Could someone please drain my soils?

I want to grow pulses

Sabine Banniza, Crop Development Centre, University of Saskatchewan
Early and late season precipitation in Saskatchewan 2005-2015

Precipitation (mm)

- April to June
- July to October

2005: 180 (April to June), 200 (July to October)
2006: 160 (April to June), 220 (July to October)
2007: 170 (April to June), 210 (July to October)
2008: 180 (April to June), 200 (July to October)
2009: 190 (April to June), 210 (July to October)
2010: 450 (April to June), 550 (July to October)
2011: 230 (April to June), 220 (July to October)
2012: 240 (April to June), 210 (July to October)
2013: 250 (April to June), 200 (July to October)
2014: 300 (April to June), 350 (July to October)
2015: 270 (April to June), 280 (July to October)
Root rot pathogens in Saskatchewan

- Caused by a combination of species

  ⇒ ROOT ROT COMPLEX
  - *Fusarium* spp.
  - sometimes *Rhizoctonia* and *Pythium*
  - in many cases *APHANOMYCES euteiches*
    - Very persistent and potentially very aggressive
Symptoms

Courtesy of S. Phelps, SPG
Wet soils, peas and lentil

- Peas and lentil do not like wet feet
- A pea or lentil plant in wet soil is a stressed plant even without presence of pathogens

Peas grown in **STERILE field soil**: left normal watering, right water-logged conditions
Effect of water-logging on aphanomyces root rot severity

Normal watering
Non sterile vs sterile
field soil

Water-logged
Non sterile vs sterile
field soil

Undergraduate student thesis project 2013: Matthew Tetreault
Contributing factors to root rot increase:
Soil compaction

Courtesy of Dr. S. Chatterton, AAFC
Rotation

• Generally 4-year rotations
• In case of *Aphanomyces* 6- to 8-year rotations away from a susceptible host

"In addition to dusting crops, McWit now rotates them."
Crop selection

• All pulse crops susceptible to *Fusarium, Pythium, Rhizoctonia*

• **PEA, LENTIL, MANY ALFALFA, AND SOME BEAN VARIETIES** are **SUSCEPTIBLE** to aphanomyces root rot

• Soybean, faba bean and chickpeas have good partial resistance to aphanomyces root rot
Crop resistance to Aphanomyces

**PEA**

**DRIY BEAN**

**FABA BEAN**

**LENTIL**
In This Issue: March 2016

Unlocking Pulse Potential

- Seed testing is a wise investment ahead of 2016 planting
- Looking at new ways to control herbicide resistant weeds in pulse crops
- Growing lentils in shortened rotations - what to be aware of
- Chickpeas continue to see growth in Saskatchewan

VIEW PUBLICATION
Aphanomyces – Partially resistant crop
ALFALFA

Root discoloration (% of CDC Meadow)
Soil sampling for root rot diagnostic

- SPG-funded research project on spatial distribution of Aphanomyces/risk model
- Variation in depth
- Variation across the field

Anthony Erickson & Syama Chatterton, AAFC Lethbridge
Suppression of Aphanomyces root rot through fungicides

- Intego Solo
  - Full label for pulses except pea
  - Received emergency registration again for pea in 2016
  - Multiple mode of action including inhibition of cell division
- Phostrol
  - Possible registration for pea in 2017
- Others....?????
Faba bean

• Good partial resistance to aphanomyces root rot
• Susceptible to foliar diseases:
  – Chocolate spot (Botrytis)
  – Ascochyta blight
  – Anthracnose (?)

Rohan Kimber and Jenny Davidson (SARDI, South Australia)
Lesions NOT caused by pathogens

Rohan Kimber and Jenny Davidson (SARDI, South Australia)

Faba beans at Kernen 2015
Viper and Basagran application

It's not a disease – herbicide effect / oil additive reaction?

- Difference between surfaces & often directional effect
- Entry point for minor pathogens
- Botrytis can infest necrotic material

Rohan Kimber and Jenny Davidson (SARDI, South Australia)
Fungicide applications

• Most efficacious application before canopy closure (3-5 flowering node?)
• Later applications if rain and/or canopy remains wet
  – Botrytis spores (chocolate spot) are airborne!
# Growth stages of faba beans

<table>
<thead>
<tr>
<th>BBCH Code</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Seedling emergence</td>
</tr>
<tr>
<td>10</td>
<td>Shoot with scale leaves</td>
</tr>
<tr>
<td>11</td>
<td>First leaf unfolds</td>
</tr>
<tr>
<td>15-20</td>
<td>Further leafy nodes</td>
</tr>
<tr>
<td>21</td>
<td>First side shoots</td>
</tr>
<tr>
<td>50</td>
<td>First flower bud visible</td>
</tr>
<tr>
<td>61</td>
<td>First flowering node in bloom</td>
</tr>
<tr>
<td>65</td>
<td>Full flower: 5th flowering node in bloom</td>
</tr>
<tr>
<td>71</td>
<td>10% of pods have reached maximum size</td>
</tr>
<tr>
<td>89</td>
<td>Full maturity: all pods dark, seeds hard and dry</td>
</tr>
</tbody>
</table>

Meier, U 2001. BBCH Monografie. Biologische Bundesanstalt für Land und Forstwirtschaft
Lentil disease refresher

- Anthracnose, ascochyta blight
- Sclerotinia white mould, botrytis grey mould, stemphylium blight
- Highest efficacy of fungicide at 8- to 9-node stage
- Limited control of late season disease
- Chlorothalonil under review!
A successful 2016!