



As summer rolls into fall, the warm days and cool nights are producing some sweet produce. Things are ripening nicely out there, and with the start of fall, here is a new edition of Hort Snacks to get you started.

In this edition, you will find a visible uptick in the number of conferences and workshops that are being offered, as extension season gets started. You'll see that there are lots of webinars, workshops and other events to keep you busy and educated on a wide variety of topics.

Each year, we attend a number of conferences, tours and workshops in Alberta, Canada and the USA and we try and report on some of the things that we see, learn and hear about, with you. In August, the North American Strawberry Growers Association (NASGA) held their annual summer bus tour in Minnesota, so you'll find the report on that trip in this edition. Hopefully there are will be a few nuggets of information that you can think about using yourself. You'll also find information on a few different disease and insect pests, as usual, to gross you out, interest you or keep you aware of the problems that can pop up in your crops.

As you head into wrapping up harvest, feel free to send us a note about your season and how things went. We are happy to hear about things that went well and things that could use some fixing.

Rob Spencer/Dustin Morton, Commercial Horticulture Specialists
 Alberta Ag-Info Centre, Alberta Agriculture & Forestry
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Featured App of the Month



BeetClock

Track labour, plan crops or manage other tasks on the farm



Horticulture >

ARD Horticulture Microsite – click the image

In this edition of Hort Snacks

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THINGS TO DO / THINGS TO THINK ABOUT THIS MONTH

Strawberries

- Good soil moisture must be maintained in June bearing strawberries to ensure maximum branch crown and flower bud formation (next year's production)
- Old weeds should be removed this month. Reducing the amount of foliage and trash will facilitate proper placement of herbicides later this or next month. Cultivation between rows to eliminate weeds, incorporation of straw and aeration of the soil should also be done
- Day-neutral strawberry producers often find irrigation for frost protection beneficial during fall months. Very often producers experience 1 or 2 frosty nights in late August-September followed by weeks of "Indian Summer"
 - Frost protection has proved invaluable during this brief period
 - Water releases heat as it freezes on the plant, thereby keeping the plant parts above freezing. Protection can be obtained down to approximately -6.6°C . At temperatures of -1°C at plant level frost may cause slight injury to open flowers. Medium injury may occur to open flowers at temperatures of -2°C . Producers should have accurate thermometers stationed throughout their field, especially in depression areas
 - Irrigation should commence when temperatures at ground level reach $+1^{\circ}\text{C}$. Ice may not form immediately. Ice formation of 1 cm in thickness may form without serious damage to the plants. Irrigation should continue until the ice melts off the plants. A thermometer in the field at ground level in a location not frost protected may assist in determining field temperature
 - Field warming through the use of irrigation during periods of frost is a relatively inexpensive form of insurance. Much of the year's income can be wiped out in one chilly night. Straw mulch within the row is also a definite asset. Some producers find that fibre/fabric row covers are providing $1-2^{\circ}\text{C}$ frost protection

- Do not apply 2,4-D or Lontrel in September due to flower bud initiation. September is a good time to apply Devrinol or Sinbar to control winter annuals
- Strawberry growers should be making arrangements for obtaining clean rye or wheat straw for mulch this fall. Personally walking farmer's fields to decide how clean (free from weeds) the straw will be might be a good idea prior to purchase.

Apples

- Stop watering/irrigation to encourage shut down and winter acclimation. Apples will continue to grow if water is available

Raspberries

- Prune out spent or fruited canes, as well as weak or diseased canes
- Reduce irrigation this month to encourage hardening
- Consider fall herbicide applications in established plantings – some restrictions apply to certain products (e.g. Casoron)

Saskatoon berries

- Disease pruning and weeding
- If you are planning to rejuvenate (mow-off) your orchard next spring, do not use Casoron this fall

Vegetables

- Remove mature product and cool quickly to ensure maximum post-harvest life
- Field covers can be used to protect crops from fall frosts
- Curing of some crops (potatoes, bulb veg, pumpkins) can help in wound healing and post-harvest lifespan
- Fall planting may be done for some crops (e.g. garlic, spinach, etc.) – timing varies – too late can result in winter injury and poor survival

General / Other

- Mow grass and weeds around plantings to discourage mice as well as reduce insect and disease overwintering sites

Pest Management / Monitoring

- Monitor insects and control if necessary (to reduce overwintering stages)

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.

