



# HORT SNACKS

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Welcome to another edition of Hort Snacks. It seems like winter has finally left us and depending on where you live, you've been getting a bit of rain or a lot of rain. Temperatures are decent, although there have been a few cool nights. Hopefully you got everything in the ground and things are progressing nicely.

In this edition, you'll find lots of bits and pieces, events and announcements, notes and links to articles worth taking a look at when you find the time. There is a larger article on Lepidoptera (caterpillars) and how to recognize them, or at least differentiate them.

With the summer, there tend to be few extension events, but there are 3 summer field days to take in for direct market producers. They should be quite interesting. If you get a chance to go further afield, I'd highly recommend it. It is mind-opening to see the way things work in other regions, even if it is the same as what you do at home.

If you have suggestions for articles, questions or things to share, feel free to send them. Updates are also welcome. I hope that you find the time to enjoy the summer, even if it is a busy time. I had a sad moment today when I actually had to consider that winter would be here in a few short months. Blech!

**Rob Spencer, Commercial Horticulture Specialist**

Alberta Ag-Info Centre  
 Alberta Agriculture and Rural Development  
 310-FARM (3276)

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### MENTAL SNACKTIME

“There are times when fear is good. It must keep its watchful place at the heart’s controls.” – Aeschylus

“More firm and sure the hand of courage strikes, when it obeys the watchful eye of caution.” – James Thomson

“A garden is a grand teacher. It teaches patience and careful watchfulness; it teaches industry and thrift; above all it teaches entire trust.” – Gertrude Jekyll

“Watchfulness is the only guard against cunning. Be intent on his intentions. Many succeed in making others do their own affairs, and unless you possess the key to their motives you may at any moment be forced to take their chestnuts out of the fire to the damage of your own fingers.” – Baltasar Gracian

**THINGS TO DO / THINGS TO THINK ABOUT THIS MONTH**

**Strawberries**

- 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
- Maintain good straw cover on all strawberries, as this reduces the incidence of disease
- 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 (2<sup>nd</sup> 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

**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) 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

**Interesting News / Articles to Read this month**

- [Scouting for Vegetable and Fruit Pests on Organic Farms](#) – eXtension webinar
- [Controlling common chickweed \(Stellaria media\) in strawberries](#) – OMAFRA article
- [Who is making your food?](#) – Supermarket Guru video
- [Green Roofs Take Root](#) – Swissnex article
- [Soil pH too high? Can you acidify?](#) – OMAFRA article
- [Poly tank inspection and maintenance](#) – OMAFRA article

**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 22-28, 2013**  
DED Hotline 1-877-837-ELMS (3567)  
[www.stoppeded.org](http://www.stoppeded.org)

## Upcoming Conferences / Workshops

### June 2013

- **International Potato Processing & Storage Convention 2013**  
June 4-6, 2013 – Sonesta Hotel, Philadelphia, Pennsylvania  
[www.potatoconvention.com](http://www.potatoconvention.com)
- **University of Saskatchewan Plant Sale Day**  
June 7, 2013 – Horticulture Field Lab – Saskatoon, SK  
[www.fruit.usask.ca/extension.html](http://www.fruit.usask.ca/extension.html)
- **An Evening with Henk van Dongen (International Marketing Guru)**  
June 13, 2013 – JGO'Donoghue Bldg – Edmonton, AB  
To register: Contact [Delores Serafin](mailto:Delores.Serafin@usask.ca) or 780-427-4611 (by June 6, 2013)
- **International Floriculture Expo**  
June 18-19, 2013 – Miami Beach Convention Centre – Miami Beach, FL  
<http://www.floriexpo.com/>
- **Greenhouse Canada Grower Day 2013**  
June 19, 2013 – Parkway Convention Centre – St. Catharines, ON  
[www.greenhousecanada.com](http://www.greenhousecanada.com)
- **Small Scale Livestock & Vegetable CSA Field Day**  
June 19, 2013 – Didsbury, AB area  
[www.albertafarmfresh.com](http://www.albertafarmfresh.com)
- **Vegetable Field Day**  
June 25, 2013 – Innisfail, AB area  
[www.albertafarmfresh.com](http://www.albertafarmfresh.com)

