

Response to Growth and Yield Melon Plant (*Cucumis Melo L.*) in the Giving of Rabbit Urine and KNO_3

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Abstract

The purpose of this study was to obtain rabbit urine concentration and the right dose of KNO_3 to increase fertility and nutrient availability to get the best growth and yield of melons. This research is a factorial experiment, with a Basic Design Randomized Block Design with 2 factors tried. In the first factor giving rabbit urine consists of 4 levels: U0= without giving urine, U1= giving urine 100 cc L^{-1} water, U2= giving urine 200 cc L^{-1} water, U3 = giving urine 300 cc L^{-1} water. The second factor with 3 levels: K0= without KNO_3 , K1= dose of 100 kg ha^{-1} KNO_3 , K2= dose of 200 kg ha^{-1} KNO_3 . 12 combination treatments will be obtained and repeated 3 times. From the analysis, results obtained the interaction between administration of rabbit urine and KNO_3 significantly affected the highest fresh weight variable per plant in the combination of 300 cc L^{-1} water rabbit urine with KNO_3 dose of 200 kg ha^{-1} (U3K2) of 225.02 g and the lowest in combination without urine rabbits with no KNO_3 (U0K0) of 158.23 g and this increased 42.21%. The fresh weight of fruit per plant in the administration of 300 cc L^{-1} rabbit urine water (U3) obtained the highest weight of 851.72 g and the lowest without rabbit urine (U0) of 680.96 g and U3 increased by 25.08% when compared with U0. Fresh weight of fruit per plant at a dose of 200 kg ha^{-1} KNO_3 (K2) obtained the highest weight is 903.21 g and the lowest at no KNO_3 (K0) is 651.37 g and the dose of 200 kg ha^{-1} KNO_3 (K2) increased 38,66% compared to without KNO_3 (K0).

Keyword: Urine rabbit, KNO_3 , Melon Crop Improvement

1. Introduction

Melon is an annual plant that has significant value and has grown into agribusiness commodities. Melon has economic value and prospects in marketing. The development of tourism in Bali, make an impact on the farmers to continue to develop the melon quality and can be available continuously to fill the market is still wide open from the tourism sector in addition to meet the desires and needs of the general public. Melon's market availability will be influenced by many factors, among others, lower production levels, environmental conditions in the centers of production and natural disasters, the increasing demands. Seeing the development of melon production in Bali in 2017 only contributed by some districts, among others Jembrana, Buleleng and Denpasar each of 307 tons, 45 tons and 19 tons with a total of 371 tons. The production decreased when compared to 2013 as much as 737 tonnes, in 2014 as much as 893 tonnes, in 2015 as much as 1190 tons and 2016 amounted to 463 tonnes [1]. Filling a fairly wide market in addition to extensive planting to obtain enhanced and melon quality and meet the market, then in its cultivation requires intensive treatment.

Increased regulation of plant growth and yield of melon can be done with proper cultivation techniques, namely with fertilization. Much-needed nutrients melon plants are nitrogen (N), phosphorus (P) and potassium (K). According to [2] that the main nutrients that should be available for plant growth and development melon is an element of N, P, K. Sources of plant nutrients can be sourced from animals (organic). Cow manure, chicken is being circulated in the market and used by

the community/farmer on any cultivation of plants in solid form. But still, there are types of animals that can be used as a nutrient source that is derived from a rabbit. Rabbit nutrient content is higher when compared with cow manure, chicken, others do not make the goat and rabbit droppings ogled by people/farmers, including in the form of rabbit urine has not been widely used. Research conducted by the Livestock Research Agency (Balitnak) Ciawi 2005 mentions rabbit urine containing N, P and K respectively higher by 2.72%, 1.1% and 0.5% from the feces and urine of other animals such as cows, buffalo, sheep, horses, pigs, chickens and even [3]. The results of the study [4] state that the granting of rabbit urine at intervals of 3 days gives the highest fruit weight when compared to administration of 6 days, 9 days and without giving. In the 5% of the feces and urine of other animals such as cattle, buffalo, sheep, horses, pigs, chickens and even [3]. The results of the study [4] state that the granting of rabbit urine at intervals of 3 days gives the highest fruit weight when compared to administration of 6 days, 9 days and without giving. 5% of the feces and urine of other animals such as cattle, buffalo, sheep, horses, pigs, chickens and even [3]. The results of the study [4] state that the granting of rabbit urine at intervals of 3 days gives the highest fruit weight when compared to administration of 6 days, 9 days and without giving.

