

# **DISEASE SEVERITY CERCOSPORA LEAF SPOT (*Cercospora henningsii*) AND STORAGE ROOT ROT OF 11 CASSAVA CLONES**

**Setyo Dwi Utomo<sup>1</sup>, Chintya Ningsih<sup>2</sup>, Titik Nur Aeny<sup>2</sup>, dan Radix Suharjo<sup>2</sup>**

<sup>1</sup>Agronomy and Horticulture <sup>2</sup>Department Plant Protection Department;  
Faculty of Agriculture, University of Lampung, Indonesia  
e-mail: setyo.dwiutomo@fp.unila.ac.id

## **ABSTRACT**

The objective of this study was to estimate disease severity *Cercospora* Leaf Spot (*Cercospora henningsii*) and storage root rot of 11 cassava clones. The study was executed in the field research station of University of Lampung, Bandar Lampung from October 2016 to May 2017. Completely-randomized block design was used with three replications. The treatment consisted of 11 clones, i.e., Cimanggu, Bendo 3A, Duwet 3A, BL 1A, UJ 5, GM-1, UJ 3, Sembung, BL2, Batak, and Mulyo 3. Each experimental unit consisted 10 plants in per row; the planting distance were 100 x 50 cm. Clones Mulyo 3 dan Duwet 3 showed disease severity of *Cercospora* brown leafspot (1.3 dan 2.5%) less than UJ 3 and UJ 5; overall, the disease severity of all 11 clones was less than 7%, Clones Cimanggu dan Bendo 3A showed disease severity of root rot (1.4 dan 1.7%) less than UJ 3 and UJ 5. The disease severity of BL 2 was 74% (very susceptible). The range of the disease severity of root rot all 11 clones was 0 – 74%.

**Keywords:** Cassava clones, *Cercospora. Henningsii*, brown leafspot, root rot

## **INTRODUCTION**

One of the objectives of cassava breeding was to develop cassava clones resistant to major pathogens causing diseases (Fig. 1). The objectives of this study was to estimate disease severity *Cercospora* Leaf Spot (*Cercospora henningsii*) and storage root rot of 11 cassava clones.

