Journal Agrisep: Kajian Sosial Ekonomi dan Agribisnis. 23 (02): 623-642 (2024)

AGRISEP: Journal Of Agricultural Socio-Economic and Agribusiness Studies

https://ejournal.unib.ac.id/agrisep/index

DOI: 10.31186/jagrisep.23.02.623-642

COMPARATIVE ANALYSIS AND FACTORS AFFECTING INCOME ON SHALLOT FARMING OF BIRU LANCOR AND BATU IJO VARIETIES IN PROBOLINGGO REGENCY

Ratih Apri Utami[1)*]; Ratna Nur Firdaus[2)]; Joni Murti Mulyo Aji[3)]; Titin Agustina[4)]

[1),2),3)]Department of Agribusiness, Faculty of Agricultural, University of Jember, East Java, Indonesia

* Corresponding Author: ratihapri17@unej.ac.id

ABSTRACT

Consumer demand for shallots continues to increase yearly, influencing farmers to cultivate the commodity. One of the influential factors is the use of good-quality seeds. The superior seed varieties used in shallot cultivation in Probolinggo Regency, East Java Province are Biru Lancor and Batu Ijo. Both varieties are equally superior in production, but there are advantages and disadvantages to each of them. This study investigates the income disparities and influential factors between two varieties of shallot farming: Biru Lancor and Batu Ijo. The research in Dringu District, Probolinggo Regency, was conducted in four selected villages as sample areas. Employing multistage purposive sampling, 60 shallot farmers participated, with 30 utilizing Biru Lancor and 30 adopting Batu Ijo varieties. Data collection involved primary and secondary sources, with surveys and interviews. This research used quantitative methods, including income analysis, t-tests, and dummy multiple linear regression analysis using SPSS. The findings reveal significant differences in farming income between Biru Lancor and Batu Ijo varieties. Key factors influencing shallot farming income encompass seed type, land costs, pesticide expenses, labor expenditures, production yields, and selling prices. This research provides valuable insights into optimizing shallot farming practices and enhancing farmers' income levels.

Keywords: *different test (t-test), income, comparative analysis, shallots*

* Submitted: July 10, 2023
Accepted: August 21, 2024

***Cite as*:**
Utami, R. A., Firdaus, R. N., Aji, J. M. M., & Agustina, T. (2024). Comparative Analysis And Factors Affecting Income On Shallot Farming Of Biru Lancor And Batu Ijo Varieties In Probolinggo Regency, 23(02), 623–642. https://doi.org/10.31509/jagrisep.23.02.623-642

INTRODUCTION

Horticultural plants are included in the agricultural subsector, where they have great potential for the country's economic development. According to Syafruddin et al. (2018), horticulture plants, included in the agricultural sector, contribute to the country's foreign exchange. Khairad et al. (2020) stated that there is a program to increase the production and quality of horticultural crop products aimed at achieving sustainable self-sufficiency. However, the impact of the regional government's program implementation must be visible realistically.

According to Fitria et al. (2023), shallots are an annual plant used daily for household consumption, so the need for shallots increases. Shallot (Allium cepa L.) is a horticultural crop that belongs to the type of vegetables. Shallots are widely cultivated in Central Java, such as Brebes and Tegal Regencies, and in East Java, such as Nganjuk and Probolinggo Regencies. The shallot commodity has an important role for the people of Indonesia in meeting household needs, especially as a complement to seasonings or spices in Indonesian specialties. According to Permana et al. (2021), shallots can also be used as an ingredient in herbal medicines such as herbs, which help maintain immunity.

East Java Province has many farmers cultivating onions because shallots are suitable commodities to be planted and have a high potential for development in the region. Commodity red onion, which farmers widely cultivate, is believed to be able to fulfill consumer demand because it produces sufficient shallot production overflow. According to Sholeh & Suhartiningsih (2023), several districts in East Java Province are the main production areas for shallot commodities, including the Probolinggo Regency. In 2018 and 2021, the Probolinggo Regency will experience fluctuations in land area. It will affect the production of shallot produced. The wider the land used in shallot farming, the greater the production generated (Mahananto et al., 2021). Vice versa, the narrower the area of land used in shallot farming, the smaller the production will be.

According to Ghozali & Wibowo (2019), several sources of risk can cause failure in shallot farming, including seed quality, weather/climate, arable land, pests and diseases, and human resources (HR). The shallot farming community is very concerned about the varieties used. Election seeds use varieties that are very influential to level the resulting production. Enhancement production in an accurate manner will increase wide land use (Badan Pusat Statistik of

Probolinggo Regency, 2023). Probolinggo Regency is an area that occupies the highest amount of shallot production, which is included in the East Java region after the Nganjuk Regency. This is due to environmental conditions that can influence good production results.

According to the Badan Pusat Statistik of Probolinggo Regency (2017), land in Probolinggo Regency can be divided into four parts, namely 6,344 ha of agricultural land, plantation land as much as 1,138 ha, community forest land as much as 3,731 ha, and as much as upland land 45,397 ha. Farmers in Probolinggo Regency use upland land for shallot farming because it is suitable for use as land planted with seasonal crops that are dry and deep; its irrigation requires rainwater to serve as a water source. According to Hindarti & Maula (2020), there are many varieties cultivated by farmers shallots, including the Yellow variety, Bangkok Warso variety, Bima Timor variety, Bima Sawo variety, Bima Brebes variety, Engkel variety, Bangkok varieties, Philippines variety, and Thailand variety. Probolinggo Regency, in running shallot farming, has superior varieties, namely the Biru Lancor and Batu Ijo varieties.

Biru Lancor Variety comes from Cabean Hamlet, Pabean Village, Dringu District, Probolinggo Regency. According to Trismawati et al. (2018), the Biru Lancor variety is characterized by a bulb shape that is round with a sharp tip, is purplish-dark red, has little water content, and has many tillers in one plant. The drawback of this variety is that it cannot last long during the growing season in the rainy season, so it quickly causes damage and crop failure due to diseases caused by fungi. According to Sinaga et al. (2021), the Batu Ijo variety is a new variety obtained from the Batu area, Malang Regency. The characteristics of this variety are having a large tuber shape, bright red color, high water content, and few tillers. The drawback of the Batu Ijo variety is that it can be affected by diseases and pests due to cultivation for too long in the rainy season. The selling price of shallot production with this variety tends to be higher than that of the Biru Lancor variety due to the high price of seeds.