Source not only of organic fertilizers can be provided through fertilization of organic fertilizer. Completing the element Potassium (K), which has existed in rabbit urine fertilizer that is insufficient in meeting the nutrient in the soil can be sourced from KNO_3 . The results of the study [5] state that the granting of rabbit urine fertilizer and KNO_3 provides growth and yield response to the number of leaves, total interest, the amount of fruit, fruit length, fruit diameter, fruit sugar content and yield of strawberries. By giving the rabbit urine and the right of KNO_3 will be efficient and effective.

Until now, Baturiti consisting of 12 Village / Sub rabbit breeding still contributes quite a lot, and it was only maintained by the community in the village of Desa Mekarsari 15 tail and tail Candikuning 998 [6]. Similarly, in [7] stated that the rabbit breeders registered 112 people with 1,500 rabbit tail number. With the amount of uneven in rabbit breeding as a source of urine, but its chances to urine as a good organic fertilizer be more opportunities for livestock farmers to develop farm rabbits.

From the description above background can be formulated problem is farmers are fertilizing both organic and inorganic, but not yet at the level of concentration and the proper dosage. As part of the melon cultivation technology will have an impact when the use of rabbit urine and KNO_3 as a nutrient source can provide growth and yield the best melon.

The purpose of this study is to get a rabbit urine administration and KNO_3 as a source of nutrients that can improve the results of both quality and quantity as well as farmers' income melon plants. How the cultivation is done by applying a specific cultivation technology and other components in integrated aquaculture in sustainable production systems.

The expected benefits of this research are the applicability of the provision of urine and KNO_3 best in the field and have a real impact on sustainably increase farmers' income, improve production efficiency melon and sustainability agricultural resources.

2. Material and Methods

This study is an experiment in a greenhouse located at the Faculty of Agriculture, University Warmadewa Terompong Street, 24 Tanjung Bungkak Denpasar which lasts from June s / d September 2019 located at a height of 25 meters above sea level. Materials used in this study are Melon varieties Alisha, rabbit urine, insecticides, Furadan 3 G, NPK. While the tool used is a pair of scissors, sprayer, metered, stationery, scales, paper millimeter blocks, buckets, plastic measuring cup.

This study is a factorial experiment, with the basic design Group, Random Design with 2 factors is attempted. On the first factor giving urine rabbit consists of 4 levels: U0 = without giving urine, U1 = urine 100 cc L⁻¹ water, U2 = urine 200 cc L⁻¹ water, U3 = urine 300 cc L⁻¹ water. Factors to two with three levels: K0 = without KNO₃, K1 = a dose of 100 kg ha⁻¹, K2 = a dose of 200 kg ha⁻¹. From these experiments will be obtained 12 combination treatment repeated 3 times will get a total of 36 treatment combinations. Data were analyzed by analysis of variance followed by LSD and Duncan Range Test 5% [8].

3. Results and Discussion

Results of statistical analysis on the variables that were observed in this study and the results of the significance of rabbit urine (U) and KNO₃ (K) on the growth and yield of melon (*Cucumis melo* L.) and their interactions (NK) is presented in Table 1.

Table 1
Significance of Plant Growth and Yield Response Melon (*Cucumis melo* L.) On Giving Urine Rabbits and KNO₃

No.	Variables	Treatment		
		Urine Rabbits (U)	KNO ₃ (K)	Interaction (UK)
1	Maximum plant height (cm)	ns	ns	ns
2	The number of leaves per plant strands)	**	ns	ns
3	Heavy Fresh leaves per plant (g)	ns	*	*
4	Oven Dry Weight leaves per plant (g)	ns	ns	ns
5	Heavy Fresh fruit per plant (g)	**	**	ns
6	Oven-Dried fruit weight per plant (g)	*	ns	ns

Information: ns = no real effect ($P \geq 0.05$), * = Significant ($P < 0.05$), ** = Very significant ($P < 0.01$)

