



The seasons seemed to fly by and the winter extension season is looming, as is the full arrival of winter and all of the associated fun that comes with both of them. Welcome to another edition of Hort Snacks, for all your information needs (well, most of them).

In this edition, as suggested you'll see a diverse list of extension events for you to choose from, whether you want to travel to a conference or event somewhere within Canada or North America, or whether you want to take in a webinar from the comfort of your desk (live or recorded). There are lots to choose from, depending on your needs. Even if all of the details of every event aren't specifically listed, you can always visit Alberta Agriculture and Forestry's Coming Events listings to get up-to-date event information and posters, as well as registration information if applicable.

Also contained within this edition are some articles on managing pests. Pulled from the archives and dusted off (with a bit of an update) is an article on managing some of the problem vertebrate pests that are common in horticulture crops. There is also an article comparing the two types of potato scab, as well as an article on a novel insect pest of willows.

As the year comes to an end, planning is underway for the next year of Hort Snacks, including written articles, as well as items that will be delivered electronically through social media and the internet (such as videos, tweets, etc.). We hope to expand our offering of short video factsheets and try and reach more people in more ways. If you have suggestions or ideas, feel free to send them along.

Rob Spencer/Dustin Morton, Commercial Horticulture Specialists
 Alberta Ag-Info Centre, Alberta Agriculture and Forestry
 310-FARM (3276)

FEATURED WEBSITE

A nice little website with small farm resources...

[Small Farm Central](http://www.smallfarmcentral.com)

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.

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THINGS TO DO / THINGS TO THINK ABOUT THIS MONTH

- Dedicate some time to reviewing this past season
 - What went well?
 - What could have been different?
 - What changes might be implemented next year?
 - Make sure all your records are up to date
 - Gaze into your own crystal ball – what do you anticipate might happen or be an issue next year? – What can you prepare for
- Start thinking about your plant requirements (and probably put your orders in) and your various association memberships
- Take time to overhaul irrigation and spray equipment before putting it away for winter
- Plan to visit or contact a number of fellow producers over the course of the winter (at meetings or courses) to discuss successes and failures. Identify 1 or 2 specific individuals that you think you could learn from.
- Plan to attend at least 1 or more workshops / courses over the winter
 - Register for workshops
- If you haven't applied winter protection to strawberries or fall-planted garlic, it should be done this month before hard freezes arrive and kill off plants
 - Strawberry plants can be damaged and killed by exposure to temperatures below -6°C to -9°C
- Application of Casoron to Saskatoon berries should be done prior to snowfall, after the ground has cooled off
 - Remember to carefully adjust the rate for banding
 - If you are planning on rejuvenation or renovation pruning, do not apply Casoron, or plants will be damaged



Q: What criteria do you use to select winter educational programs or activities?

A: Date, destination.

A: I select programs based on our future expansion plans and marketing ideas.

A: 1. Is it relevant to what's going on at our farm & who is speaking/presenting?; 2. Timing and previous commitments; 3. Location of workshop

A: 1) Topic/pertinence to my farm/discipline and gaps in knowledge; 2) Proximity; 3) Cost

Next Month's ? → [Do you have a restful or recuperative activity that you rely on each year to recharge your batteries?](#)

MENTAL SNACKTIME – Learning from Past

"A people without the knowledge of their past history, origin and culture is like a tree without roots." – **Marcus Garvey**

"We learn from history that we learn nothing from history."
– **George Bernard Shaw**

"Those that fail to learn from history, are doomed to repeat it."
– **Winston Churchill**

"In history, a great volume is unrolled for our instruction, drawing the materials of future wisdom from the past errors and infirmities of mankind." – **Edmund Burke**

"History is for human self-knowledge ... the only clue to what man can do is what man has done. The value of history, then, is that it teaches us what man has done and thus what man is."
– **R. G. Collingwood**

"Whoever wishes to foresee the future must consult the past; for human events ever resemble those of preceding times. This arises from the fact that they are produced by men who ever have been, and ever shall be, animated by the same passions, and thus they necessarily have the same results." – **Machiavelli**

