Agronomic Performance of Three Lowland Onion Varieties in Bengkulu City

Yahumri and Nurmegawati

Balai Pengkajian Teknologi Pertanian (BPTP) Bengkulu
(Bengkulu Assessment Institute for Agricultural Techology)
Jl Irian Km 6,5 Kota Bengkulu 38119 Telp. (0736) 23030 Fax. (0736) 345568
E-mail: yahumri.bptpbengkulu@gmail.com

ABSTRACT

This research aims to determine the performance of growth and yield of three varieties of onion lowlands. The research was conducted from August to November 2012 were held at Visitor land Plot Assesment Institute for Agricultural Technology Bengkulu. Experiments using a randomized complete block design to the single factor that is high yielding varieties of onion lowland consisting of Pancasona (V1), Pikatan (V2) and Mentes (V3) which is repeated seven times. Data were analyzed by analysis of variance and tested further by DMRT to determine differences between treatments. The results showed that there was no real difference to the parameters of wet weight, dry weight, number of tillers and number of cloves per clump at all treatments, whereas the weight parameters of tubers per cloves there are significant differences among the treatments with the highest weight obtained varieties of Pikatan (5.89 g) and followed by variety of Mentes (4.75 g) as well as variety of Pancasona (3.95 g). Pancasona, Mentes and Pikatan are varieties able to adapt well, while Pikatan and Mentes have a higher yield than Pancasona varieties, it is shown from the wet weight, dry weight and the weight of tuber per cloves.

Key words: *Allium ascalonicum* L., growth and yield, lowland.

INTRODUCTION

Red onion (*Allium ascalonicum* L.) is one of the vegetable crops that have significance for the public good of high economic value as well as of the nutritional content. Purbiati (2012) reported that onion is a vegetable commodities that have high economic value and can be developed in the lowlands to highlands. Red onions requires fertile soil, loose, and many containing humus with 70% of solar radiation and air temperature 25-32ºC best type of soil that is sandy loam or loam with a pH of 5.5-6.5 and dusty drainage and soil aeration the good one.

Extensive planting shallots in Bengkulu province in 2012 recorded 116 ha with a production of 6.959 quintals (productivity of 6.96 t/ha). Sentra planting shallots in Bengkulu located in upland areas at Rejang Lebong. Thus the general development of onion plants in the province of Bengkulu is still relatively less while that is potential agro-ecosystems. Red onion development opportunities for lowland like the city of Bengkulu more open because of its location and proximity to market strategy. Besides onions are widely used as vegetables, spices and drugs, causing the high demand for onion.

To develop the onion crop in Bengkulu Province with the development effort required extensification planting area on dry land lowland agro-ecosystem. According Kusmana *et al*., (2009) age onion crop in lowland faster, just 50 days compared to plateau at 90 days. In the upland ecosystems onion growth is less than optimal because of the maturation process of dry bulb onions requires a fairly long period. Additionally in the highlands, red onion compete with other vegetable crops such as potatoes, cabbage, tomatoes and red peppers. In addition to seeing agro-ecosystems also need to consider the use of varieties, it is important because not all varieties adaptive to regional development.

Based on the land suitability and potential development of onion in Bengkulu it is expected to develop in lowland agro-ecosystem. Tested the adaptation of varieties must be done in order to determine the performance of growth and yield of three varieties of onion lowlands.

MATERIALS AND METHODS

Research was carried out from August to November 2012 were held at the Visitor land Plot of Bengkulu Assessment Institute for Agricultural Technology. Experiments using a randomized block design (RBD) to the single factor which is 3 varieties of onion lowland consisting of Pikatan (V1), Pancasona (V2) and Mentes (V3) which is repeated seven times in order to obtain as much as 21 combined treatment. Each experimental unit consisted of 3 plants, bringing the total as many as 63 plants.