Table 2.
Average plant height, number of leaves per plant, the oven-dry weight of leaves per plant, fresh weight of fruit per plant, oven-dry weight of fruits per plant on Giving Urine Rabbits and KNO₃

Treatment	Plant height (cm)	The number of leaves per plant (strands)	Oven dry weight of leaves per plant (g)	Fresh weight of fruit per plant (g)	Oven dry weight of fruit per plant (g)
Urine concentration					
U0 (control)	140.31 a	118.89 a	24.83 a	680.96 a	50.33 a
U1 (100 cc L ⁻¹)	140.50 a	152.22 b	28.76 a	739.44 a	54.40 a
U2 (200 cc L ⁻¹)	141.20 a	151.67 b	28.08 a	845.12 b	55.24 a
U3 (300 cc L ⁻¹)	143.60 a	152.89 b	28.32 a	851.72 b	58.19 a
BNT 5%	-	15.21	-	92.36	-
Fertilizer KNO₃					
K0 (control)	140.31 a	141.08 a	26.76 a	651.37 a	50.09 a
K1 (100 kg ha ⁻¹)	141.39 a	141.50 a	27.90 a	783.36 b	52.50 b
K2 (200 kg ha ⁻¹)	141.53 a	149.17 a	27.83 a	903.21 c	61.03 b
BNT 5%	-	-	-	106.65	10.23

Description: The average value followed by the same letter on the treatment and the same column means no significant effect on the level of LSD 5%

From Table 1 among treatment provision rabbit urine and KNO_3 seen that the interaction (UK) effect was not significant ($P \geq 0.05$) on all the observed variables except the fresh weight of leaves per plant. Award arrangements rabbit urine (U) significantly ($P < 0.05$) in the oven-dry weight of fruits per plant as well as highly significant ($P < 0.01$) in the number of leaves and the fresh weight of fruit per plant. Dosing KNO_3 significant ($P < 0.05$) on fresh weight of leaves per plant, while highly significant ($P < 0.01$) in the fresh weight of fruit per plant.

The maximum plant height (cm)

In Table 2. The average value of rabbit urine treatment provision 300 cc L^{-1} of water provide the highest value to the maximum plant height is 143.60 cm and the lowest in the urine without giving 140.31 cm with a value that no significant effect by administration of rabbit urine 200 cc L^{-1} water and the provision of rabbit urine 100 cc L^{-1} water with each value that is 141.20 cm, 140.50 cm. KNO_3 fertilizer treatment while in a dose of 200 kg ha^{-1} provides the highest value to the maximum plant height with a value that is 141.53 cm and was not significant with KNO_3 doses 100 kg ha^{-1} and without giving KNO_3 with each value that is 141.39 cm and 140.31 cm. There is a tendency increasingly given KNO_3 Urine or no increase in plant height, and this indicates a fairly good crop response to fertilizer for vegetative growth.

The number of leaves per plant (strands)

In Table 2 the average value of rabbit urine treatment provision 300 cc L^{-1} of water provide the highest value on a variable number of leaves of the crop is 152.89 and the lowest strand without giving urine with a value 118.89 strands where the provision of rabbit urine 300 cc L^{-1} of water increased by 28.59% when compared to unannounced urine, as well as no significant with rabbit urine treatment provision 200 cc L^{-1} water and the provision of rabbit urine 100 cc L^{-1} water with respective values: 152.22 151.67 strands and strands. The content of N, P, K in rabbit urine is very important for plants, especially in the number of leaves because it can rapidly be translocated to the leaves as an important organ photosynthesis formation. According to [9] that some elements easily translocated from old leaves to young leaves and organs such as organ reproduction containers or bulbs and elements are nitrogen, phosphorus, potassium, magnesium, chlorine, and sulfur.

KNO_3 fertilizer treatment while in a dose of 200 kg ha^{-1} provide the highest value on the number of leaves per plant with a value that is different strands 149.17 unreal with the provision of KNO_3 at a dose of 100 kg ha^{-1} and without fertilizer with respective values: 141.08 and 141.50 strands.

