**Cropping systems with Plantain/Banana**

**In**

**Nigeria**

National Horticultural Research Institute

<table>
<thead>
<tr>
<th>Musa production country wide</th>
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<tbody>
<tr>
<td>Hectares</td>
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<tr>
<td>7,720,754</td>
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<tr>
<td>Cultivar group</td>
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</tr>
<tr>
<td>1 Cavendish AAA</td>
</tr>
<tr>
<td>2 Gros Michel AAA</td>
</tr>
<tr>
<td>3 other AAA dessert types</td>
</tr>
<tr>
<td>4 East African Highland AAA</td>
</tr>
<tr>
<td>5 Plantain AAB</td>
</tr>
<tr>
<td>6 other AAB, including South Pacific plantains</td>
</tr>
<tr>
<td>7 ABB cooking bananas</td>
</tr>
<tr>
<td>8 Diploid types</td>
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<tr>
<td>Production system/cultivar gp</td>
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<tr>
<td>------------------------------</td>
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<tr>
<td>[1] Assoc. with Perennial Crops</td>
</tr>
<tr>
<td>[2] AFC int. Musa (4-5yrs)</td>
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<tr>
<td>[3] P. Musa + AFC</td>
</tr>
<tr>
<td>[4] Musa + short AFC @ estabmt.</td>
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<tr>
<td>[5] P. Musa monocrop</td>
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</tbody>
</table>
Nigeria map with major production zones:
Production
in the most {1b} important production zone in the country
by the different production systems

<table>
<thead>
<tr>
<th>Production system</th>
<th>Hectares</th>
<th>Total production tonnes</th>
<th>% banana / plantain production for market</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1] Assoc. with Perennial Crops</td>
<td>990,566.76</td>
<td>1,168,868.78</td>
<td>95%</td>
</tr>
<tr>
<td>[2] AFC int. Musa (4-5yrs)</td>
<td>1,142,961.65</td>
<td>828,647.20</td>
<td>85%</td>
</tr>
<tr>
<td>[3] P. Musa + AFC</td>
<td>952,468.04</td>
<td>881,032.94</td>
<td>85%</td>
</tr>
</tbody>
</table>

Climate for production zone
Average annual rainfall: 2500mm

Number of dry months (less than 60 mm/month): 3 months

Average temperature: 27°C
Production
in the second most {1a} important production zone
by the different production systems

<table>
<thead>
<tr>
<th>Production system</th>
<th>Hectares</th>
<th>Total production tonnes</th>
<th>% banana / plantain production for market</th>
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<tbody>
<tr>
<td>[1] Assoc. with Perennial Crops</td>
<td>238,297.65</td>
<td>204,935.98</td>
<td>85%</td>
</tr>
<tr>
<td>[2] AFC int. Musa (4-5yrs)</td>
<td>304,997.00</td>
<td>99,124.03</td>
<td>85%</td>
</tr>
<tr>
<td>[3] P. Musa + AFC</td>
<td>247,810.10</td>
<td>130,100.30</td>
<td>90%</td>
</tr>
</tbody>
</table>

Climate for production zone
Average annual rainfall: **1250mm**

Number of dry months
(less than 60 mm/month): **5 months**

Average temperature: **27oC**
### Production in the third most important production zone by the different production systems

<table>
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<th>Hectares</th>
<th>Total production tonnes</th>
<th>% banana / plantain production for market</th>
</tr>
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<tbody>
<tr>
<td>[1] Assoc. with Perennial Crops</td>
<td>287,488.67</td>
<td>206,991.84</td>
<td>60%</td>
</tr>
<tr>
<td>[4] Musa + short AFC @ estabmt.</td>
<td>47,9147.78</td>
<td>263,531.28</td>
<td>60%</td>
</tr>
</tbody>
</table>

### Climate for production zone
- Average annual rainfall: **2000mm**
- Number of dry months (less than 60 mm/month): **5 months**
- Average temperature: **27oC**
### Production
**in the fourth most important {2} production zone**

by the different production systems

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<th>% banana / plantain production for market</th>
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<tr>
<td>[2] AFC int. Musa (4-5yrs)</td>
<td>307690.57</td>
<td>356921.0612</td>
<td>65%</td>
</tr>
</tbody>
</table>

### Climate for production zone
**Average annual rainfall:** 1000mm

**Number of dry months (less than 60 mm/month):** 7 months

**Average temperature:** 35°C
Describe cropping system for most important production system from establishment to end of year 3

• Manual Field clearing leaving few trees/shrubs that are not disturbing followed by trash burning.
• Cocoa seedlings planted and plantain intercropped within. Short duration crops (SDC) (maize, melon) comes in mainly in first year.
• Management practices (weeding, fertilization etc)
• Maize and/or melon harvested, then cassava.
• In the second year cocoyam may be planted and harvested.
• Propping done at fruiting and harvesting done at fruit maturity.
• Plantain harvested the second year, excess sucker transferred to increase plant population or given out.
• Plantain cont. with cocoa until canopy closed out.
Describe cropping practices for most important production system:

**Year 1:**
Planting density of banana/plantain: 800 - 900 plants/ha
Average size of field: 2 ha
Source of suckers: Purchase, Neighbours, own farm
Sucker preparation practices: Only desuckering and atimes paring

Associated crops including months in crop cycle and yield:
1. Cocoa
2. Maize
3. Cocoyam
4. Melon
5. Cassava
Note: Not all, depending on the interest of the farmer.

