The Growth And Result Of Gogo Rice Plants (Oryza Sativa L.) With A Few Aplication Of Biofertilizerss Based On Organic Liquid Waste In Peat Soil Medium

Hapsoh, Wawan, Isna Rahma Dini, Desi Ratna Sari

ABSTRACT: Gogo rice plant ia able to grow in peat soil medium although it has many obstacles such as poor nutrient in pat soil. One of effort what can be done was utilized biofertilized made from local microbes that was Bacillus cereus and combination with various types of organic liquid waste. This research aims to know of effect and the best formulation with giving biofertilizers based on organic liquid waste of rice plants in peat soil medium. This research used with six treatments randomized design completely. The treatment were include six levels such as P0 (water) P1 (B. cereus without formulation) P2 (B. cereus + rice washing water) P3 (B. cereus + coconut water) P4 (B. cereus + tofu water) P5 (B. cereus + oil palm liquid waste). This research of result show that was given of biofertilizers based organic liquid waste has an effect on the panicles lenght and the percentage of pithy grains. Biofertilizers based on coconut water organic waste liquid was the best treatment for panicles length parameters and percentage of pithy grains.

Keywords: Rice Plants, peat soil, Bacillus cereus, organic Liquid waste

INTRODUCTION

Gogo rice plants is a food crop that can be cultivated on dry land. Rice production in Indonesia in 2015 reported around 75,40 million tons (BPS, 2016). To increase rice production by expanding the land with utilizing peat soil. Peat soil formed by dead plants tissues that are stacked and not completely decomposed effect to waterlogging . [2] the area of peatland in Indonesian is 14.9 million hectares [3] that the area of peat soil in Riau Province is 3.9 million hectares. This land the potentially for agricultural used. Naturally it is difficult to cultivate peat soil like other plantation crops. This can be overcome to drainage by making canals so that the management of peat soils is needed by adjusting the water level. [4] the height of the peat soil water level should not be more than 40 cm so that the land is not categorized as damaged.It cause the industrial plants such as plantsation crops difficulty to grow because of the root doesn't develop optimally. Peat soil more potentially developing the food crops such as gogo rice plants varieties in ipago eight witch have shallow roots. Peatlands have low fertility rates such as having acidic pH, low nutrient availability [5]. One step to overcome this problem is to utilize the formulation of biofertilizers based on local microbes, namely Bacillus cereus with organic liquid waste. Bacillus cereus used is a bacteria isolated from rice straw on peatland [6]. Bacillus cereus is a gram-positive bacterium that can be found in dead plants tissue and soil [7]

- *Hapsoh, Department of Agrotechnology, Agriculture Faculty, Universitas Riau, Riau Indonesia*
- *Wawan, Department of Agrotechnology, Agriculture Faculty, Universitas Riau, Riau Indonesia*
- *Isna Rahma Dini, Department of Agrotechnology, Agriculture Faculty, Universitas Riau, Riau Indonesia*
- *Desi Ratna Sari, Department of Agrotechnology, Agriculture Faculty, Universitas Riau, Riau Indonesia*
- **Corresponding : isnarahmadini19@gmail.com*

This bacteria can production IAA hormones [8], mineralization of organic matter [9] antifungi [10] and antibacterial [11] Research result [12] that giving of consortium biofertilizers Bacillus cereus, B.thuringiensis, B. megaterium, B. pantothenticus significantly effect pod weight / plot (1240 g) weight of seed / plot (740 g) weight of skin/plot (500 g) weight of stover/plot (4 kg) rice plants. The quality of biofertilizers based on Bacillus cereus can be improved by adding organic liquid waste. This research utilizes organic waste water such as tofu liquid waste, coconut water, palm oil liquid waste and rice washing water. Organic liquid waste is one of the forms of organic waste that has not been widely used. Some waste water such as tofu water, coconut water, rice washing water and palm oil waste water contain organic compounds that can be used as a source of nutrition for microbes such as Bacillus cereus. This waste can also be used as organic fertilizer that can improve soil fertility and increase plants growth and production. Research result [13] treatment of biofertilizers formulations based on tofu liquid waste and palm oil mill effluent is the best treatment for the seed height, root volume, root canopy ratio and dry weight on oil palm seedling. Giving of few biofertilizers formulations based on organic liquid waste is expected to increase the growth and result of gogo rice plants (Oryza sativa L.) in peat soil. This research aims to know the best effect and formulation of biofertilizerss based on organic liquid waste to growth and result of gogo rice plants (Oryza sativa L.) in peat soil medium.

