THE GENETIC POTENCY OF PLANTAIN AGUNG SEMERU VARIETY FROM LUMAJANG REGENCY EAST JAVA INDONESIA

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ABSTRACT

Lumajang regency is one of the banana production centre in East Java having high- diversity of banana germ plasm. There are 33 cultivars of banana germ plasm in the regency, consist of eaten ripe and plantain. One of uniqe plantain used as the symbol of Lumajang regency is plantain Agung Semeru variety, the local superior variety of this regency. This variety can grow well at 450 – 650 m above sea level. The uniqueness of banana Agung Semeru variety can be seen by the number of sucker per cluster (only 1 – 2 suckers per cluster), the size of the finger (33 – 36 cm long and 19 cm around) and the number of hand per bunch (only 1 – 2 hand per bunch). Other characteristics of the variety are the thickness of fruit skin, the long period of fruit storage (3 – 4 weeks after harvesting) and the sweetness of fruit flesh. Even though the skin changes from yellow to black, the flesh still can be consumed, because it doesn't become soft. This variety also resistant to the Sigatoka disease compared to other plantain cultivars.

Key words: Banana germ plasm, superior variety, plantain Agung Semeru variety

Introduction

Banana especially plantain is already well known as tropical fruit and highly potencial to be developed in similar agroecological zone in East Java. Besides that, its taste, its nutrient content, vitamin and calory is also very useful to keep the body healthy.

Based on the growth requirements, plantain grow well from low land till the altitude of 1000 m above sea level, pH 4,5 – 7,5. Plantain has shallow roots, spread out under the soil and needs soil containing much organic matters.

Plantain var. Agung Semeru is one of new released variety. For this time being, it is become a trade mark of Lumajang, and widely consumed as processed product, such as chips, sale and powder. The main producer area in Lumajang is at Senduro district.

Genetic Resources

Plantain var. Agung Semeru found at Senduro district Lumajang, its originally growing in this location, spread out at 12 villages. Besides that, there are 33 cultivars of banana germ plasm in those regency, consist of eaten ripe (Emas, Ambon, Susu variety, ect) and plantain (Kepok, Byar, and Embug variety ect.). Based on the information provided by Extension Office for Agriculture, this varieties was already exist since long time ago.

Propagation of this varieties is ussually done vegetatively by using sucker or bulb. Based on the genetic characteristics (morphology, growth characters and production) of two kinds of plantain grown at two districts, namely Senduro and Pasru Jambe and supported by isozym analysis, the two of them belong to one varieties, var. Agung Semeru.

Field test and Observation

Material and Method

Field test and observation was done in 2003 - 2006, at two districts namely Senduro and Pasru Jambe, using an interview method and observation. Interview using a questionaire actively involved farmers, extensionists and researchers.

Observation was done on 10 – 24 month-old- plantain, by identifying and characterizing in the field and laboratory. Pests and diseases observation was done using a survey method on the existing plantation at the two locations.

Result and Discussion

The average of plantation grown at Senduro and Pasru Jambe was presented in Table 1, while farmer's profile in Table 2 and average pests and diseases attack in Table 3.

Table 1. The average and production of plantain var. Agung Semeru at Senduroand Pasru Jambe, lumajang

The name of district	Wide (Ha)	Populatin (number of plants)	Number of farmers
Senduro	323,0	209.950	8.398
Pasru Jambe	217,7	261.240	528

Agrict. Dept. of Lumajang regency, 2005

Table 2. Farmer' profile of plantain var. Agung Semeru in Lumajang regency

The name of farmers	Location	Number of plants (stem)	Age of plant month	Elevation
Nanang Khosim	Kandangan village, Senduro	150	10 – 15	650 m above sea level
Sugiyo	Kandang Tepus village, Senduro	30	18 – 24	600 m above sea level
Sucipto	JambeArum-village, Pasru Jambe	1500	12- 15	450 m above sea level

Agrict. Dept. of Lumajang regency, 2003

Table 3. Average pests and diseases on attack, intensity and population of plantain var. Agung Semeru at Senduro- Lumajang regency

pests and diseases	Attact (%)	Intensity (%)	Population	
Erionata thrax	57	34,57	22,43	Moderat
Nacolea octosema (*scab moth*),	15	4,13	-	Resistant
Sigatoka disease	26,67	4	-	Resistant

Outstanding characteristics of plantain var. Agung Semeru

Based on:

1. It's usefulness, it can be consumed as processed food, raw material in home industry, such as fried banana, chips, sale, dodol, jams, wine, dried chips and powder.
2. It's unique performance, with big size compared to other varieties of plantain
3. Resistency towards pests and diseases: very resistent towards *N. octosema, E thrax,* and fusarium
4. Yield: flowering 8 – 10 months after planting with 10 – 20 kg/ bunch of production
5. Having 1 – 2 suckers/ cluster, so that it will be efficiently managed
6. Having relatively thick and hard fruit skin, so that self life will be longer and its' taste become sweeter

Weaknesses

Weaknesses caused by genetic factor, plant regeneration after three-years of growing, as younger sucker grown on old-roots, so it should be removed and replanting in other location.

