UNRAVELING THE SECRETS OF BANANA BUNCHY TOP DISEASE IN BURUNDI: VECTOR VARIETAL PREFERENCE AND ALTITUDE EFFECTS

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Introduction & Objectives

Introduction

• Banana Bunchy Top Disease (BBTD) was reported for the first time in Burundi in 1987.
• It is spread by an aphid (*Pentalonia nigronervosa*) as well as sucker exchange.
• It is not only confined to the Rusizi valley, as some cases have been reported in neighbouring highlands.
• All *Pentalonia nigronervosa* are able to acquire and spread the BBTD virus from an infected banana, regardless of altitude. Higher transmission rates and a lower incubation period is observed at lower altitudes.

Objectives:

• Establish the seasonal and spatial variation of *Pentalonia nigronervosa* populations at low and high altitudes.
• Identify whether *Pentalonia nigronervosa* has banana variety preferences.
**Materials and Methods**

- **Sites**: Cibitoke (1162m), Gitega (1646m), Kirundo (1409m)
- **Trial dates**: February 2011 - July 2012 during both dry season (May-October) and rainy season (November-April)
- **Variation of *Pentalonia nigronervosa***:
  - Installation of yellow traps in banana field (left picture).
  - Collection and counting of Pn from yellow trap (3x p/week).
- **Vector Varietal preference**:

<table>
<thead>
<tr>
<th>Varieties</th>
<th>Genome Group</th>
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<tbody>
<tr>
<td>BS089, Igisahira, Mbirabire, NSH20, NSH22, NSH42, Yangambi Km5</td>
<td>AAA</td>
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<tr>
<td>Prata, Kamaramasenge</td>
<td>AAB</td>
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<tr>
<td>FHIA-17, FHIA-25</td>
<td>AAAA</td>
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<td>FHIA-03</td>
<td>AABB</td>
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- Monthly data collection on aphids: number of winged and non-winged aphids (right picture).
Spatial and seasonnal variation in numbers of *Pentalonia nigronervosa*:

- The number of *Pn* was higher in dry season than the rainy season in all sites.
- The monthly average of *Pn* numbers per season (dry / rainy) per site were (87.9 / 48.5) for Cibitoke, (23.3 / 7.8) for Gitega and (7.4 / 2.0) for Kirundo.
- The maximum number of winged aphids per month was 193 in Cibitoke, followed by 93 in Gitega and 28.0 in Kirundo; all these peaks occurred in dry season.
Vector varietal preference:

- On the Chart of varietal preference, the number of Pentalonia nigronervosa is expressed in percentage terms.
- The percentages of non-winged (apterous) Pentalonia nigronervosa are far superior to those of winged.
- Varieties on which many winged and apterous aphids were found were Prata (22.1/54.9), Km 5 (19.9/47.5), NSH20 (17.6/41.1) and NSH22 (15.1/39.8).
Results obtained allow to conclude that:

- At low altitude sites in Burundi (Cibitoke), the movement of winged *Pentalonia nigronervosa* and therefore the spread of BBTV is more higher than at higher altitude (Gitega and Kirundo).

- *Pentalonia nigronervosa* population varies seasonally, with peaks in the dry season.

- AAA genome varieties (Prata, Yangambi Km5, NSH20 and NSH22) are potentially more susceptible to infection by BBTV, and increase the risk of disease spread by acting as virus reservoirs.
References

- Understanding banana bunchy top disease epidemiology in Burundi for an enhanced and integrated management approach

PLANT PATHOLOGY

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