The Social Profile of Farmers On Pest Control's Techniques In Rice Plant at Plosoklaten

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ABSTRACT

Jarak Village, located in the Plosoklaten Subdistrict, exhibits considerable promise in the agricultural sector. It has potential to contribute the local economy through the production of food crops, horticulture, and livestock. Of these potential benefits, the food crop sector stands out, particularly in regard to rice production. The purpose of this study was to determine the relationship between age, education level, length of farming business with integrated pest control in rice plants.This research was conducted from October 2024 - January 2025. The analysis of the data was executed through the implementation of the rank Spearman method. The relationship between the age of respondents and pest control techniques on rice plants showed insignificant results in Jarak Village, Plosoklaten District, Kediri. A non-significant relationship was identified between education and pest control techniques in rice plants in Jarak Village, Plosoklaten District, Kediri. A substantial correlation has been identified between the duration of agricultural practices involving pest management techniques in rice plants in Jarak Village, Plosoklaten District, Kediri Regency.

Keywords: pest control, rank spearman, age, education level, farming business duration

INTRODUCTION

One of areas in Plosoklaten Subdistrict is Jarak Village. These village exhibits considerable promise in the agricultural sector, potential to contribute the local economy through the production of food crops, horticulture, and livestock. The food crop sector stands out, particularly in regard to rice production. This is due to the fact that food crops, particularly rice, are extensively cultivated and constitute a fundamental necessity for the community.

Meanwhile, the area of wet-rice farmland in Jarak Village has not increased significantly from 2020 to 2023. In 2023, there is even a tendency for a decrease. This decline has also had an economic impact on farmers, resulting in a decline in their income. The correlation between the extent of paddy fields and income is positive. The decline in the area of rice fields can also be attributed to pest attacks, resulting in a reduction in available rice fields. In 2020, the area of irrigated rice fields amounted to 335,345 hectares (Badan Pusat Statistik Kabupaten Kediri, 2021). In 2021 and 2022 the area of irrigated paddy fields did not change and remained at 335,345 hectares (Badan Pusat Statistik Kabupaten Kediri, 2022). In 2023 the area of irrigated rice fields decreased to 299 hectares (Badan Pusat Statistik Kabupaten Kediri, 2024).

Presently, the rice sector is grappling with significant challenges, particularly in regard to pest infestations. Pest attacks have been shown to have a detrimental effect on crop yields. Pests are defined as animals that cause damage to plants and are economically detrimental to farmers (Wati et al., 2021). In addition to causing harm to plants, pests can also act as vectors for diseases. For example, brown planthoppers have been observed transmitting dwarf virus disease (Nuryanto, 2018). A multitude of factors have been identified as contributors to the economic well-being of farmers. Among these factors, pest attacks have been identified as a significant source of income variability. (Saranani, 2023) posits that the management of thrips, a pest species, has a significant impact on the augmentation of production and revenue in the context of cayenne pepper farming. The aforementioned results are consistent with those

reported in other studies. A substantial discrepancy has been observed between plants with and without integrated pest control in garlic (Prangge et al., 2023).

Farmers who manage rice fields in Jarak village consist of various backgrounds ranging from age, education level, to the length of farming business. This study will analyze the relationship between age, education level, and length of farming business with the level of integrated pest control in rice plants. This is important because rice is a staple food for the community.

The purpose of this study was to determine the relationship between age, education level, length of farming business with integrated pest control in rice plants. The factors of pest's attack refer to the elements that cause damage, which can be mitigated through effective control measures. The employment of pest management techniques has been found to be associated with farmers' income levels. It has been demonstrated that damage to plant life resulting from infestations of pests can have a deleterious effect on the yield of crops.