METHODS

The materials used in this study were Bacillus cereus isolates obtained from the research [6], gogo rice plants seeds varieties Inpago 9 baby polybag, polybag size 35 cm x 40 cm, liquid waste of rice washing water, tofu waste, liquid palm oil mill effluent, coconut water liquid waste, 70% alcohol, aquades, agar nutrients, nutrient bolt, dolomite, gandafan, chitin, molasses, water, NPK fertilizer, fungicides, ragent, and decis. The tools used in this

research were buckets, analytic scales, petri dishes, test tubes, stirring rods, erlenmeyer, drip pipets, needle ose, bunsen, hot plates, autoclaves, shakers, rice envelopes, laminar or enkas, shovel runners, knives, sieve, label paper, hoe, meter, polynet, stationery and other supporting tools. This research was conducted experimentally using a Completely Randomized Design (CRD) consisting of six treatments with four replications so that there were twenty six experimental units. Each unit consisted of four plants. Overall total 6 x 4 x 4 = 96 plants which are used as samples. This research consisted of six treatments consisting of six levels namely P0 (water) P1 (B. cereus without formulation) P2 (B. cereus + rice washing water) P3 (B. cereus + coconut water) P4 (B. cereus + tofu water) P5 (B. cereus + palm oil liquid waste). Data were analyzed statistically using variance fingerprints with DNMRT advanced test level of 5%.The stages in the research were the preparation of the place, the manufacture of biofertilizers formulations, preparation of peat soil plantsing medium taken from the village of Kualu Nenas, Kampar Regency, Riau Province, Rhizobium inoculation, plantsing, giving twice the treatment, maintenance and harvest. Parameters of observation conducted consist of three components namely physiological observation, growth observation and observation of results. Physiological observations consist of photosynthesis rate, stomata conductivity, CO_2 concentration, transpiration rate and amount of chlorophyll. Growth observations consist of the age of appearance of panicle harvest age, plants height and total number of tillers. Observation of results consisted of the number of productive tillers, panicle length, total grain size, percentage of pithy grains, pithy grained weight, one thousand weight of grained grains.

RESULTS AND DISCUSSION

Physiological Response

The results of variance analysis showed that the givingof few biofertilizers formulations based on organic liquid waste on peat soil significantly effected the photosynthesis rate, stomata conductivity, CO_2 concentration, transpiration rate and the amount of chlorophyll. Physiological response test results with Duncan's multiple distance test at 5% level can be seen in Table 1.

1) Photosynthesis rate: The data in Table 1 show that the photosynthesis rate of rice plants with biofertilizerss based on organic liquid waste was not significantly different in all treatments tested. It is assumption that Bacillus cereus bacteria can grow are unable to produce secondary metabolites such as IAA hormone in peat soil which has a acidic pH. [14] generally peat soil has a relatively high level of acidity with a pH range of 3 - 5. Low peat soil pH results in the activity and metabolic process of Bacillus cereus bacteria inhibited in producing IAA hormones so that it does not effect all the treatments tested. This is supported by [15] one of the important factors in bacterial growth is the pH value.

