

Analysis of the Factors Influencing The Production of Sweet Orange Farming

Fatmah¹, Salawati², Nurmala³, Yanti Sasmita⁴, Rida Kurniawati⁵

Agribusiness Study Program, Mujahidin Tolitoli College of Agricultural Sciences, Indonesia¹²³⁴⁵

Corresponding Author : Fatmah (fatmahdjalar@gmail.com)

Article Info	Abstract
<p>Received: March 20, 2023</p> <p>Revised: April 9, 2023</p> <p>Online available: June 7, 2023</p> <p>Keywords: Production, Production Factor, Multiple Regression Analysis, Sweet Orange Production</p>	<p>This study aims to determine the factors that influence sweet orange production in Ogomatanang Village, Lampasio District, Tolitoli Regency. The research was carried out from August 2020 to October 2020. The data was processed and analyzed using the Cobb-Douglass production function. The results of the analysis show that simultaneously the F-count value is 1165.986 and the R² determination is 0.99. Partially Land Area (X1) has a significant effect on the production of sweet oranges with a t-count value of 5.088, Fertilizers (X-2) have a significant effect on the production of sweet oranges with a t-count value of 8.880, Pesticides (X-3) have a significant effect on sweet orange production with a t-count value of 4.353, Labor (X4) has a significant effect on sweet orange production with a t-count value of 6.568.</p>

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INTRODUCTION

Indonesia is an agricultural country, because the majority of Indonesia's population depends on the agricultural sector which produces various horticultural products. the majority of Indonesia's population lives in the agricultural sector, with more than 60% of Indonesian citizens living in rural areas with various types of agriculture as the main livelihood for Indonesians (Lalo dkk, 2020).

Sweet Orange is one of the important horticultural commodities whose demand is quite large from year to year and is the most profitable to cultivate. Data from the agriculture department show that national production is around 17-25 tons/hectare and the potential is 25-40 tons/hectare. (Departemen Pertanian, 2009).

Sweet Orange is one of the important horticultural commodities whose demand is quite large from year to year and is the most profitable to cultivate. Data from the agriculture department show that national production is around 17-25 tons/hectare and the potential is 25-40 tons/hectare (Setiadi dkk, 2022). Maintenance of oranges is carried out by providing fertilizers, pesticides properly and regularly. Many factors determine the yield and income of citrus farmers, such as the area of land planted with oranges, the yield of oranges at the time they are harvested, so that the market selling price and the cultivation process for oranges can be fulfilled. Costs incurred during tree maintenance (Alitawan & Sutrisna, 2017).

The area of control of agricultural land is one of the important factors in increasing the production of farming so that income can also increase. The greater the increase in the area of cultivated land and supported by the application of the right farming technology, tends to provide higher production. land area has a positive and significant influence on the amount of production (Fatmah dkk, 2020).

The level of productivity of rice farming is basically very much influenced by the level of application of the technology, and one of them is fertilization. The correct use of fertilizer will greatly affect the increase in production and vice versa if the use of excessive fertilizer the plant will die (Fatmah dkk, 2022).

The outpouring of labor has a positive effect on the production of Soe Tangerines. The higher the outpouring of labor with sufficient mastery of technology and knowledge about Tangerine Soe farming, causing the production of Soe Tangerines to increase (Chris dan Dina, 2012). Pesticides are one of the important production factors in citrus and dragon fruit farming activities using the right dose and time (Hadi S, 2016).

Sweet orange farming is economically very dependent on the amount of use of factors of production and plant maintenance needed to produce the expected production. To increase production and business development, it is necessary to know the factors that influence the production of sweet orange farming so that the use of technology becomes efficient.

Ogomatanang Village is one of the villages in Lampasio District, Tolitoli Regency. Ogomatanang Village is one of the villages where most of the population works as Sweet Orange farmers for generations. Ogomatanang Village, Lampasio District has geographical conditions that can support the cultivation of Sweet Oranges. Ogomatanang Village, Lampasio District, Tolitoli Regency is the village that has the largest harvested area compared to other villages in Lampasio District, which is 23 ha, from an average hectare area of 8 other villages of 2.77 ha (Mantri Tani Kecamatan Lampasio, 2019)

Ogomatanang Village, Lampasio District consists of 4 hamlets which are sweet orange producing areas. for Sweet Orange farming, although not all farmers have large areas of land. Ogomatanang Village, which has a tropical climate, is very potential for agricultural business, the soil conditions are very supportive for Sweet Orange farming. Farmers in Ogomatanang Village make sweet orange plants as their main job, in contrast to other villages where sweet orange plants are only a side job. Ogomatanang Village is a village that has the largest harvest area compared to other villages in Lampasio District so that it is able to produce quite a large amount of production. Production results or commodities are influenced by various things, which are called factors of production, such as land area, fertilizers, pesticides, and labor.

