 97%. This shows that most farmers are male because jobs in the agricultural sector require extensive physical labor and flexible working hours.

Based on the farmers' ages, the age range is 31 to 40 years. The largest age group is 31-40, with 16 people or 53.33%. Furthermore, the age group of 41-50 years is eight people (26.67%), the age group of 21-30 years is five people (16.67%), and the age group of 51-60 years is only one person (3.33%). This finding differs slightly from the research of Astuti et al. (2023), which found that the majority of oil palm farmers are in the productive age range (21-50 years), at 53%. This age group has great potential in supporting agricultural sustainability because they tend to be more open to innovation.

The education level of farmers is more dominant in elementary school as many as 21 people (70%), showing a relatively low level of education, followed by five people (16.67%) with high school education, three people (10%) junior high school, and only one person (3.33%) who have reached the bachelor's level. This condition affects

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farmers' preferences in choosing organic fertilizers, especially regarding ease of use and price. Farmers with education ranging from elementary to junior high tend to use fertilizers that are easy to apply and affordable, because they prioritize practical products and align with farmers' economic capabilities. This finding aligns with Yusmel's (2019) research, which suggests that the level of farmers' education will affect how farmers manage their farming businesses, specifically their ability to manage farming and adopt innovations. This statement follows Setiyowati *et al.* (2022) opinion that the level of education will affect the way of thinking, receiving, and trying new things. Education also has a positive relationship with a person's aspirations, which will ultimately determine a person's decision-making.

Based on land ownership characteristics, 22 people (73.33%) are landowners, reflecting the potential for economic independence. In comparison, eight people (26.67%) are labor-intensive farmers, more economically vulnerable due to wage dependence. This status affects preferences in the use of organic fertilizers. Land-owning farmers are usually freer to choose fertilizers based on quality and effectiveness because they have complete control over cultivation decisions and long-term business orientation. On the other hand, labor farmers tend to be more sensitive to fertilizer prices. Suppose the price of fertilizer is too high. In that case, it can impact farmers' income because the profit-sharing system decreases net income, and landowners reduce wages to lower production costs. Therefore, for farmers, labor costs are the primary consideration when choosing organic fertilizers.

Based on the land area managed by 30 Okiagaru Agricoop partner farmers, it is known that most of the farmers, namely 29 people (96.67%), have a land area between 0-2000 square meters, and one person (3.33%) has a land area of 5001-8000 square meters. This finding is also in line with Yusmel's (2019) research, which shows that land area affects production, but it must also be balanced with the level of maintenance to increase production. Abdullah *et al.* (2015) stated that the area of farmland determines the income, standard of living, and welfare of farmer households. For example, in farming, land ownership has an average area of 1 hectare. Farmers with ample land will find it easier to implement innovation than those with narrow land. This is because it is property rights cultivated by farmers.

The characteristics of farming experience among 30 Okiagaru Agricoop partner farmers in Cianjur Regency is described as follows. Most farmers have more than 10 years of farming experience, 17 people or 56.67%. Meanwhile, 9 farmers with 5-10 years of experience (30.00%) and the remaining 4 people (13.33%) have less than 5 years of experience. This finding is in line with the research of Setiyowati *et al.* (2022), which found that farming experience affects farmers' knowledge and skills in running a clove farming business, as farmers with extensive clove farming can overcome problems they face based on their experience.

The income of most okiagaru partner farmers is around IDR 1,000,000 - IDR 3,000,000 per month, with 15 farmers (50%) among the total respondents. A total of 8 farmers (26.67%) had an income of IDR 3,000,001 - IDR 5,000,000, while four farmers (13.33%) had an income below IDR 1,000,000, and only three farmers (10%) had an income above IDR 5,000,000. This condition indicates that most farmers are in the lower-middle-income group. This income level significantly affects farmers' ability and willingness to allocate funds to buy fertilizer. Therefore, farmers' preferences for organic fertilizers are greatly influenced by economic considerations. One strategy is to encourage farmers to process household waste into organic fertilizer independently.

