



Spring/early summer is here and the 2016 growing season is well underway. The predictable unpredictability of the weather has brought the typical challenges that we face on an annual basis. Hopefully the majority of you are untouched or unaffected by the quirky weather that has been observed. Hopefully you've gotten some of the rain that has fallen across the Prairies.

To combat or counteract the unpredictability of the weather, welcome to another ever-so-predictable edition of Hort Snacks. The content isn't always predictable, but the arrival of it is.

In this edition, you'll notice a theme. And that theme is largely creepy/crawly. The season of insect wildlife is upon us, and to prepare you (and perhaps some of your customers) for identifying and dealing with some of those pests, you'll find some caterpillar-related resources. That doesn't mean that there aren't more things out there, but this is a start.

Otherwise, please take a moment to look at the various bits and pieces that might be of interest to you. Regardless, we wish you all the best for your growing season. Stay in touch.

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 Alberta Agriculture and Forestry
 310-FARM (3276)

FEATURED SURVEYS

Input being sought with regards to Future Government Programs – surveys

- 1) [AAFC - Next Agricultural Policy Framework – Share Your Experience and Ideas](#)
- 2) [Canadian Horticulture Council \(CHC\) – Risk Management Policy Development for GF3](#)

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Strawberries

- Maintain good straw cover on all strawberries, as this reduces the incidence of disease
- Apply 3-5 cm (1 –2 inches) of straw to newly planted Day-neutrals
 - 3 – 5 cm (1 – 2 inches) = 40 small square or 3-4 large round bales per acre
- Initiate applications of nitrogen to Day-neutrals – 10-20 lbs actual N/ac/month – may be split into weekly or bi-monthly applications

Raspberries

- Consider trellising options for primocane types

Saskatoon Berries

- Application of nitrogen and phosphorus (2nd of 2 – split application) – 15-25 lbs actual N/acre; 10-20 lbs P/acre – adjust rate when banding
- Arrange harvesting, refrigeration and sales outlets of Saskatoon berries

Vegetables

- Transplanting of most warm season plants should / be completed in the first part of the month (if it wasn't done late last month)
- Complete any additional staggered-date plantings of crops

Interesting News / Articles to Read this month

- [The many benefits of using windbreaks](#) – OMAFRA article
- [Bringing the supermarket of the future to the present](#) - The Boston Globe article
- [Why On-Farm Dinners Cost So Much](#) – Growing Produce article
- [Protecting tomatoes from herbicide drift](#) – MSU article
- [Three factors that can impact the pH of growth media](#) – Greenhouse Grower article
- [Why light matters in greenhouse structures](#) – Greenhouse Grower article
- [Netting no longer “against something” but “for something”](#) – HortiDaily article
- [Does sulfur drop the pH of growing media?](#) – HortiDaily article

General / Other

- Ensure that irrigation and spray equipment is ready to go
- Monitor and maintain optimum soil moisture conditions in all crops (pay close attention to critical moisture stages – see [Water Requirements in Horticulture Crops - FAQ](#))
- Maintain good weed control in field and headlands
- Final arrangements for marketing of crops, e.g. pails, buckets, training of field personnel, advertising, etc.
- Put honeybee colonies in field at start of flowering (~2 hives per acre)

Pest Monitoring / Management

- Continue regular and thorough scouting / monitoring of fields for disease and insect pest problems
- Remove diseased plant material
- Use appropriate control measures if necessary
- Adhere to “Days to Harvest / Pre-Harvest Interval” and “Re-entry Intervals” (for worker and customer safety)
- Strawberries
 - Monitor strawberry fields for aphids, Tarnished Plant Bug, bud/clipper weevils, root weevils, leaf rollers
 - Botrytis fruit rot control sprays at bloom stages are most effective; apply at 5-7 day intervals
- Saskatoon berries
 - Application of insecticides (Decis) and fungicides (Topas / Mission / Jade / Pristine / Switch / Kumulus / Cyproflu) at later bloom stages (petal drop, green fruit) – depending on development of crop
- Black Currants
 - Monitoring (and control if necessary) of aphids, sawfly (imported currant worm or currant fruit worm)

REMEMBER – DO NOT APPLY DISEASE/PEST CONTROL SPRAYS DURING FULL BLOOM (Saskatoon berries, currants, raspberries) – most insecticides are toxic to pollinating insects and some fungicides have repellent qualities

NEWSLETTER USE RESTRICTIONS

Please feel free to share all or portions of this newsletter with other interested parties.

If you want to use content from this newsletter in other media, please request permission before doing so.

