Your best strategy for dealing with blackleg? Prevention.

Blackleg is one of the most impactful diseases in Western Canada affecting canola yield potential and crop quality. This scouting guide will describe the life cycle of blackleg, its impact on crops, scouting and measurement along with management strategies.

The following table provides a useful introduction to blackleg.

<table>
<thead>
<tr>
<th>Disease timing</th>
<th>Anytime during the season.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual symptoms</td>
<td>Lesions on cotyledons, leaves, stems and pods.</td>
</tr>
<tr>
<td></td>
<td>Leaf spots are dirty-white, roundish and spotted with pepper-like pycnidia.</td>
</tr>
<tr>
<td></td>
<td>Dry rot or cankers at base of stem.</td>
</tr>
<tr>
<td>Crop symptoms</td>
<td>Severe cankers at stem base can girdle stem after flowering and sever, resulting in lodging.</td>
</tr>
<tr>
<td>Fungicide application</td>
<td>Before symptoms appear. 2 to 6 leaf.</td>
</tr>
<tr>
<td>Scouting</td>
<td>Scout early, before seeding, looking for pseudothecia on old canola residue. Scout at swath timing to assess disease pressure and to make informed management decisions in future years.</td>
</tr>
<tr>
<td>Resistant varieties</td>
<td>Varieties with resistance to blackleg are well developed. Using resistant (R-rated) varieties alone is no longer enough to control the disease.</td>
</tr>
</tbody>
</table>
Learn to recognize blackleg.

Blackleg is a fungal disease caused by two species, both found in Canada. *Leptosphaeria biglobosa*, also known as the ‘weakly virulent strain’, and *Leptosphaeria maculans*, the ‘virulent strain’.

When blackleg establishes in canola, small greyish-white lesions form on the leaves, appearing round to irregular in shape. The centre of the lesion is often dotted with small, black fruiting bodies called pycnidia that look like black pepper. Similar lesions also appear on the stems and eventually form sunken cankers with a dark black border.

What to look for.

Blackleg is one of the most devastating diseases in canola.

Blackleg infection can result in the plant’s stem being restricted, reduced nutrient uptake and can lead to premature plant death, increased lodging and yield losses of up to 50%.

1 Canola Council of Canada, 2016.
Don’t let it slip under the radar. Scout for blackleg in the fall.

Scouting at maturity.
The best time to scout for blackleg is in the fall, within a week of swathing to ensure stems have not decomposed and blackleg can be identified correctly. You can also scout at other stages although identification may be more difficult.

Scouting best practices.
- All samples should be taken from a representative area of the field
  - Avoid approaches, headlands, telephone poles, sloughs
- Walk in a zig-zag or W pattern, taking samples at each point
- Map out approximately 100 ft² and move to 5 different locations at least 20 m apart. Randomly select 10 plants at each point.
  - Pull plants out of the ground or;
  - Use a pair of shears and cut the plants where the stem meets the soil
- Rate stems for severity using the WCC RRC 0 to 5 rating system on the following page

Where to cut canola plants.
It is important to cut the canola plants at the surface of the soil. Cutting higher or lower than the surface of the soil can misrepresent symptoms.
Measuring blackleg.

Inside the stems, the black-bordered lesions can be measured using the field-rating scale (WCC RRC rating system) shown below. Severity is rated from 0 to 5, where 0 shows no signs of infection and 5 has 100% of the stem affected. Assign 1 to 5 ratings for all infected stems collected and then average these ratings.

A score of 5 indicates the plant has essentially died as a result of nutrients being blocked from travelling up the stem. If crops seeded with a blackleg-resistant variety show ratings of 1 or more, a fungicide application should be planned in this field to help reduce the loss from disease.

<table>
<thead>
<tr>
<th>Image</th>
<th>Disease Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.jpg" alt="Image" /></td>
<td>0</td>
<td>No diseased tissue viable in the cross section.</td>
</tr>
<tr>
<td><img src="image2.jpg" alt="Image" /></td>
<td>1</td>
<td>Diseased tissue occupies 25% or less of cross section.</td>
</tr>
<tr>
<td><img src="image3.jpg" alt="Image" /></td>
<td>2</td>
<td>Diseased tissue occupies 26%-50% of cross section.</td>
</tr>
<tr>
<td><img src="image4.jpg" alt="Image" /></td>
<td>3</td>
<td>Diseased tissue occupies 51%-75% of cross section.</td>
</tr>
<tr>
<td><img src="image5.jpg" alt="Image" /></td>
<td>4</td>
<td>Disease tissue occupies &gt;75% of cross section with little or no constriction of affected tissue.</td>
</tr>
<tr>
<td><img src="image6.jpg" alt="Image" /></td>
<td>5</td>
<td>Diseased tissue occupies 100% of cross section with significant constriction of affected tissue; tissue dry and brittle, plant dead.</td>
</tr>
</tbody>
</table>

Source: Canola Council of Canada. Photo credit: Gary Peng, Agriculture and Agri-Food Canada, Saskatoon.
Calculating yield loss from blackleg.