### July 2013

- **Canada's Fruit & Veg Tech X-change**  
July 10-11, 2013 – St. Williams, ON  
[www.fruitvegtechxchange.com](http://www.fruitvegtechxchange.com)
- **Haskap Day**  
July 19, 2013 – Horticulture Field Lab – Saskatoon, SK  
[www.fruit.usask.ca/extension.html](http://www.fruit.usask.ca/extension.html)
- **97<sup>th</sup> Potato Association of America (PAA) Conference**  
July 28 - Aug 01, 2013 – Chateau Laurier Hotel – Quebec City, Quebec  
[www.potatoassociation.org](http://www.potatoassociation.org)

### August 2013

- **North American Strawberry Growers Association (NASGA) Summer Tour**  
August 13-14, 2013 – Burlington, Vermont area  
[www.nasga.org](http://www.nasga.org)
- **Fruit Field Day**  
August 19th, 2013 – Bowden, AB  
[www.albertafarmfresh.com](http://www.albertafarmfresh.com)
- **Farwest Show**  
Aug 22-24, 2013 – Oregon Convention Centre – Portland, OR  
<http://www.farwestshow.com/>

### UPCOMING EVENT

## Small Scale Livestock and Vegetable CSA Field Day

A summer field day is planned for the Didsbury, AB area on Wednesday, **June 19, 2013**. A single location will be visited. The following is the tentative agenda:

**11:30 – 1 pm** – Lunch at the **Fisher Farm** (Nolan & Kari Fisher – West of Didsbury on HWY 582; 9.5 km North on RR30; 2.7 km East on laneway marked 31451)  
**1 – 4 pm** – Tour of Fisher Farm

There is no cost to attend this event.  
R.S.V.P. to Alberta Farm Fresh Producers Association  
(1-800-661-2642) or email [info@albertafarmfresh.com](mailto:info@albertafarmfresh.com)

### UPCOMING EVENT

## Vegetable Field Day

A summer field day is planned for the Innisfail area on Tuesday, **June 25, 2013**. Beck Farms will be the tour site – we'll look at vegetable production and storage. The following is the tentative agenda:

**Noon – 1 pm** – Lunch at **Beck Farms** (Rod & Shelley Bradshaw – 2 km south of Innisfail on Highway 2. Go west 7 km on Cottonwood Road; 1 km S on Range Road 13, on east side of the road)  
**1 – 4 pm** – Tour of Beck Farms

There is no cost to attend this event.  
R.S.V.P. to Alberta Farm Fresh Producers Association  
(1-800-661-2642) or email [info@albertafarmfresh.com](mailto:info@albertafarmfresh.com)

### UPCOMING EVENT

## Fruit Field Day

A summer field day is being planned for the Bowden area the week of **August 19<sup>th</sup>, 2013**. Pearson's Berry Farm will be the tour site. The following is the tentative agenda:

**Noon – 1 pm**: Lunch at Pearson's Berry Farm (about 28 km west of Bowden on Hwy 587, north on RR 40 about 1.5 km)  
**1 – 4 pm**: Tour of Pearson's Berry Farm and processing operation

There is no cost to attend this event.  
R.S.V.P. to Alberta Farm Fresh Producers Association  
(1-800-661-2642) or email [info@albertafarmfresh.com](mailto:info@albertafarmfresh.com)

## BE ON THE LOOKOUT FOR LATE BLIGHT

While the incidence and severity of late blight were reduced in the 2012 growing season, some of the pathogen was detected in Alberta. The excellent disease conditions in other regions where some tomato transplants are sourced combined with the occasional occurrence of suitable conditions for disease development throughout the season creates the potential risk for late blight to occur in 2013.