DUTCH ELM DISEASE AWARENESS WEEK

June 20-26, 2016

DED Hotline 1-877-837-ELMS (3567)

www.stopped.org

Upcoming Conferences / Workshops

June 2016

- 13th International Conference of the European Industrial Hemp Association (EIHA)
June 1-2, 2016 – Rheinform – Wesseling/Cologne, Germany
<http://www.eiha-conference.org/>
- University of Saskatchewan Plant Sale Day
June 3, 2016 – Horticulture Field Lab – Saskatoon, SK
www.fruit.usask.ca/extension.html
- Greenhouse Canada Grower Day 2016
June 15, 2016 – Holiday Inn – St. Catherines, ON
<http://www.greenhousecanada.com/grower-day/>
- International Floriculture Expo
June 21-22, 2016 – McCormick Place, Chicago, Illinois, USA
<http://www.floriexpo.com/>
- Hort Snacks in the Field (Veg Growing Season Extension focus)
June 27, 2016 – Seeds to Greens - Calgary area
<http://www.albertafarmfresh.com/> or AAF [Coming Events](#)

July 2016

- Haskap Intro Course – U of S
July 7, 2016 – University of Saskatchewan – Saskatoon, SK
www.fruit.usask.ca/extension.html
- Haskap Day 2016
July 8, 2016 – Horticulture Field Lab – Saskatoon, SK
www.fruit.usask.ca/extension.html
- Cultivate 16 (Formerly OFA Short Course)
July 9-12, 2016 – Greater Columbus Convention Centre – Columbus, OH
<http://cultivate16.org/>
- 100th Potato Association of America (PAA) Conference
July 31 – August 4, 2016 – Amway Grand Plaza Hotel – Grand Rapids, Michigan, USA
www.potatoassociation.org

August 2016

- Hort Snacks in the Field (Strawberry varieties focus)
Aug 27, 2016 – The Jungle Farm – Innisfail, AB
<http://www.albertafarmfresh.com/> or AAF [Coming Events](#)
- 8th International Strawberry Symposium
Aug 13-17, 2016 – Quebec City Convention Center – Quebec City, QC
<http://www.iss2016-quebec.org/>
- North American Strawberry Growers Association (NASGA) Summer Tour
Aug 17--18, 2016 – Quebec City, QC area
www.nasga.org
- Farwest Show
Aug 25-27, 2016 – Oregon Convention Centre – Portland, OR
<http://www.farwestshow.com/>

DETAILS TO COME SOON

Fruit & Vegetable Field Days

- #1 Vegetable Growing Season Extension & Small Farm Equipment (June 27) – Seeds to Greens (Calgary area)
- #2 Strawberry Varieties (August 29) – The Jungle Farm (Innisfail, AB)

The plan for this year:

- Afternoons (starting with lunch)
- Single farm locations
- Focused / Specific topics

Watch www.albertafarmfresh.com OR AAF [Coming Events](#) for event details.

MENTAL SNACKTIME – New Growth

“And the day came when the risk to remain tight in a bud was more painful than the risk it took to blossom.” – Anais Nin

“Strength and growth come only through continuous effort and struggle.” – Napoleon Hill

“Without continual growth and progress, such words as improvement, achievement, and success have no meaning.” – Benjamin Franklin

“All change is not growth, as all movement is not forward.” – Ellen Glasgow

“Between stimulus and response there is a space. In that space is our power to choose our response. In our response lies our growth and our freedom.” – Viktor E. Frankl

CleanFARMS 2016

CleanFARMS will be running obsolete pesticide & livestock medication collections in October of 2016 as follow:

- Northern Alberta (Red Deer to AB Peace)

The program is free and ag-retail collection locations/dates will be released in early summer. The program is delivered by CleanFARMS and its members in each province/region of the country every three years.

Visit www.cleanfarms.ca for more information.

Note: In 2015, Alberta farmers disposed of more than 72,000 kg of obsolete pesticides and livestock medications



Hort Snacks in the Field – Growing Season Extension & Small Farm Equipment

June 27, 2016

Seeds to Greens CSA – 222160 Range Road 285, Rocky View, AB

This field day will provide market gardeners with an opportunity to visit a market garden Community Shared Agriculture (CSA) farm to see and learn about growing season extension technologies and small farm equipment and tools. This interactive field day encourages participants to learn from each other, as well as the host farm.

Registration: 11:30 a.m. to 12 Noon

Lunch: 12 Noon to 1 p.m.

Farm Tour: 1 p.m. to 3 p.m.

To register: 1-800-387-6030

Registration deadline: June 20, 2016

Cost: \$10/person

Lunch and snacks provided

GROWING FORWARD 2 PROGRAMS

Have a look at the Growing Forward 2 website to see the open programs that have funding available in different areas. There are a number of programs that have funding that is applicable to horticulture producers (small and large; new entrants or established) or groups in the areas of Agri-Processing Product Automation and Efficiency, Agri-Processing Product and Market Development, Business Management Skills and Business Management Opportunity, Food Safety Systems, Irrigation Efficiency, On-Farm Energy Management, On-Farm Water Management, etc. These provide funds for a bunch of areas, including things like training and/or skill development, expansion/succession planning, equipment for increased efficiency, innovative products, increasing competitiveness, etc. Don't be afraid to be creative in your ideas.

Please note, even if programs fill up this year, it is possible that they will repeat in future years, so you would have time to get your ideas and projects straight for the next funding year. Visit the site regularly to see which programs are taking applications.