One effort that can be done by farmers in order to obtain a high level of production is to carry out their farming activities as efficiently as possible. The use of production factors in farming is a determining factor in increasing production (Luttiana dan Hariyati, 2019). Based on the background above, the researcher will conduct research on “Analysis Of The Factors Influencing The Production Of Swet Orange Farming In Ogomatanang Village, Lampasio District, Tolitoli Regency”

Research purposes

1. To find out the factors that influence the production of Sweet Oranges in Ogomatanang Village, Lampasio District, Tolitoli Regency.
2. To find out the magnitude of the factors that influence the production of Sweet Oranges in Ogomatanang Village, Lampasio District, Tolitoli Regency.

Research Usability

Providing information to sweet orange farmers regarding the factors that affect sweet orange production and as a consideration for the Tolitoli Regency government, especially Ogomatanang Village, in making decisions on improving the factors affecting sweet orange production.

METHOD

The population of Sweet Orange farmers in Ogomatanang Village, Lampasio District, Tolitoli Regency is the entirety of farmers who cultivate Sweet Oranges, a total of 16 Sweet Oranges farmers. Determination of the sample in this study was determined by census, so that the sample in this study amounted to 16 Sweet Orange farmers.

This research was carried out in Ogomatanang Village, Lampasio District, Tolitoli Regency. The location was determined purposively on the basis of the consideration that Ogomatanang Village, Lampasio District, is one of the villages with the largest harvested area in Tolitoli District. The research was carried out from August to October 2020.

Jenis dan sumber data penelitian ini yaitu :

1. Primary data, namely data obtained from direct interviews with selected respondents using a questionnaire and field observations through direct visits to the research location.
2. Secondary data, is supporting data obtained from government agencies and institutions related to this research.

The data processing method in this study uses the Cobb-Dougllass production function analysis. Analysis of the Cobb-Dougllass production function is an analysis to determine the factors of production that influence the production of Sweet Oranges, or an analysis tool that explains the relationship between production inputs (X) and production (Y). Where the production inputs are X1 = planted area (Ha), X2 = Fertilizer use (Kg), X3 = Pesticide (ml) X4 = Labor (HOK) and Y Sweet Orange Production (Tons). Mathematically, the form of the Cobb-Dougllass production function equation can be written as follows. (Soekartawi, 2003).

Cobb-Dougllass Production Function Analysis

Formula :

$$Y = b_0 \cdot X_1^{b_1} \cdot X_2^{b_2} \cdot X_3^{b_3} \dots X_n^{b_n} \cdot e^{\mu}$$

In order to be linear transformed in natural logarithms (ln), then the equation changes to:

$$\ln Y = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2 + \dots b_n \ln X_n + \mu$$

According to the variable to be studied, the equation can be written as follows:

$$\ln Y = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + \mu$$

Information :

Y	= Sweet Orange Production
b ₁ , b ₂ , b ₃	= Regression Coefficient
X ₁	= Land area
X ₂	= fertilizer
X ₃	= Pesticide

X4 = Labor
 μ = Term of error

RESULTS AND DISCUSSION

Ogomatanang Village is one of the areas in Lampasio District, Tolitoli Regency, Central Sulawesi Province with the following boundaries:

- To the north it is bordered by the village of Bambalaga
- To the south it is bordered by the village of Kinapasan
- To the east it is winding with Lampasio village
- To the west it is bordered by the village of Silondou

Ogomatanang Village is located at an altitude of 10-120 meters above sea level with an average daily temperature of 30-45 °C, average rainfall of 0.5 mm-2 mm. Ogomatanang Village has an area of approximately 54 km² which consists of 4 hamlets, namely: Batuan Hamlet, Bambuan Hamlet, Salusupande Hamlet, and Pamengkalan Hamlet (Kantor Desa Ogomatanang).

Climatic conditions are very closely related to farming, because they affect the determination of cropping patterns and also the types of plants that suit the agro-climatic conditions of the area. In addition, climatic conditions also affect plant growth and development. The climate itself has several elements, namely rainfall, air humidity, temperature, wind, and light intensity. Under certain conditions, one of the climate elements that needs to be known and analyzed to determine the type of climate in an area is based on the amount of monthly rainfall over a certain period of time, the number of wet months and dry months. Based on bulk data

Based on rainfall data obtained from the Meteorology, Climatology and Geophysics Agency (BMKG) of Tolitoli Regency for the last 10 years, the results of calculating dry months and wet months for the Tolitoli Region are obtained.

Dry month average = 2,2

Wet month average = 7,8

$Q = 2,2/7,8 \times 100$

$Q = 28,21 \%$

In accordance with the Q calculation of 28.21%, the climate type research area is B, which means that Ogomatanang Village is included in "Wet". Climate is one of the factors that can affect the process of plant growth both in quality and quantity of Sweet Oranges. These climatic elements include temperature, light intensity and rainfall or the availability of water which greatly influences plant metabolic processes.

