

Pea Leaf Weevil : *Sitona lineatus* Linnaeus Monitoring Protocol

Host plants:

Plants belong to the family Leguminaceae and include cultivated and wild legume species, specifically dry beans, faba beans but economic damage caused in peas and faba beans.

Identification, Life cycle and Damage:

Adult: Adults overwinter in alfalfa or other perennial legumes and emerge in the spring primarily by flying (at temperatures above 17°C) or they may walk short distances. Pea leaf weevil movement into peas and faba beans is achieved primarily through flight. Adults are slender, greyish-brown measuring approximately 5 mm in length (Figures 1 and 2). The pea leaf weevil resembles the sweet clover weevil (*Sitona cylindricollis*) yet the former is distinguished by three light-coloured stripes extending length-wise down thorax and sometimes the abdomen (Figure 8). All species of *Sitona*, including the pea leaf weevil, have a short snout.

Adults will feed upon the leaf margins and growing points of legume seedlings (alfalfa, clover, dry beans, faba beans, peas) and produce a characteristic, scalloped (notched) edge (Figures 3-5). Pea leaf weevils that are not reproductive will feed on several species of legumes. Females lay 1000 to 1500 eggs in the soil either near or on developing pea or faba bean plants from May to June.



Figure 1: Adult *S. lineatus* on pea leaf (Photo: L. Dossdall).



Figure 2: Dorsal view of adult *S. lineatus* (Photo: H. Goulet).

Eggs: Eggs are laid singly in the soil either near or on developing plants from May to June.



Figure 3: Pea seedling with weevil damage consisting of notching on leaves (Photo: L. Dosdall).



Figure 4: Weevil feeding notches along perimeter of pea leaves (Photo: L. Dosdall).

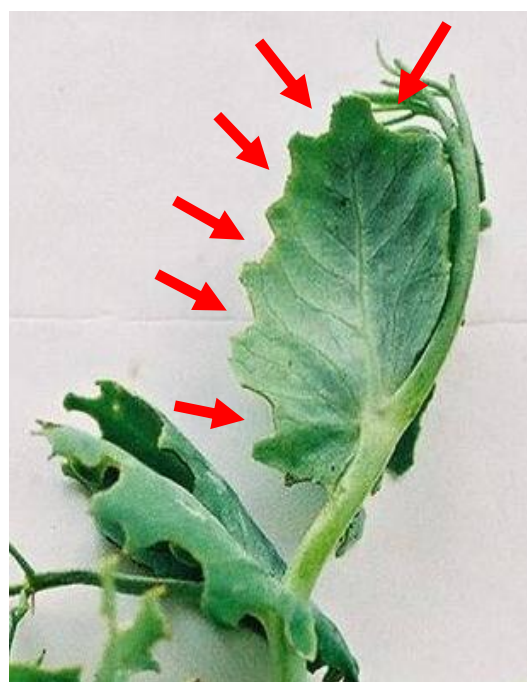


Figure 5: Pea leaf weevil feeding notches on clam leaf (Photo: L. Dosdall).

Larva: Larvae develop under the soil and are “C” shaped and milky-white with a dark-brown head capsule ranging in length from 3.5-5.5 mm (Figure 6). Larvae develop through five instar stages. After hatching, larvae seek and enter the roots of a pea plant. Larvae will enter and consume the contents of the nodules of the legume host plant. It is the nodules that are responsible for nitrogen-fixation which affect yield plus the plant’s ability to input nitrogen into the soil. Consumption of or damage to the nodules (Figure 7) results in partial or complete inhibition of nitrogen fixation by the plant and results in poor plant growth and low seed yields.



Figure 6: Weevil larva in soil (Photo: L. Dosdall).



Figure 7: Pea nodules damaged by larval feeding (Photo: L. Dosdall).

Pupa: Pupation takes place in the soil. New generation adults emerge from late July to August and seek pulse crops to feed upon prior to overwintering in the late fall.

Figure 8. *Sitona* species that occur on the Canadian prairies.