If you want to apply or have questions of what is in and what is out or on eligibility, contact a New Venture Coach or a business development officer or the contact for the specific program. Applications have to go through staff to be vetted or reviewed.

www.growingforward.alberta.ca/programs

BE ON THE LOOKOUT FOR LATE BLIGHT

Over the last few years, there has been a great deal of concern in Alberta surrounding a serious disease called Late blight that affects mainly potatoes and tomatoes. This disease is caused by a fungal pathogen called *Phytophthora infestans*. The favourable conditions for disease development, combined with the presence of the pathogen, have resulted in multiple outbreaks of Late blight in commercial, market garden and urban potato and tomato crops throughout parts of Alberta in past years. A number of different strains of the pathogen have been identified in different years, each being more or less aggressive on either potatoes or tomatoes. For 2016, this disease continues to be a risk for all Solanaceous crops (potato/tomato family) grown in Alberta.

It is recommended that ALL growers of potatoes and tomatoes be extra vigilant to try and catch any diseased material early on, before a significant outbreak can occur. In the early season, growers should watch for:

- Tomato transplants and newly emerged potato shoots with water-soaked leaf lesions
- Plants that develop lesions early on in the season or as the season progresses, particularly if conditions are moderate and wet/humid

If you find plants showing suspicious lesions, it is recommended that you can contact 310-FARM (3276) to determine if further testing is required and to discuss management. Please do not hesitate to report an incidence, as early awareness will help to prevent and contain an outbreak and can help others to protect their crops.

While undertaking identification, producers should dispose of infected material as quickly as possible, removing disease parts (small scale) or killing out plants so disease cannot develop further. Protective fungicide applications can be made if conditions favour disease (and if disease is known to be present in the province)

Information on Late Blight

[FAQ – Late Blight of Potatoes and Tomatoes](#)

A blue rectangular box containing the white text 'Q&A' in a stylized, bold font.

Q: How do you prepare yourself and your staff for pest management activities in the season?

A: We went to Alberta Farm Fresh Presentation by Dustin called [Integrated Pest Management](#). At this session Dustin gave a management score sheet to fill out. When filling out the questions it makes a person really have a good look at one's own operation. Thanks Dustin.

Next Month's ? → [What is one pest management practice that you have found to be of great value to you?](#)

Caterpillars and caterpillar-like larvae

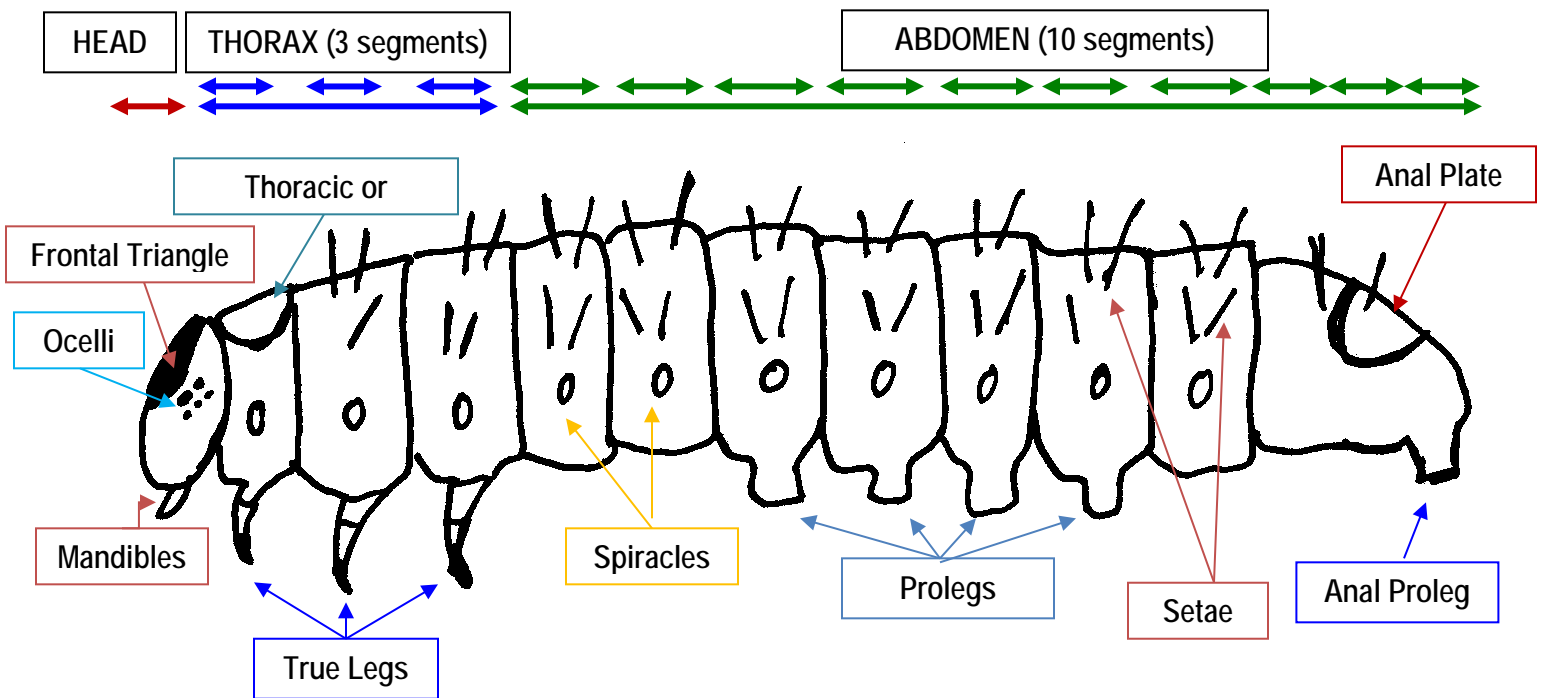
There are dozens of different insects that are found on and/or around horticultural crops which may or may not attack the crops. Some are aggressive and voracious and others just nibble at the fringes. Some are just present.