Table 1. Comparison Of Batu Ijo And Biru Lancor Varieties Of Shallots

Description	Batu Ijo	Biru Lancor
Plant origin	Batu – Malang	Probolinggo
Plant height	45-60 cm	36-43 cm
Tuber shape	Spherical	Oval
Number of offspring	2-5 tubers per hill	5-13 tubers per hill
Harvest age	55-60 days after planting	53-56 days after planting
Yields	±18.5 tons per ha	10.76-11.53 tons per ha

Source: Minister of Agriculture (2009)

The cultivation and care applied in shallot farming of the two varieties, namely Biru Lancor and Batu Ijo, differ in several ways. This difference can be seen in preparing the seeds to be used. The resulting differences in shallot cultivation using the Biru Lancor and Batu Ijo varieties affect the selling price set

by the farmers. In addition, it also has an impact on the acceptance and income earned by farmers. This research analyzes the difference in income and factors affecting farmers' income in shallot farming using the Biru Lancor and Batu Ijo varieties in Probolinggo Regency.

Two clear objectives guide the research. The first is to determine the differences in income among farmers who cultivate shallots using the Biru Lancor and Batu Ijo varieties in Probolinggo Regency. We employ an analytical approach and an independent two-sample t-test to achieve this. This analysis aims to establish whether there is a significant difference in income among shallot farmers who use the two seed types. The second objective is to identify the factors influencing shallot farming income using the Biru Lancor and Batu Ijo varieties in Probolinggo Regency. By focusing on these two objectives and using these specific methods, we can compare the income and factors that influence the income of cultivating the Biru Lancor and Batu Ijo varieties in Probolinggo Regency.

RESEARCH METHOD

The research was conducted in the District Dringu Regency Probolinggo from February to March 2023. The research location consists of four villages: Dringu Village, Tegalrejo Village, Pabean Village, and Sumbersuko Village. Consider choosing the fourth in the village, namely many who cultivate shallot varieties of Biru Lancor and Batu Ijo. According to Nursalam (2008), in quantitative research using statistical tests, the minimum number of research samples taken as respondents is 30 people. The sampled shallot farmers were 60 farmers, including 30 farmers using the Biru Lancor variety and 30 farmers using the Batu Ijo variety. The sampling method used is purposive sampling. According to Rengganis et al. (2022), purposive sampling needs to be corrected by one sampling with specific criteria and objectives and adjusted to the consideration of the research to be carried out.

The methods used in this research are analytical and comparative research methods. According to Ratna (2009), an analytical method is used to test quantitative research hypotheses. The analytical method in this research aims to determine what factors influence shallot farming income for Biru Lancor and Batu Ijo varieties. According to Siregar (2017), comparative analysis is data analysis used to test the presence or absence of differences or comparisons of variables in two or more data groups. The comparative analysis method in this research aims to compare differences in income in farming shallot varieties, Biru Lancor and Batu Ijo.

This study utilized both primary and secondary data, ensuring a comprehensive and reliable research process. As per Sinaga (2020), primary data is obtained through direct observation, while secondary data is sourced from various existing and indirect sources. In this case, primary data was collected

through structured interviews with farmers using a questionnaire. Secondary data was obtained from reputable sources such as the study library, related institutions, and other relevant data (Fitrianata & Fatchur, 2023).

The analysis in this study was conducted using advanced methods, including the income analysis approach, two-sample t-test independent (t-test), and dummy multiple linear regression analysis with SPSS. These methods were chosen for their ability to provide robust and reliable results, enhancing the credibility of the research.

Analysis Income Farming Shallots of Biru Lancor and Batu Ijo Varieties

According to Hajar et al. (2019), income analysis is generated from the costs incurred by farmers, starting from the initial production activities of manufacturing to harvesting. For know-income farming, shallots of Biru Lancor and Batu Ijo varieties use the formula that can be formulated as follows (Hajar et al., 2019):

$$Pd = TR - TC$$

Pd is shallot farmer income (IDR/ha), TR is the total revenue of shallot farming (IDR/ha), and TC is the total cost of shallot farming (IDR/ha).

Analysis of Difference Test (t-test) Income farming Shallots of Biru Lancor and Batu Ijo varieties

For this purpose, use dummy multiple linear regression analysis with the SPSS application, which includes several variables used in the research, including dummy variables (Biru Lancor and Batu Ijo shallots), land costs, fertilizer costs, pesticide costs, labor costs, production results, and selling prices. The hypothesis formulated regarding the difference in operating income proves the shallots of the Biru Lancor and Batu Ijo varieties using a tool analysis test (t-test). Different test analysis (t-test) uses the following calculation formula (Hasan, 1999) :

$$\text{t-test} = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\frac{(n_1-1)S_1^2 + (n_2-1)S_2^2}{n_1+n_2-2}\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}}$$

Information X_1 is the average income of shallot farming of the Biru Lancor variety, X_2 is the average income of shallot farming of the Batu Ijo variety, n_1 is number of shallot farmers using the Biru Lancor variety, n_2 is the number of shallot farmers using the Batu Ijo variety, S_1 is the standard deviation of shallot farming income of the Biru Lancor variety, and S_2 is the standard deviation of shallot farming income of the Batu Ijo variety.

Hypothesis testing, a crucial part of our research, is employed in the different tests (t-test) as follows:

H_0= There is no significant difference between the shallot farming income of the Biru Lancor and Batu Ijo varieties

H_1= There is a significant difference between the shallot farming income of the Biru Lancor and Batu Ijo varieties

The criteria for decision making, a key aspect of our analysis, is as follows: if the significance value is < α (0.05) then H_0 is rejected and H_1 accepted, whereas if the significance value is > α (0.05) then H_0 is accepted and H_1 rejected.