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Farmer Preferences for Organic Fertilizer Attributes

Conjoint analysis was conducted to examine the preferences of Okiagaru Agricoop partner farmers regarding the application of organic fertilizers to horticultural commodities in Cianjur Regency, West Java. The analysis considered four main attributes, namely price, quality, effectiveness, and ease of use. Each attribute consisted of two levels: price (affordable and expensive), quality (high and low), effectiveness (effective and less effective), and ease of use (easy and difficult). These attributes were selected to represent the main factors influencing farmers' decisions when choosing organic fertilizers.

The results of the conjoint analysis are presented in Table 4, which shows the utility estimates and the importance values for each attribute and level. The utility values indicate the direction of farmers' preferences for each attribute level, while the importance values reflect the relative contribution of each attribute to the overall decision-making process.

Overall, the results suggest that farmers tend to prefer organic fertilizers that are easy to use, effective, affordable, and of high quality. Among these attributes, ease of use is the most important factor influencing farmers' preferences, followed by quality, price, and effectiveness. This indicates that practical considerations in fertilizer application play a significant role in farmers' decisions, particularly in small-scale horticultural farming systems.

Table 4. Results of the combined analysis of Okiagaru Agricoop Partner Farmers' preferences in applying organic fertilizers to horticultural commodities in Cianjur Regency, West Java

Value of Interest (%)	Variable	Attribute	*Utility Estimate*	*Std. Error*	Preferences
22.930	Price	Affordable	.325	.176	Affordable
		Expensive	-.325	.176	
23.580	Quality	Tall	.196	.216	Tall
		Low	-.196	.216	
23.093	Effectiveness	Effective	.404	.216	Effective
		Less Effective	-.404	.216	
30.397	Use	Easy	.542	.249	Easy
		Difficult	-.542	.249	

Source: Primary Data, processed (2025)

Results of Combined Analysis for Utility Value

Based on the conjoint analysis results, Okiagaru partner farmers' preferences in using organic fertilizers on horticultural crops are influenced by four main attributes: price, quality, effectiveness, and ease of use. Of the four attributes, ease of use was the most preferred factor, with the highest utility value of 0.542 in the "easy" category. This shows that farmers prioritize the ease of applying organic fertilizers in the field. These findings align with the research of Yasin *et al.* (2024), which states that farmers tend to choose organic fertilizers that are easy to use, as shown by optimistic utility estimates. In the study, ease of use was important because farmers wanted to avoid complicated and time-consuming fertilizer application procedures. In addition, ease of use can be theoretically linked to the respondents' educational characteristics, with 70% having only completed elementary school (SD). The literature review supports that those with lower levels of education

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tend to prefer adopting technology that is easy to use (Mutisya & Kumar, 2025)

Effectiveness attributes are divided into two categories, namely "effective" and "less effective". The study results indicate that farmers prefer organic fertilizers that are classified as effective. This is shown by the estimated utility value of 0.404 in the effective category, which reflects farmers' expectations for real and optimal results in the growth of horticultural crops.

The price attribute is divided into two categories, namely affordable and expensive. The results of the study show that farmers tend to choose relatively affordable organic fertilizers. This is demonstrated by the estimated utility value of 0.325 for the cheap category, indicating that farmers tend to choose fertilizers within their economic means without compromising their effectiveness in cultivating horticultural crops. This finding is supported by research by Wirdayani (2023), who states that most farmers agree that the price of cheap but quality organic fertilizers is the main reason for purchasing decisions. The preference for affordability also reflects farmers' economic constraints: many earn between IDR 1,000,000 and IDR 3,000,000 per month, leading them to choose inputs that meet minimum financial feasibility while maintaining expected agricultural productivity.

Quality attributes also influence farmers' decisions. The "high quality" category obtained a utility value of 0.196, indicating that farmers prefer organic fertilizers that can increase yields and support overall crop productivity. This finding is supported by research by Wirdayani (2023), which shows that the quality of organic fertilizer products is the dominant factor in increasing crop yields.

Overall, the preference for easy-to-use, effective, and affordable organic fertilizers reflects farmers' rational adaptation to their socio-economic conditions and farming characteristics. Ease of use becomes particularly important for supporting practical field application, while effectiveness and quality ensure that fertilizers contribute to stable crop production. At the same time, affordability remains a key consideration given farmers' financial constraints. Therefore, organic fertilizer products that combine simple application, proven effectiveness, and affordable prices are more likely to be adopted by Okiagaru Agricoop partner farmers.