Characteristics of Respondents

In general, 87.5% of the respondents' age of Sweet Orange farmers in Ogomatanang Village are classified as productive because they fall into the age group of 15-64 years. The high rate of productive age is commonly referred to as the Demographic Bonus. Demographic bonus is a condition in an area where the productive age population (15-64 years) is greater than the non-productive age population (< 15 years and > 64 years). This demographic bonus can be of great benefit to an area if it is properly prepared by the government. However, it can become a big problem if the government cannot manage it properly. Demographic bonuses can be a tool for developing regional conditions if the government properly prepares high-quality young people (Sukmaningrum, 2017).

The formal education level of the respondent farmers is concentrated at the elementary and junior high school levels by 56.25% and 25.00% so that it can be said that the education level of the respondent farmers is classified as medium. This can affect the way of thinking and applying technology, especially in agriculture, so that it can run better, which in turn can influence efforts to increase production.

Most of the respondent farmers have experience in farming between less than 5 years and 6-10 years in total, so that it can be said as a farmer who have just started sweet orange

farming but are already able to produce quite good sweet orange production. Analysis Of The Factors Influencing The Production Of Swet Orange Farming.

Efficiency in the use of factors of production is one indication of the success of a farming business. Farming carried out by farmers is highly dependent on the managerial abilities of farmers.

The production of Sweet Oranges is basically the result of the working of production inputs together. For this reason, it is necessary to regulate the combination of the most efficient use of production inputs in order to increase the production of Sweet Oranges. Optimization of production inputs such as land area, fertilizers, pesticides and labor can affect the productivity of Sweet Orange farmers. To find out the factors that influence production in general, production can be done using Multiple Regression Analysis, which is a function or equation that involves two or more variables. The variable one is called the explained dependent variable (Y) and the other is called the explained independent variable (X). Untuk Melihat pengaruh variabel independen (X) secara simultan terhadap variabel dependen (Y) digunakan uji F (F-test). Untuk lebih jelasnya terlihat pada tabel 1 berikut :

Table 1. ANOVA of the Factors Influencing Sweet Orange Farming Production in Ogomatanang Village, Lampasio District, Tolitoli Regency in 2020.

	DB	JK	KT	F	F-table5%
Regression	4	1,412	0,353	1165,986	3,490
Residual	11	0,003	0,000		
Total	15	1,415			

Source: Processed from primary data for 2020

Table 1. Shows that simultaneously the independent variable X (land area, fertilizers, pesticides, and labor) has a significant effect on the dependent variable Y (sweet orange farming production in Ogomatanang village, Lampasio sub-district, Tolitoli district). This effect can be seen where the F-count value is 1165, 986 > from the F-table α 5% of 3.490. In addition, the value of the coefficient of determination (R^2) is 0.99, which means that variations in land area, amount of fertilizer, amount of pesticides, and amount of labor use can explain the variation in Sweet Orange production 99% while 1% is caused by other factors outside the production function model. which is analyzed. The results of this study are in line with the research conducted by Rahayu and Dewi (2019) entitled Analysis of the factors that influence orange production in Kenagarian Kototinggi, Gunuang Omeh District, 50 Cities District using Multiple Linear Regression, based on the results of the best model interpretation, the factors that affecting citrus production, including: land area, amount of fertilizer, amount of pesticides.

Furthermore, to determine the effect of each independent variable (X) on the dependent variable (Y) a T test can be used, shown in table 2 below :

Table 2. Multiple Regression Coefficients of Factors Influencing Sweet Orange Farming Production in Ogomatanang Village, Lampasio District, Tolitoli Regency in 2020.

Variable	Koefisien Regresi	t	t-table $\alpha= 5\%$	Sig Std. Error
Constant	-0,949	-5,709	2,18	0,000
Land area (X1)	0,233	5,088	2,18	0,000
Fertilizer (X2)	0,259	8,880	2,18	0,000
Pesticide (X3)	0,094	4,353	2,18	0,001
Labor (X4)	0,351	6,568	2,18	0,000

Source: processed from primary data for 2020

Table 2 Shows that the results of the t-test of the 4 variables studied, that in fact the 4 variables have a significant effect on production, namely Land Area (X1), Fertilizer Use (X2), Pesticide Use (X3) and Labor (X4), all of which have an effect significantly to the production of Sweet Orange farming in Ogomatanang Village, Lampasio District, Tolitoli Regency. The estimation results of Sweet Orange production in Ogomatanang Village are as follows: $Ln Y = -0,949 + 0,233 (X1) + 0,259 (X2) + 0,094 (X3) + 0,351 (X4)$

From this equation, it can be seen that the influence of the independent variable (X) on the dependent variable (Y) is shown from the value of the regression coefficient. The influence of each production factor on Sweet Oranges is as follows:

1. Land Area (X1)

Ho : It is suspected that the variable land area has no significant effect on the amount of sweet orange production

H1 : it is suspected that the variable land area has a significant effect on the amount of sweet orange production.