Caterpillars are the immature form of butterflies and moths, which fall in the order **Lepidoptera**. Caterpillars feed on all plant parts and grow rapidly through several stages until they enter a pupation stage.

Caterpillars have soft, segmented bodies, which are divided into 3 parts or segments. Each segment possesses a number of specific anatomical characteristics, which allows identification and differentiation.

The 3 segments include:

- 1) Head – well-defined, toughened or sclerotized head capsule
- 2) Thorax – three segments bearing 1 pair of true legs per segment
- 3) Abdomen – ten abdominal segments with 3 to 5 pairs of fleshy/stubby prolegs (1 pair is typically on the last [anal] segment)



Caterpillars differ in a number of features or characteristics, giving them their variation in appearance. Some caterpillars are smooth and hairless, while others have differing lengths and densities of hair or spines. Colouration can also vary, as well as whether they have any striping, spotting or other distinctive features. If you get really up close and personal with a caterpillar, you can also tell the difference between species using more detailed or hard to see features, such as how the hooks on their anal proleg are arranged or what their face is shaped like.

Some of the identifying characteristics include:

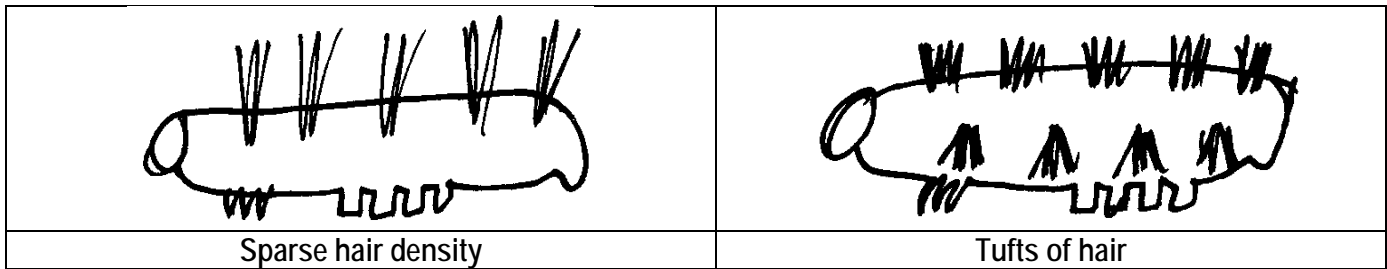
- **Setae** (sing = seta) – hair-like sensory projections from the skin of the caterpillar. Setae can range from long and flexible to short and stout or even inconspicuous. Some setae are on top of a projection of different shape or size. There are typically a minimum of 6 setae per side of each abdominal segment. The appearance and orientation of groups of setae (and number of setae per group) can be used for identification. Specific differences can be used to identify closely related species.

Differences in setae

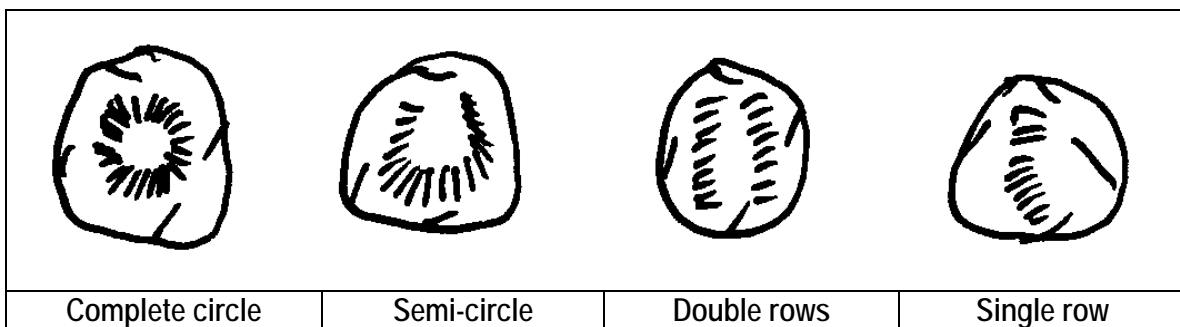
Solitary	Solitary on projection	Projection with more than 1 seta	Disc-like area bearing parallel setae	Discs bearing divergent setae
Hair pencils – narrow cluster of long setae			Spinules – minute circular spines on surface of the caterpillar	

Density of Hair

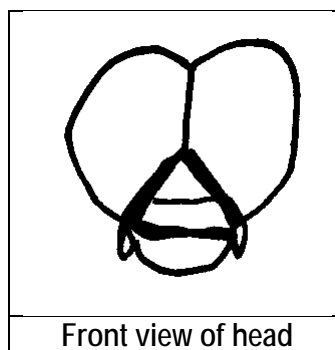
No hair or inconspicuous	Dense hair



- **Prothoracic shield** – a plate that may or may not be present on the top of the first thoracic segment; may be darkened.
- **Spiracles** – breathing holes on the side of the body, on all abdominal segments and the first thoracic segment. Appear as holes or dots along the sides of the caterpillar. Some species are quite distinctive (spiracles may be coloured, shaped a specific way or positioned uniquely).
- **Crochets** – grasping hooks or hook-like structures on the ends of the prolegs. Length and arrangement of crochets can vary.