The level of acidity is one of the environmental factors that influence the growth and development of bacteria. In generally, bacteria need a neutral pH which is around 6.5-7.5 [16] This research uses Bacillus cereus bacteria obtained from rice straw in peat soil in previous research [6] Some bacteria can live at pH below four and at alkaline pH [17]. But to produce secondary metabolites, bacteria need optimum pH. According to [18] the production of secondary microorganism metabolites is generally produced in the optimal pH state of the medium for microbes. Bacillus cereus is one of the bacteria that is able to stimulate plants growth (PGPR) by producing secondary metabolites namely indole acetic acid (IAA).The results of the analysis conducted by [12], showed that bacillus cereus was able to produce IAA hormone as much as 6.0842 ppm. IAA is one of the auxin hormones that play a role in cell division and division [19].Cleavage and cell division effect the formation of plants tissues such as the leaf organ so that it effects the rate of photosynthesis. [20] states that leaves are one of the main organs of plants that have chlorophyll pigments that play a role in photosynthesis. The giving of organic liquid biofertilizers formulations based on coconut water waste tends to increase photosynthesis rate by 19.45 µmol CO2 m-2 s-1 compared to other treatments. It is assumption that coconut water contains auxin and cytokinin hormones which play a role in boosting rice plants growth. The results of the analysis conducted by Savitri, in [21] shows that in coconut water there is a cytokinin hormone (0.441 ppm kinetin, 0.247 ppm zeatin), and auxin (0.237 ppm IAA). Accourding [22] auxin has a role as a booster for cell enlargement while cytokines act as a booster for cell division. Division and enlargement cell occurs throughout plants organs such as leaves. This caused in an increase in the rate of photosynthesis in rice plants. The results of the analysis of elements in biofertilizers formulations based on organic liquid waste coconut water contain N (0.028%), P (0043), K (0271) and Mg (0837%). It is assumption that there are elements in this formulation is more sufficient to increase the rate photosynthesis of rice plants. Accourding [23] N and Mg elements act as constituents of leaf tissue, P elements play a role in photosynthetic reactions while element K act as an enzyme activator in photosynthesis. This resulted in an increase in the rate of photosynthesis in rice plants. The results [24] that giving phosphorus effects the photosynthetic capacity of pine plants through its effects on the enzyme activity of Rubisco.

***Table 1**. Physiological Response of Rice Plants by Giving Some Formulation of Biofertilizers Based nn Organic Waste Liquid on Peat Soil*

Treatments	Physiological response				
	Photosynthesis rate (μmol CO_2 m^{-2} s^{-1})	The Power of Stomata conductivity (mol H_2O m^{-2} s^{-1})	CO_2 concentration (μmol CO_2 mol^{-1})	Transpiration rate (mmol H_2O m^{-2} s^{-1})	Total Chlorophyll (μmol m^{-2})
Water	15.87 a	0.11 a	236.96 a	1.85 a	30.29 a
B. cereus without formulation	17.68 a	0.13 a	168.00 a	2.29 a	29.45 a
B. cereus + rice washing water	18.10 a	0.11 a	206.70 a	1.76 a	30.37 a
B. cereus + coconut water	19.45 a	0.11 a	152.23 a	2.00 a	29.80 a
B. cereus + tofu water	16.81 a	0.13 a	161.80 a	2.04 a	27.20 a
B. cereus + palm oil liquid waste	18.03 a	0.07 a	182.40 a	1.30 a	29.30 a
F test	0.71^{ns}	0.49^{ns}	0.34^{ns}	0.59^{ns}	0.66^{ns}

Description: The numbers followed by the same lowercase letters show no significant difference according to Duncan's multiple range test at the 5% level. ns: non significant, *: significant.

2) The Power of Stomata conductivity: The data in Table 1 shows that the stomata conductivity with only a few biofertilizerss organic waste liquid is not different for all the experimen. This assumption the Bacillus cereus bacteria contained in biofertilizerss based organic waste liquid that can grow but cannot move properly in the peat soil that has a acidic pH. This situation starts the Bacillus cereus bacteria not able to produce IAA hormones. Indole acetic acid (IAA) is one of the hormones that play a role in the process of cell enlargement and division. [22] states that IAA is an auxin hormone needed by plants in physiological processes such as stimulating cell division and regulating cell enlargement. This physiological process occurs throughout plants organs as in leaf tissue in which there are stomata cells that act as a place for gas exchange of H_2O and CO_2. The conductivity of stomata is a process of gas exchange which is influenced by the density of stomata [25]. Stomata density is effected by cell division and enlargement.