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 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)

If you have suspect plants, 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.

### Information on Late Blight

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

## FOR SALE:

Email operator to express interest or email [me](#) to have your contact info sent to the operator

### OPERATION #1

- Strawberry planter: MT Transplanter
  - Very good condition
  - \$2000.00 OBO

### OPERATION #2

- Box of 104 new white 4 litre buckets (Pro Western Plastic)
- 400 - berry bags 3ml heavy 14x22" (they hold 10 pounds of Saskatoon berries) – great freezer bags (Crawling Valley Plastics)
- 605 - 2ml sturdy plastic purple food grade bags (easily holds 1- 4 litre bucket of berries) – customers are proud walking out with these bags
- 68 corrugated new boxes, holds 30 pounds
  
- 1 farm including 2000 saskatoon berry bushes, (Smoky, Thiessen and Northline) on 5 acres
  - Total farm area is 86 acres
  - Rest of farm is presently farmed by local farmer. It is a great u pick location.

### FOR FREE (OPERATION #2)

- 2 chest freezers, free for the taking
- 39 corrugated used once boxes, hold 20 pounds of berries, free as well



### *Q: Supervising Staff #1 – How do you explain tasks to new or existing staff?*

**A:** No staff, but I have no problem explaining to my kids what tasks need doing. My husband and I discuss what needs doing instead of either of us telling each other what to do. Works better for us.

**A:** Better to be clear from the get-go. Ask staff to explain back what is expected at the end of it to ensure they understood. Alternatively, a step by step list can be useful, especially if it isn't a 1 step process. I think that you should also be open to questions. – Rob Spencer (AARD)

**[Next Month's ? → Supervising Staff #2 – What are your tips and tricks for a happy, ongoing relationship?](#)**

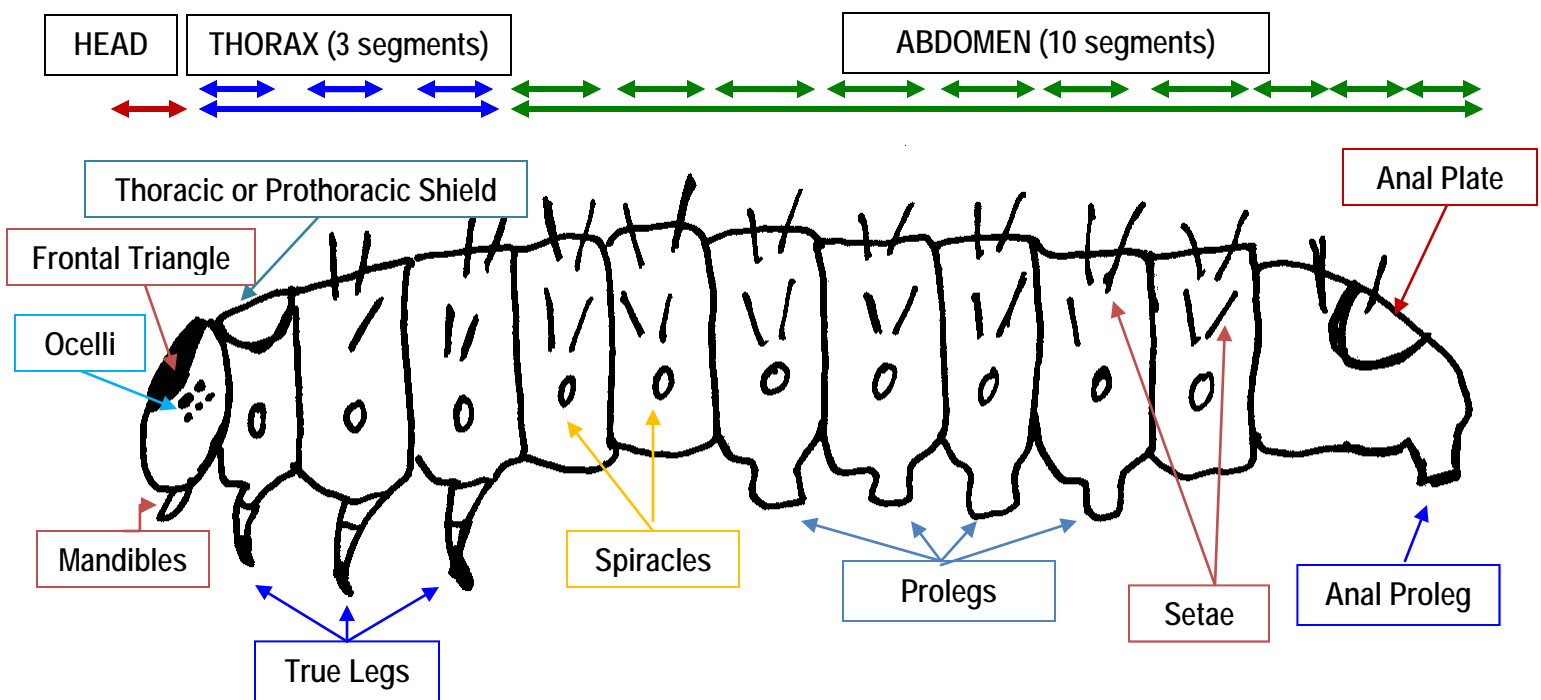
## Caterpillars and caterpillar-like larvae