Multiple Linear Regression Analysis

The hypothesis testing model used in this study is multiple regression analysis, a method to determine the relationship between the dependent variable and more than one independent variable in the form of a regression model equation. According to Sembiring (1995), the Ordinary Least Square (OLS) method estimates β in the regression equation. OLS is a method used to achieve minimal deviation or error. The OLS method will produce a minimal error to provide a good regression coefficient estimator or BLUE (Best Linear Unbiased Estimator). The properties of the Ordinary Least Square estimator, or OLS for short, are Linear, unbiased, and have a minimum variance, which in summary is BLUE. Unbiasedness is one of the properties of repeated sampling. Suppose one obtains repeated samples and estimates an OLS estimator on each sample. In that case, the mean of the samples will lead to the population value that the estimator should be by adding up the number of samples. Indeed, collinearity will not break the minimum variance property, but this does not mean that the variance of the OLS estimator will be slight in a given sample.

According to Muzazin (2022), multiple linear regression analysis aims to see whether there is a significant influence between the existing relationship variables. Multiple regression is a regression with two or more variables X_1, X_2, X_3, and X_k as independent variables and Y as the independent variable. The coefficient values or estimates of multiple regression parameters can be obtained by the OLS method. The multiple linear regression model can be seen in the equation:

$$Y_I = \beta_0 + \beta_1 X_{I1} + \beta_2 X_{I2} + \beta_3 X_{I3} + \beta_K X_{IK} + \varepsilon_I$$

In multiple regression for k independent variables the estimation of β is expressed by β. According to the OLS method, the estimation can be obtained by minimizing the quadratic form. So the OLS estimate for β (Gujarati, 1999):

$$\hat{\beta} = \left(X^T X\right)^{-1} X^T y$$

Two variables are used in this study, namely the independent and dependent variables. The independent variables used in this study were dummy (type of seed), land costs, fertilizer costs, pesticide costs, labor costs, production results, and selling prices. The dependent variable used in this study is the income of shallot farming in Probolinggo Regency. Calculations in solving the formulation of this problem are as follows:

$$Y_{I} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_5 D_1 + \varepsilon$$

Information, Y is income (IDR), β_0 is constant, β_1 is regression equation coefficients or regression parameters (for I = 1, 2, 3, 4, 5, 6), X_1 is the cost of land (IDR), X_2 is fertilizer costs (IDR), X_3 is the cost of pesticides (IDR), X_4 is labor costs (IDR), X_5 isproduction result (Tons), X_6 is selling price (IDR), and D_1 is type of seed (D_1 = 0, Biru Lancor seeds, and D_1 = 1, Batu Ijo seeds).

The autocorrelation test was used to observe whether there is a residual correlation between ε 1and ε i-1. The results of this assumption can be detected analytically using the *Durbin-Watson* (DW) statistic. If DW < dl shows positive autocorrelation, if dl < DW < du, the results cannot be concluded, and if du < DW < 4 – du, there is no correlation; if 4 – du < DW < 4 – dl cannot be concluded, and if DW > 4 – dl shows negative autocorrelation. The multicollinearity test was used to see whether there was a correlation between the independent variables and the VIF value and tolerance. VIF value assessment can be done using the rule of thumb, which has a non-hazardous value of less than 10.

RESULT AND DISCUSSION

Respondents Characteristics

This study used respondents from four villages in the Dringu sub-district, Probolinggo district, East Java province. The respondents were 60 people divided into two groups, namely 30 shallot farmers of the Biru Lancor variety and 30 shallot farmers of the Batu Ijo variety. The following are the characteristics of shallot farmer respondents in Probolinggo Regency. In research, characteristics of farmer coverage and type of gender farmer, rate education, land area, ownership land, and length of farming. Age criteria and type gender: It is known that the sex chosen as the respondent consisted of 57% male farmers and 43% female farmers, with the highest age group in the age range of 26-35 years, namely 23 people (38.33%), while the lowest age group was in the age range >65 years, namely one person (1.66%).

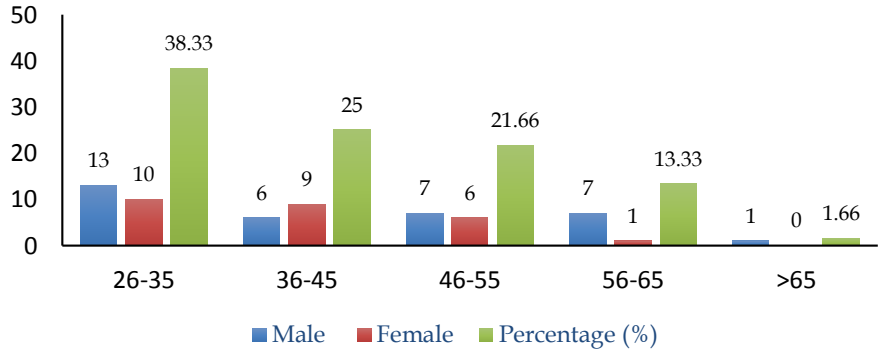

Figure 1.
Age and Gender Data of the Respondents of Shallot Farmers
in Probolinggo District

Regarding the education rate of farmers, most were elementary school graduates/equivalent, with a total of 32 (53.33%). The education level of farmers is the lowest; that is, they did not finish elementary school and bachelor's degrees, respectively (2.33%). Those results show that the cultivation of shallots can be done by anyone, regardless of graduates from the level of education attained.

