www.bircu-journal.com/index.php/birci
Budapest International Research and Critics Institute-Journal (BIRCI-Journal)
Humanities and Social Sciences
ISSN 2615-3076 Online)
ISSN 2615-1715 (Print)
Budapest Institute

Response of City's Garbage Compost on the Production of Several Varieties of Shallots

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Abstract

One effort to increase the production of shallots through cultivation techniques is to test several varieties and provide city's garbage compost. This research was conducted in North Sumatera province in March-April. This research uses the rando draft group (RAK) with2 factors and 3 blocks. The first factor is the varieties (V) and the second factor is the city's garbage compost (K). the results showed that the most excellent varieties are the Super philip varieties which show the results of wet and dried dry bulbs at most whereas the city's garbage compost .

Keywords
shallot; varieties; city's garbage compost; production

I. Introduction

Shallots are one of the commodities of horticultural crops that are widely consumed by humans as a mixture of cooking spices after chili. Aside from being a mixture of cooking spices, red onions are also sold in processed forms such as onion extract, powder, essential oil, fried onions and even as a medicinal ingredient to lower cholesterol levels, blood sugar, prevent blood clots, lower blood pressure and improve blood flow (Suriani, 2011). Shallots can be used in various menu dishes already familiar, both as a flavor enhancer and beauty (aesthetic) on the menu, as well as a source of some vitamins and minerals. Results of the analysis of the ingredients showed that in 100 g of shallots contains 1.5 g of Protein, 0.3 g fat, 9.2 g carbohydrates, 36 mg calcium, 40.0 mg iron, 0.03 mg of Vitamin B, 2.0 mg of Vitamin C, and Water 88 g (Anshar, 2002).

Shallots have long been cultivated by farmers intensively because it is a source of income and employment opportunities that contribute sufficiently high to the economic development of the region. Good cultivation will achieve a high level of productivity and is required in the selection of varieties that are highly determined by the genetic potential of such varieties or cultivars. Variety is one aspect that needs to be considered in the management of plant cultivation techniques. Selection of varieties plays an important role in cultivation, because to achieve a high level of productivity is largely determined by its genetic potential. If the management of the growing environment is not carried out properly, the potential for high seed yield of these superior varieties cannot be achieved.

Given the very important role of organic matter on the one hand and the problem of soil organic matter on the other, the use of organic fertilizers to improve the quality and productivity of agricultural land is a must. The policy on the use of organic fertilizers must be able to utilize all the potential of existing raw materials, including the use of municipal waste. In line with this policy, there are factors that encourage increased use of organic fertilizers, namely: increasing correct understanding of the function of organic fertilizers; increasing environmental pollution (soil, air, and water) due to excessive use of agrochemicals; more expensive and more difficult to obtain raw materials for artificial fertilizers; increasing demand for organic agricultural products; and organic fertilizer raw materials that are widely available locally and are renewable (Iswandi, 2010).

II. Review of Literature

Shallots are annual plants that are rarely propagated by seeds but by tubers (bulbus), the base of the tuber forms a disc which is an imperfect (rudimentary) main stem. Rahayu and Berlian (2004). From the bottom of the disc, fibrous roots grow and at the top, between the swollen leaf petals There are buds that can grow into new plants. These shoots are called lateral shoots. These shoots will form a tuber where the photosynthate is stored (Sunarjono and Soedomo, 1983). The roots of the shallot plant have fibrous roots with a shallow root system and scattered branches, at a depth of between 15-20 cm in the soil. The number of roots of shallot plants can reach 20-200 roots. The diameter varies between 5-2 mm, the root branches grow and form between 3-5 roots (Suhaeni, 2007). The stem of the shallot plant has a true stem or is called a "discus" shaped like a disc, thin and short as a place for attaching roots and shoots (growing point), above the disc there is a pseudo stem composed of leaf midribs and stems, all different in the soil changing shape and function into tubers. The leaves of the shallot plant are small cylindrical in shape extending between 50-70 cm, with holes and a pointed tip, light green to dark green, and the location of the leaves attached to a relatively short stalk. From the tip of the plant (growing point) which is between 30-90 cm long, and at the end there are 50-200 flower buds arranged in a circle (round) as if in the shape of an umbrella. Each flower consists of 5-6 white petals, six green or yellow stamens, one pistil and an almost triangular ovary (Sudirja, 2007). Onion bulbs are double bulbs, there is a thin layer that is clearly visible, and the tubers are also visible as lumps to the right and left, and are like cloves of garlic. The layers of the onion cloves are not much, only about two to three layers, and they are thin and easy to dry. Meanwhile, the layers of each tuber are larger and thicker (Suparman, 2007).