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:

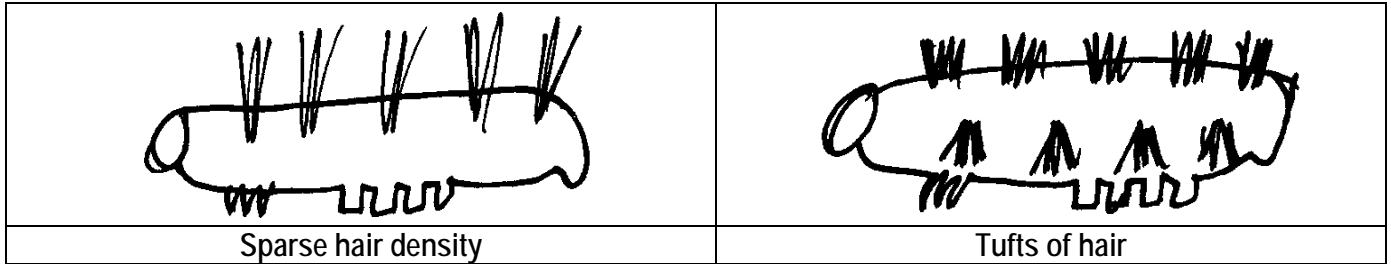
- **Setae** (sing = seta) – hair-like sensory projections from the skin of the caterpillar. Setae can range from long and flexible to short and stout or even inconspicuous. Some setae are on top of a projection of different shape or size. There are typically a minimum of 6 setae per side of each abdominal 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

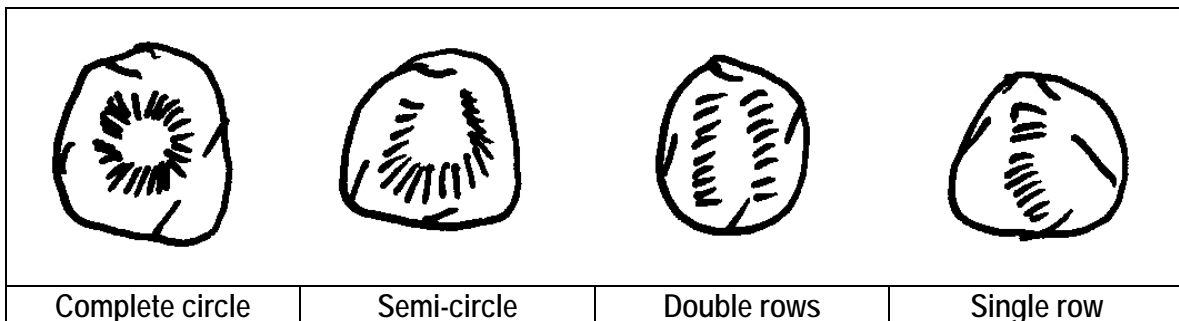
Solitary	Solitary on projection	Projection with more than 1 seta	Disc-like area bearing parallel setae	Discs bearing divergent setae
Hair pencils – narrow cluster of long setae		Spinules – minute circular spines on surface of the caterpillar		

