TABELA
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Artikel Penelitian

Reaction Creation of Tomato *(Solanum lycopersicum L)* by Giving Strong (Oil Palm Void Organic Product Pack) and Charcoal Rice Husk

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INFORMASI ARTIKEL

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A B S T R A K

Arrangement of Strong Produced using Oil Palm Void Natural product Packs and Rice Husk Charcoal on Creation of Tomato Plants (*Solanum lycopersicum* L) means to decide the impact of different sorts of Strong (Oil Palm Void Organic product Bundles) and Rice Husk Charcoal on Creation of Tomato Plants (*Solanum lycopersicum* L). This exploration was led in Sona Town with a level of 18 meters above ocean level Labuhanbatu Regime in Juli 2022 to December 2022. The material utilized was tomato seeds, husk charcoal, strong, water. The hardware utilized was a 35x40 polybag, shaper cutting edge, scientific equilibrium, ruler, scissors, mortar, estimating jar, can, calipers, perfect rope, digger. The examination will be directed with a factorial gathering plan. The main variable is the arrangement of Strong to be specific S0: Without Strong (Control), S1: 0.50 kg/polybag, S2: 0.70 kg/polybag S3: 1kg/polybag. The subsequent component is the organization of rice husk charcoal P0: Without Husk Charcoal (Control), P1: 0.2 kg/polybag, P2: 0.4 kg/polybag. The quantity of treatment mixes is 12 blends. The aftereffects of this study show that the arrangement of Strong and Rice Husk Charcoal Against Tomato Plant Creation (*Solanum lycopersicum* L) has no huge impact in Stem Diamater (cm), All out Number of Natural products per Plant (g), All out Weight of Organic products per Plant (g) however treatment connection of 1 kg/polybag and 0.2 kg/polybag of Rice Husk Charcoal can expand Stem breadth (cm), Complete Number of Natural products per Plant (g), All out Weight of Natural products per Plant (g).

PENDAHULUAN

Solid is solid waste from the by-product of the process of processing fresh fruit bunches (FFB) in palm oil mills into crude palm oil (CPO). The content of nutrients and organic matter contained in solid allows it to be used as a nutrient enhancer in plants, so that palm oil mill waste that has been detrimental can be used properly. (Anom, E., and Armaini, 2016).

Tomato Plant (*Lycopersicum esculentum* Mill) is an agricultural commodity plant, has a unique taste, which is a combination of sweet and sour tastes, making tomatoes one of the fruits that have many fans (Astarini, 2009). The market demand for tomato commodities from year to year is increasing. The area of tomato cultivation in Indonesia is also increasing. Tomato plant centers also appeared. However, until now there are still many obstacles experienced by tomato farmers, ranging from problems in implementing appropriate cultivation techniques, pest and disease problems, to problems marketing crops (Saragih, 2008). One of the efforts made to improve the quality and quantity of tomatoes is the addition of organic matter in the soil. The provision of organic matter through bokashi, in addition to increasing soil and plant productivity, the use of organic matter is one of the components of environmentally friendly plant cultivation.

In the cultivation of plants including tomatoes, environmental factors play an important role in achieving maximum growth and yield. Hayati *et al*., (2012) state that environmental factors play a very important role in the process of plant growth, growing media is one of the environmental factors that need to be considered. Furthermore, it is also stated that

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a good planting medium is usually used a mixture of sand, soil, manure. The use of sand is excellent for the improvement of the physical properties of soils especially clay. Osman (1996) stated that soil with a good state of texture and structure is very supportive of the success of agricultural business, the desired soil structure of plants is a loose soil structure that has a pore space containing water and air so that nutrient absorption can run optimally.

Rice husks can also be used as planting media, according to Rifai and Subroto (1982) rice husks are a by-product of burning remains. The nutrients contained in rice sekan are relatively quickly available to plants and can increase soil pH. The results of research by Kolo and Rahajo (2016) showed that a rice husk charcoal dose of 0.5 kg gave the highest total yield per plant, namely 646g (1.9 t / ha). The frequency of watering once every three days with a water level for 90 days is 120 liters / plant giving the highest total yield per plant of 705.7g (2,075 t / ha).

The addition of husk charcoal to the growing medium will be beneficial, including streamlining fertilization because in addition to improving soil properties (porosity, aerase), husk charcoal also functions as a nutrient binder (when excess nutrients) that plants will use when lacking nutrients, then the nutrients are released slowly according to plant needs or *slow release* (Komarayati *et al*. 2003). However, the use of husk charcoal so far has been more in the cultivation of ornamental plants and the right dosage is not yet known. Therefore, it is necessary to conduct research on how to use the amount of rice husk charcoal and the right watering frequency so that it can provide the most optimal growth and yield of tomatoes.