3) CO_2 concentration: The data in Table 1 shows that CO_2 concentration with biofertilizerss based on organic waste liquid was not significantly different in all treatments tested. This assumption the Bacillus cereus bacteria contained in biofertilizerss based organic waste liquid that can grow but cannot move properly in the peat soil that has a acidic pH. This situation starts the Bacillus cereus bacteria not able to produce IAA hormones. That giving of water tends to give higher CO_2 concentrations than other treatments. It is assumption that the H_2O content of the water given is an optimal amount so as to provide high result on the content of CO_2 concentrations of rice plants. In the physiological process of plants H_2O is a material that is very important in the photosynthesis process and greatly influences the presence of CO2 in the leaves of plants. [23] states that if the amount of air absorbed in an optimal amount, the turgidity of the cell will increase so that the stomata will open and increase CO2 uptake. The results of the study indicate that when the stomata will accumulate potassium ions (K +) in the salvation [23].

4) Transpiration rate: The data in Table 1 shows that the transpiration rate by applying biofertilizerss based on organic waste liquid was not significantly different in all treatments tested. This assumption the Bacillus cereus bacteria contained in biofertilizerss based organic waste liquid that can grow but cannot move properly in the peat soil that has a acidic pH. This situation starts the Bacillus cereus bacteria not able to produce IAA hormones. That giving of biofertilizers formulations based on organic waste liquid oil palm liquid waste tends to provide a lower transpiration rate compared to other treatments. It is assumption that the nutrient content of K contained in this formulation is more sufficient to reduce water loss through leaves. According [23] the element of potassium is a dissolved material in the cell that plays a role in spurring the entry of water into the guard cells, causing the opening of stomata and an increase in the rate of transpiration. This causes if the element of potassium in the optimum state will effect the open stomata will also be optimum so that the rate of transpiration is not too high

5) Amount of Chlorophyll: Data in Table 1 shows that the amount of chlorophyll by applying biofertilizerss based on organic waste liquid was not significantly different in all treatments tested. This is presumably the low pH of peat soil which inhibits the growth and activity of Bacillus cereus so as to give the same effect on all treatments. The acidity of this peat soil results in Bacillus cereus being unable to produce IAA hormones which function for the development of cells and plants tissues. This is in accordance with [22] which states that Indol Acetic Acid (IAA) has an effect on phototropic response through cell extension stimulation, stimulation of secondary growth and leaf development. That giving of biofertilizers formulations based on organic waste liquid rice washing water tends to provide a higher amount of chlorophyll compared to other treatments. This assumption in this formulation to contain sufficient N and Mg nutrients for the formation of chlorophyll. The results of the analysis showed that the formulation of biofertilizerss

based on organic waste liquid rice washing water contained N (0.025%) and Mg (0.836%). [26] argued that elements of magnesium and nitrogen are the basic elements needed in the formation of the amount of chlorophyll from plants. Based on the results of research by [27]. showed that the application of N fertilizer effected the amount of chlorophyll of corn plants.

Growth Response

The results of variance analysis showed that the giving of few biofertilizers formulations based on organic waste liquid in peat soil significantly effected on the panicles lenght and the percentage of pithy grains. The results of further test of growth response with Duncan's multiple distance test at 5% level can be seen in Table 2.

1) Age of Panicle Appearance: Data in Table 2 shows that the age of panicle appearance with Bacillus cereus + oil palm liquid waste biofertilizers was significantly different from the giving of water, Bacillus cereus biofertilizers + rice washing water and Bacillus cereus + tofu water but not significantly different from Biofertilizer Bacillus cereus without formulation and biofertilizers Bacillus cereus + coconut water. Giving of Bacillus cereus + rice washing water tends to give the appearance of panicle faster, which is 69.25 hst. Assumed that the formulation of Bacillus cereus + rice washing water containing P and K elements (0.069%) which is more sufficient to accelerate the appearance of panicles. Based on the results of the analysis of Bacillus cereus biofertilizers formulation + rice washing water contains elements of P (0.06%) and K (0.069%).Phosphorus and potassium are macro essential nutrients that are needed by plants in their growth and production. [28] states that one of the roles of P elements in plants physiological processes, namely in the formation of ATP which is an energy source that plays a role in various metabolic processes of plants. The reactions in the metabolism process of the plants will run well if the supplied ATP supply is sufficient, thus accelerating the appearance of panicles on rice plants. [29] showed that the application of P fertilizer significantly effected the age of cucumber flowering (Cucumis sativus L.). Potassium is an essential element needed in large quantities by plant for plants biochemistry process. According [28], potassium is an activator of a number of enzymes that are important for the metabolic processes of plants. One of the metabolic processes that occurs in plants is photosynthesis which plays a role in generating energy for plants growth and development. This effects the growth rate of plants such as accelerating the appearance of panicles. The results of research conducted by [30], showed that increasing the dose of potassium can significantly accelerate the age of flowering control in tomato plants.