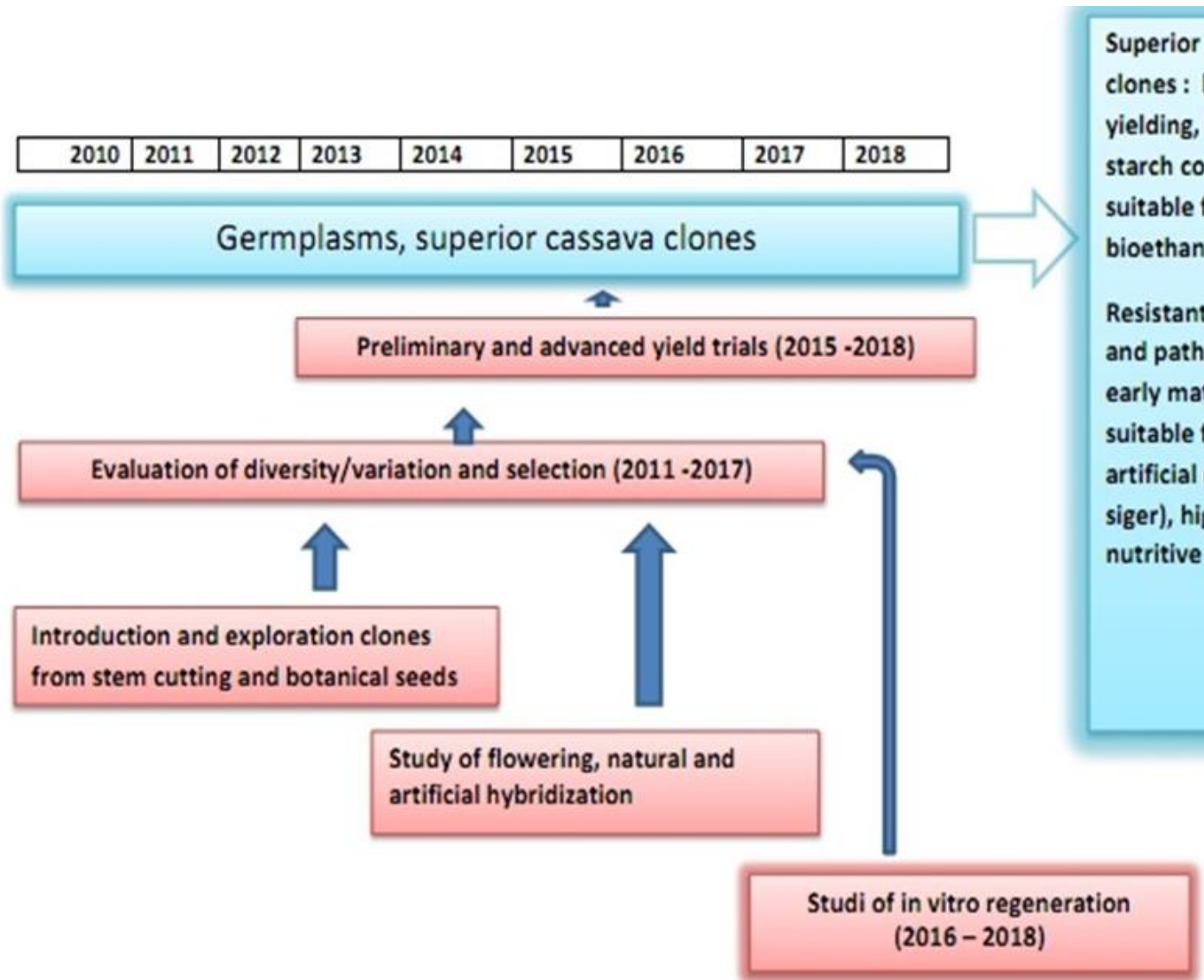


Fig. 1. Roadmap of cassava breeding at University of Lampung, i.e., to develop clones resistant to major pathogens

## MATERIALS AND METHODS

The study was conducted in the field research station of University of Lampung, Bandar Lampung from October 2016 to May 2017. Completely-randomized block design was used with three replications. The treatment consisted of 11 clones, i.e., Cimanggu, Bendo 3A ,

Duwet 3A, BL 1A , UJ 5, GM-1, UJ 3, Sembung, BL2, Batak , and Mulyo 3 (Fig. 2). Each experimental unit consisted 10 plants in per row; the planting distance were 100 x 50 cm. The disease severity of brown leafspot was scored scaled 0 – 5 (Fig.3)

I	II	III
Cimanggu	Mulyo 3	Bendo 3A
Bendo 3A	GM-1	Duwet 3A
Duwet 3A	Sembung TBB	BL-1A
BL-1A	UJ 5 TBB	Cimanggu
UJ 5 TBB	Batak TBB	UJ 3
GM-1	BL-2	Batak TBB
UJ 3	Cimanggu	Sembung TBB
Sembung TBB	Duwet 3A	GM-1
BL-2	UJ 3	UJ 5 TBB
Batak TBB	Bendo 3A	Mulyo 3
Mulyo 3	BL-1A	BL-2

Fig. 2. The layout of experiment

## DISEASE SEVERITY

$$S = \frac{\sum_{i=0}^{\infty} (ni \times vi)}{N \times Z}$$

KP = Keparahan penyakit (%)  
 n = Jumlah bagian tanaman yang memiliki kategori skala kerusakan yang sama  
 N = Jumlah tanaman yang di amati  
 v = Skor kerusakan dari tiap kategori serangan  
 Z = Skor kerusakan tertinggi

### Skor

- 0 = Tanpa serangan
- 1 = 0-10% permukaan tanaman atau bagian tanaman bergejala
- 2 = 10-25% permukaan tanaman atau bagian tanaman bergejala
- 3 = 25-45% permukaan tanaman atau bagian tanaman bergejala
- 4 = 45-75% permukaan tanaman atau bagian tanaman bergejala
- 5 = >75% permukaan tanaman atau bagian tanaman bergejala.