### Density of Hair

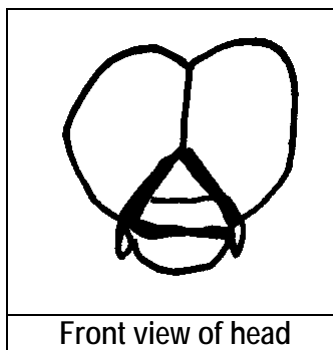
No hair or inconspicuous	Dense hair



- **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.




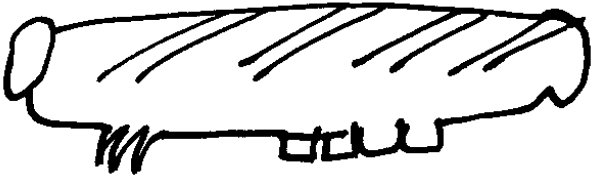
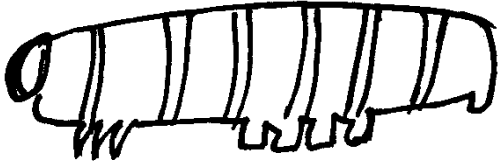



- **Face grooves** (technically referred to as adfrontal and epicranial suture) – can be used to differentiate certain types of caterpillars. The position or orientation of the frontal triangle is also used.

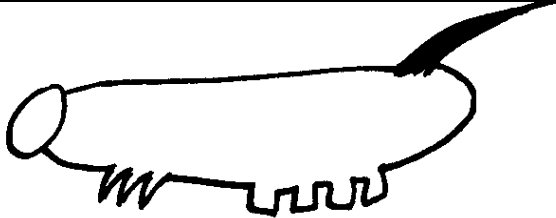
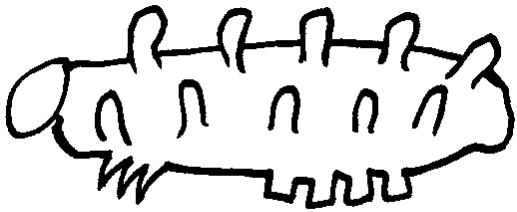
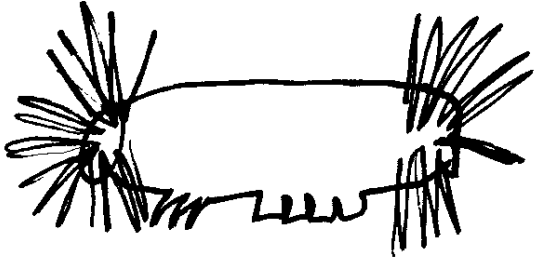



- **Mandibles** – jaws; Structure can vary somewhat, allowing differentiation between species.
- **Body colour** – can vary, including solid colours of different shades, such as black, brown, grey, blue, green, red, orange, yellow, white, etc.