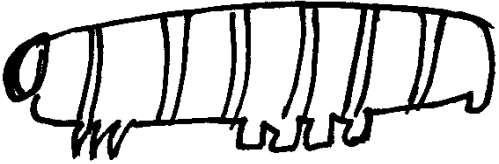



- **Face grooves** (technically referred to as adfrontal and epicranial suture) – can be used to differentiate certain types of caterpillars. The position or orientation of the frontal triangle is also used.

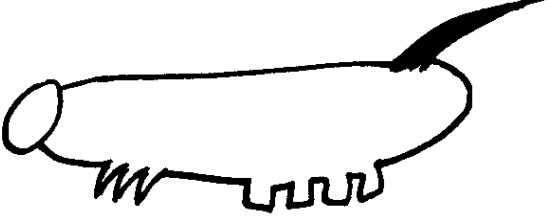
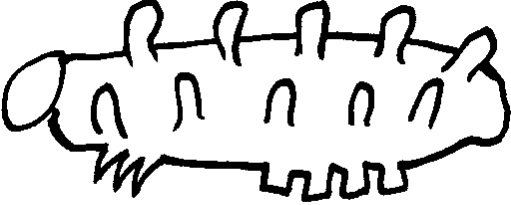
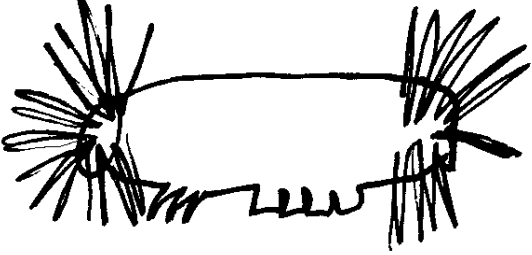



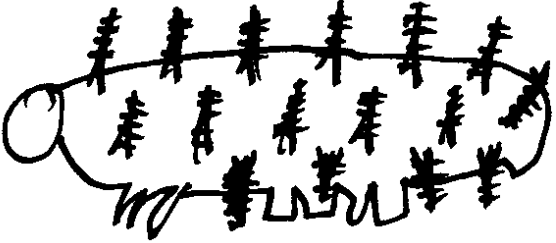
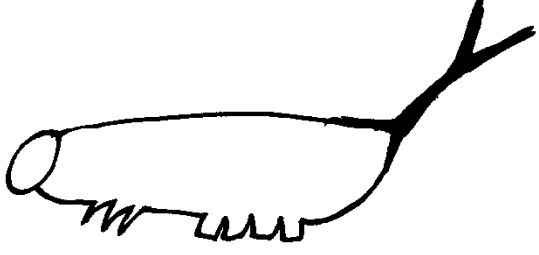


- **Mandibles** – jaws; Structure can vary somewhat, allowing differentiation between species.
- **Body colour** – can vary, including solid colours of different shades, such as black, brown, grey, blue, green, red, orange, yellow, white, etc.

- **Patterning** – may be longitudinal or latitudinal (think racing stripe versus bumblebee), or may vary in shape or colour.

	
Solid colour	Camouflage
	
Spotted	Slashed
	
Banded	Striped




- **Other features** – some species have dorsal horns, knobs, spikes, eyespots, etc.



	
Dorsal (back) horn or tail on segments	Knobs
	
Lashes	Head horns



	
Spines	Split tail
	
Example of a caterpillar with spines and a striped colouration	Example of a caterpillar with a tail (tuft) and various tufting and arrangement of setae


Common Features of Various Caterpillar Families

The following table outlines some of the common features of a number of families of caterpillars within the Order Lepidoptera, as well as the key characteristics of some species that are frequently or occasionally observed in this area. Please note: this is not a complete list of all pest species that occur in this area.