Planting medium used in this study was a mixture of soil, manure quail dirt and chaff to volume ratio of 2: 2: 1 by volume polybag each of 4 kg dry weight wind up with polybag size 40x30 cm. Media preparation was done by mixing the three ingredients of the medium, and mix evenly using a hoe and dried. Media mix was dry wind and weighed weighing 4 kg, then put into polybag in 63 pieces.

Before the seeds were planted beforehand, they were given ameliorant material in the form of dolomite at a dose of 10 g/polybag given 2 weeks before planting and basic fertilizers such as manure SP-36 at a dose of 0.75 g/polybag given 3 days before planting by broadcasting and stir evenly with the ground. After the media was prepared, then executed the planting. Seedlings were ready for planting cut (cutting at the end of the onion bulb) using a sharp knife to break dormancy and accelerate the growth of shoots. Using the drill tool, created planting hole as deep as the average height of tubers. Onion bulbs put in the hole with movements such as turning the screw, so that the tip of the bulbs appear flush with the soil surface.

The first supplementary fertilization in the form of urea and KCl were given at 15 days after planting (DAP) with each dose of Urea 0.2 g/polybag and KCl 0.2 g/polybag. The second supplementary fertilizer at the age of 30 HST at the same dose on the first supplementary fertilizer. The parameters observed were plant height, number of leaves, number of tillers per hill, tuber wet weight, dry root weight, weight per cloves and clove number per clump. Data were analyzed by analysis of variance (ANOVA) using SPSS Statistics 20 and tested further with different test average Duncan Multiple Range Test (DMRT) at 5% level, when the F test showed significant effect (Steel and Torrie 1995).

RESULTS AND DISCUSSION

Components of Growth

The average yield plant growth plant height, number of leaves and number of tillers per hill is presented in Figure 1-2.

Plant Height

The highest plant height obtained was 44,7cm Pancasona varieties, followed by luring varieties and Mentes varieties 43.2 cm to 42.7 cm. From Figure 1 shows that the maximum plant height reached by the onion crop in the seventh week and the eighth week. Such circumstances are influenced by genetic traits possessed by the three red onions, which influenced plant height (Putrasamedja, 2010). The big difference in maximum plant height alleged differences in the outbreak of dormancy in each variety. According to Gardner et. al. (1985), that the growing power and plant growth is strongly influenced by factors outside and inside. Factor in one of which is a genetic trait of these varieties. While external factors are climate, temperature, humidity, rainfall, nutrient availability and intensity of sunlight.
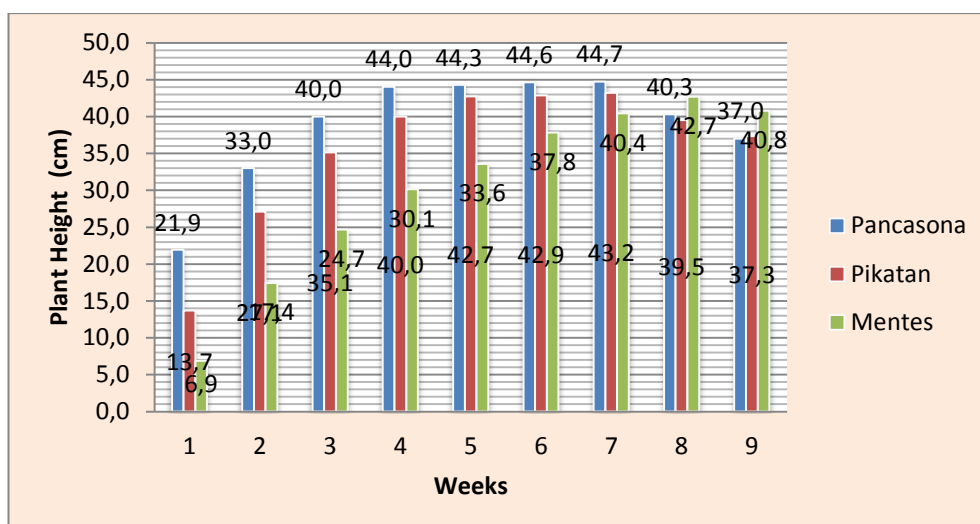
Figure 1. Graph the average growth of plant height (cm) three VUB shallots in the first week until the ninth week.

