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Pea Leaf Weevil on Chickpea (Cropland Insects)

Description: Chemical control options are listed in the https://wiki.bugwood.org/HPIPM:PC_Pea_leaf_weevil and a new MontGuide provides biology and management practices summary. Both preventive (seed treatment) and sprayed insecticides can be used to manage the pea leaf weevil. Seed treatments protect the root nodules from larval feeding. Foliar sprays are targeted toward the adults, specifically the female weevils before they lay eggs, to prevent yield loss caused by the larvae. It remains uncertain whether pea leaf weevil adults feeding on chickpea will cause economic damage or not since Saskatchewan Canada Pulse growers' news bulletin considers this as minor pest for chick pea as because of failing to multiply their generations. However, thresholds developed for pea could be used for spraying field infested with pea leaf weevil adults. Spraying is generally reached in pea when 1/4 to 1/3 of the plants display feeding notches on the clam leaves (the most recently emerging leaves) or leaf pairs.

Alert Period: 05/22/2017 - 06/30/2017

Submitted By: Gadi VP Reddy

Alert Documents:

Wheat streak mosaic virus and the wheat curl mite (Cropland Diseases)

Description: A lot of information on wheat streak mosaic virus: the host, the pathogen and the environment. Contact me if you have any questions, --Mary Burrows mburrows@montana.edu, 599-9966

Alert Period: 05/15/2017 - 05/31/2017

Submitted By: mary burrows

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Author: Sue Blodgett

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Identification (and life cycle/seasonal history)

The Pea leaf weevil (*Sitona lineata*) is a pest of seedling pea plants. The adult which is the over wintering stage is gray-brown in color measuring between about 1/5 of an inch, with a short, blunt shaped beak and has 3 light but inconspicuous stripes that run lengthwise from the thorax to the wing covers. The larvae is legless, curved and resembles a grub. It is white in color with a dark brown head reaching ¼ inch in length.

Both adults and larvae have chewing mouthparts Larvae feed on nitrogen-fixing nodules on roots. Larval feeding does not cause economic damage.

Adults over winter in alfalfa fields, roadsides or protected by crop residues and debris. Adults emerge in the spring seeking their preferred hosts, peas and vetch but have also been noted to feed on alfalfa and clover. Fields or areas that are low-lying, with heavy soils, and only partially incorporated residues are more likely to harbor large numbers of adults and receive greater injury to the subsequent pea crop.

Damage

Adult feeding results in scalloped leaf edges which can coalesce causing significant injury to seedling alfalfa. Typically the damage is more severe on edges of field adjacent to grassland, pasture, riparian areas or other similar refuges.

Monitoring

Pea leaf weevil can be very damaging to the growing point of seedling plants. Plant inspection is recommended. When more than 25% of the leaves are notched or there are more than 0.2 – 1 weevils per plant, treatment is justified. Another threshold is between the 2-4 leaf stage when ¼ of the plants have feeding injury and insects are present. Once 6 leaf stage is reached, some defoliation can be tolerated.

Management

Cultural control

Variety trials conducted in Washington indicate than semi-leafless peas are more susceptible to pea leaf weevil than conventional peas.

Chemical Control

Product List for Pea Leaf Weevil:

Insecticide	Lbs Active Ingredient per Acre (Fl oz. or oz. product)	Preharvest Interval, remarks
Carbaryl 4L, 80S, XL^{R1,3}	1 – 1.5 qt (4L) 1 ¼ - 1 7/8 lbs (80S) 1 – 1.5 qts (XLR)	14 days grazing or harvest for forage, 21 days harvest dry seed. Do not apply more than 6 qts (4L or XLR) or 7.5 lbs (80S)/A/ season.
Imidan 70 WP¹	1 – 1.3 lbs	7 day. 10 days for hay or 7 days for forage. Pacific Northwest only. Do not apply more than 4 lbs/A/season. Minimum tank mix of 5 gal/A.
Fury 1.5^R	3 – 4.3 oz	21 days. 12 hr REI. Do not apply more than 24 oz per season.
Mustang Max, 1.5 EC^R	2.72 – 4. oz	21 days. 12 hr REI. Do not apply more than 24 oz per season.
Malathion³	1 – 2.5 pt (8EC)	3 days. 12 REI. Do not feed or graze treated foliage.
^R Restricted Use Pesticide, ¹ Labeled for chemigation, 224c labels may be available, check with State Dept of Agriculture, ³ Several formulations		

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Pea Leaf Weevil

Pea leaf weevil is an introduced pest that has become established in Montana and continues to move eastward in areas planted with field peas.

by Kevin Wanner, Associate Professor, Plant Sciences and Plant Pathology

Species name: *Sitona lineata* L.