Tabel 2. *Response of Growth of Rice Plants by Giving Some Formulation of Biofertilizers Based on Organic Waste Liquid on Peat Soil*

Treatments	Growth Response			
	Age of panicles appearance (day)	Harvest age (day)	The height of plant (cm)	Total number of tillers (stem)
Water	69.66 b	94.75 b	91.12 a	21.66 a
B. cereus without formulation	69.91 ab	94.50 ab	90.04 a	23.58 a
B. cereus + rice washing water	69.25 b	92.00 b	91.20 a	24.08 a
B. cereus + coconut water	70.41 ab	91.25 ab	93.38 a	24.33 a
B. cereus + tofu water	69.58 b	92.25 b	93.62 a	22.58 a
B. cereus + oil palm liquid waste	70.91 a	92.00 a	92.54 a	23.58 a
F test	2.57^{ns}	0.87^{ns}	1.72^{ns}	0.95^{ns}

Description : The numbers followed by the same lowercase letters show no significant differences according to Duncan's multiple distance test at the 5% level. ns: non significant, *: significant

2) Harvest Age: The data in Table 2 shows that the harvesting age of rice plants with biofertilizerss based on organic waste liquid was not significantly different in all treatments tested. . It is assumption that Bacillus cereus bacteria can grow but are unable to produce secondary metabolites such as IAA hormone in peat soil which has a acidic pH.

The giving of biofertilizers treatment based on organic waste liquid coconut water tends to be able to accelerate the harvesting age of rice plants, namely 91.25 days compared to other treatments. It is assumption that this is due to the presence of nutrients contained in biofertilizerss based on organic waste liquid of coconut water. Based on the results of biofertilizers analysis based on organic waste liquid coconut water contains elements of P (0.043) K (0.271%) and Mg (0.837%). It is assumption that the number of these elements is sufficient to accelerate the harvest of rice. Phosphorus is a macro nutrient that is very important for biochemical processes in plants. One of the functions of phosphorus in plants is as an energy-forming material in the form of ATP. This is in line with [28] who stated that phosphorus is very important in biochemical processes in plants such as ATP-forming materials. According [23] ATP is a source of energy needed by plants in the metabolism processes of plants such as photosynthesis. This has an effect the growth and plants development, thus accelerating the age of harvesting panicles. Potassium and magnesium nutrients are macro nutrients that are needed by plan for plants biochemistry process. One of the functions of potassium and magnesium is as an enzyme activator. This is in agreement with [23] who states that magnesium and potassium are elements that act as activators of few enzymes that play a role in accelerating various biochemstryl reactions that happen in plants such as photosynthesis and energy formation. This has an effect on the maturation of the grain so that it accelerates the age of harvest of rice plants. [31] showed that givingof 100 kg of potassium / ha was able to accelerate the opening of flowers on gladiol.

3) The height of plant: The data in Table 2 shows that plants height by applying biofertilizers based on organic waste liquid was not significantly different in all treatments tested. This assumption the Bacillus cereus bacteria contained in biofertilizerss based organic waste liquid that