Varieties are a group of individual plants that can be distinguished by each characteristic such as morphology, physiology, cytology, chemistry and others (Allard, 2005). Selection of varieties plays an important role in cultivation, because to achieve a high level of productivity is largely determined by its genetic potential. There are some cultivars or varieties that come from certain areas such as Bima Brebes, Maja Cipanas, Sumenep, Super Philip, Medan and other varieties. Where between these varieties has a clear distinction. The difference in growth affects the production results of any varieties or cultivars. Super Philip variety comes from the introduction of the Philippines. Flowering plants 50 days after planting. Age until harvest 60 days. Round tuber shape with purplish red color. The tuber production was 17.60 tons per ha with a tuber loss of 22%. The Bima Brebes variety is a variety originating from the local area of Brebes. Plant age 60 days after planting. The shape of the tuber is oval with a small ring on the neck of the disc. Pink tuber color. Production of tubers 9.9 tons/ha. Weight loss of tubers (wet - dry) 21.5%. Medan variety originating from local Samosir. Flowering plants at the age of 52 days. Age until harvest is 70 days. Bulbs are round with a tapered tip. Red tuber color with dry tuber production of 7.4 tons per hectare (Suwandi and Sartono, 1996). Provision of growth regulators aims to accelerate root growth. Plant growth regulators or plant hormones are a group of organic compounds that are formed naturally or artificially in very low concentrations able to influence plant physiology processes such as pushing, inhibiting, or changing the growth, development, and movement (taxis) of plants (Davis in Muslimah et al, 2020).

One of the organic fertilizers that can be used is compost. Compost is a complete source of macro and micromineral nutrients, although in relatively small amounts (N, P, K, Ca, Mg, Zn, Cu, B, Zn, Mo, and Si). In the long term, composting can improve pH and

increase crop yields. The use of compost as a soil enhancer can increase the organic matter content of the soil so as to maintain and increase soil fertility (Setyorini, 2003). Using the city's trash, it looks as if there is some reluctance. There is an assumption that municipal waste compost has poor quality. Whether or not the compost product is produced depends on the raw materials and the composting process. Municipal waste is one of the good compost raw materials. Therefore, if the municipal waste composting process goes well, then the compost product produced is also good. City's garbage compost consists of organic and inorganic waste. Organic material can be in the form of food scraps, animal waste, agricultural biomass, as well as dead plants and various microorganisms and from a socio-economic point of view it is of no value and from an environmental point of view it can cause pollution or disruption to sustainability. Compost as an organic fertilizer is not a substitute for chemical fertilizers that are more familiar to farmers. Organic fertilizers are complementary to chemical fertilizers and vice versa. Organic fertilizers and chemical fertilizers will be more optimal and more efficient when used together. According to Santoso (2003) municipal waste compost functions as a soil conditioner containing nutrients such as nitrogen, phosphorus, and potassium as well as important minerals needed by plants. This function will improve soil structure, critical land texture, increase aeration porosity, and decomposition by soil microorganisms. Agricultural land is increasingly narrow due to the shifting of the function of agricultural land into industrial areas, so that hydroponic cultivation is considered appropriate to utilize available land because this cultivation system does not require soil media. (Zailani, 2019)

III. Research Methods

This research activity was conducted in the province of Sumatera Utra Indonesia from March to April. The material used is a shallots tuber consisting of several varieties of shallots and garbage compost town. The study used the Randomize group factorial design with 2 treatment factors and 3 blocks. First factor varieties (Bima Brebes, Super Philip and Medan). Second factor is Compost city garbage (Control, 1 kg/m2, and 2 kg/m2). Plot size 1x1 m2. The sample plants are taken randomly.The implementation of research includes land preparation, the preparation of shallots, preparation of moving crops, preparation of compost city garbage, the determination of plant samples every m2 (plot) and maintenance such as watering, fertilization, weed control, insertion and management of plant destruction organisms. The observed parameters are the wet weight of the bulbs per plot (g) and the dry weight of the tuber per plot (g). Data is analysed using various print analyses. If there is a significant influence of the treatment factor then the data analysis is followed by a double distance test Duncan (Duncan multiple Range Test).

IV. Results and Discussion

4.1 Wet Weight Bulbs Per Plot (g)

The results of statistical variance showed that the treatment of varieties and the provision of city's garbage compost showed a significant effect, while the interaction of varieties and the application of waste compost gave an insignificant difference to the wet weight of tubers per plot. Wet weight of tubers in the application of city's garbage compost on several shallot varieties is shown in table 1.