METHOD

The research was conducted in Jarak village, Plosoklaten sub-district, Kediri district, and Faculty of Agriculture KH.A. Wahab Hasbullah University, October 2024 - January 2025. This research used purposive sampling technique. Sample size in this research was 20 respondents, and data collection techniques included in-person interviews and the administration of questionnaires. Variables comprised both independent and dependent variables. The independent variable encompasses age, education, and the duration of agricultural experience, while the dependent variable comprises pest management methodologies. The analysis of the data was executed through the implementation of the rank Spearman method. The rank Spearman method is expressed through the following equation (Restianingrum et al., 2025):

$$rs = 1 - \frac{6 - \sum di^2}{N^3 - N} \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1)$$

Description:
r_S : rank spearman correlation coefficien
N : amount Of Sample
di : difference between the ranks of the variables
To determine the level of relationship strength or correlation, the interpretation coefficient value is according to as follows (Arifa et al., 2025):
0,00 – 0,25 : weak
0,26 – 0,50 : enough
0,51 – 0,75 : strong
0,76 – 0,99 : very strong
1,00   : perfect

RESULT AND DISCUSSION (font size 12pt)

The age of farmers in Jarak village who were respondents in this study ranged from 30 to 60 years. Based on the respondents, the majority are between 40 to 50 years old while only 25% of the respondents are under 40 years old. This shows that the regeneration of farmers in Jarak Village is fairly slow because there is very little participation of the younger generation in agriculture. The age of farmers who are respondents in this study is in Table 1.

Table 1. Distribution of Respondents Based on Farmer Age

No.	Age (year)	Category	Amount	Percentage(%)
1	< 40	Low	5	25
2	40-50	Medium	9	45
3	> 50	High	6	30
Total			20	100

Source: Data processed, 2025

The educational level of farmers in Desa Jarak varies, encompassing levels from elementary school to bachelor's degree. Regarding the farmers' educational level, the majority pursued their studies at the secondary level. The disparity in education levels has been shown to influence the mindset and

adaptability to contemporary agricultural technologies. In general, there is a positive correlation between educational level and the adoption of novel agricultural technologies. The distribution of respondents based on farmer education is enumerated in table 2.

Table 2. Distribution of Respondents Based on Farmer Education

No.	Education	Category	Amount	Percentage(%)
1	Elementary school	Low	8	40
2	Medium – Senior high school	Medium	11	60
3	Bacelor degree	High	1	5
	Total		20	100

Source: Data processed, 2025

The duration of farming ranges from less than 10 years to more than 20 years. Based on respondent data, it can be seen that the majority of farmers who are respondents in this study have been doing farming for less than 10 years. There were Only three people have been doing farming for more than 20 years. The length of the respondents' farming business in this study is in Table 3.

Table 3. Distribution of Respondents Based on the Length of Farming Business

No.	Farming duration	Category	Amount	Percentage(%)
1	< 10 years	Low	13	65
2	10 – 20 years	Medium	4	20
3	>20 years	High	3	15
Total			20	100

Source: Data processed, 2025

Pest control techniques in rice plants refer to methods employed to reduce or eliminate pest populations that have the potential to cause damage to plants. The detailed distribution of pest control techniques in rice plants can be seen in Table 4.

Table 4. Distribution Of Pest Control Techniques In Rice Plants

No.	Controlling techniques	Indicator	Low	Medium	High
1	Land management	Land resting	2	7	11
2	Nurseries	Seed treatment	1	7	12
3	Planting	Seed replacement	0	11	9
4	Fertilization	Type of fertilization	1	5	14
5	Pest management	Pest control	2	11	7

Source: Data processed, 2025

The determination of the relationship between the variables of age $(X1)$, education level $(X2)$, and length of farming business $(X3)$ with the level of integrated pest control can be achieved through the implementation of Spearman's rank analysis. The results of the spearman rank analysis are presented in Table 5.

Table 5. Rank Sperman Correlation Between Age, Level Education, Farming Business Duration With Integrated Pest Management

Variable	Σd^2	$6 \Sigma d^2$	N	(N^3-N)	Rs
X1 (Age)	828	4968	20	7980	0,377444
X2 (Level education)	808,5	4851	20	7980	0,392105
X3 (Farming business duration)	576,5	3459	20	7980	0,566541

Source: Data processed, 2025

In order to the age, correlation value is found to be insignificant or weak, exhibiting unidirectional correlation with coefficient of 0.3774. This finding indicates that the relationship between

the two variables tends to be unidirectional, though it lacks the strength to be considered a statistically significant relationship. As demonstrated in the research (Munawir et al., 2016). The age of farmers has been identified as a factor associated with their capacity to engage in agricultural practices. The concept of age can also function as an indicator to assess an individual's level of activity at work. When an individual is in a productive age group. It is probable that they will demonstrate optimal levels of work performance.