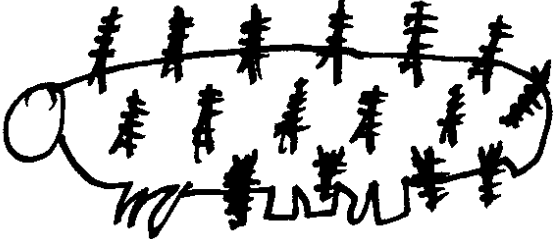
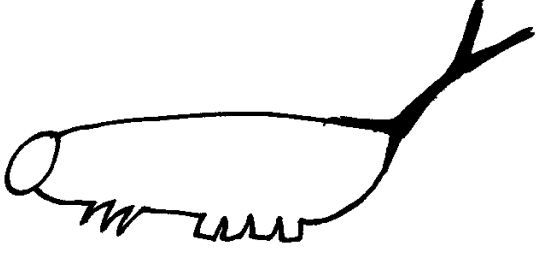
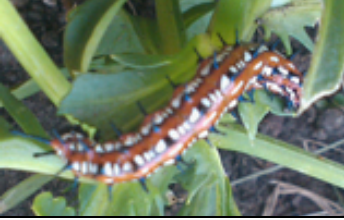

- **Patterning** – may be longitudinal or latitudinal (think racing stripe versus bumblebee), or may vary in shape or colour.

	
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
			<p>Yellow woolly bear caterpillar (Photo by wikimedia.org)</p> <p>Woolly bear caterpillar (Photo by smithsonianscience.org)</p> <p>Tussock moth caterpillar (Photo by Robert Spencer)</p>

<b>Pieridae</b>	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
<b>Imported cabbageworm larva</b> (Photo by MAFRI)			
<b>Sphingidae</b>	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).
<b>Later stage tomato hornworm larva</b> (Photo by insects.about.com)			
<b>Sesiidae</b>	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;
<b>Papilionidae</b>	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 <sup>st</sup> thoracic segment

<b>Gelechiidae</b>	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
<b>Plutellidae</b>		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"><b>Diamondback moth larva</b> (Photo by Canola Council of Canada)</p>			
<b>Noctuidae</b>	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 tubercles (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"><b>Cabbage Looper larvae</b> (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

## 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 Processing Product and Market Development, Automation, Business Opportunity, Business Skills, 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 sounds like they will repeat in future years, so you would have time to get your ideas and projects straight for the next funding year.

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](http://www.growingforward.alberta.ca/programs)

## Imported Cabbageworm (a.k.a. Cabbage butterfly, Cabbage white)

*Pieris rapae*

### Crops Affected:

Broccoli, Brussels sprouts, cabbage, cauliflower, radish, rutabaga, turnip, and other cruciferous & non-cruciferous crops

### Life Cycle:

- Not known to over winter on the prairies (but does as a pupa everywhere else)
- Adults appear in mid-spring to early summer (depending on the area) and lay eggs along the midrib on the lower leaf surfaces
- Eggs hatch in a week or less and larvae go through 5 instars. Early instars feed on the underside of leaves on the outside of the plants, while later instars move to the centre or head of the plant.
- Pupae are found in the lower leaves or in crop residue (for summer generations). Adults emerge in 1-3 weeks.
- More than one generation will occur in all areas

### Symptoms:

- Larvae chew holes in the leaves and render heads unmarketable
- Larval frass (poop) is notable and is a contaminant of leaves and flower heads

### Monitoring:

- Adult moths are active during daylight hours (unless weather is cloudy, cold or windy) and are very visible
- Adult is a white butterfly, about 50 mm (2 inches) wide. There may be 1 or 2 black spots on the forewing (depends on the gender) and there is a dark mark on the point of the wing.
- Larvae are 30mm (~1 inch) long and are pale green with a yellow-orange stripe along the top of the abdomen. It is covered with short white hairs, giving it a velvety appearance.
- Economic tolerance is determined by counting new larval feeding sites (no callus or wound healing yet occurring)

### Management:

- Natural predators and viruses will reduce populations
- Biological and chemical controls are registered for control – adhere to application timings and rates for effective control



