

YIELD TRIAL OF CASSAVA CLONES IN NATAR SOUTH LAMPUNG

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ABSTRACT

The objective of this was to evaluate promising cassava clones in preliminary trial. Two units of experiment (Experiment I and II) were conducted in Unit Research Station, Natar, South Lampung; each experiment consisted of two replications. Experiment 1 evaluated 21 clones, compared to standard cultivar UJ 3. Experiment 2 evaluated 23 clones, compared to standard cultivar UJ 3 and UJ 5. The planting distance was 100 x 50 cm. The results of Experiment 1 showed that the fresh root weight per plant (FRWPP) of clones Bayam Liwa 4, Bendo 3, CMM 96-1-110, CMM 96-1-105, CMM 96-1-3, Duwet 1, Duwet 3, MU 111, SL 103, and SL 35 was quantitatively higher than that of UJ 3. FRWPP of Bayam Liwa 4, MU 111, and UJ 3 was 4458, 4216, and 2092 gram per plant respectively. The starch rendement of SL 35, Duwet 3, MU 111, CMM 96-1-105, Duwet 1, and UJ 3 was 36, 30, 27, 26, and 23% respectively. The Results of Experiment II indicated that FRWPP of CMM 96-1-105, MU 111, UJ 3 100116 MB-2, T 190414, Malang 6-101, UJ 3 and UJ 5 was 3742, 3425, 3392, 3075, 3025, 1208, and 2342 gram per plant respectively. The starch rendement of MU 111 = 29%, SL 221= 28%, SL 36= 27%, CMM 25-27-3= 26%, CMM 25-27-172=26%, UJ 3= 12%, and UJ 5= 15%.

Keywords: clones, *Manihot esculenta*, yield trial, starch content

INTRODUCTION

Cassava (*Manihot esculenta* Crantz) is a crop originating from Southern America. The nutrition content of cassava consists of carbohydrates (34.7 g / 100g), protein (1.2 g / 100g) (Soetanto, 2008) as well as starch and high levels of free sugar (Carvalho *et al.*, 2004). Cassava production in Indonesia has not been able to meet consumer demand both as a raw material of food and industrial raw materials. The low level of cassava production is may be due to the limited use of high yielding varieties are high yielding and lack of fertilizer use (Karama, 2003). One way to increase the production and productivity of cassava is with the use of high yielding varieties. The procedures to develop superior varieties of cassava include germplasm collection, characterization, selection, creation or expansion of genetic diversity, genetic diversity selection after expansion, evaluation and testing, and release of varieties. (Utomo, 2015).

Aldiansyah and Simatupang (2012) conducted an evaluation of vegetative and generative character clones of cassava in the village of Muara White South Lampung Natar which states that among 40 clones were evaluated earned 10 best clones are clones CMM 97-6, 2-16 CMM, CMM 21 -7, 1-10 CMM, CMM 20-2, 38-7 CMM, CMM 36-5, Duwet-3, Duwet- 1 and temple. Putri et al. (2013), evaluated the diversity of agronomic characters of F1 cassava clones derived from female parents UJ 3, CMM 25-27, and Mentik Urang. Sukmawan (2017) evaluate morphologic and Agronomic character 20 clones in Lampung. The objective of this was to evaluate promising cassava clones in preliminary trial in Natar, South Lampung.

MATERIALS AND METHODS

This study consisted of two experiments, Experiments 1 and 2 conducted at the Field Research Station of Unila at Natar, South Lampung. Each trial consisted of two replications. Experiment 1 evaluated the 21 clones, compared with standard cultivars UJ 3. Experiment 2 evaluated 23 clones, compared with standard cultivars UJ 3 and UJ 5. One experimental unit consisted of 10 cuttings of the clones planted in a single row. Planting distance was 100 cm x 50 cm. Planting was done in January 2016.. Plants fertilized 300 kg NPK (16:16:16) two weeks after planting. Weeds were controlled both manually and using herbicides.