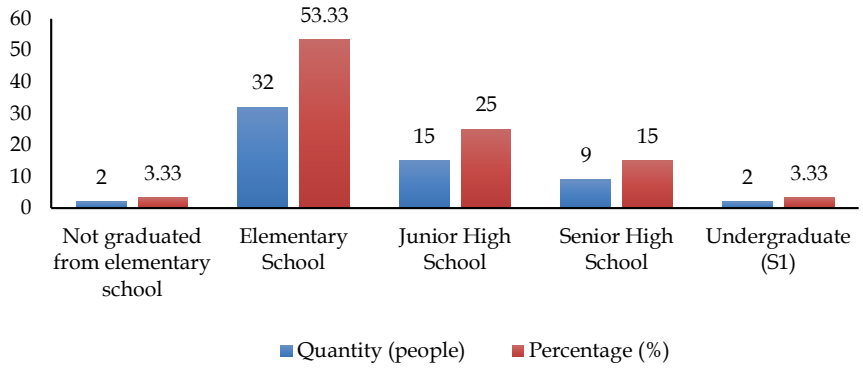

Figure 2.
Education Level of the Respondents of Shallot Farmers
in Probolinggo District

On land area shallot of the Biru Lancor variety, it is known that the largest land area used is 0.10–0.20 ha with a total of 14 (46.66%), while the least land is 0.76–1.00 ha with a total of 1 (3.33%). The land area of shallot Batu Ijo varieties is the largest at 0.26–0.50 ha, with 13 people (43.33%). In comparison, the most minor area is 0.51-0.75 ha with a total of 1 person (3.33%).

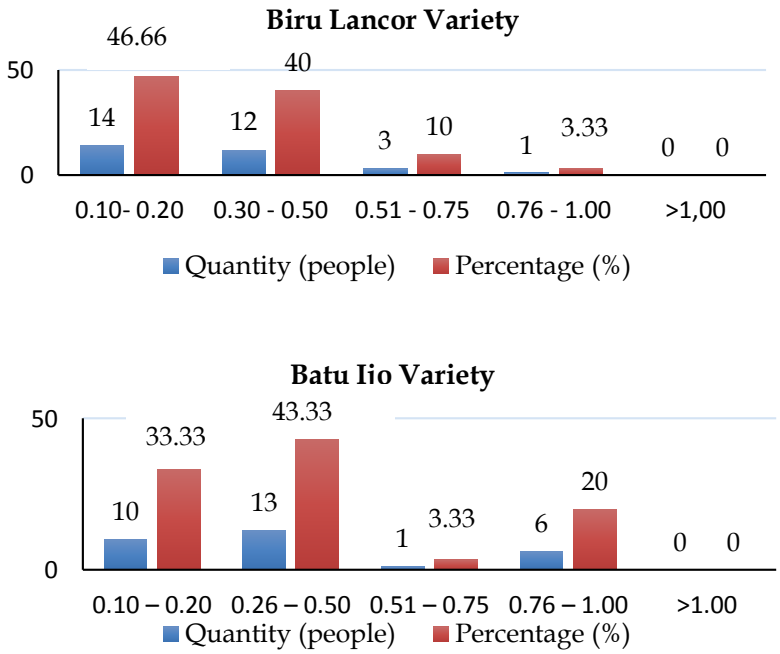

Figure 3.
Data on Land Area of Shallot Farmers with Biru Lancor and Batu Ijo Variety in Probolinggo District

Regarding land ownership, 60 respondents used privately owned land, including as many as 25 persons who grew shallots of the Biru Lancor and Batu Ijo varieties. In contrast, as many as 35 people use leased land, including those who grow shallots of the Biru Lancor and Batu Ijo varieties.

Shallot Farming Income in Dringu District, Probolinggo Regency

Cost of Shallot Farming of Biru Lancor and Batu Ijo Varieties in Dringu District, Probolinggo Regency

A cost is a unit of money used to meet needs, one of which is shallot farmers. According to Nugraha & Maria (2021), the more significant the area of land used in farming, the greater the income farmers receive. The costs of conducting shallot farming are divided into fixed and variable costs. *Fixed costs* are costs that do not depend on the amount produced, while variable costs depend on the amount produced (Maharani, 2019). Table 1 shows the average data on the use of fixed and variable costs in shallot farming activities of the Biru Lancor and Batu Ijo varieties in Dringu District, Probolinggo Regency.

Table 1. Average Use of Fixed Costs and Variable Costs in Shallot Farming Activities of Biru Lancor and Batu Ijo Varieties in Dringu District, Probolinggo Regency in 2022.

Cost component	Seed Type	
	Biru Lancor (IDR/Ha)	Batu Ijo (IDR/Ha)
Fixed cost		
a. Tool depreciation	8,646,072.51	15,529,310.12
b. Land lease	5,523,248.36	4,776,190.48
c. Land tax	25,750.36	49,494.05
d. Irrigation	2,052,489.18	2,402,023.81
Total Fixed Cost (TFC)	15,695,235.57	22,757,018.46
Variable Cost		
a. Seeds	23,871,645.02	37,979,047.62
b. Fertilizer	4,709,160.17	4,818,380.95
c. Pesticide	16,629,870.13	15,120,000.00
d. labor	15,520,197.67	16.512892,86
Total Variable Cost (TVC)	60,730,873.00	74,430,321.43
Total Cost (TC)	76,426,108.57	97,187,339.89

Source: Primary Data (Processed), (2022)

The research findings, as summarized in Table 1, highlight the key differences in the cost comparison of shallot farming using the Biru Lancor and Batu Ijo varieties in the last planting season (rainy season) in Dringu District. Notably, the use of fixed costs in shallot farming, particularly in the component costs of equipment depreciation, shows significant variations between the two varieties. For instance, the average cost of equipment depreciation in the Biru Lancor variety is IDR 8,646,072.51, while in the Batu Ijo variety, it is IDR 15,529,310.12.

These results show that the equipment depreciation costs incurred in the onions Batu Ijo variety are more significant than the Biru Lancor variety; this is the case because more Batu Ijo farmers use nets than Biru Lancor farmers. The net tool is sufficient for shallot farming to protect the commodity from pest infestation. Most farmers get these tools by rent for IDR 2,500,000 – IDR 4,000,000/group. Regarding variable costs in farming, Biru Lancor and Batu Ijo varieties have differences in total variable costs regarding total costs. The difference in the variable costs can be seen from the cost difference in seed components used in shallot farming. Cost average Biru Lancor variety seeds amounting to IDR 23,871,645.02 and Batu Ijo IDR 37,979,047.62. Based on this, the average cost of seeds in the Batu Ijo variety is higher than Biru Lancor. This is due to the quality and durability of the Batu Ijo variety, which is better than the Biru Lancor variety, which, if you look at it from that perspective, physically has a larger shape and is red. Its resistance to the rainy season is also better than Biru Lancor.