Results of Combined Analysis for Value of Interest

The results of the combined analysis of the values of interest were obtained by aggregating all respondents' preferences for each attribute. This value is used to determine which attributes respondents consider essential in decision-making.

The results of the attribute importance analysis showed that the ease-of-use factor had the greatest influence on farmers' preferences. This attribute has the highest importance value of 30.397%, indicating that farmers are very concerned about how practical and easy it is to use the fertilizer in daily farming activities. Yusmel (2019) found that ease of use is one of the main factors farmers consider when choosing organic fertilizers. This includes the ease of trying the product and the results that are readily observed during the cultivation process.

Furthermore, the fertilizer quality attribute ranks second, with an importance value of 23.580%, indicating that farmers also consider the quality of the organic fertilizers used, such as nutrient content and resistance to plant diseases. Elfarisna *et al.* (2016) in their research reported that farmers are aware of the importance of the quality of organic fertilizers as an effective planting medium.

The fertilizer's effectiveness of 23.093% is a significant concern. This means that farmers assess how well the organic fertilizer increases the growth and yield of horticultural crops. This value

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reflects that farmers are very considerate of the extent to which organic fertilizers can have a tangible impact on the development and yield of their horticultural crops. Effectiveness is directly related to production efficiency; the more effective the fertilizer, the more optimal the yield.

Meanwhile, the price attribute is 22.930%. These findings indicate that while price remains an important consideration, farmers prioritize practical and technical aspects, especially the ease of use of organic fertilizers and their quality and effectiveness in supporting plant growth. These findings align with previous research, such as the Wirdayani study (2023), which shows that 58.3% of farmers consider the price of organic fertilizer very important, and that prices have been shown to significantly affect crop yields.

Correlation and Significance Test

This study evaluated the validity of the conjoined analysis using Pearson's r and Kendall's tau correlation coefficients, which measure prediction accuracy and the conformity between the estimate and the actual assessment. In detail, it is presented in Table 5.

Table 5. The correlation *value of Pearson's R* and *Kendall's tau*

	Value	**Sig.**
Pearson's R	.953	.001
Kendall's tau	.786	.003

Source: Primary Data, processed (2025)

Based on the results of the correlation analysis, Pearson's R value was 0.953 and Kendall's tau value was 0.786, with significance of 0.001 and 0.003, respectively. These results indicate a firm and significant relationship between farmers' actual preferences and the conjoint model's predictions. Therefore, the conjoint model used in this study can be considered valid in representing farmers' preferences for various attributes of organic fertilizers.

Furthermore, this study examines the willingness of farmers to independently apply organic fertilizers from processed household waste. This data was obtained by distributing questionnaires to Okiagaru Agricoop partner farmers, as shown in

Table 6. Willingness to apply organic fertilizers

Table 6. Willingness to apply organic fertilizers

Information	**Respond**	**Percentage**
Yes	29	96.67%
Not	1	3.33%

Source: Primary Data, processed (2025)

Based on the results of the questionnaire distribution, it is known that 96.67% of respondents (29 out of 30 farmers) stated that they were willing to make their organic fertilizers. In comparison, only 3.33% of respondents were unwilling. This high level of willingness shows that farmers have a strong spirit of independence and are open to innovations that use organic waste, such as leftover agricultural products and household waste. This finding is in line with the research by Sari and Nugroho (2021), who found that farmers tend to be willing to process organic waste independently due to the emphasis on cost efficiency and the abundant availability of raw materials in the surrounding environment. In addition, according to Wahyuni *et al.* (2020), the independent processing of organic waste by farmers not only has a positive impact on the environment but also has the potential to increase farmers' income by reducing production costs and enabling the sale of organic fertilizers as an additional product.