Family	Common Characteristics	Important Species - Common Names	Key Characteristics
Arctiidae	Very hairy appearance (long secondary setae); crochets on prolegs in single line	Saltmarsh caterpillar	Reddish brown, with yellow to brown bodies covered in short bristles and long whitish secondary setae; yellowish-brown head;
		Woolly bear caterpillar	Body covered with dense tufts of stiff hair; reddish brown with black at both ends – other variations may have different coloured stripe.
		Various Tussock moths	Dense clumps of “tussock” hairs on back (approximately 4 clumps); long setae; long pencils may be present
			
Yellow woolly bear caterpillar (Photo by wikimedia.org)	Woolly bear caterpillar (Photo by smithsonianscience.org)	Tussock moth caterpillar (Photo by Robert Spencer)	

Pieridae	Ringed body segments; many short secondary setae (velvety appearance); crochets in a single line parallel to midline	Imported cabbageworm	Light green larvae; narrow yellowish line on the back and a broken line on the sides; short white hairs gives a velvety appearance
Imported cabbageworm larva (Photo by MAFRI)			
Sphingidae	Large, fat, smooth, brightly coloured with inconspicuous setae; may have a distinct dorsal spine/horn on one abdominal segment; 4 ventral prolegs with crochets arranged in a single line; abdominal segments have wrinkles which give appearance of subsegments	Hawk moths, sphinx moths and hornworms	Medium to large and stout; 5 pairs of prolegs; lack hairs or tubercles; often have a dorsal horn; Some are green to brown, with "countershading" colouration; some are conspicuously coloured with spots on a dark background; diagonal slashes are common
		Tomato hornworm	Large larvae; greenish to dark reddish brown; conspicuous v-shaped greenish-white marks on abdomen facing forward and slightly down; green anal horn; black spiracles within v-shaped mark (at point of mark).
Later stage tomato hornworm larva (Photo by insects.about.com)			
Sesiidae	Clearwing moths (wasp-like adults); larvae typically bore or burrow into host	Squash vine borer	Creamy white with brownish heads; prothoracic shield is yellowish; 4 pairs of less conspicuous prolegs with 2 rows of crochets;
Papilionidae	Larvae have a fleshy defensive organ (called an osmeterium) which is pushed out to emit an unpleasant odour;	Parsleyworm; Swallowtails	Large, smooth larvae; green to yellowish colour, with black lines and yellow or orange spots across segments; retractable "Y" or "V"-shaped defensive gland on the top of the 1 st thoracic segment

Gelechiidae	Small; light, inconspicuous primary setae; 4 ventral prolegs; variable crochets; many are internal-feeding insects	Potato tuberworm	Small, creamy-white to greenish or pinkish white larvae; very dark coloured head, prothoracic shield and true legs; crochets are in a complete circle;
		Tomato pinworm	Small larvae; yellowish green to purple-black; purplish spots; head = dark with dark line on each side; yellowish prothoracic shield; crochets are in a semi-circle;
		Peach twig borer	Reddish-brown with pale to white segments giving a ringed appearance; head and thorax dark brown to gray
Plutellidae		Diamondback moth	Small pale green to cream coloured larvae; conspicuous dark setae on all body segments; crochets are in a complete circle;
<p align="center">Diamondback moth larva (Photo by Canola Council of Canada)</p>			
Noctuidae	Primary setae only; groupings of setae vary; crochets in single line	Cabbage looper	Move with a looping motion; pale green to blue-green; 3 pairs of wavy white stripes on top and sides of body;
		Tomato fruitworm / Corn earworm	Large larvae; vary from light green-yellow or pink to deep brown or almost black on the back; bottom side is usually light coloured; prominent dark tubercules (outgrowths); dark microspines on skin;
		Cutworms	Pale to dirty brown; solid coloured or mottled; skin covered with microscopic bumps; differ from armyworms based on facial structure
		Armyworms	Greenish-brown heads with lots of dark streaks and interlacing lines; backs are greenish-brown to black; paired dark markings; prolegs have dark diagonal band on outside
<p align="center">Cabbage Looper larvae (Photo by U of Florida)</p>			

Red-backed cutworm larvae (Photos by Robert Spencer)			
Pyralidae / Crambidae	Few or no secondary setae; groups of setae vary; 4 pairs of ventral prolegs; crochets in complete circle	Webworms (garden webworm, beet webworm, etc.)	Greyish-green/yellow larvae; depending on species, may have either darker stripes down body or spots; beet webworms have two white or cream-colored stripes on either side of a black center line and two rows of paired circular marks down either side of the back
		European Corn Borer	Dirty white larvae; backs are dark grey- brown to light brown; brown/black mottled head;
Tortricidae	Tortrix moths	Codling moth	Codling moth larvae are yellow with black heads
		Ugly nest caterpillar	Yellowish-green bodies with small dark spots and dark heads, thoracic shields and anal shields
		Large aspen tortrix	5 pairs of prolegs; yellowish or pale green bodies turning darker as they get larger and older; black heads, thoracic shields and anal patches; 2 rows of paired spots along the back of the body
		Strawberry leaf roller	Slender, green or bronze to grayish brown larvae; brown-headed
		Oblique-banded leafroller	Yellowish-green turning darker with age; black or brown head and thoracic shield
Lasiocampidae		Forest tent caterpillar	Black, hairy larvae; broad bluish lateral bands and narrow broken orange and brown lines on the body, with white/creamy-white keyhole-shaped marking on the back.
Geometridae	A.k.a. "inchworms", "loopers", "spanworms"; lack prolegs in centre of body, therefore move by clasping front legs and then lifting back end forward, clasping and repeating; often resemble twigs; seldom hairy	Fall cankerworm	Light green with white lines to brownish- green with dark band on back; 3 pairs of abdominal prolegs (1 rudimentary)
		Spring cankerworm	3 pairs of prolegs; mottled yellow-green to blackish; may have yellow lateral stripes; pair of outgrowths end of the abdomen