Table 1. Average Wet Weight of Bulbs Per Plot (g) due to the provision of city's garbage compost on several varieties of onion plants

Treatment	City's Garbage Compost			Average
	K0	K1	K2	
V1 (Bima Brebes)	2151,3	2578	2417	794 b
V2 (Super Philip)	2137,3	3610,7	2631	931 a
V3 (Medan)	1256,6	1016	1191,7	384,9 c
Average	616,1	800,5	693,3	

Description: The numbers followed by the letters that are not the same show differ very real according to the double Distance Test (Duncan) at 5% level

In table 1 It is known that the varieties of Super philip (V2) are the most superior varieties compared to the treatment of Medan varieties (V3) and Bima brebes (V1) for the parameters of wet weight of bulbs per plot. The wet weight of the highest bulbs in Super philip variety treatment (V2) is 931 g and the lowest on the Medan varieties (V1) is 384,9 g. Varieties is one of the important technological components that have a major contribution in increasing farm production and income. This technology component plays a very important role in changing the rice farming system, from a subsystem to a commercial rice farming system. Various high-yielding rice varieties are available and can be selected according to regional conditions, farmer preferences, and market needs. Varieties can be defined as a group of plants of a type or plant species that have certain characteristics such as shape, plant growth, leaves, flowers, and seeds that can distinguish them from other plant species or species, and when propagated there is no change. The type of variety shows how the variety is assembled and the method of seed propagation, so that seeds are available that can be planted by farmers.

According to Subandi (1990) the success of increasing production is highly dependent on the ability to provide and apply technological innovations such as new high yielding and high-quality varieties, provision of quality seeds and appropriate cultivation technology. In accordance with the description from the Vegetable Crops Research Institute (2000) that the Super Philip variety is capable of producing 9-18 tubers per clump with a production potential of 17.6 tons/ha. According to Tambak, *et. all* (2013) which states that differences in genetic composition are one of the factors causing plant diversity such as plant properties that include the shape and production of shallots. Genetic diversity is one of the most influential factors on the success of plant breeding efforts. The components of genetic diversity consist of phenotypic variation, genotype variation, and environmental variation.

The significantly different tuber yields are in line with research by Ambarwati and Prapto (2003) that the production of shallots is influenced by varieties. According to Sumarni *et al*. (2012) that each variety has different yield potential and characters. This is because the formation of tubers is influenced by the ability of plants to distribute photosistat products to the leaves and tubers. The number of bulbs that do not differ due to the number of leaves and plant height are not different, so that the photosynthesis of plants is not different. Furthermore, Azmi *et al*. (2011), stated that the actual number of shallot bulbs is influenced by genetic factors and only slightly influenced by the environment. In contrast to the number of tubers, which is mostly influenced by genetic factors, it is only influenced by a small part of the environment. The tuber diameter variable was influenced by genetic and environmental factors equally.

4.2 Dry Weight Bulbs Per Plot (g)

The results of statistical variance showed that the treatment of varieties and the provision of city's garbage compost showed a significant effect, while the interaction of varieties and the application of waste compost gave an insignificant difference to the dry weight of bulbs per plot. dry weight of bulbs in the application of city's garbage compost on several shallot varieties is shown in table 2.

Table 2. Average dry Weight of Bulbs Per Plot (g) due to the provision of city's garbage compost on several varieties of onion plants

Treatment	Compost			Average
	K0	K1	K2	
V1 (Bima Brebes)	1556,4	2122,5	1610	587,7 b
V2 (Super Philip)	1505	2573	2338	712,9 a
V3 (Medan)	901	710	969	286,7 c
Average	440,3	600,6	546,3	

In table 2 It is known that the varieties of Super philip (V2) are the most superior varieties compared to the treatment of Medan varieties (V3) and Bima brebes (V1) for the parameters of dry weight of bulbs per plot. The wet weight of the highest bulbs in Super philip variety treatment (V2) is 712,9 g and the lowest on the Medan varieties (V1) is 286,7 g. According to Susilo (2015) the role of leaves in plant growth is to determine the production of plant biomass caused by differences in the ability of leaves to produce biomass. The ability of the three varieties in the absorption of nutrients, light and water. The tuber layer is directly proportional to the number of leaves above it so that if the amount of auan is large, the tuber layer inside will also be thicker. According to Sufiyanti *et al.* (2006) large tubers have relatively more tuber layers and have a larger root cross-sectional area so as to increase the ability to absorb water and nutrients for plant growth.

V. Conclusion

Sitompul and Guritno (1995) that in general, plants have different phenotypes and genotypes. Varieties are large enough to affect differences in traits in plants. Differences in genetic makeup is a strand of genetic composition that will be expressed in one or all different growth phases and can be expressed in various plant traits that include plant form and function and ultimately produce plant growth diversity. The results showed that the most excellent varieties are the Super philip varieties which show the results of wet and dried dry bulbs at most whereas the city's garbage compost .

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