

ORGANOLEPTICS TEST FOR MELON CULTIVATION WITH *CHLORELLA PYRENOIDOSA* MICROAGAE BASED FERTILIZER

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ABSTRACT

Melon cultivation is not easy and requires intensive handling because melon plants are sensitive to environmental changes and are susceptible to disease. The use of *Chlorella pyrenoidosa* microalgae-based fertilizer is one of the breakthroughs that have been made by researchers in helping melon cultivation. This microalgae fertilizer is intended for nutrient fulfillment as well as controlling soil pH. People are still very unfamiliar with the use of this *Chlorella Pyrenoidosa* microalgae-based fertilizer. It is necessary to carry out further analysis of the use of microalgae *Chlorella Pyrenoidosa* as fertilizer, especially for use in melon cultivation. The analysis carried out was to see the results of the preference test based on the organoleptic test of the melon itself with the use of *Chlorella Pyrenoidosa* fertilizer.

It is intended that the community, especially melon farmers, can have more knowledge about this microalgae-based organic fertilizer. The feasibility test of the results was carried out by the organoleptic test method on 30 respondents with different age variations on the preferences for melons produced by each treatment. Organoleptic test includes testing of the color, smell, taste, and texture of each melon produced by each treatment. Organoleptic data were analyzed using SPSS using the One Way Anova method and followed by Duncan's analysis. The use of *Chlorella Pyrenoidosa* microalgae fertilizer did not have a significant difference to the organoleptic test on its use in melon cultivation. This can be used as an option for farmers to use *Chlorella Pyrenoidosa* microalgae fertilizer as a substitute fertilizer for melon cultivation.

Keywords: microalgae fertilizer, *Chlorella Pyrenoidosa*, organoleptic test, melon

INTRODUCTION

Melon (*Cucumis melo* L.) is a fruit plant of the *Cucurbitaceae* family. It is believed that melon comes from the Persian Hot Valley or the Mediterranean area which is the border between West Asia and Europe and Africa. Melons eventually spread to the Middle East and to Europe. In the 14th century, the melon was brought to America by Columbus and finally planted widely in Colorado, California and Texas. Melons are scattered throughout the world, especially in tropical and subtropical areas, including Indonesia.

Melon cultivation is not easy and requires intensive handling because melon plants are sensitive to environmental changes and are susceptible to disease. Melon plants are susceptible to stem rust, fruit rot, and powdery mildew. This will reduce the productivity and quality of melons, reduce the selling value of melons, and even cause crop failure (Daryono & Qurrohman. 2009). Melon production is influenced by many factors, one of which is the fulfillment of nutrients through fertilization, both in determining the dose and timing of administration (Daryono et al.

2015). Melons also require a neutral pH of 5-7 to grow and have high productivity. Therefore, the influence of several methods of increasing nutrient and pH levels carried out in this study is expected to ensure that melon farmers get the best method in regulating soil pH so as to increase their productivity. The use of *Chlorella pyrenoidosa* microalgae-based fertilizer is one of the breakthroughs that have been made by researchers in helping melon cultivation. This microalgae fertilizer is intended for nutrient fulfillment as well as controlling soil pH. (Aulia, M.P. & Aji, R. W., 2021)

People are still very unfamiliar with the use of this *Chlorella Pyrenoidosa* microalgae-based fertilizer. It is necessary to carry out further analysis of the use of microalgae *Chlorella Pyrenoidosa* as fertilizer, especially for use in melon cultivation. The analysis carried out was to see the results of the preference test based on the organoleptic test of the melon itself with the use of *Chlorella Pyrenoidosa* fertilizer. It is intended that the community, especially melon farmers, can have more knowledge about this microalgae-based organic fertilizer. Organoleptic testing is a scientific discipline that is used to reveal, measure, analyze and interpret the reactions of the senses of sight, taste, smell, and touch when capturing product characteristics. The organoleptic test displays the results of the response from the panelist's preference test for an item. In this study, untrained panelists of various ages were used.

METHODS

In research conducted by Aullia, M.P. In 2021, the use of *Chlorella Pyrenoidosa* microalgae fertilizer was proven to have satisfactory results in terms of pH and productivity. The research was carried out in several stages, namely the field survey in collaboration with farmers who would plant melons in the Klaten Regency area who agreed to have the soil pH adjustment treatment using 4 methods, while in the planting process using the planting method of the farmer with some input from the researcher.

