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PREFACE

Praise being said to Allah Almighty God for all the grace and guidance that has been given to us all, so the Proceedings of the 15th ADRI 2017 International Conference Rata Ampat, Papua Barat, November 10-12, 2017 can be realized. Proceedings contains a number of articles and research papers from lecturers, teachers, students, researchers and / or observer of the development of science and technology.

Hopefully, these proceedings may give benefit to us all, for the development of science, technology, arts, culture, and sports. In addition, is also expected to be a reference for the nation and state-building efforts so that science and technology become a strong pillar in the face of the ASEAN Economic Community.

Lastly, there is no ivory that is not cracked. We are sorry if there are things that are less pleasing.

Thanks you very much.

Raja Ampat, November 10, 2017.
Publisher Manager of Perkumpulan Ahli & Dosen Republik Indonesia (ADRI),

Andi Mursidi

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The Growth and Yield of Shallots (*Allium ascalonicum* L.) Grown on Soils Previously Treated with Flooding and Ameliorants at Brebes Regency

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Abstract. Shallot is one of economically potential agricultural commodities in the Brebes Regency. Farmers commonly apply excessive inorganic fertilizers and pesticides on shallot plants. These practices reduce soil health and soil fertility. In addition, residual pesticides are detected in soils and bulbs of shallots. Flooding the fields and applying soil ameliorants before planting the shallots is one of alternative innovation technologies which can reduce the residual pesticides in soils and bulbs. This study aimed to know the effect of flooding duration and types of soil ameliorants on the soil before planting on the growth and yield of shallots. The study was conducted at Wanasari village, Wanasari District, Brebes Regency fromAgust toOctober 2017. Split plot with block designs was used for arranging the units of experimental. The main plots were flooding duration i.e. without flooding, 12 hours of flooding, 24 hours of flooding, or 36 hours of flooding. The subplots were types of soil ameliorants i.e. without soil ameliorant, chicken litters, or zeolite. Measured variables were plant high, number of leaves, number of tiller, number of bulbs, fresh weight of bulbs, and weight of bulbs after 3 days of sun drying. Results showed that the growth and yield characters of shallots on soils previously treated with flooding and soil ameliorants were similar except that flooding of soil before planting reduced the weight of bulb after 3 days of sun drying.

Keywords**:** flooding**;** ameliorant; shallot

I. INTRODUCTION

Shallot is one of economical and prospected horticulture commodities [1]. The shallot is one of exported commodies of Indonesia. The ministry of Agriculture sated that in 2017 Indonesia has exported 5,600 tons to Malaysia, Vietnam, dan Thailand. It values US$ 8,5 millions [2].

The shallot production in The Regency of Brebes in 2016 reached 3,387 thousand tons with a total harvest area of 32.434 thousand hectares and the productivity in 2016 reached 10.44 tons per hectare [3]. The productivity of shallot in this area in 2016 was lower than the productivity in 2013 which was 12.23 tons per hectare [4], and in 1970s which was 16 tons per hectare [5]. Actually, the potential productivity of shallot could reach 20 tons per hectare [6]. This may resulted from that farmers applied excessive herbicides for controlling weeds before planting and after plants emerging, pesticides for controlling plant pests and diseases, and unbalance inorganic fertilizers[7].

The excessive use of herbicides, pesticides, and unbalance fertilizers continuously for a long period of times increased heavy metal content, environmental pollution, deterioration and decline in soil fertility [8]. In addition, farmers always apply synthetic pesticides unwisely. They applied a mixture of four to eight pesticides every two to three days [9].

Innovation of technologies must be introduced to the farmers for increasing the productivity, soil health, and soil fertilities. In addition, the introduced technologies should be cheap, applicable and could reduce residual pesticide in soil and product. Flooding of soil and applying soil ameliorants are two of such technologies. Flooding hopefully can leach residual pesticides and can reduce salinity resulted from excessive fertilizers [10]. Soil ameliorants hopefully can increase organic content and can improve physical, chemical, and biological soil characters. Then it results in improving soil health and plant productivity [11]. Some soil ameliorants are compost, animal fertilizers, zeolite, and silt [12].