		Bruce spanworm	Stout bodied; 2 pairs of abdominal prolegs; colour ranges from light green to dark gray; 1 prominent and 2 less prominent yellowish stripes on each side of body or broad white stripes on side; dark brown to blackish heads
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Caterpillar-like larvae

There are a number of species of insect that have larvae which resemble caterpillars (also known as eruciform larvae – caterpillar-like). Many of these are within the Order Hymenoptera, Suborder Symphyta (a.k.a. sawflies). There are a few characteristics that can be used to tell the difference between a true caterpillar (Lepidoptera) and a caterpillar-like larva. Why does it matter whether it is a caterpillar or a sawfly larva? This is because some pesticides are very specific to caterpillars (Lepidoptera) and will not work on sawfly larvae. For example, Bt (*Bacillus thuringiensis*) only works on caterpillars.

Lepidoptera – Butterflies, skippers and moths	Hymenoptera – Sawflies
Fake eye spots	Eye visible
Head end sometimes difficult to tell from tail end	Head obvious
3 pairs of jointed thoracic legs (true legs)	3 pairs of jointed thoracic legs (true legs)
5 or fewer pairs of prolegs (including anal proleg)	Enough pairs of prolegs to spell "SAWFLY" (6 or more pairs of prolegs)
Anal claspers (anal proleg) always present	Anal claspers sometimes present



Forest Tent Caterpillar / Other Tent Caterpillars / Ugly Nest Caterpillar

Forest Tent Caterpillar (*Malacosoma disstria*):

- Insect pest native to North America
- Attacks a wide range of hardwood tree species – trembling aspen, white birch, oak, ash, maple
- Based on historical data, typically occur in outbreaks lasting 2-6 years, approximately every 10 years
 - Duration of outbreaks is affected by weather, parasitoid populations and the structure of the host forest/stand
- Adults are brown/tan coloured moths with 3 darker bands across the forewings
 - Adults actively fly in late June to early August (depending on the region), and may be carried on wind currents several hundred kilometers
 - Lifespan of the adult moths are less than 2 weeks
 - Single generation per year
 - Emerge, mate and lay eggs
 - Typically in mid to late-July on Prairies
- Eggs are laid in bands that completely encircle twigs
 - Egg bands are covered with a foamy, sticky protective coating – appears shiny at first
 - Bands can be ½ inch to 1 inch (10-20mm) long
 - Larvae do not emerge until the following spring



Forest Tent Caterpillar larvae (above) & FTC grouping of larvae in rain (below) - Photos by Robert Spencer

- Larvae emerge from egg bands in spring, as leaves open on trees
 - Larvae (caterpillars) are dark brown with broad graying-blue bands along the side of the body, with white, key-hole shaped marks in a row along the back
 - Larvae are hairy and reach about 2 inches (50mm) in length
- Larvae feed for about 6 weeks, following which they spin a yellowish cocoon to pupate

Prairie tent caterpillar (*Malacosoma californicum lutescens*):

- Chokecherry is primary host, but also attacks various hardwoods
- Adults = light brown to dark tan coloured moths with whitish band across forewing
- Egg masses are laid within 12 inches (30cm) of the ground, on the base of the host plant
 - Masses do not encircle the stem
- Larvae have black backs, with a white-coloured mid-back stripe. The sides of the body are a light blue and larvae are hairy.
 - Larvae feed for 6-8 weeks and then spin a cocoon, emerging as adults after a 3 week pupation period
 - Single generation



Northern/Western tent caterpillar (*Malacosoma californicum pluviale*):

- Pin cherry, willow and chokecherry are primary hosts, but also attacks hardwoods
- Adult moths resemble PTC very closely
- Egg masses are laid within 12 inches (30cm) of the ground, on the base of the host plant
 - Masses do not encircle the stem
- Larvae emerge in spring and form a silky nest near a fork in the stem
 - Larvae are black when young, but that is overlooked as they age and develop conspicuous markings
 - They have a broken white stripe along the mid-back, along with broad orange bands enclosing bluish-white and black markings; Larvae are hairy
- Larvae feed for 6-8 weeks and then spin a cocoon, emerging as adults after a 3 week pupation period
- Single generation

Eastern tent caterpillar (*Malacosoma americanum*):

- Pin cherry and chokecherry are principal hosts, but may attack hardwoods
- Adult moths resemble PTC very closely
- Eggs are laid in masses that encircle small twigs and are covered with a frothy covering
- Larvae emerge in spring and form a silk nest at a fork in the stem
 - Larvae are black, sparsely hairy and have a white stripe along the back, as well as narrow, orange stripes parallel on the mid-back and white and blue markings on the sides
- Larvae feed for 6-8 weeks and then spin a cocoon, emerging as adults after a 3 week pupation period
- Single generation

Forest Tent Caterpillar / Other Tent Caterpillars / Ugly Nest Caterpillar continued

Ugly Nest Caterpillar (*Archips cerasivorana*):