Number of Leaves

The amount of the three leaf onion varieties showed a tendency to grow until the age of 5 weeks after planting (WAP), but at age 6 to age 9 is starting to decline because of dead leaves. The highest number of leaves obtained Pancasona varieties by 45 strands, and is followed by 42 strands Pikatan varieties and Mentes varieties 36 strands (Figure 2). The number of leaves produced between varieties produced varies, according Sofiari et. al. (2009) variation between the number of leaves onion varieties indicates that the number of leaves are very sensitive to the influence of environmental conditions to grow. Pikatan varieties and Pancasona varieties seem to adaptive trait that seems to indicate quite as having been planted in the previous study.
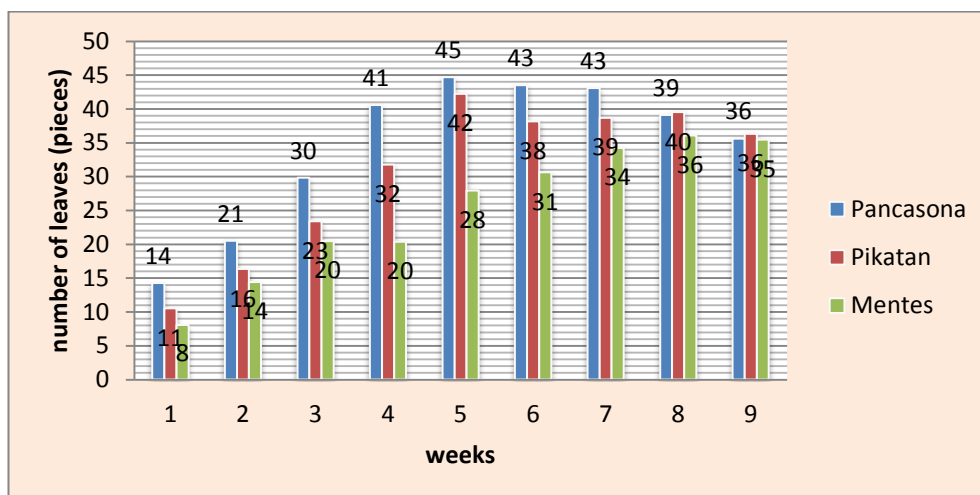

Figure 2. Graph the average number of leaves (pieces) three VUB shallots in the first week until the ninth week.

Number of Tillers

Observations number of seedlings is done when the plants aged 6 to 9 WAP. This observation is based on the formation of saplings to the generative growth phase three crops of onion. The average maximum number of saplings each onion varieties were not significantly different based on the statistic analysis (Table 1). Nevertheless Mentes varieties and varieties Pikatan has the highest number of tillers the number of each rod 14.7 and 14.29 rods. According Sumarni et. al. (2012) the number of tillers shallots are more determined by genetic factors rather than factors fertilization.

Table 1. Graphs number of leaves (pieces) of each variety in the first week until the ninth week.

Treatment (Variety)	Number of Tillers (stems)
Pikatan (V1)	14,29 a
Pancasona (V2)	14,00 a
Mentes (V3)	14,71 a

Description: The numbers in the same column followed by the same letter show no significant difference at 5% level DMRT.

Component Results

The mean weight of tuber yield components are wet, dry bulb weight, bulb weight per cloves and clove number per clump is presented in Table 2.

Table 2. Average yield components of three red onions VUB.