This study aimed to know the effect of flooding and soil ameliorants before planting on the growth and productivity of shallots in Brebes Regency.

II. METHODS

The study was conducted at Wanasari village, Wanasari District, Brebes Regency fromAgust toOctober 2017. Split plot with block designs was used for arranging the units of experimental. The main plots were flooding duration i.e. without flooding, 12 hours of flooding, 24 hours of flooding, or 36 hours of flooding. The subplots were types of soil ameliorants i.e. without soil ameliorant, chicken litters, or zeolite. There were 4 blocks, five samples on each unit experiment.

Soil ameliorants were applied five days after flooding of soils. Bulbs of shallots were planted five days after application of soil ameliorants. 150 kg ha^{-1} of urea, 400 kg $ha^{-1}$of ZA, 200 kg $ha^{-1}$of SP36, and 200 kg ha^{-1} of KCl were applied. Organic pesticides were applied every week.

Watering was done when needed. The plants were harvested 60 days after planting.

Measured variables were plant high, number of leaves, number of tiller, number of bulbs, fresh weight of bulbs, and weight of bulbs after 3 days of sun drying.

III. Result and Discussion

Based on Anova, there is no interaction effect of flooding and soil ameliorants on all measured variables. Then, only individual effect of flooding and soil ameliorants on measured variables were presented in this article.

Table 1. shows average values of measured variables of shallots grown on soil after treated by flooding. Based on F tests, growth and yield characters of the shallots grown on soil previously flooded for 0, 12, 24, or 36 hours were similar, except for the weight of bulbs after sun dried for 3 days. Flooding of soils 12, 24, or 36 hours before planting reduced the weight of sun dried bulbs.

Flooding of soil ten days before planting did not have beneficial or harmful effect on all measured variables of shallots except for dry weight. This indicated that leaching of harmful substances [10] did not instantly remove all the substances. In contrast, leaching removed most of residual fertilizers especially Nitrogen [12].

Table 2. shows average values of measured variables of shallots grown on soil after treated by soil ameliorants. Based on F test, growth and yield characters of the shallots grown on soil previously modified by adding chicken litters or zeolite were similar to that of shallots were grown on unmodified soil. This indicated that beneficial effect of soil ameliorant zeolite or chicken litters on the growth and yield of shallot can not been seen at only one growing season. In addition, some nutrients content of the soil in Brebes such as P , K, Ca, and Mg are high [13].

IV. Conclusions

The growth and yield characters of shallots grown on soils previously treated with flooding and soil ameliorants were similar except that flooding of soil before planting reduced the weight of bulb after 3 days of sun drying

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We would like to thank Directorate Research and community engagement, the Ministry of Research, Technology, and Higher Education of the Republic of Indonesia who gave grant to this research**.**

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Table 1. The effect of flooding before planting on growth and yield of shallots

Flooding before planting (hours)	Variables						
	Number of bulbs (units)	Bulb diameter (cm)	bulb dry weight per cluster (g)	Number of leaves (units)	Number of tillers per cluster (units)	Fresh weight of plant (g)	Plant height (cm)
0	3.9a	0.78a	6.87b	15.50a	4.88a	14.87a	22.16a
12	4.1a	0.79a	4.23a	16.42a	6.00a	12.09a	22.65a
24	3.6a	0.70a	3.13a	17.26a	5.59a	11.75a	21.60a
36	2.7a	0.52a	2.92a	14.54a	5.93a	9.41a	21.60a

Remark : a value followed by a same letter means no different

Table 2. The effect of soil ameliorant application before planting on growth and yield of shallots

Type of ameliorants applied	Variables						
	Number of bulbs (units)	Bulb diameter (cm)	bulb dry weight per cluster (g)	Number of leaves (units)	Number of tillers per cluster (units)	Fresh weight of plant (g)	Plant height (cm)
without	3.45a	0.68a	4.44a	15.58a	5.71a	11.75a	21.51a
Chicken litters	3.63a	0.71a	4.24a	16.25a	5.56a	12.39a	17.18a
zeolite	3.6a	0.71a	4.18a	15.96a	5.54a	11.94a	21.29a

Remark: a value followed by a same letter means no different