Reduced fungicide input in late blight control
(REDUCE 2007-2011)

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Exploiting host resistance in the haulm to reduce the fungicide input.

- Field trials at 2 locations per year with inoculated spreader rows
- Varieties (resistance in haulm and tubers):
  - Asterix (3-7)
  - Saturna (5-6)
  - Peik (7-7)
- Preventive treatments according to VIPS, protection period is 5-7 days (5 days protection period if 4 or more blight risk days)
  - Host resistance and risk adjusted dose
  - Full dose
  - Control, untreated
## Adjusting dose to host resistance and risk

<table>
<thead>
<tr>
<th>Variety (resistance)</th>
<th>Number of days with warning (to day and tomorrow) at <a href="http://www.vips-landbruk.no">www.vips-landbruk.no</a></th>
<th>Consecutive days with more than 1 mm rain the next 5 days at <a href="http://www.yr.no">www.yr.no</a></th>
<th>Dose %</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Astrix (3)</strong></td>
<td>1</td>
<td>0-1</td>
<td>75</td>
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<tr>
<td></td>
<td></td>
<td>2 or more</td>
<td>88</td>
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<tr>
<td></td>
<td>2</td>
<td>0-1</td>
<td>100</td>
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<tr>
<td></td>
<td></td>
<td>2 or more</td>
<td>100</td>
</tr>
<tr>
<td><strong>Saturna (5)</strong></td>
<td>1</td>
<td>0-1</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 or more</td>
<td>75</td>
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<tr>
<td></td>
<td>2</td>
<td>0-1</td>
<td>75</td>
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<td></td>
<td></td>
<td>2 or more</td>
<td>100</td>
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<tr>
<td><strong>Peik (7)</strong></td>
<td>1</td>
<td>0-1</td>
<td>25</td>
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<tr>
<td></td>
<td></td>
<td>2 or more</td>
<td>50</td>
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<td>2</td>
<td>0-1</td>
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<td></td>
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<td>2 or more</td>
<td>75</td>
</tr>
</tbody>
</table>
**New lesions (0-2)**

- **Peik Full dose**
- **Saturna Full dose**
- **Asterix Full dose**
- **Peik Adjusted dose**
- **Saturna Adjusted dose**
- **Asterix Adjusted dose**
- **Peik Control**
- **Saturna Control**
- **Asterix Control**

**% blight in the haulm**

- **Asterix Control**
- **Saturna Control**
- **Peik Control**
- **Asterix Adjusted dose**
- **Saturna Adjusted dose**
- **Peik Adjusted dose**
- **Asterix Full dose**
- **Saturna Full dose**
- **Peik Full dose**
Rygge 2008

% blight in the haulm

New lesions (0-2)
Optional text analysis or description goes here.
Fungicide reduction: full dose <> adjusted dose

- Low resistance (Asterix): 6% - 19%
- Medium resistance (Saturna): 17% - 36%
- High resistance (Peik): 42% - 61%
Wash down of spores in soil

- 2 soil types: Silt and light clay
- 2 spore concentration: 50 or 500,000 spores/liter soil
- 3 irrigation regimes: 5, 10 og 15 mm
- 3 replications + negative controls
- \(2 \times 2 \times 3 \times 3 + 6 = 42\) pots

- Lacey test for 2 soil depths: 0 cm and 4 cm
- Number of Lacey tests: \(78 \times 80 = 6240\) octants
Conclusion:
Most of the spores remains in the top soil
Tuber blight resistance at different maturity

- Varieties (resistance in haulm and tubers)
  - Kerrs Pink (6-3)
  - Saturna (5-6)
  - Troll (6-8)

- 4 harvest dates

- 10 samples pr variety at each harvest
  - 5 samples were wounded
  - 5 samples unwounded

- 4 inoculum mixes (20 ml of 10,000 spores/ml) + controls
Conclusions:
More attacks by wounding.
More attacks at low resistance in tubers.
No effect of maturity.
Testing of tuber blight model

- Soil inoculum factor = Haulm inoculum factor * rain
- 2 locations with artificially inoculated fields per year
- Varieties (resistance in haulm and tubers)
  - Kerrs Pink(6-3)
  - Saturna(5-6)
  - Troll(6-8)
- Irrigation at critical dates
  - Irrigation
  - No irrigation
- 4 harvest dates
Soil inoculum factor, Rygge 2008

% Blight in the haulm, Rygge 2008

% Tubers with blight, Rygge 2008
% blight in the haulm, Solør 2009

Solør 2009

- irrigation, - chlorine

- irrigation, + chlorine

+ irrigation, - chlorine

+ irrigation, + chlorine
Conclusions

- There were less tuber blight after the haulm were killed by blight

- Tuber blight were mainly caused by infection at harvest

Acknowledgement

- The field experiments were conducted by the Norwegian extension service groups at SørØst and Solør Odal