THE
PEA LEAF WEEVIL
MANAGEMENT GUIDE
Introduction

Pea leaf weevil management starts here

The pea leaf weevil (*Sitona lineatus*) is an invasive pest that poses an increasing threat to field pea and faba bean production in Western Canada. The insect can cause damage at multiple stages of the life cycle, leading to significantly reduced yields.

Use this guide to help you correctly identify, scout and manage this damaging insect in your pulse crops. With the agronomic tips and actionable management strategies found in the pages ahead, you’ll be well equipped to make informed decisions about protecting your pea and faba bean crops.
## The Pea Leaf Weevil Management Guide

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PEA LEAF WEEVILS
Identification

Adult

Adult pea leaf weevils are slender, greyish-brown beetles about 5 mm long with a broad-shaped snout. Three light-coloured stripes extend lengthwise down the thorax and sometimes the abdomen.

Larvae

Pea leaf weevil larvae are C-shaped and measure about 3 to 6 mm in length. The legless larvae are soft-bodied and milky white with a dark brown head.
The pea leaf weevil produces one generation per year and develops through four life stages: egg, larvae, pupae and adult.¹,²

<table>
<thead>
<tr>
<th>Season</th>
<th>Life cycle</th>
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<tbody>
<tr>
<td>Winter</td>
<td>Adults overwinter in alfalfa or other perennial legume crops, ditches and shelterbelts.</td>
</tr>
<tr>
<td>Late April–to early May</td>
<td>Adults emerge from their winter habitat and begin feeding on available leguminous greens.</td>
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<tr>
<td>May to June</td>
<td>Adults walk or fly (at temperatures above 17°C) to legume fields to reproduce. Females lay up to 1,500 eggs in the soil near developing plants. Eggs are small, smooth and oblong. They are white when laid, but turn nearly black at hatching.</td>
</tr>
<tr>
<td>July</td>
<td>Larvae feed on pulse crop nodules and grow through five instar stages, then burrow into the soil and pupate.</td>
</tr>
<tr>
<td>August</td>
<td>Adults emerge and feed on pea crops.</td>
</tr>
<tr>
<td>Late summer to fall</td>
<td>Adult weevils fly and migrate to their overwintering sites.</td>
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</tbody>
</table>

Sources:
Outbreak factors

Spring weather conditions have a significant effect on the timing and severity of pea leaf weevil damage.\textsuperscript{1,2}

<table>
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<tr>
<th>Outbreak factor</th>
<th>Result</th>
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<tbody>
<tr>
<td>Temperature</td>
<td>Pea leaf weevils will arrive in fields early if warm conditions (above 20°C) persist for more than a few days in late April or early May, resulting in higher yield loss. In years when cool weather persists, the arrival of pea leaf weevils can be much later, and the yield impact less serious.</td>
</tr>
<tr>
<td>Moisture</td>
<td>Dry years make plants more susceptible to the pea leaf weevil. In wetter years there is more nitrogen available to the plant, making it less susceptible to the pest.</td>
</tr>
</tbody>
</table>

Sources:
Affected areas

First spotted in Alberta in 2000, pea leaf weevil is now a serious pest in southern Alberta and southern Saskatchewan. In recent years it has been sighted as far north as Athabasca, Alberta.

The map below displays the incidence of pea leaf weevil in 2018, as monitored by the government of Alberta. Officials advise that central Alberta is a transitional area where pea leaf weevil incidence has worsened in recent years.

Pea leaf weevil in Alberta - 2018

While pea leaf weevil populations were low in 2018, the pest’s overall spread and intensity have been on the rise for several years. Alberta Agriculture and Forestry specialist Scott Meers cautions against interpreting low presence as a reduced need to apply seed treatment, as populations have been known to rebound quickly.

Source: Alberta Agriculture, Food and Rural Development, 2018
Affected areas

Pea leaf weevil has been expanding to the north and east in Saskatchewan the past several years.

Pea leaf weevil in Saskatchewan - 2018

Average notches per plant
- 0 – 1
- >1 – 3
- >3 – 9
- >9 – 27
- >27

Source: Government of Saskatchewan, Agriculture and Knowledge Centre and Crops Branch, 2018
What’s at stake?

High pea leaf weevil populations can destroy up to 90 percent of the root nodules. Larval feeding on the nitrogen-fixing root nodules (Rhizobium) of the plant can result in:

- Significant yield losses
- Weaker plants that are less drought tolerant and produce less seed

Adult feeding on the leaves and growing point of seedlings can result in:

- Adult feeding on the leaves and growing point of seedlings can result in economic losses due to reduced yield.
- Plants can typically withstand 50 percent defoliation without the damage impacting yields. The difficult-to-see larval feeding on nodules is where the major losses occur.
Management practices

1. **Plant early** to maximize yields and potentially avoid weevil damage in colder temperatures.

2. **No-till cropping systems**, integrated pest management systems and good crop rotations are recommended.

3. **Registered seed treatments** are recommended as your first line of defense. Not only do seed treatments protect against adults feeding on the foliage but they also delay and reduce egg-laying, preventing larvae feeding on *Rhizobium* nodules.

4. **Trap crops** can be planted along field borders in the fall or early spring. If warranted, spray trap crops with a registered insecticide to control pea leaf weevils before they move into the main crop.