Heavy Fresh leaves per plant (g)

The results showed that the interaction of rabbit urine concentration and KNO_3 fertilizer effect is not significant ($P \geq 0.05$) in all of the observed variables except the fresh weight of the leaves which shows the real effect ($P < 0.05$). The highest result on the interaction of fresh weight of leaves obtained in rabbit urine giving 300 cc L^{-1} KNO_3 fertilizer application of 200 kg ha^{-1} (U3K2) 225.02 g and the lowest is obtained on an unannounced urine rabbit and without fertilizers KNO_3 (U0K0) ie 158.23 g and K2U3 increased 42.21% when compared to U0K0. Increasing the provision of rabbit urine and KNO_3 given the availability of nutrients required by plants for growth and development melon leaves can be fulfilled. Nutrients nitrogen, phosphate contained in the high rabbit urine and potassium, nitrogen contained in fertilizers KNO_3 can meet the needs of the plant so that the leaves are formed more and more.

The results of the study [10] get $\text{KNO}_3 \text{ ha}^{-1}$ at a dose range of $100\text{-}150 \text{ kg ha}^{-1}$ resulted in the highest plant height, leaf number more, leaf area index wider, the weight of dry stover larger, more per cob line number, number of seeds per more lines, higher production and a higher potassium uptake compared to controls.

Table 3
The effect of the interaction of the fresh weight of leaves (g) the provision of rabbit urine and KNO₃

Treatment	Type Fertilizer					
	K0		K1		K2	
Dose						
U0	158.23	a	209.43	a	200.13	ab
	A		A		B	
U1	209.17	a	192.20	a	183.50	b
	A		A		A	
U2	173.87	ab	212.53	a	204.40	ab
	A		A		B	
U3	172.53	a	199.57	a	225.02	a
	A		B		AB	
BNT 0.05	36.57					

Information :

1. The figures followed same lowercase letters in the same column (the same KNO₃ fertilizer) no significant effect on the level of LSD 5%
2. The figures followed the same capitalization in the same line (the same rabbit urine fertilizer) no significant effect on the level of LSD 5%

Oven Dry Weight leaves per plant (g)

In Table 2 the average value of treatment administration rabbit urine 200 cc L⁻¹ water provide the highest value in the variable leaves the oven-dry weight per plant, namely 28.76 g and the lowest at no urine that is with a different value of 24.83 g unreal with the treatment of rabbit urine Award L⁻¹ 300 cc of water and the provision of rabbit urine 100 cc L⁻¹ water with each value that is 28,32g and 28.08 g. While on treatment KNO₃ fertilizer one dose of 100 kg ha⁻¹ provides the highest value on the oven-dry weight of leaves per plant with a value of 27.90 g different is unreal with KNO₃ at a dose of 200 kg ha⁻¹ and without fertilizer with each value is 27.83 g and 26.76 g.

Heavy Fresh fruit per plant (g)

Fresh weight of fruit per plant on providing the highest rabbit urine on U3 at 851.72 g was significantly different with U2 and U1 treatment amounted to 845.12 g and 739.44 g, which increased 0.78% and 15.18%, and no significant with U0 is 680.96 where U3 increased by 25.12%. The high weight of fresh fruit on the provision of urine 300 cc L⁻¹ high-powered plant and number of leaves. Rabbit urine liquid organic fertilizer that contains elements of N, P, K, which is quite high. The provision of rabbit urine can provide nutrients to support vegetative growth and crop production as well as increasing the nutrient content and can promote growth and crop production. The role of N, P, and K contained in the urine of rabbits are: Nitrogen (N) is the main nutrient for plant growth, which in general is very necessary for the establishment or growth of vegetative parts of the plant such as leaves, stems, and roots, helps in the metabolic processes such as photosynthesis, Phosphorus (P) plays a role in accelerating the growth of the roots of the various processes and the formation of the root system root is good, as the core constituent of the cell (nucleic acid), fat and protein, and potassium (K) play a role in the formation of proteins and carbohydrates, increases plant resistance to pests and diseases. Based on the results of the study [12] to get the effect of fermented liquid manure solids rabbit against bitter growth showed that the concentration of 30% increase in high-growth parameters, number of leaves, leaf length and root

length. [13] in a study stating that rabbit urine concentration significant effect of plant fresh weight, dry weight of plants, leaf dry weight, dry weight of stem and root dry weight. Rabbit urine is the best concentration of 3000 ppm on plant growth.