"History cannot give us a program for the future, but it can give us a fuller understanding of ourselves, and of our common humanity, so that we can better face the future." – **Robert Penn Warren**

Upcoming Conferences / Workshops

November 2016

- **Saskatchewan Green Trades Conference**
Nov 2-3, 2016 – Saskatoon Inn, Saskatoon, SK
<http://www.saskgreenhouses.com>
- **Explore Local Webinar – Market Channel Overview**
Nov 9, 2016 – [Registration link](#)
- **Getting into On-Farm Sales Workshop** (see Poster)
Nov 15, 2016 – Leduc, AB - [Coming Events link](#)
- **Green Industry Show & Conference**
Nov 17-18, 2016 – EXPO Centre at Northlands Park, Edmonton, AB
Pre-conference Workshop
Nov 16, 2016 – Edmonton area
www.greenindustryshow.com
- **Hort Snacks-to-Go Webinar**
Nov 21, 2016 – [Registration link](#)
- **Potato Growers of Alberta Annual General Meeting**
Nov 21-23, 2016 – Fairmont Banff Springs Hotel – Banff, AB
www.albertapotatoes.ca
- **Getting into Local Food Workshops** (see Poster)
Nov 22, 23, 24, 2016 – Lethbridge/Airdrie/Parkland County, AB – Coming Event Link – [Lethbridge](#) – [Airdrie](#) – [Parkland](#)
- **5th Canadian Food & Drink Summit**
Nov 28-29, 2016 – Toronto Downtown Marriott Eaton Centre – Toronto, ON
<http://www.conferenceboard.ca/conf/foodsummit/default.aspx>

December 2016

- **Marketing Essentials for Local Food Workshop** (Tentative)
Dec 1, 2016 – Stony Plain, AB
- **2016 North American Strawberry Growers Association (NASGA) and North American Raspberry and Blackberry Growers (NARBA) Joint Meetings**
Dec 4, 2016 – joint reception – Grand Rapids, Michigan
Dec 5, 2016 – educational sessions – Grand Rapids, Michigan
Dec 6, 2016 – educational sessions with GLEXPO 2016
- **Great Lakes EXPO Farm Market Bus Tour**
Dec 5, 2016 – Grand Rapids, Michigan
<http://bustour.greatamericanmediaservices.com/>
- **Great Lakes Fruit, Vegetable and Farm Market Expo**
Dec 6-8, 2016 – DeVos Place Convention Centre – Grand Rapids, MI
www.glexpo.com
- **Getting into Retail Workshop** (Tentative)
Dec 6, 2016 – Lacombe, AB
- **Explore Local Webinar – Get It Off The Shelf: Putting Your Business Plan in Action**
Dec 7, 2016 – [Registration link](#)
- **Hort Snacks To Go Webinar – Season Extension**
Dec 12, 2016 – [Registration link](#)

Upcoming Conferences / Workshops

January 2017

- **Potato Expo 2017**
Jan 2-6, 2017 – Moscone Center West Marriot Marquis – San Francisco, California, USA
www.potato-expo.com
- **Productivity Improvement Workshop – Intro to Lean**
Jan 11, 2017 – Airdrie Ag Centre – Airdrie, AB
- **Hort Snacks-to-Go Webinar – Carrot IPM**
Jan 16, 2017 – [Registration link](#)
- **Adding it Up: Getting a Handle on Your Greenhouse Financials**
Jan 17-18, 2017 – Red Hat Coop Boardroom - Redcliff, AB
- **Agronomy Update 2017**
Jan 17-18, 2017 – Lethbridge Lodge – Lethbridge, AB
Ropin' the Web (www.agriculture.alberta.ca) – Coming Events
- **Local Foods – On-farm Retail Tour** (Tentative)
Jan 18, 2017 – Southern Alberta
- **Scotia Horticultural Congress 2017 – “Building Blocks for Tomorrow’s Farms”**
Jan 23-24, 2017 – Old Orchard Inn Convention Centre – Greenwich, NS -
<http://www.horticulturals.ca/index.php/events/scotia-horticultural-congress/>
- **Adding it Up: Getting a Handle on Your Greenhouse Financials**
Jan 24-25, 2017 – Lacombe Agriculture Building - Lacombe, AB
- **Manitoba Potato Production Days**
Jan 24-26, 2017 – Keystone Centre – Brandon, MB
www.mbpotatodays.ca
- **48th Annual Northwest Agricultural Show**
Jan 24-26, 2017 – Portland Expo Centre – Portland, Oregon, USA
www.nwagshow.com
- **19th Annual Pacific Agricultural Show**
Jan 26-28, 2017 – Tradex Exhibition Centre – Abbotsford, BC
www.agricultureshow.net
- **Pricing Principles Workshop**
Jan 24, 2017 – Agri-Food Business Centre - [Leduc, AB](#)
Jan 26, 2017 – Airdrie Ag Centre – [Airdrie, AB](#)
Jan 31, 2017 – TBD – [Grande Prairie, AB](#)
- **36th Annual Guelph Organic Conference & Expo**
Jan 26-29, 2017 – Guelph University Centre, Guelph, ON
www.guelphorganicconf.ca
- **Hort Snacks-to-Go Webinar – Drip Irrigation**
Jan 30, 2017 – [Registration link](#)
- **FarmTech 2017**
Jan 31 – Feb 2, 2017 – Edmonton Expo Centre at Northlands – Edmonton, AB
www.farmtechconference.com