Based on production cost calculations, the total average costs of Biru Lancor and Batu Ijo farming shallot varieties are calculated by adding total fixed and variable costs. Fixed costs of 60 used in shallot farming in Dringu District consist of equipment depreciation, land rental costs/taxes, and irrigation costs, while the variables used consist of seed costs, fertilizer costs, pesticide costs, and labor costs. The resulting total costs indicate that the total costs produced in the Batu Ijo variety of red onion farming are more significant compared to the Blue Lancor variety, where the total cost is for the Biru Lancor variety, namely IDR 76,426,108.57 and the total cost for the Batu Ijo variety is IDR 97,187,339.89. The Batu Ijo variety of shallots can cause this to spend a lot of fixed costs, namely on equipment depreciation components. Meanwhile, many variable costs are incurred in the seed cost component.

This research is in line with research by Sardianti (2018), which states that there is a significant difference in the average cost of potato production in Gowa Regency. Potato farmers in the Gowa Regency use two varieties, namely local varieties and new-generation varieties. The research results show that the production of new-generation varieties is higher than local varieties due to the use of locally experienced seed varieties degeneration. However, many farmers still use a variety of new-generation seeds even though the price is relatively high.

Revenue of Shallot Farming of Biru Lancor and Batu Ijo Varietiesin Dringu District, Probolinggo Regency

According to Utomo & Umi (2021), revenue is the money farmers earn from selling a product at a specific price. Based on the research that has been carried out, data is produced to provide a statement regarding the revenue obtained by shallot farmers of the Batu Ijo variety is greater than the income obtained by farmers of shallots of the Biru Lancor variety. This can be caused by the selling price determined by farmers when marketing the production of shallot varieties. Batu Ijo is taller than the Biru Lancor variety. In 2022, the selling price of the Biru Lancor variety of shallots ranges from IDR 17,000 – to IDR 32,000, while the selling price of the Batu Ijo variety of shallots is around IDR 22,000 – to IDR 35,000. The selling price is determined through various means of consideration regarding seed price and quality. Batu Ijo varieties have higher seed prices than the Biru Lancor variety. Apart from that, the physical form of the Batu Ijo variety has larger tubers and bright red to influence people's interest. Based on these considerations, the average difference arises from acceptance from shallot farmers of Batu Ijo and Biru Lancor varieties. Table 2. is the average data on production yields, selling prices, and revenues obtained by shallot farmers of the Batu Ijo and Biru Lancor varieties in the Dringu District.

Table 2. Average Production Yield, Selling Price, and Revenue Received by Shallot Farmers of the Batu Ijo and Biru Lancor Varieties in Dringu District

Component	Shallot Varieties	
	Biru Lancor	Batu Ijo
Production (Tons/Ha)	5.90	8.00
Selling price (IDR/Kg)	23,366.67	26,100.00
Revenue (IDR/Ha)	137,703,246.75	217,659,523.81

Source: Primary Data (Processed), (2022)

Based on the calculation results, the average acceptance of shallot farmers for the Biru Lancor and Batu Ijo varieties shows a significant difference. The Shallot of the Batu Ijo variety is higher than the Biru Lancor farmers' receipt. This difference will affect farmers' income because the average production produced and the selling price set are higher than those of the Biru Lancor variety. The following is data on total costs, receipts, and income earned by shallot farmers of the Batu Ijo and Biru Lancor varieties in the Dringu District.

Table 3. indicates that the cost results for each type of shallot seed, specifically the Biru Lancor and Batu Ijo varieties, differ in total cost, revenue, and income. This disparity is attributed to variations in production volume and selling prices between the two varieties. The Batu Ijo variety shows a higher production volume than the Biru Lancor variety, which is attributed to its larger cultivated area and increased consumer demand. Additionally, the selling price of Batu Ijo is higher, reflecting its superior quality and resistance to the rainy season compared to Biru Lancor. The text highlights the growing interest among farmers in planting the Batu Ijo variety due to its newness and acceptance within the farming community. Farmers are drawn to the larger size and perceived quality of Batu Ijo, allowing them to expand their market beyond Probolinggo Regency. The data reveals that farmers using the Batu Ijo variety generate higher income than those using Biru Lancor despite incurring higher total costs. The Batu Ijo variety incurs IDR 97,187,339.89/ha in one production process, while the Biru Lancor variety incurs IDR 76,426,108.57/ha.

Table 3. Total Costs, Acceptance, And Income Earned By Farmers Varieties Of Batu Ijo And Biru Lancor Shallots In Dringu District

Seed Type	Total Cost (IDR/Ha)	Reception (IDR/Ha)	Income (IDR/Ha)
Biru Lancor	76,426,108.57	137,703,246.75	61,277,138.19
Greenstone	97,187,339.89	217,659,523.81	120,472,183.92

Source: Primary Data (Processed), (2022)

The text parallels a previous study by Zulkaida (2020), which similarly observed differences in total costs between shallot farmers cultivating Kapur and

Bima varieties. In that study, the Kapur variety incurred higher total costs than the Bima variety, with Kapur incurring IDR 95,100,659/ha and Bima incurring IDR 83,145,331/ha in total costs during one production process. Comparison of Shallot FarmingIncome of Biru Lancor and Batu Ijo Varieties in Dringu District, Probolinggo RegencyIncome comparison is used to find out whether there is a significant difference in the income of shallot farmers using the Biru Lancor and Batu Ijo varieties in Dringu District. To prove this, t-test calculation analysis (Independent Sample T-Test) assisted by the SPSS application—the level of trust used by 95%. The following are the output results from the t-test analysis using the SPSS application.

The significant difference in income between farmers cultivating the Biru Lancor and Batu Ijo varieties suggests that there are underlying factors contributing to this variation. These factors could include differences in seed costs, crop yields, market demand, and farming practices between the two varieties. Understanding these factors is crucial for optimizing shallot farming practices and maximizing income for farmers in the Dringu District. Moreover, comprehending the reasons behind the higher income associated with the Batu Ijo variety could inform future agricultural policies and interventions to support smallholder farmers and improve overall agricultural productivity in the region.