OMAFRA

MAFRI

## Other caterpillars similar to Imported Cabbageworm

### Cabbage Loopers

*Trichoplusia ni*

### Crops Affected:

Broccoli, Brussels sprouts, cabbage, cauliflower, beet, celery, lettuce, parsley, pea, potato, spinach, tomato and some ornamental plants

### Monitoring / Appearance:

- Adults are mottled grey-brown moths (kite-shaped) about 1.5 inches (38 mm) wide. There is a silver-white mark on the forewing. Adult moths are active in the evenings and are quite visible
- Larvae are light green with 3 pairs of wavy white lines on the back and a white or pale-yellow line on side. It moves in the classic "looper" style (raising the centre of its abdomen)

### Diamondback Moth

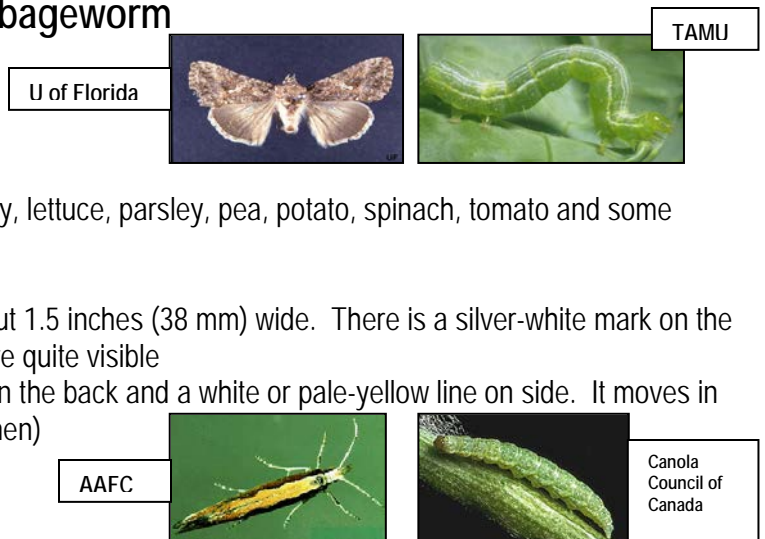
*Plutella xylostella*

### Crops Affected:

All cruciferous crops – specifically broccoli, Brussels sprouts, cabbage, cauliflower, cruciferous crops (canola), and cruciferous weeds

### Monitoring / Appearance:

- Adults are grey-brown moths about 13 mm (0.5 inch) wide. They have 3 silvery white diamond-shaped marks visible when the moth is at rest. Adults become active at dusk.
- Larvae are relatively hairless, green to grey-green and reach 12 mm (0.5 inch) in length. They wriggle when disturbed and suspend themselves on silk strings.



U of Florida

TAMU

AAFC

Canola Council of Canada

## Sclerotinia Rot

A.k.a. White Mould, Cottony Soft Rot, (Lettuce) Drop,

**Causal Organism:** *Sclerotinia sclerotiorum*

### Crops Affected:

Carrots, lettuce, celery, beans, Cole crops, potatoes, peas, cucurbits (pumpkins, cucumbers, squash, and melons), Solanaceous crops (tomato, pepper, and eggplant), various weed species (e.g. cruciferous), canola, soybeans, etc. (over 400 host species)

### Disease Cycle:

- Soil-borne sclerotia (hard mycelial bodies) produce mycelium, which infect plant tissues
  - Sclerotia can survive for over 10 years in the soil
- Sclerotia can also produce little mushrooms (apothecia), which release spores
  - Spores can infect weak tissues in high and prolonged humidity conditions
- Disease develops at temperatures above 0°C, but prefers 13-18°C for optimum growth.
- High humidity and free moisture also contribute to disease infection