This study indicate that age doesn't correlate with the utilization of pest control techniques. The correlation between farmer's age and the efficacy of pest control techniques is not guaranteed to be positive. The ideal scenario, the farmer's age would be a determining factor in the efficacy of the employed pest control techniques. The younger the farmer, the more likely to have access to the most recent advancements in pest control technology. This phenomenon may be attributed to various factors, including a lack of socialization or inadequate assistance with regard to pest control methodologies. A secondary factor that may contribute to this phenomenon is the perception of agriculture as a secondary endeavor. Consequently, there is often a lack of emphasis on implementing optimal pest control methodologies.

The statistical analysis employing the Spearman rank correlation test demonstrate that the education level variable exhibits an insignificant or weak correlation value. However, the variable manifests a unidirectional relationship, evidenced by a correlation coefficient of 0.3921. This suggests that, while the relationship between two variables is unidirectional, its strength is insufficient to be deemed a statistically significant relationship. Munawir et al., (2016) reported that the level of education has a significant impact on ability respondents to manage farms, particularly in terms of decision-making and the rate at which they adopt innovations and new technologies. The correlation between educational and the utilization of pest control techniques is not statistically significant. in the other hand, the higher levels of education have been demonstrated to facilitate the transfer of technology in pest control techniques.

The length of the farming business exhibits a substantial relationship, as evidenced by the coefficient of 0.5665. The farming experience is typically characterized by a range of both long and medium durations. The majority of farmers have acquired their agricultural skills from their parents and have expanded their knowledge through participation in farmer organizations. The duration of farmers' experience give a significant influence on their responses and acceptance of novel information or innovations from external sources. They have limited experience in agriculture have the opportunity to enhance their understanding through participation in educational programs and discourse with experienced farmers.

A powerful correlation exists between the duration of agricultural enterprises and efficacy of pest control methodologies employed. It is evident that the duration of operation of a farming business directly correlates with the efficacy of pest control techniques employed. This phenomenon can be attributed to the fact that, over time, farms become the primary source of income, thereby elevating pest control to a priority. Furthermore, the duration of operation of a farming business has been demonstrated to be positively correlated with the development of expertise in managing pests. This is distinct from the operation of nascent farming businesses. In general, agricultural enterprises that have been in operation for a relatively brief period often demonstrate deficiencies in their understanding and technical expertise with regard to pest management.

This study suggest that the duration of agricultural practices exhibits a significant correlation with the utilization of pest management techniques. This phenomenon can be explained by the fact that, as the duration of agricultural operations increases, the agricultural enterprise becomes the primary source of revenue. The efficacy of pest control techniques directly correlates with the mitigation of losses incurred due to pest attacks.

there are many of factors have been identified as contributors to the variability in farmers' income. The factors influencing farmer's income can be categorized into two distinct groups: amenable to control and there are not. The pest attack factor is a controllable element. In regard to the implementation of pest control techniques, it is imperative to take into account the financial implications associated with the acquisition of fertilizers. The escalating costs of fertilizer necessitate meticulous consideration. One strategy for reducing the cost of fertilizer procurement is the utilization of subsidized fertilizers.

Pest attack-related losses are an annual occurrence, a phenomenon that has been well-documented. This phenomenon has far-reaching consequences, particularly with regard to the impact on the rice harvest area. The contraction in the harvest area, attributable to infestation by pests, is anticipated

to have a deleterious effect on the revenue of farmers. This loss is most acutely felt by farmers who exclusively rely on income from the rice sector. The decline in farmer's income due to pest attacks also exerts a negative effect on the regeneration of farmers, thereby impeding its progress. The younger generation exhibits a marked disinterest in the agricultural sector, as the level of welfare is not assured.

CONCLUSIONS
The relationship between the age of respondents and pest control techniques on rice plants showed insignificant results in Jarak Village, Plosoklaten District, Kediri. A non-significant relationship was identified between education and pest control techniques in rice plants. A substantial correlation has been identified between the duration of agricultural practices involving pest management techniques in rice plants in Jarak Village, Plosoklaten District, Kediri Regency

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