

Western Yellowstriped Armyworm (*Spodoptera praefica*)

Introduction

Western yellowstriped armyworm (*Spodoptera praefica*) was reported for the first time in the North Okanagan valley of British Columbia in Enderby, Armstrong and Spallumcheen in July 2018. Thousands of caterpillars moved into crops causing extensive damage to vegetable and flower gardens, ornamentals and alfalfa. The pest is known to be distributed in British Columbia and the western United States.

Records of this pest in Southern British Columbia are from Cranbrook in 2007 and Okanagan Falls in 1992 and 2009 (Royal BC Museum Collection, Strickland Entomological Museum, University of Alberta). Western yellowstriped armyworm is a different species from the True armyworm, *Mythimna unipuncta* reported in the Fraser Valley and Vancouver Island in 2017.

Farmers and homeowners are asked to report any suspect Western yellowstriped armyworm caterpillars and damage in new regions to the B.C. Ministry of Agriculture offices or contacts below:

- Susanna Acheampong, Ministry of Agriculture, Kelowna at Susanna.Acheampong@gov.bc.ca or (250) 861-7681
- AgriService BC, Telephone: 1 888 221-7141 Email: AgriServiceBC@gov.bc.ca



Figure 1. Western yellowstriped armyworm moth.

Identification

Adult: Brown moths, front wings have light yellow, brown and dark brown markings and hind wings are silvery-grey. Adults are about 1.5 cm long (Figures 1 & 2).

Larva: Caterpillars are black with distinct pale yellow stripes on each side of the body, up to 5 cm long, front of the head has an inverted “Y” marking (Figure 2).

Egg: Eggs are laid in clusters on the upper surface of leaves and covered with gray cottony material.

Pupa: Pupae are reddish brown (Figure 2).



Figure 2. Western yellowstriped armyworm caterpillars, caterpillar showing inverted “Y” on the head, pupa, and moth.

Biology

Moths fly from March – May and lay clusters of eggs on upper leaf surfaces. Eggs hatch in 3 – 6 days and caterpillars (larvae) feed for 2 – 3 weeks. There are usually 6 larval stages; larvae grow from 2.0 – 35 mm long. The sixth larval stages dig about 5 cm deep into the soil to pupate in June. Moths emerge in 2 weeks. The entire life cycle takes about 4 – 6 weeks. Adults from the second generation fly from July and caterpillars feed from July – August. There may be 3 – 4 generations per year. Caterpillars of the last generation overwinter in the soil as pupae. Moths fly at night and mating and egg-laying occur between dusk and midnight.

Hosts

Western yellowstriped armyworm feeds on forage crops, vegetables, ornamentals, and weeds. More than 60 plant species have been listed as hosts. Hosts recorded in North Okanagan include forage (alfalfa, corn, canola, buckwheat, barley, peas), vegetables (asparagus, potatoes, beans, peas, beets, rhubarb, carrots, tomatoes, chives, squash), berries (strawberry, raspberry, currant, Saskatoons), tree fruit (pear) nuts (hazelnut, walnut), grape, ornamentals (hosta, poppy, sunflower, snapdragon, cosmos, sweet peas, dahlias, gladiolus, daisies, clover, lupine, lily, foxglove, willow, mountain ash, variegated elderberry, Kim lilac) and weeds (pigweed, kochia, lambs quarters, bindweed, mallow, burdock, nightshade, dandelion, scentless chamomile, stinging nettle, Canada thistle).

Damage

Caterpillars feed on foliage, chew large holes in leaves and can cause complete defoliation. Significant damage occurs to crops in June and July and in late September – early October.

Monitoring

Adults: Pheromone lures are available for monitoring adult male moths using bucket traps (Figure 4). Trapping will help indicate if moths are present in the area and when to expect caterpillars in fields. Set traps up in April and continue trapping into September. Traps and lures can be purchased from [Great Lakes IPM](#).

Larvae: Check fields 2 - 3 times per week in late May through early July for small larvae.



Figure 3. Top to bottom; Western yellowstriped armyworm damage to alfalfa, corn and canola.

Use a sweep net for small caterpillars and search for older caterpillars in plant debris on the soil surface. Larvae have a tendency to drop from plants to the soil when disturbed. Check the backs of caterpillars for parasitoid eggs (Figure 4).