can grow but cannot move properly in the peat soil that has a acidic pH. This situation starts the Bacillus cereus bacteria not able to produce IAA hormones. The giving of biofertilizers based on organic waste liquid, tofu waste tends to be higher than other treatments. It is assumption that the nutrient content contained in tofu waste liquid can increase the high growth of rice plants. The results of the analysis showed that biofertilizerss based on organic tofu waste liquid contained N (0.013%), and Mg (0.241%). Nitrogen is one of the elements needed by plants for the formation of amino acids which are the building blocks of proteins [28]. Protein is an ingredient in the preparation of cell nuclei and cell division. [32] argues that the occurrence of high growth of a plants is caused by an event of cell division and extension. This physiological process is what tends the high growth of rice plants. The results of the study [33], shows that nitrogen fertilizer effects the height of soybean plants. Magnesium is a macro essential element that has an important role in plants physiological processes. According [28], magnesium is an element that combines with ATP which functions in various biochemistry reactions in plants. Adenine Tri Phosphate (ATP) is a source of energy needed by plants for various biochemistry processes such as elongation and cell division. Process of division and elongation of these cells tend high growth of rice plants. The results of the research of [34] showed that giving magnesium effected the growth of garlic.

4) Total Number of Tillers: The data in Table 2 shows that the total tillers of rice plants with biofertilizers based on organic waste liquid were not significantly different in all treatments tested. This assumption the low pH of peat soil which inhibits the growth and activity of Bacillus cereus to produce IAA hormone which gives the same effect on all treatments tested. The giving of biofertilizers based on organic waste liquid coconut water waste tends to be higher than other treatments, namely 24.33 total tillers. It is assumption that liquid waste of coconut water contains hormones that play a role in increasing the total number of tillers of rice plants. The results of the analysis conducted by [35], coconut water contains IAA 0,237 ppm. indole acetic acid (IAA) is included in the auxin hormone group which has an important role for plants growth. [36] states that auxin hormones have an important role in the physiological processes of plants such as cell division processes that stimulate bud formation. This resulted in an increase in growth of tillers in rice plants. Based on the results of the analysis, biofertilizerss based on liquid waste of coconut water also contained elements of N (0.028%), P (0.043%), K (0.271%) and Mg (0.837%). It is assumption that this element is an amount that tends to be more sufficient to increase the total number of tillers. The element N in the plants physiology process plays a role in the formation of amino acids which will later be used in protein formation [23]. One of the roles of proteins in plants is as a constituent of the cell nucleus and cell division which spur the growth of shoots so that it forms saplings on rice plants. Phosphorus is a macro essential element that is very important for plants survival. According [28], states that phosphorus is a constituent of ATP formation in plants physiological processes. Adenine Tri phosphate (ATP) is a source of energy needed by plants in various biochemistryl processes that contribute to plants growth and production. One of the biochemistry process that occur in plants is cell division which promotes the growth of seedlings of rice plants. The results of the study by [37], showed that givingof 90 kg / ha of P fertilizer was able to increase the number of tillers on wheat crops. Potassium and magnesium are elements that play an important role in various biochemistry processes in plants. In the physiological process of potassium plants act as enzyme activators [28]. While Magnesium is an element that acts as enzyme activators for various reactions in plants metabolism. Enzymes play a role in helping various biochemstryl processes such as the formation of energy which is one of its functions for cell division. This spurred the growth of tillers on rice plants.

RESPONSE OF RESULTS

The results of variance analysis showed that the giving of few biofertilizers formulations based on organic waste liquid on peat soil significantly effected panicle length and percentage of pithy grains. However, there was no significant effect on the number of productive tillers, the total number of grain, pithy grain weight and 1000 grain weight. The results of further test response results with Duncan's multiple distance test at the 5% level can be seen in Table 3.

1) The Number of Productive Tiller: Data in Table 3 shows that the number of productive tillers by giving some formulations of biofertilizers in organic waste liquid is not significantly different in all treatments tested. This assumption the low pH of peat soil which inhibits the growth and activity of Bacillus cereus to produce IAA hormone which gives the same effect on all treatments tested. The giving of biofertilizers formulations based on organic waste liquid rice washing water tends to provide a higher number of tillers 20.75 stems compared to other treatments. It is assumption that biofertilizers formulations based on organic waste liquid rice washing water contain nutrients that are more sufficient to produce productive tillers in rice plants. The results of the analysis showed that the formulation of biofertilizerss based on organic waste liquid of rice washing water contained P (0.043%) and K (0.271%). This assumption that these elements that influence the formation of productive tillers of rice plants. The number of productive tillers is the number of tillers that produce panicles due to various metabolism processes that happen in plants. The metabolism process that happen optimally will greatly effect the formation of panicle of rice plants. In the metabolism process, few elements such as K and P are needed to produce energy and form an acylate that is translocated throughout the plants. According to Rahmawati in [38], phosphorus is a nutrient that is very important for the formation of ATP which is used as energy for the metabolism processes of plants. While [39], states that potassium acts as an activator of few enzymes in the metabolism processes of plants. This causes the formation of panicles on rice plants. The results of [40] study showed that the application of P fertilizer at a dose of 300 kg / ha was able to provide the highest number of tillers in addas plants.