Cropping practices done by men: Clearing, Burning, Planting, weeding,

Cropping practices done by women: Packing of trash, Planting, weeding,

What market? Local market (Farm gate, Retail and whole sale)
Year 2:
Replanting of banana/plantain: Unless there are missing stands.

Banana/plantain yield: bunches/hectare, kg/bunch: 12-15kg/bunch

Additional associated crops including months in crop cycle and yield:
1. Cocoyam (6-9months)
2. Maize (3 months)
3. Cassava (12 months)

Cropping practices done by men: Weeding, Propping, Harvesting,
Porters transporting to collection point (Road side)

Cropping practices done by women: Leaves removal, Bunch movement,
Selling of produce, marketing, processing/value addition
Year 3:
Replanting of banana/plantain:

Banana/plantain yield: bunches/hectare, kg/bunch: 9-11Kg/bunch

Additional associated crops including months in crop cycle and yield:
1. Cocoyam
2. Vegetables

Cropping practices done by men: As stated above

Cropping practices done by women: As stated above
Seasonal price fluctuation for bunch – farm gate
“Price/Kg”

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<tr>
<th>Jan</th>
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<tr>
<td>194.7</td>
<td>174.6</td>
<td>173.3</td>
<td>280.0</td>
<td>280.0</td>
<td>300.0</td>
<td>300.0</td>
<td>300.0</td>
<td>179.1</td>
<td>168.3</td>
<td>178.7</td>
<td>162.5</td>
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Seasonal distribution of bunches for one hectare crop field
“bunches harvested per month”

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Practices currently used to maintain land productivity: Using of rejuvenated land, Application of inorganic fertilizer (when available), Mulching with Farm refuse.

Limiting factors for banana/plantain yield: Over reliance on natural rainfall, Paucity of clean healthy Planting materials, Soil fertility, Pest build-up
Inadequate field management (desuckering, fertilizer).

Limiting factors for total yield from cropping system: Improper consideration of crop density and soil fertility use in the mixture.
Describe cropping system for second most important production system from establishment to end of year 3

- Manual Field clearing leaving few trees/shrubs that are not disturbing followed by trash burning.
- Perennial plantain planted, followed by AFC. Short term crops (maize or melon) comes in.
- Weeding and fertilizer application (usually not intended for cassava)
- Maize and/or melon harvested, then cassava.
- In the second year cocoyam may be planted and harvested.
- Propping done at fruiting and harvesting done at fruit maturity.
- Plantain harvested the second year, excess sucker transferred to increase plant population of given out.
Describe cropping practices for second most important production system:

**Year 1:**
Planting density of banana/plantain - average size of field: **820 -900 plant/ha**

Source of suckers: **Purchase, Neighbours, own farm**
Sucker preparation practices: **Only desuckering and atimes paring**

Associated crops including months in crop cycle and yield:
1. Cassava
2. Maize
3. Cocoyam
4. Melon
5. Vegetables

Cropping practices done by men: **As stated earlier**

Cropping practices done by women: **As stated earlier**

Who sells banana/plantain? **Farmer, whole-salers, retailers**
What market? **As stated earlier**
Year 2:
Replanting of banana/plantain:

Banana/plantain yield: bunches/hectare, kg/bunch

Additional associated crops including months in crop cycle and yield:
1.
2.

Cropping practices done by men:

Cropping practices done by women:
Year 3:
Replanting of banana/plantain:

Banana/plantain yield: bunches/hectare, kg/bunch

Additional associated crops including months in crop cycle and yield:
1.
2.

Cropping practices done by men:

Cropping practices done by women:
Seasonal price fluctuation for bunch - farm gate
“Price/bunch”

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Practices currently used to maintain land productivity
Compost (Farm trash) Shifting cultivation/ Natural rejuvenation

Limiting factors for banana/plantain yield: Over reliance on natural rainfall, Paucity of clean healthy Planting materials, Soil fertility, Pest build-up

Limiting factors for total yield from cropping system: As stated above.
Status of cropping systems research: 

Is cropping systems research being done in your country?  
Yes

Organizations/scientists: Many Research Institutes and Universities work on different cropping systems, but the long gestation period of Musa cropping systems and inadequate facilities limit the extent in many institutes.

Focus of work: Crop combinations, Economic advantages.

Recent publications:


Is cropping systems intensification with plantains being promoted by government or private sector? Yes, by both Organizations/scientists: Federal Ministry of Agriculture, ADP’s and Ministries of Agriculture

Focus of work: Supplying of Planting material (Cocoa)
Thank you All for your Attention