SAVE THE DATE

The **Alberta Farm Fresh School (From Farm to Market)** is set for March 2-3, 2017 at the Pomeroy Inn & Suites in Olds, AB (on Olds College campus). This conference is offered jointly by Alberta Farm Fresh Producers Association (AFFPA) and the Alberta Farmers' Market Association (AFMA)

Watch www.albertafarmfresh.com for details.

FYI, planning is underway for a half day Strawberry Production Workshop for New Growers to be held before the School (on March 1)

There may also be a Strawberry Industry Roundtable the Wednesday evening.



HortSnacks-to-Go: 2016/2017 Webinar Series



To register call **Dustin Morton**
at 780-679-1314 or email at
dustin.morton@gov.ab.ca

October 17 (3 PM MST) –

Barb Stefanyshyn-Cote, Black Fox Farm & Distillery

Barb and her family operate Black Fox Farm and Distillery, a cut flower farm and distillery located just outside Saskatoon, SK. Barb discusses how they got started, the trials and tribulations of cut flowers, and what they've learned along the way.

November 21 (3 PM MST) –

Amanda Thomsen, Kiss My Aster

Amanda is the thrift shopping, Ryan Gosling loving punk behind the gardening blog 'Kiss My Aster'. This renowned author, speaker and garden diva will be discussing ways of making your garden centre Kiss My Aster-proof to ensure your clients come back year after year.

December 12 (3 PM MST) –

Adithya Ramachandran, Kaleidoscope Gardens

Adithya and Jennifer own and operate Kaleidoscope Gardens near Dundurn, SK. This small farm has invested heavily into season extension and will be discussing how they've used it to open up their market to new crops and extend the season of traditional crops.

January 16 (3 PM MST) –

Rick Peters, Agriculture and Agri-Food Canada (AAFC)

Rick is a research scientist studying fungal diseases of carrots and other vegetable crops in Prince Edward Island. He will be looking at the ins and out of integrated pest management in carrots from seed to harvest and everything in between.

January 30 (3 PM MST) –

Rebecca Shortt, Ontario Ministry of Agriculture, Food, and Rural Affairs (OMAF)

An expert in irrigation management, Rebecca will discuss irrigation scheduling with drip irrigation and how to get the most bang for your buck from your irrigation system.

February 27 (3 PM MST) –

Bob Purton, Kangro Gardening

Kangro Gardening is a five acre market garden just outside Yorkton, SK. Bob's transition to hydroponic lettuce production was not without challenges and he'll discuss his approach as well as his successes and failures.

March 20 (3 PM MST) –

Suzanne Wainwright-Evans, Buglady Consulting

Suzanne has been working with biological control agents for nearly 20 years and is well known in the greenhouse industry. She'll be discussing some recent trends she's seen in greenhouse pest control as well as perennial issues everybody deals with in their operations.



invites you to:

Getting Into On-Farm Sales

This one day workshop examines selling your food products direct to consumers from your farm. Join us to discover simple options you could consider as you start on-farm direct sales.

