Impact of powdery scab on seed potato production in Sri Lanka

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Introduction

- **Total area**: 65,610km$^2$
- **Major Agro ecological Regions**:
  - Dry Zone
  - Intermediate Zone
  - Wet zone
- **Major Potato growing districts**:
  - Nuwara Eliya
  - Badulla
- **Major Seasons**:
  - *Yala*
    - Nuwara Eliya: Feb. – July
    - Badulla: June – Sept.
  - *Maha*
    - Sept. – Jan.
## Potato production in Sri Lanka

<table>
<thead>
<tr>
<th>District</th>
<th>Area (ha)</th>
<th>Production (mt)</th>
<th>Seed requirement (mt)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yala</td>
<td>Maha</td>
<td>Yala</td>
</tr>
<tr>
<td>Nuwara Eliya</td>
<td>1,250</td>
<td>750</td>
<td>18,600</td>
</tr>
<tr>
<td>Badulla</td>
<td>2,000</td>
<td>2,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Total</td>
<td>3,250</td>
<td>2,750</td>
<td>68,600</td>
</tr>
</tbody>
</table>

<p>| | | | |</p>
<table>
<thead>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>15,000</td>
</tr>
</tbody>
</table>
Supply of Seed Potato

- **Total Extent** - 6000ha/yr
- **Seed requirement** - 15000 t
- **Annual seeds supply**
  - DOA - 500 t
  - Private – 500 t
  - Importation – 1000 – 5000 t
  - Informal seeds – 9000 – 13000 t
Soils

• Soil properties of seed potato producing area
  – Acidic pH 4-5.5
  – Deep, moderately well drained soil
  – Sandy to clay loam structure
Addition of organic matter

Addition of cattle manure

Poultry manure ready for application
Seed production methods

• Imported Certified seed
  • Multiplied
    – Govt.seed production farms ($C_2$)
    – contract growers ($C_2$)

• Local seed production
  • TC based seed production - 1998
Tissue culture laboratory

In vitro mother plants

Micro tubers
RSC production in Net houses

Seed production in polytunnels
$G_0$ Seed production in poly tunnels
Geoponic seed production
Aeroponic Seed Production
Hydroponic seed production
History of powdery scab in Nuwara Eliya Sri Lanka

- **1st Observation**
  - Post control fields of SCS - 2002/03
    - Dura, Desiree, Roko,
    - Cykoda, Delawae

- **Private seed potato farms**, Diagama & Bopathalawa - 2006-07
  - Granola

- **Govt. seed potato farm Prdru** - 2007-2010
  - Granola

- **Research Fields 2009,2010**
  - Calwhite, Keuka Gold, Red La Soda, Chieftain, breeding lines
....contd

- $G_0$ production poly tunnels 2010 - 11

**Observations**
- High Organic matter
- Root galls
- No symptom on tuber
Findings

Bio assay at ARS sita Eliya -2003

• Roko, Cykoda, Delawae & Isna

Confirmation of ss by Ulei Merz

Spore balls

T-Tuber SL, G-Galls SL, CH –Tuber Check, K - Negative
## Problems & threat

### Loss of elite seed material

<table>
<thead>
<tr>
<th>Farm</th>
<th>Year</th>
<th>Grade</th>
<th>Yield t</th>
<th>Remarks</th>
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</thead>
<tbody>
<tr>
<td>Pedro</td>
<td>2009</td>
<td>$G_3$</td>
<td>51.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2010</td>
<td>$G_1$</td>
<td>29.3</td>
<td><strong>Rejected</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>$G_2$</td>
<td>30.3</td>
<td><strong>Rejected</strong></td>
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<tr>
<td></td>
<td></td>
<td>$G_3$</td>
<td>25.0</td>
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<td>$C_1$</td>
<td>31.7</td>
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<td>Bopathalawa</td>
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<td>$C_1$</td>
<td>60.0</td>
<td><strong>Rejected</strong></td>
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<tr>
<td>Diagama</td>
<td>2006</td>
<td>$C_1$</td>
<td>3.0</td>
<td><strong>Rejected</strong></td>
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<tr>
<td>Sita Eliya</td>
<td>2011</td>
<td>$G_0$</td>
<td>50,000tubers</td>
<td><strong>Rejected</strong></td>
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</tbody>
</table>
Problems & threat ...

Threat
Topography, Irrigation, Land preparation

Spread of PMTV
Future!

- Survey & Mapping of seed production lands
- Screening of new potato varieties
- Impose preventive measures
- Effect of environment
  - Micro & Micro
- Development of management strategies
  - Chemical
  - Biological
  - Integrated
Present practices for $G_0$ production

- Clean water for irrigation
  - Chlorinated 4ppm
- Steam sterilization for growing media
  - 65-75°C for 3 hours
- Chemicals used
  - Metham sodium 600ml/m³, Basamid 40g/m³
  - Mancozeb – 8kg/ha
- Other
  - Regular monitoring – roots
Thank you