RESULTS AND DISCUSSION

Experiment 1

Bayam Liwa 4, Bendo 3, CMM 96-1-110, 96-1-105 CMM, CMM 96-1-3, Duwet 1, Duwet 3, MU 111, SL 103, and SL 35 showed a higher yield than the clone UJ 3 quantitatively. The fresh root weight per plant of Bayam Liwa 4, MU 111, Duwet 1, CMM 96-1-3, and UJ 3 was 4458, 4217, 3317, 3225 and 2092 g respectively. The starch rendement of clone SL 35, Duwet 3, MU 111, CMM 96-1-105, Duwet 1 and UJ 3 was 36, 30, 27, 27, 26 and 23% respectively . Number of fresh root per plant clone MU 111, Bayam Liwa 4, Bendo 3, Duwet 1 and UJ 3 was 14.13, 12, 11, and 9. The harvest index CMM 96-1-110, Bayam Liwa 4, SL 103 and UJ 3 was 72%, 67%, 61% and 57% respectively.

Experiment 2

Quantitatively, the fresh root weight per plant of clone BL 1, CMM 96-1-105, 25-27-281014 CMM, CMM 25-27-172, 25-27-3 CMM, CMM 25-27 MB1, Gayor, Malang 6-101, MU 111, MU 22, SL 221, SL 87, SL36, T 190 414 was higher than standard clones UJ 3 and UJ 5. The fresh root weight per plant of clones CMM 96-1-105, MU 111, UJ 3 MB-2 100 116, T 190 414, Malang 6-101, UJ UJ 3 and 5 is 3742, 3425, 3392, 3075, 3025, 1208, and 2342 grams. The starch rendement of MU 111 = 29%, 28% SL 221, SL 36 = 27%, 25-27-3 = 26% CMM, CMM 25-27-172 = 26%, 3 = 12% UJ and UJ 5 = 15%. Number of fresh root per plant clones T 190 414 Branching, Gayor, Malang 6-101, MU 22, BL 1, UJ 3, and UJ 5 was 15,10, 10, 10, 10, 6, and 9 respectively. Harvest index of UJ 3 small clones, CMM 25-27 MB 1, SL 87, CMM 25-27-281014, T 190 414 Branching, UJ3, and UJ 5 each - each is 68%, 67%, 66%, 63%, 63 %, 47% and 58% respectively.

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Tabel 1. The selected best five clones based on the root number and root weight per plant

No	Clones	Root number per plant (g)	Clones	Jumlah Ubi per Tanaman (ubi)
1	Malang 4	6442	MU 111	14
2	Bayam Liwa 4	4458	Bayam Liwa 4	13
3	MU 111	4217	Bendo 3	12
4	Duwet 1	3317	Duwet 1	11
5	CMM 96-1-3	3225	Malang 4	11
	UJ 3	2092	UJ 3	8,5

Tabel 2. The selected best five clones based on harvest index and starch rendement

No	Clones	Starch rendement (%)	Clones	Harvest index (%)
1	SL 35	35,7	CMM 96-1-110	72,1
2	Duwet 3	29,6	Bayam Liwa 4	66,7
3	MU 111	26,9	Malang 4	62,9
4	CMM 96-1-105	26,6	SL 103	61,1
5	Duwet 1	26,3	UJ 3	57,4
	UJ 3	23,1		

Tabel 3. Promising clones based on the root number per plant, root weight per plant (g), harvest index (%), starch rendement (%), productive branching and color of root pulp (parenchyma)

No	Clones	Root number per plant	Root weight per plant (g)	Starch rendement (%)	Harvest index (%)	Level number of reproductive branches	Color of root pulp (parenchyma)
1	MU 111	14 ⁽¹⁾	4217 ⁽³⁾	26,9 ⁽³⁾	53,9	0	Cream
2	Bayam Liwa 4	13 ⁽²⁾	4458 ⁽²⁾	23,2	66,7 ⁽²⁾	0	Yellow
3	Bendo 3	12 ⁽³⁾	3050	25,8	48,0	2	Yellow
4	Duwet 1	11 ⁽⁴⁾	3317 ⁽⁴⁾	26,3 ⁽⁵⁾	50,3	0	Cream