Control

Cultural control

- Where practical, harvest early to reduce damage. Irrigate and fertilize fields to encourage regrowth to help limit losses in hay fields.
- Caterpillars begin to migrate from cut alfalfa fields. If there are adjacent susceptible crops, leave a strip of uncut alfalfa or apply an insecticide on the first few rows of the adjoining crop.
- Control weeds in the spring to limit potential egg-laying host plants for adult moths, as well as food sources for larvae.
- Larvae will take refuge under swaths or bales. If possible, don't move bales to different farms immediately; store bales on cement pads or in sheds for about a week prior to transport to allow larvae to disperse or die.
- To help prevent/reduce the spread of worms, ensure hay equipment, farm trucks and other equipment is cleaned between farms. Clean hay equipment by spraying with air or water. Inspect equipment coming onto your property.

Biological control

- Natural enemies including parasitic wasps and flies, assassin bugs, damsel bugs, bigeyed bugs, spiders, and viruses may provide control of western yellowstriped armyworms. Birds including magpies, starlings, red winged black birds and ravens will feed on caterpillars.
- Caterpillars attacked by virus appear yellowish and sluggish and die within a few days. Dead caterpillars hang from plants and ooze disintegrated body contents (Figure 4). The virus provides some control.
- While some biocontrol agents can be purchased for release, this is not a practical approach to limit outbreaks and damage to commercial or economically significant hay crops.



Figure 4. Top to bottom; Pheromone-baited bucket trap, Caterpillar with parasitic fly eggs and Virus infested caterpillar oozing gut contents. Virus Infested caterpillar also has parasitic fly eggs.

Chemical control

- Armyworm outbreaks are unpredictable and loss can occur quickly. If cutting the crop is not practical or larvae are causing damage to the crowns of plants that will overwinter or to stands recovering from cutting which will be cut again, apply an insecticide (see Table 1).
- Use the following action thresholds:
 - 5 larvae per square foot (30 x 30 cm) for forage grass/hay.
 - 2 - 4 larvae per square foot (30 x 30 cm) for annual cereal.
- For best control, apply insecticides before most of the larvae reach 2.5 cm (1 inch) in length.
- For armyworms migrating into fields, treat a couple of swaths ahead of the infestation in the direction of the movement to form a barrier.
- Btk (*Bacillus thuringiensis kurstaki*) can be used for organic caterpillar control. For best control, apply to small larvae (less than 2 cm).
- Rotate insecticide groups to reduce the risk of resistance development.
- For successful management of armyworm outbreaks, all farmers in outbreak areas should work together and coordinate control measures.

References

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Protecting Pollinators

To protect bees from toxic insecticides, **applicators/producers** should

- Use insecticides only if and when needed, use the least toxic product and the lowest effective rate.
- Use a ground sprayer to reduce drift and avoid spraying before flowering and when bees are foraging. Apply insecticides late in the evening.
- Notify neighbouring beekeepers at least 48 h in advance about where, when and what product will be applied.
- Read the bee poisoning information on the product label.

Bee keepers

- Inform producers within the foraging area about the location of hives and provide maps.
- Be aware of crops in the area and toxic products likely to be used.
- Hives should be placed where there is less risk of pesticide exposure.
- Post sign and contact information in all apiaries.



Figure 5. Parasitic fly adult and eggs on Western yellowstriped armyworm caterpillar.

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Updated, July 2019

Table 1. Insecticides registered for control of armyworm in forage, grass, and corn. Please refer to Health Canada's [Pest Management Regulatory Agency](#) website for insecticide label information. Read and follow label directions. Rotate insecticide groups for resistance management.

PCP #	Product name (active ingredient)	Insecticide group	Crops	Pre-harvest interval (days)	Maximum number of sprays/year	Spray interval (days)	Notes and precautions
28982	Coragen (chlorantranil iprole)	28	Corn (field, sweet), grass forage, fodder, and hay group, non-grass animal feed group, oilseeds and cereals.	Forage grass: 0 Forage corn: 14 Cereal: 1	Up to 4	7	Use high rate for heavy pest pressure.
28778	Delegate (spinetoram)	5	Cereals, field/ forage corn	Cereals: 21 Forage corn: 7	3	5	Toxic to bees. DO NOT apply to flowering crops or weeds.
5821	Malathion (malathion)	1B	Cereals, grasses, legumes, alfalfa, clover for hay	7	1		Highly toxic to bees. DO NOT apply to flowering crops or weeds. Do not apply at air temperatures below 20°C.
27876	Sevin XLR (carbaryl)	1A	Forage, pasture, cereals	1	2	8	Highly toxic to bees. Apply from late evening to early morning or when bees are not foraging.
24984 29052	Matador Silencer (lambda-cyhalothrin)	3	Cereals, corn	Corn for silage: 14 Cereals: 28 Sweet corn: 1	3	4 - 7	Toxic to bees. DO NOT apply to flowering crops or weeds.