Fungicide Strategies to Manage Pasmo Disease of Flax

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Pasmo disease of flax

- Caused by *Septoria linicola* (Speg.) Garassini
- First identified in Argentina in 1909
- Warm and humid environment favors disease development (20-21°C)
Symptoms

- Disease appear at later stage of crop growth
- Circular and brown lesions on the leaves
- Leaves become dry and wither
Symptoms

- Brown to black infected bands alternate with green bands on the stem
- Tiny black pycnidia on infected stems
- Stems become weakened, break readily
Objectives

- To study the effect of different fungicides on disease and seed yield of flax
- To determine the best fungicide application timing
Materials and methods

- Flax cultivar: CDC Bethune
- Seeding rate: 60 kg ha\(^{-1}\)
  \(\text{(1000 seeds m}^\text{-2})\)
- Seeding date: Last week of May
- Source of inoculum: Infected flax straw of previous year
Materials and methods

- **Fungicides:**
  - Headline® EC (pyraclostrobin)
  - Xemium® (fluxapyroxad)
  - Priaxor® (pyraclostrobin + fluxapyroxad)

- **Application Rate:**
  - Pyra (100 g ai/ha = 400 mL/ha)
  - Fluxa (50 g ai/ha = 170 mL/ha)
  - Pyra + Fluxa (150 g ai/ha)
Materials and methods

- Application timing: Early flowering (BBCH-scale 61)
  Mid-flowering (BBCH-scale 65)
  Both

- Experimental design: RCBD with 4 reps

Flowering stage of flax
Materials and methods

- Disease assessment: Horsfall-Barratt scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>% Diseased</th>
<th>% Healthy</th>
<th>Grade formula (%)</th>
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<tr>
<td>1</td>
<td>0–3</td>
<td>97-100</td>
<td>2.34</td>
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<tr>
<td>2</td>
<td>3–6</td>
<td>94-97</td>
<td>4.68</td>
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<tr>
<td>3</td>
<td>6–12</td>
<td>88-94</td>
<td>9.37</td>
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<tr>
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<td>12-25</td>
<td>75-88</td>
<td>18.75</td>
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<tr>
<td>5</td>
<td>25-50</td>
<td>50-75</td>
<td>37.5</td>
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<td>50-75</td>
<td>25-50</td>
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<td>6–12</td>
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<tr>
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<td>100</td>
<td>0</td>
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</tbody>
</table>
Different letters among columns of each location are significantly different, $P < 0.05$. 

**Disease severity in 2014**

- **Brandon**
  - Control: a
  - Fluxa: b
  - Pyra: b
  - Pyra+Fluxa: b

- **Melfort**
  - Control: a
  - Fluxa: b
  - Pyra: b
  - Pyra+Fluxa: b

- **Saskatoon**
  - Control: a
  - Fluxa: b
  - Pyra: bc
  - Pyra+Fluxa: c

**Disease severity in 2015**

- **Brandon**
  - Control: a
  - Fluxa: b
  - Pyra: bc
  - Pyra+Fluxa: c

- **Melfort**
  - Control: a
  - Fluxa: b
  - Pyra: b
  - Pyra+Fluxa: b

- **Saskatoon**
  - Control: a
  - Fluxa: a
  - Pyra: b
  - Pyra+Fluxa: b
Disease severity at Melfort in 2015

- Early
- Late
- Both

Disease severity (%)

Pyra
Fluxa
Pyra+Fluxa
Different letters among columns of each location are significantly different, $P < 0.05$.
Different letters among columns of each location are significantly different, $P < 0.05$. 

**Seed Yield in 2014**

- **Brandon**: Control - b, Fluxa - ab, Pyra - ab, Pyra+Fluxa - a
- **Melfort**: Control - b, Fluxa - a, Pyra - a, Pyra+Fluxa - a
- **Saskatoon**: Control - c, Fluxa - b, Pyra - b, Pyra+Fluxa - a

**Seed Yield in 2015**

- **Brandon**: Control - a, Fluxa - a, Pyra - a, Pyra+Fluxa - a
- **Melfort**: Control - b, Fluxa - a, Pyra - a, Pyra+Fluxa - a
- **Saskatoon**: Control - b, Fluxa - a, Pyra - a, Pyra+Fluxa - a

59%
Different letters among columns of each location are significantly different, $P < 0.05$.
Different letters among columns of each location are significantly different, $P < 0.05$. 
Summary

- Fungicide application decreased disease severity and increased seed yield over control.
- Headline® (pyra) & Priaxor® (pyra + fluxa) were more effective than Xemium® (fluxa).
- Timing of fungicide application had no effect on disease and seed yield.
Thanks

Supervisor
Dr. Randy Kutcher

Acknowledgement
Jess, Greg, Mallory, Anh, Mortuza
QUESTIONS???