The influence of fertilizer on plants is influenced in addition to the type, composition, dosage of fertilizers used, as well as by the mode of application and the time of their application. Wasonowati (2011) stated that the availability of sufficient and balanced nutrients is an important factor needed by plants to support a good vegetative growth rate . Plant height growth is related to the growth of stems, leaves and the root system of the plant. According to Akyas, *et al*. (2004) stem diameter is an observational variable that shows the growing strength of tomato plants because it is the center of the plant's growing point. The influence of fertilizer on plants is influenced in addition to the type, composition, dosage of fertilizers used, as well as by the mode of application and the time of their application. Plant height growth is related to the growth of stems, leaves and the root system of the plant. Research Balia *et al.* (2012) shows that the availability of nutrients for plants will affect the speed of growth and development of the leaves, stems and roots of these plants. The amount and composition of nutrients provided will affect plant growth.

Research Objectives

To determine the influence of various types of Solid (Empty Bunches of Oil Palm) and Rice Husk Charcoal on Tomato Plant Production (*Solanum lycopersicum L)*

MATERIALS AND METHODS

This research was conducted in Sona Village with an altitude of 18 meters above sea level in Labuhanbatu Regency from December 2019 to March 2020. The materials used are tomato seeds, husk charcoal, solid, water The tools used are polybags size 35x40, cutter knives, scalesanalytics, rulers, scissors, mortar, measuring flask, bucket, calipers, neat ropes, hoes. The research will be conducted with a factorial group design. The first factor is the provision of Solid, namely S 0: No Solid (Control), S_1: 0.50 kg / polybag, S_2:0.70 kg / polybag S_3: 1kg / polybag. The second factor is the administration of rice husk charcoal P 0: No Husk Charcoal (Control), P_1: 0.2 kg / polybag, P_2 :0.4 kg / polybag. The number of treatment combinations is 12 combinations. (Gomes and Gomes, 1995).

RESULTS AND DISCUSSION

Giving Solid (Empty Bunches of Oil Palm) and Rice Husk Charcoal to Tomato Plant Production (*Solanum lycopersicum L*) is a concern in this study is Stem Diamater (cm), Total Number of Fruits per Plant (g), Total Fruit Weight per Plant (g).

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Diamater Stem (cm)

The effect of solid feeding and Rice Husk Charcoal on the observation parameters of the stem diamater can be seen from Table 1. The results of the fingerprint analysis of solid and Rice Husk Charcoal data showed that the provision of solid and Rice Husk Charcoal did not have a real effect on the Stem Diamater (cm) of Tomato Plants (*Solanum lycopersicum) L.*

Results in Table 1. it can be seen that although there is no noticeable difference between the treatment of Solid and Rice Husk Ash, it can be seen that the highest and lowest average values in the stem diamater of tomato plants (cm), the highest average at S 3 P_1 is 3.66 cm and the lowest is at S 0 P_0 3.10cm. There is an increase in the diameter of the rod at each observation. An increase in the diameter of the stem of a plant can also describe the vegetative growth and development of the plant. Plants that have a large stem diameter, show that the assimilates translocated to the stem part are quite numerous for the accumulation of assimilates. In addition to leaves, the stem also has chlorophyll so it can perform photosynthesis. The proportion of plant height to stem diameter can make tomato plants stand firmly, thus supporting the growth and development of the tomato plant itself (Harahap *et al.*, 2020). This is also supported by Murbandono (2008), stating that organic matter is able to bind nutrients and maintain these nutrients so that they are not washed off so that it will create a state of nutrients that remain available in the soil. Spacing is basically to give plants the possibility to grow well without experiencing much competition when it comes to fetching water, nutrients, and sunlight.

Total Number of Fruits per Plant (grains)

The effect of solid feeding and Rice Husk Charcoal on the observation parameters of the Total Number of Fruits per Plant (g) can be seen from Table 2. The results of the fingerprint analysis of solid and Rice Husk Charcoal data showed that the provision of solid and Rice Husk Charcoal did not have a real effect on the Stem Diamater (cm) of Tomato Plants (*Solanum lycopersicum) L.*

Results in Table 2. it can be seen that although there is no real difference between the treatment of Solid and Rice Husk Ash, it can be seen that the highest and lowest average values in the stem diamater of tomato plants (cm), the highest average at S_3P 1 is 7.80 grains and the lowest is at S 0 $P_0$by$_{1.57}$ grains. This is because at a tighter planting distance, the number of plant populations is more so that it will produce more fruit. There is competition to get nutrients in tomato plants but it has been fulfilled by the provision of rice husk charcoal so that it does not affect the number of fruits. The availability of macro and micro nutrients present in bokashi fertilizer is utilized by plants for generative growth which affects the amount of production. in the provision of Solid and rice husk charcoal produces less number of pieces per plot compared to the tight plant spacing.