Content for the Day

Setting the Stage

- Learn about the different options available to you for selling direct to consumers from your farm – from u-picks to farm stands and seasonal sales centres.

Overview

Discover the behind-the-scenes considerations that help to make the consumer experience memorable and your business successful: parking and traffic flow, signage, scales, cash handling systems, washrooms, and more.

- Understand which regulations apply to your business, who to contact and why they matter.

Producer Stories

- Jim Hill with Hidden Valley Gardens near Sylvan Lake will talk about the way they implemented a simple sales solution into their u-pick operation.
- Vicky Horn with Tangle Ridge Ranch near Thorsby will share how customers access their lamb both on-farm and through off-farm deliveries.

Registration and Information

Date: Tuesday, November 15, 2016

Registration deadline: November 8, 2016

Location: Agri-Food Business Centre
6547 Sparrow Drive, Leduc

Time: 9:30 a.m. – 3 p.m.

Cost: \$25 includes GST
Lunch and refreshments provided
Payment options: Visa, MC or cheque

**To register call:
1-800-387-6030**

Refunds will be issued for cancellation requests received up to and including November 8, 2016.

For More Information:

Delores Serafin
Alberta Agriculture and Forestry
780-427-4611
delores.serafin@gov.ab.ca



invites you to:

Getting Into Local Foods

This one day workshop is for those interested in learning about the market options available for selling food products direct to consumers.

Content for the Day

Setting the Stage

- Learn about the local food opportunity and the different farm direct marketing channels, their benefits and challenges.

Overview

Examine the regulations that apply to your business directly from the agencies responsible for enforcement.

- Meet the resource specialists available to assist you within Alberta Agriculture and Forestry.

Producer Story

- In Lethbridge and Airdrie, Bonnie Spragg with Spragg's Meat Shop will share their farm story. She'll describe their early marketing efforts through to their decision to learn the meat processing business so they could produce meat products in their own processing facility and sell them from their on-site store in Rosemary, Alberta.
- At our Parkland County session, Nicola Irving with Irvings Farm Fresh will share their farm story – from their humble beginnings searching for tasty English-style sausages to their farmers' market and restaurant sales and their newly expanded on-farm processing facility.

For More Information:

Delores Serafin
Alberta Agriculture and Forestry
780-427-4611, Delores.serafin@gov.ab.ca

Registration and Information

(There are 3 dates for this workshop)

Date: Tuesday, November 22, 2016

Registration deadline: November 15, 2016

Location: Agriculture Centre
Boardroom 136
5401 1st Ave S, Lethbridge

Date: Wednesday, November 23, 2016

Registration deadline: November 16, 2016

Location: Agriculture Centre
Theatre Room
97 East Lake Ramp NE, Airdrie

Date: Thursday, November 24, 2016

Registration deadline: November 17, 2016

Location: Magnolia Community Hall
53.5921 and 114.861925
Type *Magnolia Community Hall* in
Google Maps for directions.

Time: 8:00 am – 4:30 pm (all workshops)

Cost: \$25 includes GST
Lunch and refreshments provided
Payment options: Visa, MC or cheque

**To register call:
1-800-387-6030**



Pricing Principles

Moving to Retail

Planning on selling to retail? Expand your understanding of the costs related to setting a profitable price.



Attend this workshop if you are looking to:

- Price your products for profit
- Understand the components of pricing for the retail market
- Understanding retail buyers needs

Registration Information

Dates: January 24, 2017

Agri-Food Business Centre
6547 Sparrow Drive, Leduc, Alberta

January 26, 2017

Agriculture Centre
97 East Lake Ramp NE, Airdrie, Alberta

January 31, 2017

Grande Prairie, Venue TBC

Time: 9 a.m. - 3:30 p.m.

Registration starts at 8:30 a.m.

