The Adaptation Assessment Of Superior Cassava Varieties On Yellow-Red Podsolic Soil

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ABSTRACT: The cassava demand was predicted to increase, cause now there were some derivative product of cassava. It is need efforts to increasing the national cassava productivity, by effective, efficient and optimal of cassava plantation. The efforts that could be done were enhance of plantatation system, use the superior cassava varieties, land treatment and others. One of the influence factor to application of cassava varieties in the plantation was adaptation that cassava varieties to plantation land. In Lampung Province there were some kind of land like Podsolic, Aluvial, Latosol. The research were done at The Starch Technology Center, Lampung.. The research purpose were to show the comparison of growing factor and productivity of OMM 9908-4, Kasersat, Thailand and Kaspro cassava varieties on the yellow-red podsolic land. The plantation implementation were done at 0.5 ha for every variety, used 20-30 cm stem-seed plant that cutting from stem center of 8 month's cassava plant. The land treatment were Plow-I, Plow-II and Ridger. Plow-II was done after 2 week Plow-I .Ridger was done by 25-30 cm depth of land treatment. The fertilization were done twice, by Urea, SP36 and KCl at the 1 month old and 4 month old plants. The harvesting were done at 12 months old plants. The observed parameter were plant vegetative (plant height, stem diameter) and plant generative (stem weight, tuber weight, tuber diameter), starch content and productivity. The research result shown that the increase in diameter were shown for all varieties with increasing plants old. The Thailand variety shown highest on tuber weight, although the Kasersat variety has a highest on tuber diameter. The fourth varieties has high enough productivity, about 27-35 ton/ha. In general the fourth kind of cassava varieties could be development and plantanted with Kasersat variety shown the best varieties on the yellow-red podsolic soil.

Keywords: cassava, podsolic, vegetative, productivity

INTRODUCTION
In Indonesia, the cassava (Manihot esculata) was the 3rd of fundamental food after rice and corn. The cassava have been plantated for along ago by the farmer, cause the plantation process was not difficult. The cassava demand was predicted to increase, cause now there were some derivative product of cassava. This condition would be give effect on increasing cassava price, if the cassava productivity would not increased. It is need effort to increasing the national cassava productivity, by effective, efficient and optimal of cassava platation. The efforts that could be done were enhance of platantion system, use the superior cassava varieties, land treatment and others. By The Indonesia Statitic Center Agency /BPS (2012), until March 2012 Indonesia have been importend cassava about 6.399 ton or equal with US$ 1.6 million. This was contradiction condition, cause Indonesia should be a cassava exporting nation. Figure.1 shown the production and plantation area of cassava in Indonesia until 2011.

Figure.1: The production and plantation area of cassava in Indonesia until 2011.

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The national cassava productivity could be increased, cause the the plantation area at outside Java, like Sumatera, Kalimantan and Papua were still wide. By The Indonesia Statistic Center Agency (2012), until 2012 the national cassava production about 23.712.029 ton. Lampung province was one of center of cassava production in Indonesia. At 2011, the cassava production at Lampung about 9.017 million ton by the plantation areal 360 ha, or the average productivity about 24.9 ton/ha (BPS 2012). This productivity were higher than the 19.8 ton/ha of national average productivity Some cassava varieties could be give 40-50 ton/ha productivity by the right plantation system. That data shown that there were opportunity to enhance cassava productivity by use the appropriate superior varieties and the right plantataion technology. Some cassava varieties have been released by Indonesia Agriculture Department and have been plantated by the farmer, like Malang-6, Adira-4, UJ-3 and UJ-5. Those varieties have a potentially of high productivity. At Lampung province, the cassava varieties that the farmer usually used were Karsesat, Thailand and Kaspro. Those varieties have high starch content and productivity. One of the influence factor to application of cassava varieties in the plantation was adaptation that cassava varieties to plantation land. In Lampung Province there were some kind of land like Podsolic, Aluvial, Latosol. At Starch Technology Center, The Agency for the Assessment and Application Technology, Center of Lampung, the kind of land was yellow-red podsolic. The characteristic of yellow-red podsolic land were red to yellow land colour, clay land texture, high content of Al and Fe. The research were done at The Starch Technology Center, Lampung to get a high adaptation casasava varieties to yellow-red podsolic land. The research purpose were to show the comparison of growing factor and productivity of OMM 9908-4, Kasersat, Thailand and Kaspro cassava varieties on yellow-red podsolic land.
RESEARCH METHODS

