Management of *Botrytis cinerea* on pears

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Fruit and Postharvest Pathology Research Programme
- Postharvest decay can have a major negative impact on the profitability of pear production
- Claims – rejections – repack (1-2%)
Incidence of Postharvest Decay in Pears

% Decay

OR – Orchard Fruit
LR – Packhouse Fruit

Beurre Bosch
Bon-Chretien
Forelle
Packham's Triumph

Penicillium expansum
Botrytis cinerea
Alternaria sp.
Incidence of Calyx-end Botrytis in Pears

% Decay

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<th></th>
<th>OR</th>
<th>LR</th>
<th>OR</th>
<th>LR</th>
<th>OR</th>
<th>LR</th>
<th>OR</th>
<th>LR</th>
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<tbody>
<tr>
<td>Beurre Bosch</td>
<td>0.5</td>
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<td></td>
<td></td>
<td>1.0</td>
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<tr>
<td>Bon-Chretien</td>
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<tr>
<td>Forelle</td>
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<td>2.5</td>
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<td>Packham's Triumph</td>
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Calyx end decay in pears

- Calyx end decay in pears – *Botrytis cinerea*
  - Infection at full bloom - stamens
  - Latent in calyx until fruit starts to ripen physiologically
  - Commonly only detected after storage
  - Nesting decay
- Mandatory full bloom sprays in SA prior to deregulation of the industry – for export of pears from SA
- Management options
  - Preharvest fungicides – Full bloom and shortly before harvest
  - Postharvest fungicides – protection during storage and on shelf
Fungicides for managing *Botrytis*

- **Benomyl and Iprodione – old fungicides**
  - Resistance issues
  - Still in use in SA where the market allows
  - Reversion to Benomyl full bloom sprays because of calyx end decay in Forelle and PT

- **Pyrimethanil**
  - Products registered for postharvest use on pears in 2012 in SA (Protector SC400)
  - New Chemistry in SA (cf Cyprodinil on apples)
  - Resistance risk?
  - Resistance monitoring – few tools available for postharvest use in SA
Sensitivity of *Botrytis* to fungicides

- Pears from Ceres
- Pyrimethanil Base Line Sensitivity
  - 49 unexposed *Botrytis cinerea* isolates
  - Minimal Medium – CDA
  - EC50
- Sensitivity of isolates to Benomyl, Iprodione and pyrimethanil
  - 166 isolates
  - Discriminatory dose of 3 and 5 ppm
  - Benomyl and Iprodione – PDA
  - Pyrimethanil – CDA Minimal medium
Baseline sensitivity of *Botrytis* to pyrimethanil

Figure 1. Frequency distribution of EC$_{50}$ values for pyrimethanil among 49 *Botrytis cinerea* isolates collected from pear fruit with calyx end decay symptoms from three orchards in the Ceres region of the Western Cape Province of South Africa.

Mean EC$_{50}$ – 0.13 mg/L
Table 1. Sensitivity to benomyl, iprodione and pyrimethanil of Botrytis cinerea isolates collected from pear fruit with calyx end decay symptoms from three orchards in the Ceres region of the Western Cape Province of South Africa.

<table>
<thead>
<tr>
<th>Fungicide</th>
<th>Number of Isolates tested</th>
<th>Number of isolates growing at</th>
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<tr>
<td></td>
<td></td>
<td>0.00 mg/L</td>
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<tr>
<td>Benomyl</td>
<td>166</td>
<td>166</td>
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<td>Iprodione</td>
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<tr>
<td>Pyrimethanil</td>
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Effect of Full Bloom Fungicides on Incidence of Calyx-end Botrytis in High Disease Pressure ‘Forelle’ Orchards

% Calyx-end *Botrytis cinerea*

- Control
- Procymidone
- Iprodione
- Benomyl

Legend:
- a
- b

Graph shows the percentage of calyx-end Botrytis cinerea for different treatments.
Effect of Full Bloom Fungicides on Incidence of Calyx-end Botrytis in Low Disease Pressure ‘Forelle’ Orchards

% Calyx-end *Botrytis cinerea*

Control | Procymidone | Iprodione | Benomyl

- a

- a

- a

- a
Effect of Postharvest Treatments on the Incidence of Calyx-end Botrytis in ‘Forelle’

None of the post harvest treatments significantly reduced Calyx-end Botrytis in either trial year.
Effect of Postharvest Treatments on the Incidence of Secondary Botrytis in ‘Forelle’

- All of the treatments except *C. albidus* significantly reduced the secondary spread of *Botrytis cinerea* trial year 1
Management options

- Sanitation in orchard and packline to reduce inoculum
- Preharvest fungicides
  - Full bloom – to reduce calyx end decay in high disease pressure orchards
  - Shortly before harvest
    - reduce inoculum level and provide residue during harvest and storage.
    - reduce puncture and stem end Botrytis infections
- Postharvest fungicides
  - Protection during storage and on shelf
    - Reduce nesting decay of Botrytis

- Few options available
- Take care of Maximum Residue Limits (MRL’s)
- Local withholding period, Export default withholding period
Acknowledgements

Fruit and Postharvest Pathology Research Programme

Producers and Pack-houses