Based on these findings, several practical implications can be drawn to support the wider adoption of organic fertilizers among partner farmers. The high willingness of farmers to produce their own organic fertilizers indicates strong potential for developing farmer-based organic fertilizer production at the cooperative level. Therefore, Okiagaru Agricoop can facilitate

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this potential by organizing training programs and technical assistance related to the production and application of organic fertilizers using locally available materials such as agricultural residues and household organic waste. In addition, considering that ease of use is the most important attribute influencing farmers' preferences, the cooperative should also develop simple, practical, and easy-to-apply organic fertilizer formulations. Through cooperative-based training, demonstration plots, and continuous mentoring, farmers can improve their knowledge and skills in producing and applying organic fertilizers effectively. These efforts can not only strengthen farmers' independence in accessing agricultural inputs but also support environmentally sustainable horticultural farming practices in Cianjur Regency.

4. Limitations and Future Directions

This study highlights several important constraints that may affect the interpretation and generalizability of the findings. First, the relatively small sample size of 30 respondents, selected through purposive sampling, limits the extent to which the results can be generalized to broader populations of horticultural farmers beyond the Okiagaru Agricoop partnership context in Cianjur Regency. Second, the use of a descriptive quantitative approach with conjoint analysis, while effective in identifying preference structures, may not fully capture deeper behavioral, cultural, or institutional factors influencing farmers' decision making. Additionally, the study focuses only on four attributes: price, quality, effectiveness, and ease of use, thus potentially overlooking other relevant variables such as environmental awareness, access to extension services, or social influence. Measurement limitations associated with self-reported questionnaire data may also introduce bias, particularly in reflecting actual practices rather than stated preferences.

In light of these limitations, future research is recommended to adopt more comprehensive and robust methodological approaches, such as mixed-method designs that integrate qualitative insights with quantitative analysis to better understand farmers' motivations and constraints. Expanding the sample size and including more diverse geographic regions would improve the external validity of the findings. Furthermore, future studies could incorporate additional variables, including institutional support, technological accessibility, and environmental attitudes, and test alternative analytical frameworks to deepen understanding of organic fertilizer adoption. Longitudinal studies are also suggested to examine changes in farmer preferences over time and the long-term impacts of organic fertilizer use. By addressing these aspects, future research can provide more holistic and generalizable insights, thereby advancing sustainable agricultural practices.

5. Conclusion

The results of this study indicate that Okiagaru Agricoop partner farmers in Cianjur Regency are predominantly male and mostly within the productive age range of 31–40 years. In terms of education level, the majority of farmers have a basic educational background (elementary school). Most farmers own their farmland, although the land area is relatively small, ranging from 0 to 2000 m². Additionally, most farmers have more than 10 years of farming experience, indicating they possess considerable knowledge and practical skills in agricultural activities. In terms of income, most farmers fall into the lower-middle-income category. These characteristics are important for understanding the backgrounds of partner farmers and how their socio-economic conditions may influence their decisions and preferences regarding the adoption of agricultural innovations, including the use of organic fertilizers.

Furthermore, the analysis of farmers' preferences shows that four main attributes

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influence their choice of organic fertilizers: ease of use, effectiveness, quality, and price. Among these attributes, ease of use has the highest utility value and level of importance, indicating that farmers tend to prefer organic fertilizers that are practical and easy to apply in their farming activities. This finding suggests that a product's practicality plays a crucial role in supporting farmers' adoption of organic fertilizers. In addition, the study shows that 96.67% of respondents expressed a strong willingness to use organic fertilizers in their horticultural cultivation. This result indicates that partner farmers generally have a positive attitude toward using organic fertilizers as part of more sustainable farming practices.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work, the author used ChatGPT to assist with language editing and manuscript structuring. After using this tool, the author reviewed and edited the content as needed and takes full responsibility for the content of the publication

Authorship Contribution Statement

Doni Sahat Tua Manalu: Conceptualization, methodology, formal analysis, investigation, data curation, writing original draft, visualization; Andini Tribuana Tunggadewi: Conceptualization, methodology, validation, supervision, writing, review, editing; Agief Julio Pratama: Methodology, investigation, formal analysis, writing, review, editing; Made Gayatri Anggarkasih: Data curation, validation, writing, review, editing; Abung Supama Wijaya: Writing, review, editing, visualization.

Declaration of Competing Interest

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