Limited number of suckers resulted limited production of suckers to be grown (multiplied), so it needs rapid propagation through bit production and tissue culture

Consumers' preference

This plantain is widely consumed for household or home industry, for its'colour of fruit flesh (reddish yellow), compact structure and fresh and sour taste that make it difference with other varieties. Based on the size of finger (±19 cm of diameter, 33 – 36 cm of fruit length) and life storage (± 3 – 4 weeks after harvest), it is really prefered as processed food. Even its'fruitskin become black, it is still consumeable, its'fruit flesh is not soft. In mature condition, its' chip colour is yellow so consumer prefered to this

Suitable Region

The altitude of Senduro district, where this plantain grown was 475 – 600 m above sea level, dominated by oxisol soil type, with rainy season September – May, while day season is June till August (Oldeman), with less than three months of dry months, it showed moist condition (Saraswati et al, 2001). Average yearly rainfall (for 10 years) 2825.8 mm with 138 days of rainy.

To meet the demand of plantain var. Agung Semeru, that tended to be increased more and more, extensification should anticipated to provide raw material for home industry by considering the growth requirements as stated in Table 4, similar agroecological condition.

Table 4. Growth requirements for planting var. Agung Semeru grown at Sendduro district, Lumajang

Characteristics of growth requirement	Unit
Annual average temperature (^{o}C)	22 ^{o} - 28 ^{o} C
Altitude	475 - 600 m above sea level
Yearly rainfall	2825,8 mm
Day season (< 100 mm)	< 3 bulan
Tecsture *	Clay
C/N ratio*	7
Soil pH	6
Drainage	good
Sloping rate	< 18 %

Description

Observation component	Result
Origin	Kandangtepus village, Senduro, Lumajang
Age of plant	18 month
Age of flowering	8 – 10 month after planting
Age of harvesting	12 – 14 month after planting
Stem	Erect
Plant height	6 – 8 m
Colour of stem	Reddish - green
Colour of base - stem	Brownish - red
Diameter of stem	60 – 80 cm
Width of canopy	3 – 4 m
Number of leaves	8 – 11 helai
Length of leaf	1,5 m
Width of leaf	60 – 70 cm
Angle of leaf	30 ^{o}
Shape of leaf	Flat - long
Leaves colour	Shiny-dark-green above, light-green under, main leaf-stem having red colour
Edge of leaf	Acuminate
Leaf border	Smooth, waving and having purplesh - red
Leaf structure	One on another
Flower	Oval
Flower sheat colour	Outside: Brownish – red Inside: Light - pink
Length of flower	70 cm
Diameter of flower	30 cm
Length of flower stalk	69,5 cm
Number of sucker/ cluster	1-2
Number of hand/ bunch	1 – 2
Number of finger/ hand	1, 3, 10 – 18
Fruit weight per bunch	10 – 15 kg

Observation component	Result
Bunch diameter	122 cm
Length of stalk'bunch	58 cm
Diameter of stalk'bunch	18 cm

Weight of fruit finger	500 – 650 gr
Length of fruit finger	33 – 36 cm
Diameter of fruit finger	19 cm
Length of finger stalk	5,17 cm
Fruit skin thickness	0,34 cm
Fruit flesh colour	Redish - yellow
Fruit flesh colour of optimal ripe	Light - pink
Colour of processed plantain	
- Cooked	Yellow
- Chips	Yellow
Shape of horizontal fruit	Rounded
Fruit taste at optimal ripe	Sweet with lignt sour
Chemical analysis of optimal ripe:	
Vitamin C (mg/ 100 gr fruit)	6,51
Sour (%)	0,515
Sugar (%)	9,88
Tecsture of fruit flesh (kg)	5,0
Chemical analysis of optimal ripe 20 minute after cooking	
Vitamin C (mg/ 100 gr fruit)	3,99
Sour (%)	0,66
Sugar (%)	7,27
Tecsture of fruit flesh (kg)	3,50
Fruit storage	3 – 4 weeks after harvesting
Pests and diseases resistency	
E. thrax	Moderat
N. octosema	Resistant
Sigatoka disease	Resistant

Conclusion

- This plantain grow well at 475 – 600 m above sea level
- The consumers' preference: Banana plantain of Agung Semeru variety can be used for: banana chip, banana cooking, banana flour, and others.

Besides that the fruit have long life storage

- Agung Semeru variety resistant to the Sigatoka disease compared to the other plantain cultivars

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