- The plantation implementation were done at 0.5 ha for each variety.
- The used cassava varieties in this research were OMM 9908-4, Kasersat, Thailand and Kaspro.
- The used seed plant were 20-30 cm of stem cutting from stem center of 8 month’s cassava plant.
- The land treatment were Plow-I, Plow-II and Ridger. Plow-II was done after 2 week Plow-I. Ridger was done by 25-30 cm depth of land treatment, than the guludan were make by 80 cm distance.
- Planting dead plants were done at 1-3 weeks old plant. Planting dead plants were done if plants that die more than 20 %.
- The fertilization werec done twice, first by Urea 100 kg/ha, SP36 100 kg/ha and KCl 100 kg/ha at the 1 month old plant and secondly by Urea 50 kg/ha; SP36 50 kg/ha dan KCl 50 kg/ha at 4 months old plants.
- The weed control were done at 1 week old plants (pre emergence), for 2-3 months old plants (weeding-1) and at 3-4 month old plants or before fertilization-2 (weeding-2).
- The harvesting were done at 12 months old plants.
- The observed parameter were plant vegetative (plant height, stem diameter) and plant generative (stem weight, tuber weight, tuber diameter), starch content and productivity.

RESULT AND DISCUSSION

Vegetative Measurements
The observed vegetative parameter in this research were plant height and stem diameter. Figure 2 shown the relation between plants old to plant height, while figure 3 shown the relation between plants old to stem diameter.

From the research result, the Kaspro variety shown the stem diameter higher than another varieties. The OMM 9908-4 (UK II), Kasersat and Thailand varieties shown no diffeeren result. The increase in diameter were shown for all varieties with increasing plants old.

Generative Measurements
The observed generative parameter in this research were stem weight height, tuber weight, tuber diameter. Figure 4, 5, and 6 shown the relation of plants old to stem weight, tuber weight and tuber diameter, respectively.

For all varieties, the stem weight would be increased with increasing plants old. The Kasersat variety shown more a significant weight increase than another varieties.

At the beginning of filling tubers, the OMM 9908-4 (UK II) and Thailand varieties shown the higher on the filling tubers, however approaching the harvesting old, all varieties shown not significantly different in the filling tuber process. The Thailand variety shown highest on tuber weight, than Kaspro, OMM 9908-4 and Kasersat varieties.
Cassava usually has long tubers whose 50-80 cm length and 2-3 cm average diameter. For 10 month plants old, the Kasersat variety has the highest on tuber diameter. The water availability and land nutrient were influence to filling tuber process. The good soil conditions will improve the diameter and weight tubers.

**Productivity**
The productivity were observed during harvesting time or about 12 month plants old. Figure 7, shown the productivity for each cassava variety.

The Thailand has about 37 ton/ha of productivity. That value were highest than another varieties that use in this research. The productivity was influenced by climate and soil conditions. Availability of water was one of climate factors which is very influential to productivity. Lack of C/N ratio in the plants would decrease the productivity. This research show that Thailand variety was suitable to be planted on the yellow-red podsolic land.

**Starch Content**
The starch content were observed during harvesting time by gravimetry method. Figure 8. Shown the starch content for each cassava variety.

The amylase and non starch content were influenced by genetic factors, growing condition and plants old (Moorthy, 2002). This research show that Kasersat variety has 32% starch content, highest than Thailand variety (31%), Kaspro (30.1%) and OMM 9908-04 (29.3%)

**CONCLUSION**
1. Kasersat variety shown the best varieties on the yellow-red podsolic land. This assumption could be seen by good result on the vegetative growth, productivity and starch content.
2. In general the fourth kind of cassava varieties could be be development and plantanted on yellow-red podsolic land.

**REFERENCES**