

# Variation in susceptibility of 'Grand Naine' (AAA) to *Colletotrichum musae*, one of the causal agents of crown rot, in relation to fruit position in the bunch

Ludivine Lassois<sup>1</sup>, M. Haïssam Jijakli<sup>1</sup>, de Lapeyre de Bellaire<sup>2,3</sup>

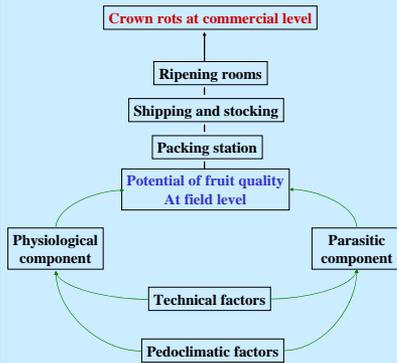
1. Gembloux Agricultural University, Plant Pathology Unit, Passage des Déportés 2, B-5030 Gembloux, Belgium. lassois.l@fsagx.ac.be

2. CIRAD, UPR 'Systèmes de culture bananes, plantains et ananas', TA B-26 / PS4, Boulevard de la Lironde, F-34398, Montpellier Cedex 5, France

3. CARBAP, Centre Africain de Recherches sur les Bananiers et Plantains, Centre de recherches de Njombé, Bureau de liaison BP 832, Douala, Cameroun.

## INTRODUCTION

Crown rot, caused by a parasitic complex, is one of the main post-harvest diseases affecting bananas. *Colletotrichum musae* is often regarded as one of the most prevalent fungi contributing to the crown rot complex. Geographical and seasonal variations in symptom expression have been observed for disease caused by *C. musae*. It has been suggested that this phenomenon results partially from variations at the level of fruit quality potential. Quality potential<sup>1</sup> is controlled by a physiological component, but also by a parasitic component, which appears as the level of banana contamination. The physiological component of the fruit quality potential determines fruit susceptibility, i.e. the response of the fruit to inoculum pressure. The aim of this study was to evaluate the within-bunch variability of fruit susceptibility to *C. musae* for better knowledge of the mechanisms influencing fruit susceptibility to crown rot. Bunches were harvested at the Diadia station (PHP, Njombé, Cameroon) and the susceptibility of each hand to *C. musae* was evaluated.



## MATERIAL AND METHOD

1 bunch/week  
During 10 weeks



900dd

Each hand  
From 1 to 8

3 clusters of 4  
bananas/hands

100µl *C. musae*  
10<sup>4</sup> conidia/ml



10 days at 13°C

Artificial ripening  
+ 3 days at 20°C

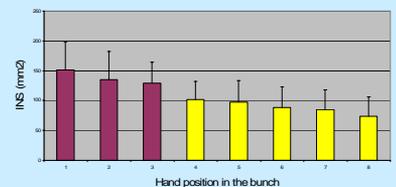
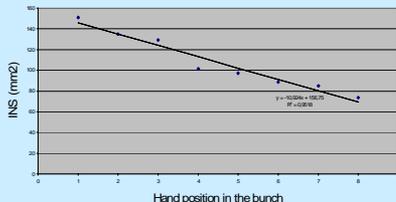
Internal necrotic surface  
mm<sup>2</sup>



Assessment of rot  
progression

## RESULTS

Statistical test showed highly significant ( $p < 0.001$ ) within-bunch variability in fruit susceptibility to *C. musae*. The fruits of hands 1 to 3 showed statistically the same susceptibility and appeared as the most susceptible, with an internal necrotic surface (INS) average of 138.3 mm<sup>2</sup>. The second statistical group comprised the fruits of hands 4 to 8 and had an INS average of 87 mm<sup>2</sup>.



Furthermore, the hand classification is an equidistant ordinal variable, which can be comparable with a quantitative one in calculations. Thus a strict linear correlation ( $R = 0.95$ ) between the INS and the hand position in the bunch are observed.

## CONCLUSION

The results have provided evidences for wide variations in the fruit susceptibility to crown rot which are related to the fruit position in the bunch. It is clear that not only the pedoclimatic and technical factors influenced the susceptibility of banana but others parameters which influence the physiological component of the individual fruit quality potential are involve. Fruit filling is the result of the photosynthetic conversion of light into assimilates, depending on the photosynthetic capacity of a banana plant, and the partitioning of these assimilates among the hands of the bunch. This partitioning leads to competition for assimilate. The data indicate that qualitative and quantitative differences in the assimilate supply through the fruit filling period seem to be linked to variations in the fruit susceptibility to crown rot. These results suggest that the fruit content in specific defence compounds implicated in the host/pathogen relationship could be a key factor in determining the level of fruit susceptibility.

## REFERENCES

1. Chillet, M. and L. de Lapeyre de Bellaire (1996). "Elaboration de la qualité des bananes au champ. Détermination de critères de mesure." *Fruits* 51(5): 317-326.