2) Panicle Length: Data in Table 3 shows that panicle length by giving Bacillus cereus + coconut water

formulation with coconut water was significantly different from other treatments 22.38 cm. Allegedly the content in coconut water contains auxin hormones which can increase the length of panicles of rice plants. According to [41] coconut water is an endosperm liquid containing auxin hormones. Savitri in [21] also added that based on the results of hormonal analysis performed that coconut water contained IAA (0.237 ppm). Auxin hormones play an important role in biochemistry processes in plant tissues. According to [36] auxin hormones have an important role and process of cell division in the physiological processes of plants. This affects the elongation of rice plant organs such as panicle lenght of rice plants.

Based on the results of nutrient analysis also showed that the formulation of biofertilizerss based on liquid waste of coconut water also contained P (0.043%). It is assumption that the number of elements is sufficient to increase the length of panicles in rice plants. The growth of panicle length is strongly influenced by cell elongation that happen in plants physiological processes. Cell elongation requires energy in the form of ATP which is one of the constituent ingredients is the element P. According [28], states that the element P is one of the ingredients contributing to the formation of ATP. The results of the study by [37] showed that giving of 90 kg / ha of P fertilizer was able to increase the panicle length of 12.83 cm in wheat crops.

***Tabel 3**. Response of Rice Plants Resulting by Giving Some Formulation of Biofertilizers Based on Organic Waste Liquid on Peat Soil*

Treatment	Result response					
	Number of productive tillers (stem)	Panicle length (cm)	Total grain (grain)	Percentage of pithy grain (%)	Weight of pithed grain (gram)	Weight of 1000 items (grams)
Water	18.83 a	21.25 a	1841.3 a	70.47 bc	21.25 a	22.85 b
B. cereus without formulation	18.91 a	21.32 a	1740.7 a	70.99 bc	31.04 a	22.41 b
B. cereus + rice washing water	20.75 a	21.07 a	1796.9 a	72.26 ab	30.48 a	23.72 ab
B. cereus + coconut water	19.08 a	22.38 a	1941.4 a	77.88 a	32.24 a	24.37 a
B. cereus + tofu water	20.66 a	21.03 a	1850.4 a	75.75 ab	31.16 a	22.82 b
B. cereus + oil palm liquid waste	19.50 a	20.84 a	1906.8 a	65.67 c	28.93 a	23.40 ab
F test	0.77^{ns}	3.49^{*}	0.7^{ns}	5.46^{*}	0.7^{ns}	2.42^{ns}

Description : The numbers followed by the same lowercase letters show no significant differences according to Duncan's multiple distance test at the 5% level. ns: non significant, *: significant

3) Total Grain: Data in Table 3 shows that the giving of few biofertilizers formulations based on organic waste liquid was not significantly different in all treatments tested. It is assumption that Bacillus cereus bacteria contained in biofertilizerss based on organic waste liquid can grow but cannot move properly on peat soil which has a acidic pH.
The giving of biofertilizers formulations based on organic waste liquid coconut water tends to product the highest grain yield compared to other treatments, namely 1941.4 grains. This assumption that the formulation of biofertilizers based on organic waste liquid coconut water contains sufficient nutrients to increase the total amount of grain. The results of nutrient analysis of biofertilizers formulations based on organic waste liquid of coconut water contained P (0.043%), and Mg (0.837%). Elements of P and Mg are very instrumental in the formation of ATP as an energy source in the metabolism processes of plants [23]. [20] also added that the ATP formed will trigger various biochemical processes in plants tissues. This will effect the results of the assimilate which will be distributed throughout the plants so tends the growth of grain in rice plants.