The experimental design was made using a completely randomized block design method with four combinations of variables with six replications, thus there were 24 experimental plots. Soil analysis was carried out by taking approximately 200 grams of soil samples from each group which carried out three replications, namely before soil cultivation, in the middle of the melon growth process and when harvesting was carried out. Parameters for soil analysis in the laboratory include soil pH, soil organic C, total N, total P and total K. Soil pH analysis was carried out every two weeks until the planting period was complete using a soil meter in the planting hole at three sample points for each group. Also carried out the calculation of the number of fruit and trees when growing fruit and at harvest. Measurement of melon productivity was carried out at harvest by measuring the weight of the melon fruit in each bed.

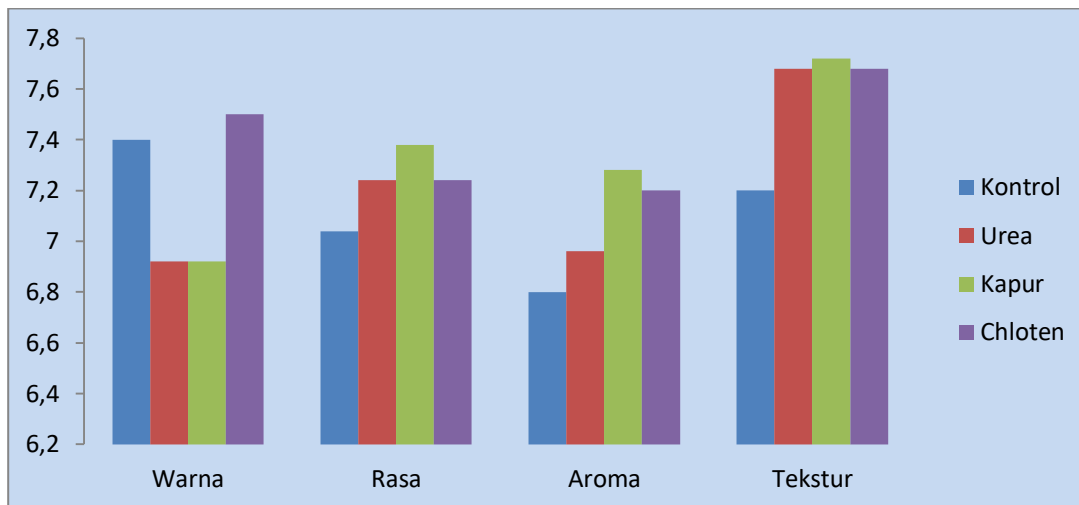
The variables tested in this study were soil nutrients, soil pH and melon productivity with 4 pH treatments. The treatments carried out were (A) Control, without treatment, in accordance with the cultivation schedule of melon farmers. (B) Urea, the use of 5 kg of urea which is done at the beginning of soil processing by mixing it directly into the soil at the beginning of soil processing. (C) Dolomite lime, the use of Dolomite lime as much as 25 kg application is carried out at the beginning of soil cultivation. (D) *Chlorella*, the use of bio-organic fertilizers based on *Chlorella Pyrenoidosa* microalgae found in Chloten. The application of biological fertilizers is divided into two methods, namely the kocor method and the spray method. Application of kocor with a ratio of chloten and water of 1: 50 when the initial conditioning of the soil is given as much as 100 ml per planting hole. The spray method is carried out by giving chloten with a ratio

of 1: 400 water with the spray method every two weeks starting from the beginning of transferring the seeds to the land on all parts of the plant, when flowering occurs, the Chloten giving is paused for a moment and resumed again during the fertilization phase.

The feasibility test of the results was carried out by the organoleptic test method on 30 respondents with different age variations on the preferences for melons produced by each treatment. Organoleptic test includes testing of the color, smell, taste, and texture of each melon produced by each treatment. Organoleptic data were analyzed using SPSS 16.0 using the one-way Anova method (One Way Anova) and continued with Duncan's anal

DISCUSSION

Figure 1. Average value of organoleptic test with different treatments



Organoleptic testing of melon fruit results using a score scale of 1: very, very dislike, 2 = very dislike, 3 = dislike, 4 = somewhat disliked, 5 = ordinary, 6 = rather like, 7 = like, 8 = Like very much, 9 = very, very much like it.