Cost: \$25 per person

(includes snacks, lunch and GST)

To register
call the **Ag-Info Centre** at

1-800-387-6030

Managing Vertebrate Pests

Relevant Resources

[Rodent and Deer Control in Orchards](#)

Pest Control Suppliers

[Margo Supplies Ltd](#)
[Wildlife Control Supplies Canada](#)

Vertebrate pests are bigger than your average insect and are simply animals that have skeletons and can include things like birds, deer, moose, elk, rodents, and other 2 or 4-legged animals (including humans). Whereas insect pests and diseases reduce the size and quality of your harvested crop and can reduce vigour and plant health, vertebrates typically directly affect plant survival, in addition to reducing yields. When growing perennial crops, this means interrupting the growth of a long-term crop and in many cases, requiring replanting and starting over. This also happens for many annual crops.

When it comes to vertebrate pests, you can't really take the same approaches to management as you might with diseases or insects. Vertebrates are a large, visible part of the food chain, and poisoning (which is essentially when we are doing with insecticides and fungicides) on an entire orchard or field scale can have huge impacts on the entire chain (some might argue the same things for pesticide use for insects and diseases, but that is for another time). My point is that you can't just spray an entire orchard or field to control a vertebrate pest, for a number of reasons. First, these pests don't typically live or stay in the area all the time and as with any pesticide, you need to get the product in contact with the target. Second, they are larger and require a lot more to kill them. Third, poisons can concentrate within the food chain and non-target organisms will inadvertently be harmed. Fourth, widespread application of chemical can harm non-target organisms. The list can go on.

So how do you manage these pests? The answer is multi-faceted (and complex). The first step is to understand the habits and life cycles of the target pest so as to find where you can reduce the damage with the least amount of impact on other non-target organisms. Then you can use a range of techniques to accomplish your goals.

Basic Life Requirements

Essentially all vertebrate pests have some basic requirements in order for them to thrive. They all require food, shelter and minimum exposure to predators or other threats. Depending on the size of the animal, this can mean that longer grass, wild and rough or wooded areas, coverings, or buildings, etc. can meet the shelter/protective requirements. Food may be supplied by your crops, depending on the season and the availability of other food sources. Access to your crop is all they need.

The key techniques to managing most of these pests include exclusion (keeping them out), exposure (removing their protection) and removal (death or relocation). Within these general themes, practices may include sanitation, use of repellents / deterrents, hunting / trapping, poisoning, etc.

Deer and other similar pests

Deer, moose, elk, etc. can cause a lot of damage to all sorts of crops, whether orchard crops or newly emerging annual vegetable crops. They are typically present in all areas and during all seasons, although they may make their presence known more in certain seasons. They feed on plants, shoots, branches, and leaves and may also cause mechanical damage when they move through crops (i.e. broken branches) or when they forage for food (e.g. damaged mulch, dug up crowns, etc.).

One of the most common ways of managing these types of pests is by allowing seasonal hunting on your property. This will not remove a problem but may reduce the population to levels that have less economic impact for your farm. When looking at this option, consider the regulations that accompany this (including both allowing and disallowing hunting). Check with your local Fish and Wildlife Officer for details.

FROM THE HORT SNACKS ARCHIVES – updated

Perhaps the most effective management practice for this crop is to put up fences. If the area where your crops are located is fenced properly, and those fences are maintained, you should be able to keep the problem out. Fences are expensive, there is no question. But if the difference between having a crop and not having a crop is the cost of a fence, then perhaps the choice you have to make is easier or clearer.

When fencing property, it is easier to start with the animals outside of the area, rather than remove them later. Fence early, rather than later. Keep future expansion and development in mind when planning a fencing project. Maybe fence a larger area than you have planted now.

When putting up your fences, consider the predominant species for your area. Bigger animals like moose or elk will require a stronger fence, while smaller deer can jump quite high, so height might be more important. Consult a fencing company or a Fish & Wildlife Officer for assistance in designing a suitable fence.

The use of deterrents or repellents is common. Unfortunately, the level of success is pretty varied and is almost never the same from one place to the next. Deterrents are things like bags of hair, bars of soap, etc. Their main feature is scent, which turns off the animal and encourages it to go elsewhere. There are also commercial repellents, which either have a bad taste or odour. It is important remember to keep them fresh and varied. Everyone can adjust to something, even pests (perhaps I should say, especially pests).