4) Percentage of Pithy Grain: Data in Table 3 shows that the percentage of pithy grains with Bacillus cereus biofertilizers + coconut water was significantly different from the giving of water, Bacillus cereus without formulation and biofertilizers Bacillus cereus + oil palm liquid waste and not significantly different from the giving of Bacillus cereus + washing water rice and Bacillus cereus + tofu water. The givingof Bacillus cereus + coconut fertilizer tends to increase the percentage of pithy grains which is 77.88%. It is assumption that biofertilizerss based on organic waste liquid of coconut water contain sufficient IAA hormone so as to increase the percentage of rice grains of rice. Based on the analysis of Savitri, in [21], it shows that in coconut water there is an IAA of 0.237 ppm. Indole Acetic Acid (IAA) is one of the hormones that are very important in increasing plants growth, especially in the process of cell division. According [42], growth hormones such as IAA can stimulate lateral root growth. This will increase root growth so that absorption of nutrients will be maximized. So that it can increase the product of asylate which is then translocated for filling grain. The results of the analysis of biofertilizers nutrients based on organic waste liquid coconut water contains K (0.271%) which is assumption to be a sufficient amount to increase the percentage of rice grains of rice. Potassium is a very important nutrient in increasing the yield of plants assimilation. According [28], one of the functions of potassium in plants is as an enzyme activator that plays a major role in various biochemical processes in plants tissues. [22] also added that enzymes are biomolecules which are very instrumental in improving biochemistry processes. Improvement of biochemistry product will be translocated throughout the plants as in the grain so that the grain becomes pithy.

5) Weight of pithed grain: Data in Table 3 shows that the weight of pithed grain by giving few formulations was not

significantly different in all treatments tested. It is assumption that Bacillus cereus bacteria contained in biofertilizerss based on organic waste liquid can grow but cannot move properly on peat soil which has a acidic pH.
The giving of biofertilizers formulations based on liquid water waste tends to give higher yield of grained grain per plants than other treatments. This is presumed that the content of P (0.043%) and Mg (0.837%) in the formulation of biofertilizers for liquid waste of coconut water is more sufficient to increase the grain weight planting. Phosphorus and magnesium are macro elements that are needed by plants in the formation of ATP which acts as energy in the metabolism of plants [23]. Energy in the form of ATP which is formed in plants tissues is very instrumental in various metabolism processes that cause the formation of assimilates which are translocated into the grain. [43], also added that sufficient amounts of Phosphorus will improve metabolic processes so that they can increase the yield of asylate in plants. The results of the study by [37], showed that the givingof 90 kg / ha of P fertilizer was able to increase the seed weight of 48.16 grams in wheat crops.

6) Weight of 1000 items: Data in Table 3 shows that 1000 weight of grained rice grains with biofertilizers based on organic waste was not significantly different in all treatments tested. It is assumption that Bacillus cereus bacteria contained in biofertilizerss based on organic waste liquid can grow but cannot move properly on peat soil which has a acidic pH. The results of the elemental analysis showed that the biofertilizers formulation of coconut water liquid waste contained N (0.028%) P (0.043%) K (0.271%) Mg (0.837%) and Ca (). The availability of these elements causes the metabolism processes of plants to increase so as to produce assimilation. According [44], crop yields are determined by the ability of plants to produce assimilates obtained from the balance of metabolism processes. [45] states that the resulting assimilate acts as a source of energy for every cell and raw material in the formation of various organic compounds in plants tissues. The amount of photosynthate produced will be translocated to all plants tissues, including for filling grain, which in turn increases the weight of pithy grains.

CONCLUSION

Giving of biofertilizers based on organic waste liquid has an effect on the panicle length parameters, and the percentage of pithy grains but does not effect the other parameters. Biofertilizers based on organic waste liquid coconut water is the best treatment in panicle length parameters (22.38 cm) and percentage of pithy grains (77.88 grams).

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