Table 4. Results of T-test Average Farming Income of Shallots of Biru Lancor and Batu Ijo Varieties in Dringu District

		f-count	Sig.	t-count	Df	Sig. (2-tails)
Income farming	Equal variancesare assumed	10.780	002	4.052	58	0.000
	Equal variances are not assumed			4.052	40.528	0.000

Source: Primary Data (Processed), (2022)

Factors Influencing Shallot Farming Income of Biru Lancor and Batu Ijo Varieties in Dringu District, Probolinggo Regency

According to Putri et al. (2021), a one-season plant's income based on production results can be calculated. Income can be generated by calculating reduced income with the overall costs of shallot farming. Several factors can influence the small size of the income received by farmers. This research uses two variables, namely the dependent variable, namely income, and the independent variables consist of a dummy (seed type), land costs, fertilizer costs, costs of pesticides, labor costs, production results, and selling prices. An analysis of the factors that influence the size of farmers' income was carried out using multiple linear regression with the help of the SPSS application. This analysis determines whether interference (error) can be seen by carrying out several classic tests, including normality, heteroscedasticity, autocorrelation, and

multicollinearity tests. To find out what factors can affect the level of farmer understanding, an analysis can be carried out using a multiple linear regression dummy with the help of the SPSS application, as presented in Table 5.

The F-test results are of significant importance, indicating a p-value smaller than 0.05 (0.000 <0.05). This suggests that the independent variables, including the dummy (type of seed), land costs, fertilizer costs, pesticide costs, labor costs, production result, and selling prices, significantly influence the dependent variable, which is the income from shallot farming.

The t-test results reveal the practical implications of the variable dummy (X_1) on the income from shallot farming. The negative coefficient value of -9,101,045.125 indicates that the income of farmers using the Lancor Biru variety is lower by IDR 9,101,045.125 compared to those using the Batu Ijo variety. The calculated t value of -2.075 with a significance of 0.043, which is less than 0.05 (0.043 <0.05), further supports this finding.

Table 5. t-test lues in Multiple Linear Regression Analysis Example

Variables	Regression Coefficient	Sig.
(Constant)	-186,878,693.500	0.000
Example	-9,101,045.125	0.043
Land costs	-68,771,537.020	0.000
Fertilizer Cost	-.102	0.961
Pesticide Costs	-1,160.000	0.000
Labor costs	-1,418.000	0.011
Production result	24,996,619.000	0.000
Selling price	7,065,933.000	0.000
F count	163,102.000	
Sig	0.000	
R^2	0.951	

Source: Primary Data Processed, (2022)

The research findings reveal the significant impact of land costs (X_2) on shallot farming of the Biru Lancor and Batu Ijo varieties. The negative coefficient value of -68,771,537.020 indicates that every additional IDR 1 in land costs will reduce farmers' income by IDR 68,771,537.020. The calculated t value is -7.022 with a significance of 0.000, less than 0.05 (0.000 <0.05). This underscores the importance of considering certified seeds for land productivity, income, and efficiency, as Raditya (2015) suggested.

Cost influential (X_3) significant to income farming shallot. The negative coefficient value is -1.160.000 The calculated t value is -3.782 with a significance value of 0.000, less than 0.05 (0.000 <0.05). A negative coefficient value means that each additional IDR 1 of pesticide costs will reduce the shallot farmer's income by IDR 1,160, assuming other variables are considered constant. According to Firmansyah & Kuntadi (2018), the variable cost of pesticides

significantly affects farmers' income because the more pesticides are used, the more income farmers receive.

Labor costs (X_4) matter significant to income farmingshallot. The negative coefficient value is -1,418.00 The calculated t value is -2.649 with a significance value of 0.011, less than 0.05 (0.011 <0.05). A negative coefficient value means that every additional IDR 1 in labor costs will reduce the shallot farmers' income by IDR 1,418, assuming other variables are considered constant. According to Firmansyah & Kuntadi (2018), farmers need a large workforce because, in shallot farming, they pay much attention to intensive care and supervision so that the production results obtained can be maximized.

The research findings highlight the influential and significant role of production (X_5) results in shallot farming income. The positive coefficient value of 24,996,619.000 underscores the potential for income growth. The calculated t-value is 21.736 with a significance value of 0.000, less than 0.05 (0.000 <0.05). This positive coefficient value means that for each additional 1 kg of production, the shallot farmer's income will increase by IDR 24,996,619.000 assuming other variables are considered constant. As Azizah et al. (2022) point out, production results significantly affect farmers' income due to a unidirectional relationship; the more production produced, the more income farmers receive, offering a promising path to success.

Selling price (X_6) is influential and significant to income farming shallot. The value of the positive coefficient is 7,065,933.000. The calculated t-value is 13.821 with a significance value of 0.000, less than 0.05 (0.000 <0.05). A positive coefficient value means that each additional selling price of IDR 1 will increase the shallot farmer's income by IDR 7,065,933.000, assuming other variables are considered constant. According to Susilo et al. (2019), the selling price factor can affect the increase in income earned by farmers. The higher the selling price of shallots that is set will affect the income received.

The research findings provide reassurance about the efficiency of fertilizer investment in shallot farming. The cost of fertilizer has no significant effect on shallot farming income, with a significance value of 0.961, which is greater than 0.05 (0.961> 0.05). As Simatupang et al. (2021) state in their research, the fertilizer cost variable does not significantly affect farmers' income. This is because the amount or dose of fertilizer needed is almost the same as the cultivated area of shallot farming, making it an efficient and cost-effective investment.