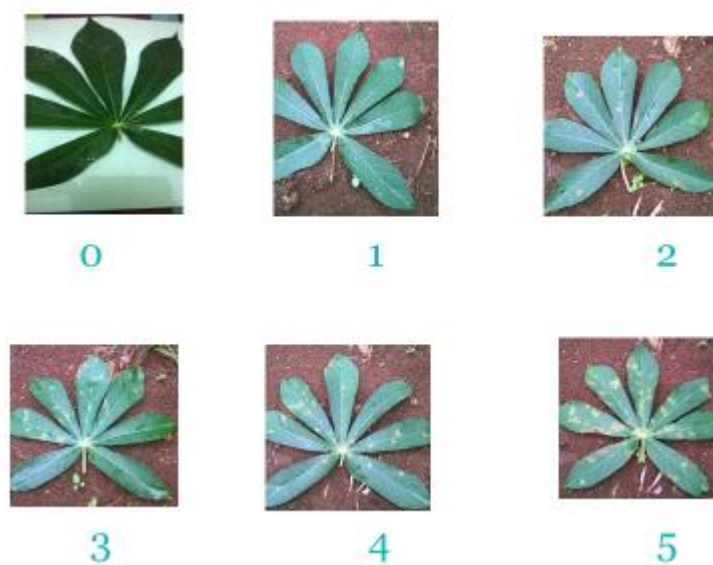


Fig. 3. The scores of disease severity of brown leafspot (*Cercospora heningsii*)

## RESULTS AND DISCUSSION

### Disease severity of brown leafspot

Klon	16	18	20	22	24	26		
Batak TBB	7,1	ab	3,0	2,9	bc	4,6	4,7	5,5
Bendo 3A	5,6	ab	3,9	2,9	bc	5,9	2,3	4,7
BL-1A	6,9	ab	4,0	6,4	a	5,3	4,0	7,9
BL-2	8,2	a	5,6	4,3	ab	5,0	5,9	5,9
Cimanggu	9,5	a	4,2	4,3	ab	6,8	4,2	9,0
Duwet 3A	3,5	bc	2,1	0,8	d	2,1	3,1	3,7
GM-1	2,5	bc	2,7	4,5	ab	3,4	2,2	5,4
Mulyo 3	1,5	c	0,1	0,6	d	0,9	1,5	3,0
Sembung TBB	6,7	ab	4,8	2,9	bc	4,9	4,5	9,6
UJ 3	2,7	bc	2,0	2,0	cd	3,2	2,2	4,0
UJ 5	3,8	abc	1,3	2,4	bc	3,8	1,4	4,9
Fhitung	2,7*		2,0 <sup>ns</sup>	6,6*		1,5 <sup>ns</sup>	1,4 <sup>ns</sup>	0,9 <sup>ns</sup>
KK	23,2		9,2	17,8		14,0	9,0	11,3
BNT	0,94		0,3	0,55		0,4	0,26	0,4

## Disease severity of brown leafspot

Batak TBB	4,7	Tahan
Bendo 3A	4,2	Tahan
BL-1A	5,7	Tahan
BL-2	5,8	Tahan
Cimanggu	6,3	Tahan
Duwet 3A	2,5	Tahan
GM-1	3,5	Tahan
Mulyo 3	1,3	Tahan
Sembung TBB	5,6	Tahan
UJ 3	2,7	Tahan
UJ 5	2,9	Tahan



Root rot (possible pathogens:  
*Sclerotium rolfsii*, *Fusarium* sp.)

**Disease incidence of root rot (10 months after planting)**

Batak TBB	6,7	Tahan
Bendo 3A	4,8	Tahan
BL 2	74,1	Sangat Rentan
BL-1A	8,3	Tahan
Cimanggu	0,0	Sangat Tahan
Duwet 3A	10,4	Moderat Tahan
GM-1	13,3	Moderat Tahan
Mulyo 3	15,9	Moderat Tahan
Sembung TBB	26,1	Moderat Rentan
UJ 3	37,0	Rentan
UJ 5	6,1	Tahan
Fhitung	2,2	
KK	26,6	
BNT	0,91	

**Correlation disease intensity and root weight per plant**

Penyakit	Bobot Ubi
Bercak Daun Coklat	0,30 <sup>tm</sup>
Bercak Daun Baur	-0,11 <sup>tm</sup>
Bercak Daun Bersudut	0,23 <sup>tm</sup>
Busuk Kering Ubi	-0,75*

### CONCLUSION

Clones Mulyo 3 dan Duwet 3 showed disease severity of Cercospora brown leafspot (1.3 dan 2.5%) less than UJ 3 and UJ 5; overall, the disease severity of all 11 clones was less than 7%, Clones Cimanggu dan Bendo 3A showed disease severity of root rot (1.4 dan 1.7%) less than UJ 3 and UJ 5. The disease severity of BL 2 was 74% (very susceptible). The range of the disease severity of root rot all 11 clones was 0 – 74%.