Calculate the potential yield loss from blackleg by determining a field’s blackleg incidence and severity.

**Potential yield loss in bushels per acre**

<table>
<thead>
<tr>
<th>Blackleg Incidence %</th>
<th>15%</th>
<th>30%</th>
<th>45%</th>
<th>60%</th>
<th>75%</th>
<th>90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.9</td>
<td>1.8</td>
<td>2.7</td>
<td>3.6</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>3.6</td>
<td>5.4</td>
<td>7.2</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td>8.1</td>
<td>10.8</td>
<td>13.5</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>14.4</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18</td>
<td>22.5</td>
</tr>
</tbody>
</table>

Research shows that for each increase in blackleg severity, seed yield per plant is lowered by 17%.

Online calculator available at agsolutions.ca/blackleg_calculator
Missed the fall scouting window? There’s still time.

Scouting prior to seeding.
Although harvest is the best time to scout for blackleg, you can still scout for the disease in the spring if you missed the opportunity in the fall. Prior to seeding, scout the field for signs on older canola stubble. Pseudothecia are black, speckled fruiting bodies on canola stubble residue. They can indicate where the disease has overwintered and can be present early in the season.

Spring scouting.
During the vegetative stage (typically from 3 leaf to 6 leaf) scout for greyish-white stem lesions or leaf surface lesions with black specks (pycnidia). Blackleg can also be present inside the stem without the presence of distinct, visible cankers.
Strategies for controlling blackleg.

**Plant genetically resistant varieties.**
All canola varieties are rated for resistance to blackleg. Plant only R (resistant) or MR (moderately resistant) rated canola varieties.

**Scout for blackleg.**
Scout canola fields in the fall for blackleg in your canola stubble. Use this information to determine the effectiveness of your blackleg management plan.

**Rotate to other crops.**
Maintain a break between canola crops to allow time for crop residue to decompose. If blackleg becomes established in the field, a minimum break of two to three years is recommended in addition to other management strategies.

**Rotate between canola varieties.**
Rotating varieties and canola systems brings a mix of blackleg resistance genes to the field over time. This can help prevent or delay the breakdown of resistance.

**Use a fungicide for blackleg.**
Plan for a spring application of a registered blackleg fungicide.

**Reduce weed pressure.**
Control volunteer canola and other Brassica weeds (stinkweed, shepherd’s-purse, wild mustard, flixweed) to help prevent blackleg build up during non-canola years.

**Blackleg disease cycle.**

*Source: Canola Council of Canada.*
Superior genetics are great. Combining them with innovative solutions is better.

To help preserve and prolong the effectiveness of resistance genetics, it’s important to understand the role that chemistry can play. Even when seeding canola that is rated blackleg-resistant (R-rated), using a multiple-mode-of-action fungicide (like Nexicor™) that targets the disease can help improve its management and provide better results while helping prolong the effectiveness of the resistance genetics.

Is it enough to just use R-rated varieties?

An R-rated variety is still susceptible to blackleg, with a severity of up to 30% relative to one of the most susceptible varieties, Westar. A moderately resistant (MR) variety is 30-49% of the severity of Westar and a moderately susceptible (MS) variety is 50-69% of the severity of Westar. In addition, there is evidence that the blackleg population is shifting to different strains that can overcome or reduce the effectiveness of today’s resistance genetics. This is why we need a more integrated approach to managing this disease.

Fungicides supplement genetics.

Source: BASF research trial, Saskatoon, SK, 2016.
Nexicor Fungicide.

Get a higher level of blackleg control, because every bushel counts.

New Nexicor fungicide delivers a new level of blackleg management with three modes of action, building on the benefits of AgCelence. All for higher yield potential and profits to match.

Active ingredients
- Pyraclostrobin – Group 11
- Fluxapyroxad – Group 7
- Propiconazole – Group 3

Formulation
Emulsifiable concentrate

One case contains
2 x 8.0 L jugs

Storage
Store above 0°C.

Source: AgSolutions Performance Trials, 2016

Nexicor application rate and staging:
For effective blackleg control, apply Nexicor at 2 to 6 leaf, with earlier application being most effective.

Apply at a rate of 202 ml/ac (500 ml/ha).
One case treats 80 acres.

* AgCelence benefits refer to products that contain the active ingredient pyraclostrobin.
* All comparisons are to untreated, unless otherwise stated.
Blackleg management that ensures the best chance for improved profitability.
With three modes of action, Nexicor provides a tool for resistance management to help canola growers achieve increased profitability.

Nexicor improves yield.
When compared to untreated fields and competitor products, Nexicor protects and builds yield potential.

Source: BASF grower field trials, Western Canada, 2016 (n=24)

INCREASED YIELD (BU/AC)

Source: BASF Research Trials, Western Canada, 2015 & 2016 (n=10)

SEVERITY RATING (1-5)

INCREASED YIELD (BU/AC)

Source: RCD trials, Western Canada, 2016 (n=7)

Source: BASF grower field trials, Western Canada, 2016 (n=24)
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