<i>Sitona lineatus</i> Linnaeus Pea leaf weevil	<i>Sitona cylindricollis</i> Fahraeus Sweet clover weevil	<i>Sitona lineelus</i> Bonsdorff Alfalfa curculio	<i>Sitona hispidula</i> Fabricius Clover root curculio
5 mm long Three dorsal stripes extending laterally from head to abdomen; unlike any other <i>Sitona</i> species, the fore-coxal cavities touch or nearly touch a narrow groove located on the ventral surface of the pronotum (Bright 1994; Bright and Bouchard 2008).	5 mm long Uniformly dark grey to black.	3-4 mm long Smaller and lighter in colour than <i>S. cylindricollis</i> .	4-5 mm long Three dorsal stripes extending laterally from head to thorax; spotting pattern on elytra; "hairy" on abdomen.
Hosts: Peas, faba beans, seedling alfalfa.	Hosts: Sweet clover, seedling alfalfa, cicer milkvetch.	Hosts: Alfalfa, sainfoin, cicer milkvetch, native vetches.	Hosts: Clovers, alfalfa, other legumes.

Monitoring

Timing: Pea leaf weevil populations are estimated by plant damage assessments performed from 2nd to 6th node stages (i.e., during the **last week of May and first week of June**), the period typically coinciding with maximum damage.

Plant Damage Assessments:

Assess pea plants for weevil feeding damage at five different locations within the field in the following pattern (Figure 10):

1. 10 metres from the field access point but remain within 2 metres of the field margin,
2. 25 metres from above but remain within 2 metres of field margin,
3. 25 metres from previous but within 2 metres of field margin,
4. 25 metres from previous but within 2 metres of field margin,
5. 25 metres from previous but within 2 metres of field margin.

At each of the five locations, record the following for 10 plants:

1. Pea node stage,
2. Total number of crescent-shaped notches,
3. Number of plants with clam-shell feeding damage.

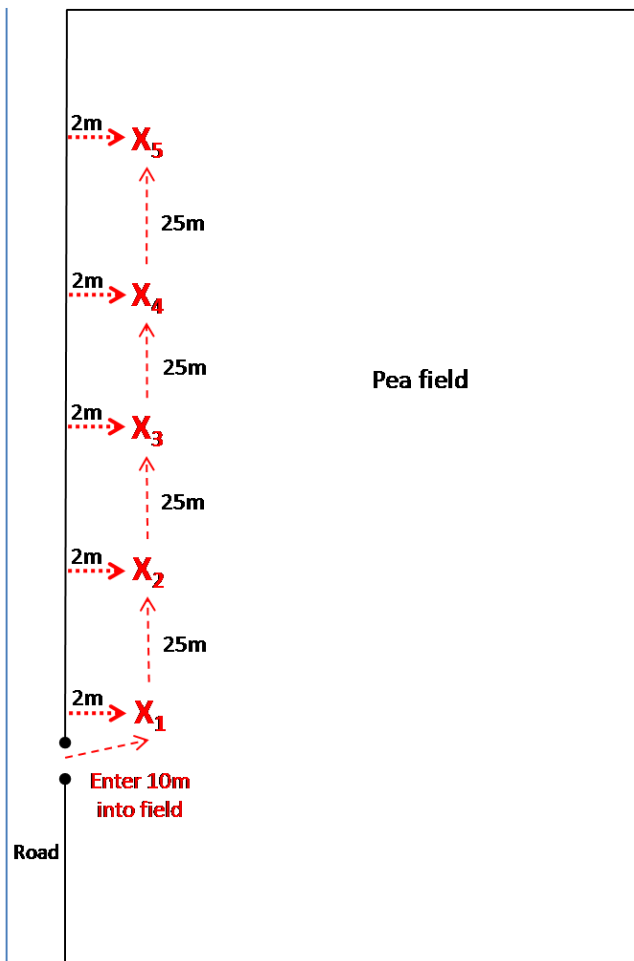


Figure 9: Example of field monitoring pattern recommended to use when sampling for pea leaf weevil.



Figure 10: Clam leaf highlighted on pea plant (Photo: L. Dosdall).