- Single generation per year
- Host crops = chokecherry, pin cherry, black cherry, other hardwood trees and shrubs
- Adults are yellowish-orange moths, active from mid-summer through September
- Eggs are laid on barks of trees
 - Eggs hatch as leaves emerge
- Larvae emerge and feed within a nest of silk and foliage (including several branches) constructed at the top of the plant from May to September
 - Larvae are approximately 1 inch (20-23mm) long, yellowish-green, with small dark spots and dark heads
- Pupation occurs within the nest

Ugly Nest Caterpillar - Adult



Photos by Robert Spencer



Ugly Nest Caterpillar - Nest

Monitoring:

- Fall or early spring monitoring can allow for detection of egg masses
- Regular monitoring early detection of nest formation or groups of larvae
- Defoliation will become apparent and can be widespread (covering many, many acres)

Management:

Forest tent caterpillar

- Natural factors can help to reduce population levels
 - Late spring frosts that damage foliage, combined with high populations can cause mass starvation
 - Very high temperatures in summer when moths are flying can reduce life span and reduce egg laying
 - Parasites can parasitize cocoons and their young will feed on pupae
 - Feeding by predators will keep populations low
- Egg bands can be removed and destroyed in fall or early spring, in small scale situations
- Chemical sprays applied in late-May or early June to control earlier instar larvae, prior to major defoliation
 - There are a number of different sprays registered, including several biological controls (containing *Bacillus thuringiensis* - Bt)
 - Spray thresholds are suggested to be when the number of egg bands on a tree exceeds the trunk diameter of the tree in centimeters at 1.5m above the ground

Other tent caterpillars

- Prune out egg masses and silk nests when discovered
- Registered chemical applications may be made to control younger larvae

Ugly nest caterpillar

- Prune to remove individual nests. Destroy nests
- Apply registered chemicals at appropriate times (registered for chokecherry shelterbelts)



Prairie Tent Caterpillar larvae

Photos by Bugguide.net & Anna Biryukova –
www.butterfliesandmoths.org



Eastern Tent Caterpillar nest

Photo by Robert L. Anderson, USDA Forest Service, Bugwood.org



Western Tent Caterpillar larvae

Photo by Whitney Cranshaw, Colorado State University, Bugwood.org

Late Blight

Causal Organism: *Phytophthora infestans*

Crops Affected: potato, tomato, other Solanaceous crops (eggplant, peppers, petunia) and weeds (nightshade, wild tomato, etc.)

Disease Cycle:

- Highly aggressive fungal pathogen
- Produces two main spore types, sporangia and zoospores
- A sexual spore type (oospore) is produced when both mating types are present in an area
 - Only one mating type is present in Western Canada at this time
- Pathogen can only survive on LIVING tissue (e.g. potato tubers, transplants, etc.)
- Sporangia are produced in lesions on infected foliage
- Zoospores are produced in sporangia (multiple zoospores per single sporangium) and swim in films of water on plant tissues or in the soil to infect plant parts
- Spores are spread from infected living tissues (transplants, volunteer and seed potatoes, weeds and diseased crop debris) by rain or water splashing (short distances) or by wind or storm fronts (long distances – 100km)
- Disease development is favoured by moderate temperatures (12-24°C) and wet/humid conditions
- Disease spreads from infected to healthy fruit and tubers in storage, and within cull piles, compost heaps and seed potato piles

Symptoms:

Foliar Symptoms

- Dark, water-soaked lesions form on leaves, often moving in from leaf tips/margins toward the centre of the leaf
- Lesions are not contained by leaf veins
- Young lesions may have a yellow edge or margin
- Lesions turn brown or black within a couple of days, potentially becoming brittle
- Spores may be produced in a fluffy, white growth on the edges of lesions on the underside of affected leaves
- The disease progresses and foliage may die back rapidly
- Lesions develop on stems, fruit and tubers

Fruit / Tuber Symptoms

- Lesions are reddish-brown, irregular and sunken, often occurring around the eyes (on tubers)
- The rot is reddish-brown in colour, dry and granular
 - Rot can penetrate deeply (1-2cm)
- The line between healthy and diseased tissues is not clearly defined

Management:

- Avoid introducing the pathogen on living tissues (infected transplants, seed potatoes, overwintered cull piles)
- Scout early, regularly and thoroughly
- Encourage good airflow around plants
 - Avoid over fertilizing; space plants properly;
- Kill, remove and dispose of infected plant materials quickly and do not leave infected materials in the open
 - Bag, bury and freeze infected tissue
- Apply protective fungicide applications when disease is discovered or when conditions favour disease development
- Avoid disease carryover in living tissues
 - Dispose of infected materials properly; encourage rapid and thorough decomposition
 - Cull seed potatoes heavily prior to storage
 - Do not maintain cull piles

For more information on Late Blight and late blight management, see [Late Blight of Potatoes & Tomatoes – FAQ](#)

Late blight lesions on potato leaves -
Photo by K. Al-Mughrabi



Late blight rot on tomato fruit and potato tubers
Photos by K. Al-Mughrabi



Late blight sporulating lesion underside of leaf
Photo by K. Al-Mughrabi