Photos by Robert Spencer

Deer / Elk / Moose Factoids [Deer Control Options](#)

- Ungulates → two-toed
- This group is native to all continents except Australia and Antarctica
- Top Speed
 - White-tailed deer = 30 mph / 48 kph
 - Moose = 35 mph / 56 kph (sprint); 20 mph / 32 kph (trot)
- Group Names
 - Deer / Moose = herds
 - Elk = gangs
- White-tailed deer can leap 10 feet (3m) high and 30 feet (9m) in a single bound
- Moose are great swimmers and can submerge completely for 30 seconds or more



Various examples of electric deer fencing and bait



Rodents

Rodents can be a big problem for producers of a wide range of crops (especially tree and shrub crops). Besides the incredible reproductive potential of some of these pests, they can be very destructive and quite literally lurk around, under and within your fields, crops, storages and the other areas on your farm.

Rodents include animals such as voles (which are commonly called mice), mice, rats (NOT IN ALBERTA!?), moles, gophers, ground squirrels, porcupines, beavers, etc. It is a pretty confusing group when it comes to names, as most of what we commonly refer to as one *this*, is actually something else (confused yet?).

Rodents damage crops and plants by feeding on seeds, chewing off bark, shoots and roots (girdling) and occasionally root pruning. Some rodents also contaminate produce in storage with their urine and feces.

Porcupines, while less prolific than things like voles, can cause problems for producers. They can be managed either by shooting, trapping and removal or by using repellents or mechanical barriers. It is illegal to poison porcupines in Alberta.

FROM THE HORT SNACKS ARCHIVES – updated

Rodent Factoids

- The name “rodent” comes from the Latin word “*rodere*” which means “to gnaw”
- Rodents’ constantly growing upper and lower incisors must be constantly filed down
- The smallest rodent weighs 7 grams at maturity
- The largest rodent, the capybara, weighs about 80kg
- Some rodents can squeeze into a space as small as a ¼ inch high

[Beavers – AEP factsheet](#)

[Control of Porcupine Damage](#)

[Mice and their Control](#)

[Control of Pocket Gophers and Ground Squirrels](#)

Correctly positioned mole trap in
Saskatoon berry orchard



Management of some of the other, smaller, rodent pests can be accomplished in different ways. Exclusion can be difficult for the smaller pests, but ensuring building and structures are well maintained can help to keep them out. For the larger ones (such as beavers or porcupines), tree wraps or wire may protect the lower trunks of trees. Repellents are also probably less effective for the smaller pests. Sanitation can help to keep populations down by removing food sources that may draw the pests in. Orchard sanitation and field clean up can also help to reduce populations by removing food sources, and at the same time, removing protection. Rodents find protection in thick grass, rough or weedy areas, trash and leaf litter. They make tunnels or pathways under this cover, which allows them to move freely, out of sight of predators. By cleaning up these areas, whether by mowing, tilling or whatever, you open them up to the view of predators. Some people will also compress or pack the snow next to rows of plants, which prevents rodents from moving underneath and getting to plants. Encourage predatory birds or other animals by being conscious of the habitats that they prefer.

Trapping and poisoning can be effective ways to reduce the populations of some types of rodents. It is important to ensure that traps are properly set, both to be effective and to prevent inadvertent trapping or poisoning of non-target species. Bait stations should be replenished regularly.

Birds

It isn't possible to describe or list all the different types of birds that can show up and cause problems on your farms. It can vary year to year. Birds, like rodents, cause problems by their sheer numbers and the difficulty in keeping them out, although they tend to show up in large numbers all at once, in an overwhelming display.

Most birds will not typically damage fruit and vegetable plants directly, but reduce yields (often completely) by their feeding. Sometimes, they don't completely remove fruit, but render it unmarketable, particularly in larger fruit. Their subsequent gastronomic activities (a.k.a. crapping all over everything) can also cause problems with marketability, buildings and the public. This same activity can also introduce non-crop species into orchards or other plantings.

Management of birds is similar to that of rodents, although on a wider scale. The method(s) that you choose may be limited by cost and likely will have to be varied, as nothing works forever.