Table 1. Anova test on the level of preference for melon color

Type III Source	Sum of Squares	df	Mean Square	F	Sig.
Corrected	66.538a	27	2.464	4.40	.000
Intercept	5162.42	1	5162.42	9225	.000
Perlakuan	7.148	3	2.383	4.25	.008
Error	40.290	72	.560		
Total	5269.25	100			
Corrected Total	106.827	99			

a. R Squared = .623 (Adjusted R Squared = .481)

The results of the multiple anava test in Table 1 show that the Fcount value of the interaction between melon treatment and melon color is 4.258 with a significant level of .008 ($P < 0.05$), which means that there is a significant effect of the interaction on pH treatment of melon color. Then the Duncan test continued on the level of preference for the panelists to the melon color.

Table 2. Duncan's test of color preference

Duncan a,b			
Perlakuan		Subset	
		N1	2
Urea	25	6.92	
Kapur	25	6.92	
kontrol	25		7.40
Chloten	25		7.50
Sig.		1.000	.638

The results of Duncan's continued test in Table 2 show that the treatment of melons with urea and lime was significantly different from that of the control and using chloten microalgae fertilizer. The highest level of preference for melon color was obtained from the results of the organoleptic test on treatment using chloten. The melon color obtained in the control and chloten treatments was more concentrated than using lime and urea on the same HST. This is related to the photosynthetic process of plants in regulating their metabolism to form color pigments (Ishak, M.A., et al, 2018). The color that was more attractive to panelists was melon with *light orange* color compared to melon with *light yellow orange* color.

Table 3. Anova test on the level of liking for melon flavor

Type III Source	Sum of Squares	df	Mean Square	F	Sig.
Corrected	54.717a	27	2.027	3.69	.000
Intercept	5220.06	1	5220.06	9522	.000
Perlakuan	1.468	3	.489	.892	.449
Error	39.470	72	.548		
Total	5314.25	100			
Corrected Total	94.187	99			

The results of the anava test in Table 3 show that the Fcount value of the interaction between melon treatment and melon flavor is .892 with a significant level of .449 ($P > 0.05$), which means that there is no significant effect of the interaction on pH treatment on melon flavor.

Table 4. Duncan Test: Taste preference level

Duncan ^{a,b}		
Perlakuan	N	Subset
kontrol	25	7.04
Chloten	25	7.24
Urea	25	7.24
Kapur	25	7.38
Sig.		.144

The results of Duncan's independent test in Table 4 show that the melon treatment in all treatments was not significantly different. The results of the organoleptic test stated that the level of liking for taste in all treatments ranged on a scale of 7, which is preferred. The use of microalgae fertilizer, which can be categorized as a new thing in melon cultivation, has proven not to affect melon taste and is still favored by panelists. This supports the research results of Abdurrachman. O., et. al., 2013 that microalgae including chlorella contained in chloten are able to absorb CO₂ which helps the photosynthesis process of plants.

Table 5. Anova test on the level of preference for the aroma of melons

Tests of Between-Subjects Effects						
Dependent Variable: Tingkat kesukaan Aroma						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	
Corrected Model	60.040 ^a	27	2.224	2.169	.005	
Intercept	4956.160	1	4956.160	4835.278	.000	
Perlakuan	3.200	3	1.067	1.041	.380	
Panelis	56.840	24	2.368	2.311	.003	
Error	73.800	72	1.025			
Total	5090.000	100				
Corrected Total	133.840	99				
a. R Squared = .449 (Adjusted R Squared = .242)						

The ANOVA test results in Table 5 show that the calculated F value of the interaction between the treatment of melons and the aroma of melon is 1.041 with a significant level of .380 ($P > 0.05$), which means that there is no significant effect of the interaction between pH treatments on melon aroma. The aroma of the melon is one of the main factors in the quality of

the melon (Allwood, J.W., 2014). A series of volatile organic compounds belonging to a variety of chemicals including ketones, aldehydes, alkanes, alkenes, and alkyne, and different sulfur compounds mostly cause the aroma of melon (Yabumoto et al., 1977). Aldehyde is known to function as the main aromatic compound in fruits which gives a cucumber-like taste (Kemp et al., 1972, 1974), it is also known to have a higher concentration in immature melons, whereas when melons are ripe their ester content is high. more abundant (Beaulieu and Grimm, 2001).