### Symptoms:

- May initially cause damping off or petiole infections, with leaves and crown areas becoming infected, especially those in contact with the soil
- Infected tissues typically turn dark brown and a characteristic white, cottony mycelium covers it
- Some crops exhibit a wilting of infected tissues (e.g. lettuce)
- Black sclerotia (hard, mycelial, overwintering bodies – not spores) form in diseased tissues later on, sometimes within tissues
  - Size of these will vary, but are often large (may resemble rat droppings or Tic Tacs)
  - May be flattened, rounded, oval or disc-like
- In storage (specifically carrots and cabbage), a watery soft rot is first observed, followed by darkened tissues, which gradually are covered with the white mycelium, with sclerotia forming in the middle of the mycelial growth
- This disease can be distinguished from similar diseases by the cottony white mycelium and the black sclerotia
  - Bacterial soft rots do not form mycelium and are slimy

### Management:

- Rotate to non-host crops; maintain a 3-5 year rotation to reduce soil borne inoculum
- If possible, remove infected debris from growing areas to reduce inoculum
- Control weeds, as they are both alternate hosts and can contribute to increased relative humidity
- Ensure good air circulation within the canopy
- Ensure good soil drainage
- Research has found that controlling canopy density can significantly reduce disease levels
  - Use reduced rates of nitrogen
  - Use varieties that are more upright or that have thinner tops
  - Trim the canopy (reduce leaves up to 40%) to ensure good air movement
    - Trimming also severs the connection between older, weak leaves that lie on the soil surface, reducing crown infection
- Rapidly cool harvested crops and store crops such as carrots at constant 0°C
- Ensure storage areas and containers (e.g. pallets, etc.) are properly sanitized, to remove any sclerotia that may adhere to surfaces
  - If possible, avoid use of storage equipment (bins, pallets, etc.) that are made of organic materials
- Preventative chemical sprays are available to protect various crops. Follow label instruction for maximum impact

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Alberta Ag-Info Centre

**310-FARM** (3276)

# PrairieSaskatoon-QMOD

## Control Entomosporium Leaf and Berry Spot Disease Effectively and Predict Harvest Times



**Exclusive offer  
free to full  
members of the  
PFGA, SFGA or  
AFFPA**

### Attention Saskatoon Orchard Managers

Protect your berry yields and predict harvest date with this disease model tool which has been extensively evaluated across the prairies the past 4+ years with amazing results.

“This model is a useful tool to help predict the pathogen *E. mespili*, which affects the majority of saskatoon crops,” said researcher Dr. Quinn Holtslag, “and serve as an operations planning tool for producers across the prairies.”

“This program should help producers’ bottom line and may also have environmental benefits,” he said, noting that there is potential for reduced fungicide applications. “In the end, customers should be more confident in the quality and consistency of saskatoon fruit.”

Simply enter into the model:

- Daily min and max temperatures from budbreak until fruit harvest (or Aug.1)
- Rainfall events during flowering
- Various plant growth stages (bud break, 50% flowering, fruit harvest)

The model will generate your orchard spray schedule and predict harvest date. The first fungicide spray of Topas 250E or Mission 418EC or Jade occurs after the first rain event that occurs 4 days after flowering.

What do you need:      1) MIN/MAX Thermometer in your orchard  
                                 2) Topas 250E or Mission 418EC fungicide  
                                 3) Access to the internet.

The program is accessed through: [www.prairiesaskatoon.com](http://www.prairiesaskatoon.com)

**FOR 2011 (and later) MODEL USERS: If you had an account last year, use the same login/password**

Simply contact your provincial horticulture specialist to confirm your provincial fruit grower membership status and to receive your PrairieSaskatoon-QMOD password. See below:

Alberta: [Robert.Spencer@gov.ab.ca](mailto:Robert.Spencer@gov.ab.ca)      Saskatchewan: [Forrest.Scharf@agr.gov.sk.ca](mailto:Forrest.Scharf@agr.gov.sk.ca)  
Manitoba: [Anthony.Mintenko@gov.mb.ca](mailto:Anthony.Mintenko@gov.mb.ca)

*For more information please contact your prov. rep. listed above.*