Integrated Pest Management in Ethiopian Rose Horticulture

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Ethiopian Rose Industry

- Young industry
- High potential
- Governmental support
- Code of Conduct
- Integrated Pest Management
IPM in Ethiopia: wide perspective

Stakeholders
- Growers
- Ethiopian Horticulture Producers and Export Organisation
- Horticultural Association
- Ministry of Agriculture and Rural Development: Plant Protection Department
- Ethiopian Institute for Agricultural Research: Plant Protection Research Centre
- Jimma University – College of Agriculture and Veterinary Medicine
- Netherlands Embassy
- Wageningen UR
- Koppert

Rules & Legislation, Knowledge, Logistics, etc.

Grower & Crop Management

Greenhouse Climate

Crop

Pest

Predator
IPM in Ethiopia: starting with one single pest

- Rose: various varieties
- Red spider mite (*Tetranychus urticae*)
- *Phytoseiulus persimilis* & *Amblyseius californicus*
Approach

- **Enabling environment**
  - Risk assessment with regards to use of beneficials
  - Permit procedures embedded in rules and legislation
    - Import permit for experimental purposes
  - Institutional linkages and partnerships (IPM association)

- **Research**
  - On-farm research
  - Applied research
  - Post-graduate research

- **Knowledge exchange**
  - Demonstration trials
  - Study groups
# Enabling environment – risk assessment

<table>
<thead>
<tr>
<th>RISK</th>
<th>RESPONSIBLE ENTITY</th>
<th>RISK MANAGEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRODUCT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect pest identification</td>
<td>Research</td>
<td>Correct identification</td>
</tr>
<tr>
<td>Incorrect organisms in BCA</td>
<td>Supplier</td>
<td>Random identification by Plant Protection Service in country of origin</td>
</tr>
<tr>
<td></td>
<td>Supplier</td>
<td>predators are on the BCA-list of the EPPO region, and the USA Exclusion list</td>
</tr>
<tr>
<td>Low activity of BCA</td>
<td>Supplier</td>
<td>batch-wise control by producer according IOBC guidelines (for Europe)</td>
</tr>
<tr>
<td></td>
<td>Supplier, grower</td>
<td>advanced transport &amp; storage system</td>
</tr>
<tr>
<td><strong>ENVIRONMENT AND WORKERS’ HEALTH</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exotic biodiversity</td>
<td>Ministry</td>
<td>BCA-list (EPPO) and Permit for Interstate Shipment (USA) are based upon broad expert knowledge, resulting in safe import in 60 countries.</td>
</tr>
<tr>
<td>Workers’ health</td>
<td>Grower</td>
<td>BCA-list and Permit for Interstate Shipment comprise allergy tests.</td>
</tr>
<tr>
<td><strong>FARM</strong></td>
<td></td>
<td></td>
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<tr>
<td>yield and quality reduction</td>
<td>Grower</td>
<td>Training, technical support, research, study groups</td>
</tr>
<tr>
<td>Crop attacked by BCA</td>
<td>supplier</td>
<td>In country of origin, a criterion to select BCA is its inability to attack plants.</td>
</tr>
</tbody>
</table>
On-farm research: climate

- Average temperature greenhouse 2008
- Minimum temperature greenhouse 2008
- RH-day greenhouse 2008
- Radiation outside 2008
On-farm research: results

- ET Highland: 2100 masl
- JJ Kothari: 2600 masl

- 10-15% more stems m⁻²
- Greater stem length
On-farm research: results

- ET Highland: 2100 masl
- JJ Kothari: 2600 masl

**ET Highlands, population dynamics**

<table>
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<th>Week</th>
<th>Infested Leaves</th>
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<tbody>
<tr>
<td>46</td>
<td>51</td>
</tr>
<tr>
<td>51</td>
<td>45</td>
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**Kothari, population dynamics**

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<td>35</td>
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<tr>
<td>51</td>
<td>20</td>
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</table>

Graphs showing population dynamics of spiders and mites over different weeks.
On-farm research: other farms

- **Oromia Wonder**: 2400 masl
- **Golden Rose**: 2000 masl
- **Herburg**: 1700 masl
On-farm research: summary

- IPM is possible, financially profitable
- Increase of production and quality
- Not-limiting factors
  - Rose variety
  - Humidity
  - Crop age (although young crop is preferable)
- Limiting factors
  - Training
  - Low temperatures
  - Chemical residues
On-farm research: lessons learned

- Commitment
- Identification & monitoring
- Intensive communication
- During transition phase:
  - Low pest levels
  - No chemical residues
- Knowledge exchange
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IPM in Ethiopia: future

- Further capacity building
- Rose – spider mite
  - acreage
  - # farms
  - propagations
- Herbs – white fly
- Strawberries – spider mite
- Fruit vegetables
- Outdoor vegetables?
Wageningen UR Greenhouse Horticulture

Thank you

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