Treatment (Variety)	Wet Weight (g)	Dry Weight (g)	Weight Cloves (g)	Amount of Cloves
Pikatan (V1)	98.26 [a]	82.59 [a]	5.89 [c]	16.43 [a]
Pancasona (V2)	103.83 [a]	73.51 [a]	3.95 [a]	17.43 [a]
Mentes (V3)	116.12 [a]	89.70 [a]	4.75 [b]	17.43 [a]

Description: The numbers in the same column followed by the same letter show no significant difference at 5% level DMRT.

Statistical analysis showed that onion varieties tested were not significantly different ($P>0.05$) to the variables of heavy wet bulb, tuber dry weight and number of cloves per clump. But significantly different ($P<0.05$) at the variable weight of tuber per cloves in treatment Pikatan varieties of 5.89 g and the lowest in Pancasona varieties. According Sinaga *et al*. (2013) that these varieties in the conditions within their growth, if not in a fit condition there will be no development of character of these plants.

Plant growth is the accumulation of dry matter of plants per unit area per unit time. Plant dry matter is a picture of translocation of photosynthesis (photosynthate) to all parts of the plant so that it can be said the rate of growth of plants is largely determined by the broad leaves of a plant that is able to intercept direct sunlight to the maximum rate of photosynthesis and subsequent crop. The rate of plant growth is the increasing weight of the community of plants per unit area in unit time. Net assimilation rate will also be higher so that the rate of plant growth will increase (Pujisiswanto and Pangaribuan, 2008).

CONCLUSION

Pancasona, Mentes and Pikatan varieties able to adapt well, while Pikatan and Mentes Varieties have a higher yield than Pancasona varieties, it is shown from the wet weight, dry weight and the weight of tuber per cloves.

ACKNOWLEDGEMENT

Authors would like to express gratitude to Mr. Dedi Junaidi, SP who have helped during the course of research in the field.

REFERENCES

Gardner, P.G., R.B. Pearee and T.L. Mitchell. 1985. Physiology of crop plants. The Iowa State University Press. U.S.A 428 p.

Kusmana, R.S. Basuki, dan Kurniawan, H. 2009. Uji adaptasi lima varietas bawang merah asal dataran tinggi dan medium pada ekosistem dataran rendah brebes. *Jurnal Hortikultura*. 19 (13) : 281-286.

Pujisiswanto, H. danD. Pangaribuan. 2008. Pengaruh dosis kompos pupuk kandang sapi terhadap pertumbuhan dan produksi buah tomat. Prosiding Seminar Nasional Sains dan Teknologi-II. Universitas Lampung, 17-18 November 2008. hal: 11-19.

Purbiati, T. 2012. Potensi pengembangan bawang merah di lahan gambut. Jurnal Litbang Pertanian 31 (3) : 113-118.

Putrasamedja, S. 2010. Adaptasi klon-klon bawang merah (*Allium ascollonicum* L.) di Pabedilan Losari-Cirebon. Agritech, Vol. XII No. 2 : 81-88.

Sinaga, E.M., Bayu, E.S. dan Nuriadi, I. 2013. Adaptasi beberapa varietas bawang merah (*Allium ascollonicum* L.) di dataran rendah Medan. Jurnal Online Agroekoteknologi, Vol. 1. No. 3 : 404-416.

Sofiari, E., Kusmana dan R.S. Basuki, R.S. 2009. Evaluasi daya hasil kultivar lokal bawang merah di Brebes. *J. Hort*., Vol. 19. No. 3. hlm. 275-280.

Steel, R.G. dan J.H. Torrie. 1995. Prinsip dan Prosedur Statistika: Suatu pendekatan bometrik. P.T. Gramedia Pustaka Utama. Jakarta.

Sumarni, N., Rosliani, R., dan R.S. Basuki. 2012. Respon pertumbuhan, hasil umbi, dan serapan hara NPK tanaman bawang merah terhadap berbagai dosis pemupukan NPK pada tanah alluvial. J. Hort., Vol. 22. No. 4. hlm. 365-374.