Photos by Robert Spencer

Scare balloons & netting,
Scare devices



FROM THE HORT SNACKS ARCHIVES – updated

Individual high value plants may be protected by excluding the birds using netting or covers. On a larger scale, this may not be feasible (although it is being done in some cases). Using noisemakers (such as propane cannons, loud speakers, etc.) can be effective, but you should give consideration to long-term efficacy and to the neighbourhood. If you have neighbours, they may not appreciate what you are doing and might put a stop to your plans. Using other scare tactics, such as mylar tape, scare balloons, fake birds of prey, etc. can be quite effective, as can encouraging natural predators. It is important to remember to move devices frequently, as birds can become used to a deterrent. You've all seen pictures or cartoons of crows using a scarecrow as a roost.

Hunting and killing of birds really isn't feasible, for a couple reasons. One, they are typically too numerous for killing them to be even remotely effective. Two, many of our bird pests are protected or there are restrictions on hunting / killing them.

Bird Factsheets

[Starlings and their Control](#)

[Managing Bird Damage to Fruit and Other Horticultural Crops](#) – big document from Australia

Photo by Robert Spencer

Netted Haskap



Rabbits and Hares

I'm not sure how much damage rabbits really do to our commercial crops in Alberta, but they reportedly do damage in other areas. Rabbits typically feed on new growth and buds but can also girdle trees by chewing off the bark at the base of trees and can prune branches off. It is pretty scary to see how much damage one cute, fluffy little bunny can do to a stand of trees.

Manage rabbits by encouraging their natural predators and by spreading/painting repellents on the bases of trees (as high as they can reach with snow). Trapping and shooting is also an option. Poisoning is illegal in Alberta (due to the impact on the other species further up the food chain). Exclusion on a local scale (either plant by plant or around orchards or gardens) can be effective, using mesh fences, cages or other mechanical devices. Removing undergrowth and exposing them to predators can reduce their activity in your crops.

Rabbit Factoids

- Prolific reproducers – litters range from 1 kit up to 18
- Average gestation period = 30-32 days
- Rabbits live in groups called "warrens" in underground burrows
- Rabbits re-ingest their own dropping to extract more nutrients from them

[Control of Rabbits and Hares](#)

Humans

I jokingly included humans in the list of potential vertebrate pests, but they really are potential pests that must be managed just like the other "animals". Some of the pests might be customers. The best way to control human predation is to fence, post signs, educate and communicate. Try and train them in how to act appropriately or carefully in your plantings.

If you are experiencing problems with vertebrate pests, talk to your local Fish & Wildlife Officer for assistance, as they can tell you what is permitted for your area and may be able to recommend a solution.

[Pest Management Regulatory Agency](#)

(PMRA) –

[Electronic Label Search Engine](#)

Search the database for electronic labels

Willow Pine Cone Gall Midge

Rabdophaga strobiloides

Crops Affected: willow species

Life Cycle:

- Single generation per year
- Insect is a midge, which is a small, two-winged fly
- Adults emerge in the spring as the leaves are starting to flush
 - They mate and the females lay eggs singly on young leaves
- Light orange larvae hatch from the eggs and move to the developing branch tips or developing growing points (may be terminal or axillary growing points)
 - Larvae bore through base of the leaves into the cavity of the growing point
 - Feeding by larvae stimulates the formation of the hard, pine cone-like, gall
 - Larvae remain inside the gall until they reach maturity in late September
 - It is possible that the larvae will overwinter inside the gall
- Damage by the insect is not significant and don't seriously harm the host
 - Higher levels of infection can reduce the aesthetic value and appearance of the tree
- The galls represent shelter for a number of other insects

Symptoms:

- Conspicuous pine cone-like galls are prominently displayed on the tips of branches
- Galls tend to be golf ball sized
- Galls persist long after the insect matures and leaves

Management:

- Galls can be removed from the plant by pruning when they are observed
 - Removal would have to be done on new galls in order to reduce populations, as older galls will be vacant
- No other management is required

INSECT OF THE MONTH



Willow branch with a Pine Cone Gall on the terminal bud



Willow Pine Cone Gall caused by a small midge

Photos by Robert Spencer



Taking apart the gall reveals a tiny white larva at the exact centre of the mass of woody "leaves" that comprise the gall