Research on shallots in Dringu District, where the farmers are using two varieties, namely Biru Lancor and Batu Ijo. Average difference Production costs from using the two seeds are caused by the price difference because the seeds are far away. The price of Batu Ijo seeds is more expensive than Biru Lancor. However, many farmers choose Batu Ijo for use in farming because it is a new variety. Based on the research that has been carried out, data provided a statement regarding the revenue obtained by shallot farmers of the Batu Ijo

variety is greater than the income obtained by farmers of shallots of the Biru Lancor variety. This can be caused by the selling price determined by farmers when marketing the production of shallot varieties. Batu Ijo is taller than the Biru Lancor variety. In 2022, The selling price of the Biru Lancor variety of shallots ranges from IDR 17,000 to IDR 32,000, while the selling price of the Batu Ijo variety of shallots is around IDR 22,000 to IDR 35,000. The selling price is determined through various means of consideration regarding seed price and quality. Batu Ijo Varieties have seed prices that tend to be higher than those of the Biru Lancor variety. Apart from that, the physical form of the Batu Ijo variety has larger tubers and bright red to influence people's interest. Based on these consideration aspects, there are differences in average revenue obtained by shallot farmers of the Batu Ijo and Biru Lancor varieties.

Each type of seed shallot planted by farmers, both the Blue Lancor variety and the Batu variety Ijo, has different cost results, including total costs, revenues, and income. The high total costs and reception can result in a difference in income for each type of seed shallot planted. The total cost of the Batu Ijo variety is a more excellent value than the Blue Lancor variety. This is due to fixed costs and fees, which are higher variables incurred, especially in the cost of depreciation of equipment, components of seed costs, and the total cost of shallots. The inferior Biru Lancor variety is due to seed costs. Results of the total costs of different Biru Lancor and Batu Ijo varieties causing differences in average admissions. This difference is due to these two varieties' production and selling prices. The amount of production of the Batu Ijo variety is more significant than the Biru Lancor variety; this is the case due to the large area of land used and the increase in consumer demand. The selling price set for the Batu Ijo variety is also higher than the selling price of Biru Lancor due to its quality and durability. Batu Ijo is better than the Biru Lancor variety, physically and in terms of aspect resistance to the rainy season. Based on this, most farmers' interest in planting the Batu Ijo variety of shallots is high due to the variety. Batu Ijo is a new variety and is gaining acceptance. Batu Ijo is more significant than the Biru Lancor variety in terms of the quality that is given. Farmers can also expand their territory by marketing the Batu Ijo variety of shallots outside the Probolinggo Regency. Based on data on differences in total costs and revenues, it is known that the income of farmers who use the Batu Ijo variety is higher than that of farmers who use the Biru Lancor variety.

CONCLUSION AND SUGGESTION

Conclusion

The income of farmers who carry out shallot farming of the Biru Lancor and Batu Ijo varieties in the Dringu District shows an actual or significant difference. This is because the total costs (fixed and variable costs) and farmers'

incomes are different. High fixed cost expenses are part of the Batu Ijo variety, namely the cost of depreciation of tools, while the high variable costs are the cost of seeds. Factors that impact farmers' income in shallot farming of the Biru Lancor and Batu Ijo varieties in Dringu District include dummy (type of seed), land costs, pesticide costs, labor costs, production results, and selling prices. The factor that does not significantly affect the income of shallot farming in Dringu District is the cost of fertilizer..

Suggestion

It is hoped that the shallot farmers can increase the Integrated Plant Organism Control (POPTT) feed to reduce variable costs, especially the cost of pesticides, so that the income earned can be more profitable. The government and research institutions are expected to carry out plant breeding to support the increased income of the Biru Lancor and Batu Ijo varieties..

REFERENCES

Azizah, N., Hakim, L., & Kadir, I. A. (2022). Factors Affecting The Income Of Shallot Farmers In Aceh Tamiang District. *Agricultural Student Science*, 7(1), 196-207. doi: 10.17969/jimfp.v7i1.19014

Badan Pusat Statistik of Probolinggo Regency. (2017). *Land Area In Probolinggo Regency 2017*. Retrieved from https://jatim.bps.go.id/en/statistics-table/1/MTgyMyMx/total-area-by-regency-municipality-in-jawa-timur-province--2017.html

Badan Pusat Statistik of Probolinggo Regency. (2023). *Shallot Production In Probolinggo Regency 2023*. Retrieved from https://probolinggokota.bps.go.id/id/publication/2023/02/28/5043991412b0c7639534e048/kota-probolinggo-dalam-angka-2023.html

Firmansyah, I. A., & Kuntadi, E. B. (2018). Factors Influencing Shallot Farming Income In Ngepoh Village, Dringu District, Probolinggo Regency. *UNEJ E-Proceedings*, (pp. 100-107). Retrieved from https://jurnal.unej.ac.id/index.php/prosiding/article/view/8972

Fitria, H., et al. (2023). Application Of NPK Fertilizer And Water Hyacinth Liquid Organic Fertilizer On The Growth And Yield Of Shallots (*Allium ascalonium L.*). *Biofarm: Jurnal Ilmiah Pertanian,* 19(2), 379-383. doi: 10.31941/biofarm.v19i2.3415

Fitrianata, M. I., & Rozci, F. (2023). Potensial Of Red Onion Commodities Musir Kidul Village Rejoso District Nganjuk District. *Journal Of Community Service (JCOS)*, 1(3), 224-230. doi: 10.56855/jcos.v1i3.590

Ghozali, M. R., & Wibowo, R. (2019). Production Risk Analysis of Shallot Farming in Petak Village, Bagor District, Nganjuk Regency. *Jurnal Ekonomi Pertanian Dan Agribisnis*, 3(2), 294-310. doi: 10.21776/ub.jepa.2019.003.02.7

Gujarati, D. (1999). *Basic Econometrics*. Jakarta: Erlangga

Hajar, I., Susanti, A. & Prasetjono H. (2019). Analysis Of Sugarcane Farming Income. *Agroscientific*, 1(2), 51-57. doi: 10.32764/agrosaintifika.v1i2.355

Hasan, I. (1999). *Fundamentals Of Statistical Material 1 (Descriptive Statistics)*. Jakarta: PT Bumi Aksara

Hindarti, S., & Maula, L. R., (2020). *Shallot Agribusiness*. Yogyakarta: Deepublish