Fresh weight of fruit per plant on manure treatment KNO_3 on a dose of 200 kg ha^{-1} give a high of 903.21 g which is significantly different from treatment KNO_3 on a dose of 100 kg ha^{-1} 783.36 g which increased by 15.29% and significantly different from those without fertilizer 651.37 g where KNO_3 on a dose of 200 kg ha^{-1} increased by 38, 66%. The highest fruit fresh weight KNO_3 fertilizer treatment at 903.21 g K2 which is powered by a variable number of leaves, maximum leaf area, leaf fresh weight, root fresh weight, fresh weight rod. KNO_3 fertilizer contains two essential nutrients that plants need 45-46% Potassium (K) and Nitrogen (N) 13%. As for the role of nutrients Potassium (K) is accelerating the growth of flowers and fruits, increase the weight of the fruit, improving the quality of taste and aroma, can improve plant resistance of the disease, while in the element nitrogen (N) that is accelerating the growth of plants, extend the period of vegetative to stimulate the growth of stems, branches, leaves, and cell division, cell enlargement and slows the ripening seeds, can provide a very real effect on plant height, number of branches, number of leaves, maximum leaf area, leaf fresh weight, stem fresh weight, dry weight oven leaves, fruit oven-dry weight, root dry weight oven, oven-dry weight rod.

The results of the study [14] get KNO_3 fertilizer application can significantly increase leaf area, fresh weight and dry weight of the sunflower plant. Research [15] get KNO_3 fertilizer application affects the quality of the pomegranate fruit is currently in the early stages of growth. [16] reported that the element potassium is needed more than the other elements as potassium plays an important role as a catalyst in changing the protein into amino acids and carbohydrate constituent. The results of the study [17] of potassium fertilizer not only improve outcomes but also improve the quality of potato tubers.

Oven-Dried fruit weight per plant (g)

In Table 2 the average value of rabbit urine treatment provision 300 cc L^{-1} provide the highest value in the variable fruit per plant dry weight is 58.19 grams and the lowest at treatment without urine that is with a different value of 50.33 g unreal with the treatment of rabbit urine Award 200 cc L^{-1} and the provision of rabbit urine 100 cc L^{-1} with each value is 55.24 g and 54.40 g. Photosynthesis of the number of leaves that more and more of the number of branches are many and accumulation fotosintat on fruit dry weight oven make the higher fruit and can cause the high oven-dry weight of the fruit. This is in line with the opinion [18] that the fresh weight of the plant consists of 80-90% water and the rest dry weight.

KNO_3 fertilizer treatment on a dose of 200 kg ha^{-1} (K2) provides the highest value on the dry weight of fruit per plant with a value of 61.03 g different is unreal with KNO_3 at a dose of 100 kg ha^{-1} and without fertilizer with each value is 52.50 g and 50.09 g. There is a trend of increased fertilizer KNO_3 to increase the dry weight of fruit per plant.

4. Conclusion

Based on the results, we can conclude some of the following: Interaction fresh weight of leaves obtained in rabbit urine giving 300 cc L^{-1} with the provision of KNO_3 200 kg ha^{-1} is 225.02 g and the lowest was obtained on an unannounced urine and without KNO_3 is 158.23 g and administration of rabbit urine 300 cc L^{-1} by administering KNO_3 200 kg ha^{-1} meningkat 42.21% when compared to an unannounced urine and KNO_3 . Fresh weight of fruit per plant on providing the highest rabbit urine in the delivery of rabbit urine 300 cc L^{-1} of 851.72 g were significantly different from the

treatment of rabbit urine giving 200 cc L⁻¹ and giving the rabbit urine 100 cc L⁻¹ amounted to 845.12 dan 739.44 g which increased 0.78% and 15.18% and was significantly different from that 680.96 g where the provision of rabbit urine 300 cc L⁻¹ increased by 25.12% when compared to unannounced urine. Fresh weight of fruit per plant in the treatment of KNO₃ giving 200 kg ha⁻¹ provides the highest value is 903.21 g was significantly different from giving treatment KNO₃ 100 kg ha⁻¹ 783.36 g which increased by 15.29% and significantly different without giving 651.37 g KNO₃ where the provision of 200 kg ha⁻¹ increased by 38.66% compared with no provision of KNO₃.

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