5. **Scout** for pea leaf weevils as soon as peas and faba beans emerge and continue up to the six-node growth stage.
Management practices

6. **Foliar applications** of insecticide are recommended at the two- to three-node stage when one or more feeding notches appear in three out of 10 seedlings. If feeding damage occurs only on the lower leaves and not on the clam leaf, the weevil is no longer a threat to the crop.

Source: Alberta Agriculture and Forestry
Scouting

• Begin scouting as soon as the plants emerge, and continue up to the six-leaf stage. Eggs laid after this period don’t affect yield.

• Pea leaf weevil is not an easy insect to spot as it ‘plays dead’ and drops to the ground on approach. Evidence of its presence comes from crescent-shaped notches on pea leaves.

• Economic threshold for foliar application: When one or more crescent-shaped notches appear on the clam leaf (most recently emerged leaves) in 30 percent of pea seedlings (three out of every 10 plants along a seeded row).

There is no economic threshold established for faba beans
Scouting

Assessing pressure in peas

Look at 10 adjacent seedlings in 10 areas of the field. Count what proportion of the seedlings have damage on the clam leaf. Calculate the average damage for all 10 areas. Make sure to select five areas on the edge of the field and five areas at least 30 metres into the field.
Watch your pulse crops grow faster and stronger

Cruiser Maxx® Vibrance® Pulses seed treatment combines an effective insecticide with three fungicides to protect your pulse crops. Plus, Cruiser Maxx Vibrance Pulses delivers Rhizoctonia control as well as:

- The broad-spectrum seed- and soil-borne disease protection of Vibrance Maxx plus the early-season insect protection of Cruiser® 5FS insecticide
- Improved yield potential due to better plant stands, root systems, uniformity and overall plant health
- Contact and systemic activity that protects growing seedlings from both insects and diseases
- Compatibility with Rhizobium-based inoculants and seed safety

(Check inoculant suppliers of Rhizobium for details on compatibility)
How does it work?

• Moves systemically through the plant as it grows
• When the adult pea leaf weevil feeds on the new leaves, it ingests the active ingredient, thiamethoxam
• The insect will stop feeding and delay egg laying. This greatly reduces the number of larvae feeding on nodules

Application tips

• May be applied on-farm or by commercial treaters using closed transfer (including closed mixing, loading, calibrating, and closed treatment equipment)
Use rates

Cruiser Maxx Vibrance Pulses can be applied on-farm, provided a closed-system treater* is used, or by commercial seed treaters:

- Cruiser 5FS @ 50 mL/100 kg of seed
- Vibrance Maxx @ 335 mL/100 kg of seed
  (Apron Maxx® RTA @ 325 mL/100 kg of seed
  and Vibrance 500FS @ 10 mL/100 kg of seed)

or

- Cruiser 5FS @ 50 mL/100 kg of seed
- Vibrance Maxx RFC @ 100 mL/100 kg of seed
- Add water to create slurry volume of 325 mL/100 kg of seed

* Cruiser Maxx Vibrance Pulses must be applied using a closed-system seed treater. Please contact your local Syngenta Representative for further information.
Why use a seed treatment?

- Insect pests can severely limit growing success. The best way to protect nodulation in fields infested with pea leaf weevil is with a seed treatment.
- Alberta Agriculture reports research has shown seed treatment is much more effective in decreasing losses from pea leaf weevil than foliar treatment.

Refer to product label for a complete list of pests, application timing, rates and directions for use.
Matador® foliar insecticide will protect your crop by controlling pea leaf weevil on contact

- Works on contact and through ingestion for up to seven days
- Fast-acting activity on adult pea leaf weevils
- Registered for ground and aerial application in field peas and faba beans

Application timing

- Make first application after plant emergence but prior to the five- to six-node stage
- Apply while adults are still present on the plants, before egg laying begins

Application tips

- Recommended rate for pea leaf weevil is 34 mL/ac
- For best results, apply Matador in the early morning, before temperatures rise, and in the evening, after the heat of day
- Temperature must be warm enough for insects to be active at the time of application
Packaging

- One jug treats 111 acres when applied at 34 mL/ac

Water volume

- Ground: 40-80 L/ac (10-20 gal/ac)
- Air: 4-16 L/ac (1-5 gal/ac)

Pre-harvest interval

- Do not apply within 21 days of harvest for dry peas

Refer to product label for a complete list of pests, application timing, rates and directions for use.
Voliam Xpress® foliar insecticide will provide both rapid knockdown and long-lasting residual control of pea leaf weevil

- Works on contact and through ingestion
- Initial and residual control is contingent upon thorough crop coverage

Application timing

In pulses:
- Apply no later than when the first feeding is seen on foliage. Reapply after seven days depending on the presence of significant populations as determined by local monitoring

Packaging

- Case: 4 x 3.78 L (treats 40 ac/jug or 160 ac/case at the standard rate for most registered pests)

Water volume

- Ground: minimum 10–20 gal/ac (100–200 L/ha)
- Aerial: 4 gal/ac (40 L/ha)
Always read and follow label directions. Cruiser Maxx Vibrance Pulses is an on-seed application of (i) Cruiser 5FS Seed Treatment insecticide; (ii) Apron Maxx® RTA Seed Treatment fungicide or Apron Maxx RFC Seed Treatment fungicide and (iii) Vibrance 500FS Seed Treatment fungicide. Apron Maxx®, Cruiser®, Cruiser Maxx®, Matador®, RTA®, Vibrance®, Voliam Xpress® and the Syngenta logo are trademarks of a Syngenta Group Company. © 2018 Syngenta.