Appearance: The adult pea leaf weevils (PLW) are slender greyish-brown beetles about 1/5" long with a broad-shaped snout (Figure 2A). The legless larvae are soft bodied and milky white in color with a darker head, about 1/7 to 1/5" in length. Larvae curl into a "C" shape when exposed (Figure 1C).

Host range: PLW infests wild and cultivated legumes, but typically causes economic damage only to field peas and fava beans. Chickpeas are not preferred, but may become infested when a nearby host crop has been removed and resident weevils migrate into the chickpea crop to mate and lay eggs. Lentils are not considered a host for pea leaf weevil. Secondary host crops for adult feeding include clover and alfalfa, but the larvae do not develop on these crops.

Geographic range: PLW is native to Europe, Asia and Africa and was introduced to the west and east coasts of North America in the 1920s. It has become established as an economic pest in Washington, Idaho and western Montana as well as Alberta and western Saskatchewan. North American populations are moving eastward as the acreage planted to field peas has expanded in the last decade. As of 2015 pea leaf weevil has migrated eastward to Lewistown but has not yet reached the major pulse acreage grown in the northeastern corner of Montana.

Damage: The adult weevils feed on the leaves, chewing a half-moon-shaped notch in the leaf edge (Figures 1A/B). Defoliation typically does not cause economic damage since the crop usually compensates and recovers. However, when weevil populations are high and the plants have only recently emerged, adult feeding can cause significant damage. Yield loss is believed to occur as a result of larval feeding on the nitrogen-fixing root nodules, which may reduce the amount of nitrogen being contributed to the

soil. High PLW populations may destroy up to 90% of the root nodules. While adult weevils can feed on a wide variety of legume plants, the larvae only survive to adulthood on the root nodules of field pea and fava bean crops.

Not to be confused with: Pea weevil (*Bruchus pisorum*) is a different pest of peas that has a similar common name. Pea weevil lays its eggs on the developing pea pod and the larvae consume the peas inside, and the adults are very different in appearance (Figure 2C). Sweetclover weevils (*Sitona cylindricollis*) can be a pest of clover and the adults are very difficult to distinguish from PLW, and both can be found in alfalfa crops. If the specimens are fresh and undamaged, parallel lines along the abdomen of the PLW (Figure 2A) can distinguish it from the sweetclover weevil (Figure 2B).

Life cycle: Adults primarily overwinter in surrounding roadsides, shelterbelts and perennial legume crops such as alfalfa. Early in the spring on warm days the adult weevils begin to fly into field pea or fava bean crops to feed and mate (in Europe flight does not occur below 55°F). Feeding damage to the leaves is often first noted on the field edges. Migration into the crop may last for several months and is influenced by spring temperatures. After a period of feeding, female weevils mate and scatter eggs over the soil surface (Figure 2A). Females lay as many as 1,655 eggs over their life span, primarily when temperatures are between 54 and 72°F. After 2-3 weeks the eggs hatch, and newly emerged larvae burrow into the soil searching for root nodules on the host

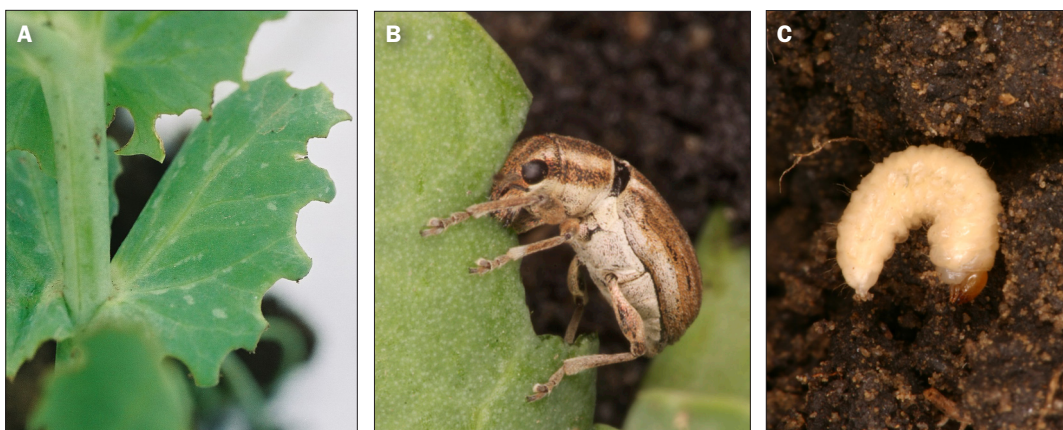


FIGURE 1. A/B) Adult pea leaf weevils make distinctive half-circle notches in the edges of pea leaves; C) Larvae are white, with c-shaped bodies and brown heads.

plant. The larvae feed within the root nodules for 4-8 weeks before developing to the next generation of adults. Sometime around late July or August adult weevils emerge from the soil and feed on a variety of legume hosts, but do not cause economic damage at this stage. From late summer to fall the adults fly and migrate to their overwintering sites.