5	Malang 4	11 ⁽⁵⁾	6442 ⁽¹⁾	23,8	62,9 ⁽³⁾	0	Cream
6	CMM 96-1-3	2	3225 ⁽⁵⁾	21,6	49,1	1	Cream
7	SL 35	5	1108	35,7 ⁽¹⁾	45,7	0	Cream
8	Duwet 3	10,5	2842	29,6 ⁽²⁾	51,7	0	Yellow
9	CMM 96-1-105	5,5	2408	26,6 ⁽⁴⁾	46,1	1	Cream
10	CMM 96-1-110	8	2842	22,6	72,1 ⁽¹⁾	0	Cream
11	SL 103	7	3160	24,9	61,1 ⁽⁴⁾	0	Cream
12	UJ 3	8,5	2092	23,1	57,3 ⁽⁵⁾	0	Cream

Tabel 4. Five clones based on the root number and root weight per plant

No	Clones	Root number per plant	Clones	Root weight per plant (g)
1	T 190414 Bercabang	14,8	CMM 96-1-105	3741,7
2	Gayor	10,0	MU 111	3425,0
3	Malang 6-101	10,2	UJ 3 110116 MB-2	3391,7
4	MU 22	9,7	T 190414 Bercabang	3075,0
5	BL1	9,8	Malang 6-101	3025,0
	UJ 3	6,0	UJ 3	1208,3
	UJ 5	9,2	UJ 5	2341,7

Tabel 5. Five promising clones based harvest index and starch rendement

No	Clones	Harvest index (%)	Clones	Starch rendement (%)
1	UJ 3 Kecil	67,48	MU 111	28,83
2	CMM 25-27 MB 1	66,53	SL 221	27,64
3	SL 87	66,11	SL 36	27,13
4	CMM 25-27-281014	63,47	CMM 25-27-3	26,08
5	T 190414 Bercabang	62,87	CMM 25-27-172	25,74
11	UJ 3	47,17	UJ 3	11,71
12	UJ 5	57,93	UJ 5	15,20

Tabel 6. 16 promising clones based on the root number per plant, root weight per plant, harvest index, starch rendement (%), reproductive branches, and color of root pulp(parenchyma)

No	Clones	Root number per plant	Root weight per plant (g)	Harvest index (%)	Starch rendement (%)	Level number of reproductive branches	Color of root pulp (parenchyma)
1	T 190414 Bercabang	14,8 ⁽¹⁾	3075,0 ⁽⁴⁾	62,87 ⁽⁵⁾	21,69	1	Cream
2	Gayor	10,0 ⁽²⁾	2800,0	62,54	20,35	0	White

3	Malang 6-101	10,2 ⁽³⁾	3025,0 ⁽⁵⁾	51,08	21,16	0	Cream
4	MU 22	9,7 ⁽⁴⁾	2600,0	46,56	19,23	0	White
5	BL 1	9,8 ⁽⁵⁾	2758,3	53,98	15,16	3	Cream
6	CMM 96-1-105	7,8	3741,7 ⁽¹⁾	59,06	21,92	0	Cream
7	MU 111	6,9	3425,0 ⁽²⁾	54,83	28,83 ⁽¹⁾	0	Cream
8	UJ 3 110116 MB-2	10,2	3391,7 ⁽³⁾	61,96	23,74	0	White
9	UJ 3-Kecil	8,5	2008,3	67,48 ⁽¹⁾	23,37	0	Cream
10	CMM 25-27 MB1	7,8	2900,0	66,53 ⁽²⁾	21,78	1	White
11	SL 87	7,7	2466,7	66,11 ⁽³⁾	22,67	0	White
12	CMM 25-27-281014	8,0	2816,7	63,47 ⁽⁴⁾	25,43	0	Cream
13	SL 221	8,0	2541,7	51,76	27,64 ⁽²⁾	0	White
14	SL 36	9,2	1866,7	54,32	27,13 ⁽³⁾	0	White
15	CMM 25-27-3	8,7	2700,0	61,79	26,08 ⁽⁴⁾	1	Cream
16	CMM 25-27-172	6,3	2666,7	57,07	25,74 ⁽⁵⁾	0	White