Khairad, et al. (2020). Analysis Of Leading Commodity Production Center Areas In The Food Crop And Horticultural Subsector In Agam Regency. *Agrifo: Jurnal Agribisnis Universitas Malikussaleh*, 5(1), 60-72. doi: 10.29103/ag.v5i1.2958

Mahananto, Prasetyowati, K., & Prasetyo, A. (2021). Farmers Characteristics And Factor Affecting Shallot Production (Case Study In Senden Village, Selo District, Boyolali Regency). *Jurnal Ilmiah Agrineca,* 21(1), 42-48. doi: 10.36728/afp.v21i1.1291

Maharani, N. (2019). Red Onion Farming Income In Junrejo District, Batu City. *Ilmiah Hijau Cendekia*, 4(2), 70-73. doi: 10.32503/hijau.v4i2.636

Muzazin, N. A. (2022). Production Analysis Of Onion (*Allium cepa L.*) In Bendo Village, Pare District, Kediri Regency. *Jurnal Sosiologi Pertanian dan Agribisnis (JuSPA)*, 4(2), 14-24. doi: 10.55542/juspa.v4i2.313

Nugraha, C. H. T., & Maria, N. S. B. (2021). Analysis Of The Factors Affecting Rice Farmers' Income. *Diponegoro Journal Of Economics,* 10(1), 1-9. Retrieved from https://ejournal3.undip.ac.id/index.php/jme/article/view/29994

Nursalam. (2008). *Concept And Application Of Nursing Research Methodology: Guidelines For Theses, Theses And Nursing Research Instruments*. Jakarta: Salemba Medika

Permana, et al. (2021). Shallot Cultivation In Brebes Regency. *Jurnal Bina Desa*, 3(2), 125-132. doi: 10.15294/jbd.v3i2.31916

Putri, I. P., Arifin, B., & Murniati, K. (2021). Analysis Of Income And Technical Efficiency Of Shallots Farming In Gunung Alip Sub-District Of Tanggamus In Lampung Province. *Journal Of Agribusiness Science*, 9(1), 62-69. doi: 10.23960/jiia.v9i1.4820

Raditya, R., Asriani, P. S., & Sriyoto, S. (2015). Comparative Analysis of Rice Farming Businesses Using Certified Seeds And Non-Certified Seeds In Kemumu District, Arma Jaya District, North Bengkulu District. *Jurnal AGRISEP: Kajian Masalah Sosial Ekonomi Pertanian Dan Agribisnis,* 14(2), 177–188. doi: 10.31186/jagrisep.14.2.177-188

Ratna, N. K. (2009). *Theory, Methods, And Techniques Of Literary Research*. Yogyakarta: Pustaka Belajar

Rengganis, et al. (2022). *Research And Development*. Medan: Yayasan Kita Menulis

Sardianti, A. L. (2018). Comparative Analysis Of Production And Income Of New Generation Seed Potato Crops And Local Variety Seeds In Gowa Regency, South Sulawesi Province. *Journal Of Agritech Science (Jasc)*, 2(2), 130-130. doi: 10.30869/jasc.v2i2.259

Sembiring, R. K. (1995). *Regression Analysis*. Bandung: ITB

Simatupang, J. T., Hutapea, K. P., & Aguaninta, D. S. (2021). Analysis Of The Effect Of Factors Of Production On The Production And Income Of Shallot Farming (Case, Hinalang Village, Purba District, Simalungun Regency, North Sumatra Province). *Jurnal Penelitian Bidang Ilmu Pertanian*, 19(2), 37-45. Retrieved from https://jurnalpenelitianbidangilmupertanian.org/index.php/jurnalpertanian/article/view/11

Sholeh, Iqbal, M., & Nurcahyanti, S. D. (2023). Development Of Moler Disease (*Fusariumoxysporum F. Sp Cepae*) At The Shallot Production Center In Probolinggo Regency. *Berkala Ilmiah Pertanian*. 6(2), 56-62. doi: 10.19184/bip.v6i2.35392

Sinaga, Evantius, E., & Dahang, D. (2021). The Effect Of A Combination Of Chicken Manure And Cow Manure On The Growth And Production Of Red Onion (*Allium ascalonicum L.*) Varieties Of Batu Ijo. *Agroteknosains*, 5(1), 11-23. doi: 10.36764/ja.v5i1.541

Sinaga, S. (2020). The Effect Of Motivation And Work Experience On Employee Productivity At PT. Trikarya Cemerlang Medan. *Jurnal Ilmiah Metadata*, 2(2), 159-169. doi: 10.47652/metadata.v2i2.28

Siregar, S. (2017). Q*uantitative Research Methods: Equipped With A Comparison Of Manual Calculations And SPSS*. Jakarta: Kencana

Susilo, A., Junaedi, & Adzim, A. (2019). The Effect Of Land Area, Production Costs, And Market Prices On Increasing The Income Of Shallot Farmers (Case Study In Banaran Wetan Village, Bagor District, Nganjuk Regency). *Journal Of Public Power*, 3(1), 12-28. Retrieved from https://ejournal.undar.or.id/index.php/jpp/issue/archive

Syafruddin, R. F., Sari, D. P., & Kadir, M. (2018). Commodity Determination Features And Structure Of Horticultural Commodities In The District Tinggimoncong Gowa Regency Based On Location Quotient (LQ) And Klassen Typology (KT). *Jurnal Galung Tropika*, 7(1), 22-32. doi: 10.31850/jgt.v7i1.259

Utomo, B. B., & Khasanah, U. (2021). Benefits Of Shallots In Brebes Regency With Three Planting Spacing Patterns. *Journal of Agribusiness and Community Development (Agrivasi) Umus*, 1(1), 45-55. doi: 10.46772/agrivasi.v1i1.440

Zulkaida. (2020). Comparative Analysis Of The Income Of Shallot Farmers Of Kapur And Bima Varieties In Banti Village, Baraka District, Enrekang Regency (Skripsi, Universitas Muhammadiyah Makassar, Makassar, Indonesia). Retrieved from https://digilib.unismuh.ac.id/dokumen/detail/10873/