Management: Preventive insecticidal seed treatments protect the root nodules from larval feeding and the foliage from adult feeding. However, the decision to treat seed should be based on the history of weevil damage in previous years, since planting occurs before pest activity can be monitored. Foliar sprays can be applied before the 6th node growth stage (Figure 3). The economic threshold for spraying is reached when ¼ to ⅓ of the plants have feeding notches on the clam leaf (the most recently emerging leaves that are still folded together). A row of 10-20 seedlings should be examined at several locations, including the interior of the field, to establish an average number of plants with feeding damage. Foliar sprays must control the female weevils before they lay eggs to prevent yield loss caused by the larvae. Some results suggest that seed treatments provide better control compared to foliar sprays, since sprays may not always control the adult females before egg laying occurs. Insecticides are listed on the High Plains IPM Guide.

Additional resources

High Plains IPM Guide: http://wiki.bugwood.org/HPIPM:PC_Pea_leaf_weevil

Pea Leaf Weevil Feeding Damage with Mating Adults, https://www.youtube.com/watch?v=yk8EV5_ppOI

Pea Leaf Weevil Overview by Alberta Entomologist Scott Meers, <https://www.youtube.com/watch?v=YJ4BTe9xstA>

IMAGE CREDITS - 1. all photos by Michael Dolinski; 2. A) Michael Dolinski, B) RKD Peterson, C) Mariusz Sobieski, bugwood.org; 3. Agriculture Canada; 4. Tom Murray; 5. Swaroop Kher, University of Alberta, Edmonton

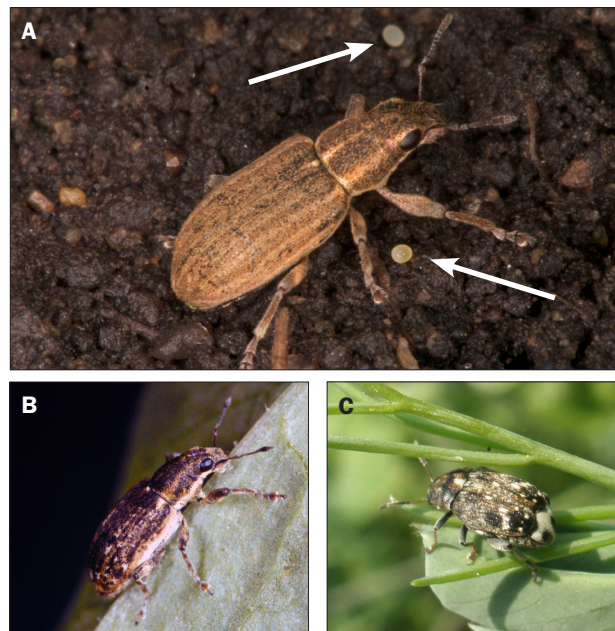


FIGURE 2. Several weevil species in legumes look similar: A) Female pea leaf weevil with freshly laid eggs (arrows) on the soil; B) sweetclover weevil; C) pea weevil.

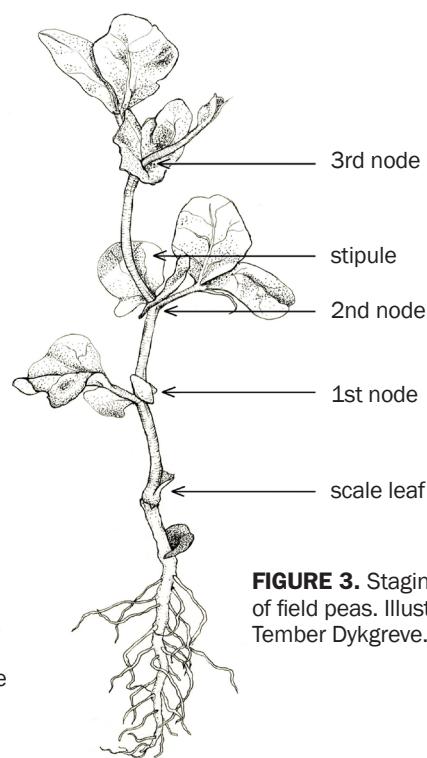


FIGURE 3. Staging the growth of field peas. Illustration by Tember Dykgreve.



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