Tiny white larva in the centre of the gall

DISEASE OF THE MONTH

Powdery Scab

Causal Organism: *Spongospora subterranea f.sp. subterranea*

Crops Affected: potatoes and some Solanaceous weeds

Disease Cycle:

- Can be easily confused with Common Scab (*Streptomyces scabies*) on the tuber
 - Laboratory testing or microscopic analysis is required to positively differentiate between the pathogens
- Seed and soil borne
 - May survive for many years in the soil (as resting spores)
 - Spread by infected seed, moving infested soil or spreading contaminated manure
- Lesions develop on roots, stolons and tuber surfaces
 - Galls develop in infected tissues
 - May develop within 3 weeks of infection
 - Contain masses of spore balls, which in turn contain numerous resting spores
- Resting spores germinate in the presence of plant roots to produce motile, flagellate zoospores
 - Infect root hairs, roots, stolons, young shoots and tubers
 - Pathogen may also penetrate through lenticels or wounds in the tuber
- Further spore dispersal can occur, resulting in more disease development
 - Multiple generations may occur in a season, via secondary spore production
- Some sources suggest that spread can occur in storage between infected and healthy tubers through aerial transfer (as spores are physically dislodged from lesions into the air)
- This pathogen will vector Potato Mop Top Virus

Symptoms:

- Purplish-brown sunken lesions develop on the tuber surface in early stages
- Brown, raised pustules will develop as lesions mature
- Pustules continue to enlarge
- Pustules eventually rupture and release spores

Conditions Favouring Disease Development:

- Cool, wet soils
- Poorly drained soils
- Low-lying or shaded areas of infested fields may also allow development in drier years
- Initially wet soils, followed by a gradual drying out is thought to favour disease development

Management:

- Avoid planting infected seed
- Maintain a rotation of at least 4-5 years or more
- Avoid the use of manure from animals that may have been fed infested tubers
- Ensure soils are well drained
- Avoid over-irrigating
- The use of appropriate seed treatments can reduce spread from infected seed

Common Scab

A.K.A. Scab, Potato Scab

Causal Organism: *Streptomyces scabies*

Crops Affected:

potatoes, carrots, beets, parsnips, rutabaga, turnip, and radish

Disease Cycle:

- Scab pathogen is a fungus-like bacterium
- Persists in the soil for years
- Typically infects during the first 5 weeks of tuber development, via the lenticels
- Colonizes several layers of cells
- Does not spread or increase during storage

Symptoms:

- Round, irregular, brown lesions form on the tuber surface – typically less than 1 cm across
- Scab lesions may be either shallow and superficial, raised and erupting, or deep and pitted
- Underground stems and stolons may also be affected
- Almost impossible to distinguish from Powdery Scab

Conditions Favouring Disease Development:

- Severity of symptoms depends on a number of factors
 - Strain of *Streptomyces*
 - Potato cultivar
 - Soil organic matter content
 - Crop rotation practices
 - Weather conditions
 - Moisture availability
- Dry conditions at or after tuber formation can increase incidence, as levels of antagonistic bacteria are reduced
- Soil pH can influence scab formation – unfortunately range for *Streptomyces* is similar to that of potatoes
- In other crops, points of injury (insects, etc.) or immature lenticels are where the pathogen enters

Management:

- Use less susceptible cultivar selections if possible (no potato cultivars are resistant)
- Exercise appropriate crop rotations, with a minimum of 4 years between host crops
- Protect susceptible crops from injury (e.g. root insects, etc.)
- **Maintain adequate and uniform levels of moisture**, particularly around the time of tuber development (typically, tuber formation coincides with flowering on potatoes) – 4-6 weeks after planting
- Altering soil pH (increasing above 8) can reduce disease severity somewhat, but is difficult to accomplish and potato yield will likely be affected
- Avoid applying manure from animals fed scabby produce
- Use clean seed
- Seed treatments can provide some control of tuber-borne scab, but will not protect daughter tubers from soil-borne scab

Common scab lesions on a red-skinned potato

Photos by Robert Spencer