The results of the analysis show that land area (X1) has a significant effect on sweet orange production (Y). This can be seen from the t-count value of 5.088 > the t-table value of 2.18 so that Ho is rejected and H1 is accepted. This shows that the high or low production of Sweet Oranges is very dependent on the area of land cultivated. The land regression coefficient value of 0.233 means that with an increase in land use of (1%) it will increase Sweet Orange production by 0.233% assuming that other factors are considered constant. This research is in line with research conducted by Muhammad Wahyu Saputra (2018) that land area influences the factors that affect the production of Sweet Oranges.

2. Fertilizer (X2)

Ho : It is suspected that the fertilizer variable has no significant effect on the amount of Sweet Orange production

H1 : it is suspected that the fertilizer variable has a significant effect on the amount of Sweet Orange production.

The results of the analysis show that fertilizer (X2) has a significant effect on the production of Sweet Oranges (Y). This can be seen from the t-count value of 8.880 > the t-table value of 2.18 so that Ho is rejected and H1 is accepted. Fertilizer regression coefficient value of 0.259 means that the addition of fertilizer use by (1%) will increase Sweet Orange production by 0.259% assuming that other factors are considered constant.

The results of this study are in line with research conducted by Chris dan Dina Tahun 2012 with the title factors affecting production and income of tangerine soe farming in South Central Timor Regency, the results show that Fertilizer has a positive effect on the production of Soe Tangerines or for every 1% addition of fertilizer, the production of Soe Tangerines farming also increases by 2.040%. This is because every addition of fertilizer with intensive handling will stimulate Soe Tangerine growth so that production will increase.

3. Pestisida (X3)

Ho : It is suspected that the pesticide variable has no significant effect on the amount of sweet orange production

H1 : it is suspected that the pesticide variable has a significant effect on the amount of sweet orange production.

The results of the analysis show that pesticides (X3) have a significant effect on the production of Sweet Oranges (Y). This can be seen from the t-count value of 4.353 > the t-table value of 2.18 so that Ho is rejected and H1 is accepted. The pesticide regression coefficient of 0.094 means that the addition of pesticide use (1%) will increase the production of Sweet Oranges by 0.094% assuming that other factors are held constant.

This research is in line with research conducted by Wilda Nur Amelia (2017), that the use of pesticides affects the factors that affect the production of Sweet Oranges.

4. Tenaga Kerja (X4)

Ho : It is suspected that the labor variable has no significant effect on the amount of sweet orange production

H1 : it is suspected that the labor variable has a significant effect on the amount of sweet orange production.

The results of the analysis show that labor (X4) has a significant effect on the production of Sweet Oranges (Y). This can be seen from the t-count value of 6.568 > the t-table value of 2.18 so that Ho is rejected and H1 is accepted. The value of the regression coefficient for labor is 0.351, meaning that the addition of labor usage by (1%) will increase the production of Sweet Oranges by 0.351% assuming that other factors are considered constant.

The results of this study are in line with research conducted by Chris dan Dina (2012) with the title factors affecting the production and income of soe tangerine farming in South Central Timor Regency, the results show that the Outpouring of Labor has a positive effect on the production of Soe Tangerines or for every additional labor outpouring of 1%, the production of Soe Tangerines farming increases by 3.065 %. The higher the outpouring of labor with sufficient mastery of technology and knowledge about Tangerine Soe farming, the production of Tangerine Soe Oranges increases.

Many people think that if the constant is negative then the variable will also have a negative value, even though negative values are not always considered wrong. The way to read constants is that if all independent variables are considered constant at 0, namely X1 0, X2 0, X3 0, and X4 0, it means that production will have a negative value, because land area, fertilizers, pesticides and labor should have a positive effect, meaning the value 0 on land area, fertilizers, pesticides, and labor needs to be interpreted qualitatively. The use of independent variables that hypothetically have a positive effect then get negative constant values, it is said that the research is correct. So that the results of the hypothesis stated that land area, fertilizers, pesticides, and labor had a real and significant effect (Isradil Mustamin, 2018).

CONCLUSION

Simultaneously (together) the independent variable X (land area, fertilizers, pesticides, and labor) has a significant effect on variable Y (sweet orange farming production in Ogomatanang village, Lampasio sub-district, Tolitoli district). This effect can be seen where the F-count value is 1165.986 > from the F-table α 5% of 3.490.

Suggestions

This paper can be used as literature material for farmers, and also in the hope that Jeruk Manis farmers can pay attention to the use of existing production factors in order to further increase the income level of farmers

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