Table 6. Duncan's test: Aroma preference level

Duncan a,b		
Perlakuan	N	Subset
		1
<u>kontrol</u>	25	6.80
<u>Urea</u>	25	6.96
<u>Chloten</u>	25	7.12
<u>Kapur</u>	25	7.28
<u>Sig.</u>		.131

The aroma produced by using microalgae fertilizer was not significantly different from other treatments. In fact, melons produced using microalgae fertilizers were preferred by panelists with a scale of 7 compared to treatment using urea and control with a scale of 6.

Table 7. Anova Test on the level of preference for melon texture

Tests of Between-Subjects Effects					
Dependent Variable: <u>Tingkat kesukaan Tekstur</u>					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	41.350 ^a	27	1.531	5.211	.000
Intercept	5730.490	1	5730.490	19498.832	.000
<u>Perlakuan</u>	4.590	3	1.530	5.206	.003
<u>Panelis</u>	36.760	24	1.532	5.212	.000
Error	21.160	72	.294		
Total	5793.000	100			
Corrected Total	62.510	99			
a. R Squared = .661 (Adjusted R Squared = .535)					

The ANOVA test results in Table 7 show that the Fcount value of the interaction between the treatment of melons and the texture of the melon is 5.206 with a significant level of .003 ($P < 0.05$), which means that there is a significant effect between the pH treatment interactions on the texture of the melon.

Table 8. Duncan's test of texture preference level

Duncan ^{a,b}			
Perlakuan	N	Subset	
		1	2
<u>kontrol</u>	25	7.20	
Urea	25		7.68
<u>Chloten</u>	25		7.68
<u>Kapur</u>	25		7.72
Sig.		1.00	.808

Treatment of addition of Chlorella, sp. Microalgae fertilizer. does not change the texture of melons in general. The melons produced were even more favorable than those in the control treatment. The melon texture obtained from the use of microalgae fertilizers is soft and soft. The melon will be softer in texture and sweeter after the post-harvest incubation process (Ishak, M.A., et al, 2018).

Table 9 Anova analysis

Tests of Between-Subjects Effects					
Dependent Variable: Overall Acceptance					
Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	36.500 ^a	27	1.352	6.426	.000
Intercept	5270.760	1	5270.760	25055.875	.000
<u>Perlakuan</u>	1.284	3	.428	2.034	.117
<u>Panelis</u>	35.217	24	1.467	6.975	.000
Error	15.146	72	.210		
Total	5322.406	100			
Corrected Total	51.646	99			
a. R Squared = .707 (Adjusted R Squared = .597)					

Table 10. Duncan Overall Acceptance Test

Overall Acceptance			
Duncan ^{a,b}			
Perlakuan	N	Subset	
		1	2
<u>kontrol</u>	25	7.11	
Urea	25	7.20	7.20
<u>Kapur</u>	25	7.33	7.33
<u>Chloten</u>	25		7.40
Sig.		.122	.140

Means for groups in homogeneous subsets are displayed.

Based on observed means.

The error term is Mean Square(Error) = .210.

- a. Uses Harmonic Mean Sample Size = 25.000.
- b. Alpha = 0.05.

There was no significant difference in all treatments for the level of preference, either the aroma, color, taste or texture of the melon. That means that the use of pH treatment does not affect the level of preference for melons. Melon cultivation using *Chlorella Pyrenoidosa* microalgae fertilizer can be accepted by the community based on the organoleptic test that has been carried out. So that it can be continued with an economic analysis of the use of the *Chlorella Pyrenoidosa* microalgae fertilizer.

CONCLUSSION

The use of *Chlorella Pyrenoidosa* microalgae fertilizer did not have a significant difference to the organoleptic test on its use in melon cultivation. This can be used as an option for farmers to use *Chlorella Pyrenoidosa* microalgae fertilizer as a substitute fertilizer for melon cultivation.

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