Fruit flies harmful to mango in Haiti: host plant range and population fluctuations

Presentation of:

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Student PHD

Oral presentation in the 10th International Mango Symposium
Rep. Dominican, June 2013
Global context of mangoes in Haiti
MANGO PRODUCTION AREAS AND STUDY AREA
MANGO EXPORTS ARE LIMITED TO LESS THAN 5% OF THE LOCAL PRODUCTION

Varieties of Haitian mangoes exported: Francisque, Blanc & Corne

Import from USA

<table>
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<tbody>
<tr>
<td>Total</td>
<td>239,051</td>
<td>240,278</td>
<td>256,220</td>
<td>282,360</td>
<td>281,658</td>
<td>267,017</td>
<td>298,088</td>
<td>303,562</td>
<td>305,958</td>
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<td>156,548</td>
<td>164,193</td>
<td>173,630</td>
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<td>159,550</td>
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<td>185,279</td>
<td>182,754</td>
<td>186,807</td>
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<td>15,553</td>
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<td>20,582</td>
<td>30,334</td>
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<td>33,614</td>
<td>29,193</td>
<td>38,323</td>
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<td>Brasil</td>
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<td>26,937</td>
<td>36,040</td>
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<td>27,187</td>
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<td>23,088</td>
<td>24,679</td>
<td>25,774</td>
<td>23,193</td>
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<td>Guatemala</td>
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<td>10,314</td>
<td>9,550</td>
<td>8,259</td>
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<td>9,317</td>
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<td>12,881</td>
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<td>Haiti</td>
<td>10,195</td>
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<td>9,391</td>
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<td>8,053</td>
<td>7,964</td>
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Source: douanes US (code 000450)
Mango pests & diseases in Haiti
Objectives of the study of the bioecology of tephritid fruit flies harmful to mango in Haiti

- To determine the host plant range of two species of Anastrepha (A. obliqua and A. suspensa) and their phenology;
- To assess the relative abundance of both fly species on the main host fruits;
- To determine the population fluctuations of both species and factors, biotic and abiotic, that influence them;
- To identify essential floral or extra-floral resources for fruit flies and their natural enemies provided by wild and cultivated plants inside and around mango plantations.
Methodology

- Study conducted in two important mango production areas:
  - South-East (Jacmel, Cayes-Jacmel, Marigot)
  - South (Cayes, Camperrin)
- Survey with farmers and consumers
- Regular sampling of punctured fruits from potential host plants and incubation in the laboratory
- Identification of emerging fruit flies and parasitoid adults
Methodology (contd.)

- Monitoring of seasonal fluctuations of fruit flies populations with traps
- Exposition of *A. obliqua* pupae in the soil, every two months, to determine the rate of predation, especially by ants and other predators
- Determination of the diversity and abundance of flowering plants and fruit trees, botanic classification and phenological calendar of host-plants
- Monthly determination of the importance of the various natural enemies during the fruiting period on quadrates located inside and outside mango crops
Preliminary results

![Graph showing the number of fruit flies captured over time in different locations. The graph compares three locations: marigot, cayes jacmel, and jacmel. The x-axis represents the months from January to December, and the y-axis represents the number of fruit flies captured. The graph shows peaks and troughs in fruit fly numbers throughout the year.]
### Preliminary results

#### Essai 1 : sites du PNDCMF

<table>
<thead>
<tr>
<th>Method</th>
<th>Male</th>
<th>Femelle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maxi-trap</td>
<td>15.67</td>
<td>3.33</td>
</tr>
<tr>
<td>Better World</td>
<td>6.5</td>
<td>1.67</td>
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#### Essai 2 : Ferme privée

<table>
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<tr>
<th>Method</th>
<th>Male</th>
<th>Femelle</th>
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<tbody>
<tr>
<td>Maxi-trap</td>
<td>3.5</td>
<td>1</td>
</tr>
<tr>
<td>Better World</td>
<td>2.17</td>
<td>0.33</td>
</tr>
</tbody>
</table>
Period of susceptibility to fruit fly attacks of different host plants

Périodes de sensibilité des fruits aux mouches (Tephritidae) nuisibles

Avril

Manguier
Mombin
Cirouelle
Goyavier

Octobre

Go

Juillet

Mois de l’année

Fruits-hôtes extra-saison

Période de sensibilité

Période de "Cassure"

http://www.recettes-cuisine-afrique.info/?Papaye,284

Papaya case
Infestation rate and relative sensitivity to fruit fly attacks of alternate host plant species and mango varieties

- **LABICHE, 28**
- **MISKA VERT, 21**
- **FIL, 19**
- **CAROTTE, 9**
- **FRANCISQUE, 9**
- **ROND, 7**
- **ROSALIE, 7**
- **ZE KODENN, 0**
Perspectives

• List of different fruit fly species (biology, fluctuation and distribution),
• Phenology and period of sensitivity of their hosts plant,
• Relative susceptibility of the varieties of mango
• Confirmation of the presence of parasitoids of mangoes fruit flies.
With the collaboration of

- **S. Quilici**, CIRAD, UMR PVBMT, Saint-Pierre, La Réunion, France
- **A. Ratnadass**, CIRAD, UR Hortsys, F-34398 Montpellier, France
- **R. Scutt**, PNDCMF, DDASE-MARNDR, Jacmel, Haïti
- **J-F Vayssiéres**, CIRAD, UR Hortsys, Cotonou, Benin
THANK YOU FOR YOUR ATTENTION!!!