Table 1. Average Diamater Stem (cm)

Solid	**Rice Husk Charcoal**			**Flattening**
	P_0	**P_1**	**P_2**	
S_0	3,01	3,31	3,39	3,24
S_1	3,42	3,45	3,46	3,44
S2	3,41	3,61	3,32	3,45
S_3	3,22	3,66	3,51	3,46
Flattening	3,27	3,51	3,42	3,40

Table 2. Total Number of Fruits per Plant (g)

Solid	**Rice Husk Charcoal**			**Flattening**
	P_0	**P_1**	**P_2**	
S_0	1,57	4,10	2,90	2,86
S_1	5,90	3,77	4,87	5,55
S2	4,77	6,53	5,33	4,42
S_3	5,67	7,80	4,57	4,67
Flattening	4,48	5,55	4,42	4,36

This is influenced by the equilibrium of nutrients that occur in the soil. Good nutrient equilibrium in the soil can affect production (Caspersen *et al*. 2016; Tautges *et al*. 2016). with fewer plant populations. Meanwhile, in tomato plants, the provision of Solid and Rice Husk Ash produces a greater number of fruits per plot. This happens because of the larger number of plant populations, so it will produce a greater number of fruits per plot. Harmonious nutrient equilibrium in the soil greatly affects good absorption, so it is expected to increase crop production (Pincus *et al*. 2016). So it is suspected that the application of Solid and Rice Husk Charcoal should be done together, because biological fertilizers rich in microbes can help overhaul organic matter from compost. This is expected to optimize the change of organic compounds into ion forms that can be available and absorbed by plants, along with an increase in production (Wang *et al.* 2015).

Total Number of Fruits per Plant (grains)

The effect of solid feeding and Rice Husk Charcoal on the observation parameters of the stem diamater can be seen from Table 3. The results of the fingerprint analysis of solid and Rice Husk Charcoal data showed that the provision of solid feeding materials and Rice Husk Charcoal did not have a real effect on the Stem Diamater (cm) Tomato Plant (*Solanum lycopersicum) L.*

Results in Table 3. it can be seen that although there is no real difference between the treatment of Solid and Rice Husk Ash, the highest and lowest average values can be seen in the stem diamater of tomato plants (cm), the highest average in S_3P_1 of 271.10 grams and the lowest is in S 0 P_0 of 40.57 grams. fruit weight per plant on each Solid and Rice Husk Ash treatment. Photosynthetics produced by plants in addition to being used for growth and development are also stored by plants as food reserves. The photosynthetics contained in the leaves are transported throughout the body of the plant, that is, the meristem part at the growing point and to the fruits that are in development. If the photosynthesis carried out by the plant can take place optimally, the resulting photosynthetics will be optimal as well, which will eventually affect the size and weight of the fruit.

Table 3. Total Fruit Weights per Plant (g)

Solid	**Rice Husk Charcoal**			**Flattening**
	P_0	**P_1**	**P_2**	
S_0	40,57	120	87,70	82,79
S_1	187,90	120	262,23	190,04
S2	136,53	226,67	173,33	178,84
S_3	166,57	271,10	151,13	196,27
Flattening	132,89	184,44	168,62	161,99

According to Soleh (2009), organic matter in the soil for plants can also improve generative growth, especially the flower formation phase and the fruiting process.

When vegetative growth is good, more photosynthetics are produced, this causes the plant's ability to form generative organs to increase. With good spacing, the utilization of existing growing space for plant growth and buffer capacity against adverse events can be efficient. Harahap *et al.*, (2020), tomato plants need to be planted with ideal planting distances so as to increase production yields. At a tight distance, namely high population density, there is heavy competition between plants which results in stunted growth and decreased crop yields. The tighter the planting distance, the competition between plants to get light is also more limited, so that if there is a reduction in light in the fruit formation phase, it will produce relatively small fruits.

CONCLUSION

The results of this study show that the provision of Solid and Rice Husk Charcoal to Tomato Plant Production (*Solanum lycopersicum L) has no* real effect in the Stem Diamater (cm), Total Number of Fruits per Plant (g), Total Fruit Weight per Plant (g) but the interaction treatment of solid 1kg / polybag and Rice Husk Charcoal 0.2 kg / polybag can increase the effect Stem Diamater (cm), Total Number of Fruits per Plant (g), Total Fruit Weight per Plant (g).

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