MENTAL SNACKTIME – Satisfaction

- "Happiness does not come from doing easy work but from the afterglow of satisfaction that comes after the achievement of a difficult task that demanded our best." – Theodore Isaac Rubin
- "Satisfaction lies in the effort, not in the attainment, full effort is full victory." – Mahatma Gandhi
- "Challenge is the pathway to engagement and progress in our lives. But not all challenges are created equal. Some challenges make us feel alive, engaged, connected, and fulfilled. Others simply overwhelm us. Knowing the difference as you set bigger and bolder challenges for yourself is critical to your sanity, success, and satisfaction." – Brendon Burchard
- "Laziness may appear attractive, but work gives satisfaction." – Anne Frank
- "The value of life lies not in the length of days, but in the use we make of them... Whether you find satisfaction in life depends not on your tale of years, but on your will." – Michel de Montaigne

Q: What are the deciding factors that you use to drop or cut loose a product or crop?

A: If it doesn't work for me. Or if the produce is not as good as the one beside

A: There are numerous reasons that could lead to discontinuing any given crop or portion of it, but at the top of the list is profits – will it sell? Is it dropping in popularity? Next is the degree of difficulty in growing it properly, is it being replaced by an improved variety? Or maybe it's just not available anymore – e.g. Orange Petunias.

A: Grade

A: #1 Demand #2 input costs compared to return

A: I do my best to determine if it is profitable or not and then look at how much nuisance it is.

A: The deciding factor in any product change after cost, desire for change and customer input is my own personal feeling on the change. i.e. does it feel right?

A: If there is not enough product for customers to be satisfied (U Pick operation)

A: Labour availability and labour cost

A: If after having tried to build a demand for a certain product for several years, it is time to analyze good or no good. If it's no good, then just better cut.

A: Customer responses and feedback Plant performance, susceptibility to disease and pests

Next Month's ? → [What are some of the critical tasks that you carry out in fall? Why do they have to be done in fall, rather than another time of year?](#)

Hort Snacks To Go – Winter Webinar Series

Oct 16, 2017 – Dr. Bob Bors (U of Saskatchewan) – *New Haskap Varieties & Fruit Breeding Pipeline*

Oct 30, 2017 – Dr. Bridget Behe (Michigan State U) – *Eye-tracking Technology & Garden Centre Marketing*

Nov 20, 2017 – Ron Valentin (Bioline AgroSciences) – *Using Biocontrols in Field Scale Fruit & Vegetable Crops*

Dec 18, 2017 – Dr. Kate Congreves (U of Saskatchewan) – *Soil Fertility & Soil Health*

Jan 15, 2018 – Eric Doef (Doef's Greenhouses) – *Challenges and Successes of Larger-scale Greenhouses in Alberta*

Jan 29, 2018 – Dawn Boileau (Sunrise Gardens) – *Season Extension = Sustainable Farm*

Feb 12, 2018 – Chris Blanchard (Purple Pitchfork / "Farmer to Farmer" podcast) – *Nuts and Bolts of Running a Market Garden*

Mar 12, 2018 – Graeme Murphy (bioLogical Control Solutions) – *Crunching the Numbers on Biocontrols in Bedding Plant Production*

Upcoming Conferences / Workshops

September 2017

- **3rd International Strawberry Congress 2017**
Sept 6-8, 2017 – Flanders Meeting & Convention Center – Antwerp, Belgium
<http://www.iscbelgium.com/>
- **AgriTourism & Farm Direct Marketing Bus Tour (SEE POSTER)**
Sept 11, 2017 – Spruce Grove/West Yellowhead Region
Register – 1-800-387-6030 (by September 6)
- **CityFARMed – Small Farm Tour**
Sept 12, 2017 – Calgary, AB – Call 1-800-387-6030 to register
- **2017 Canada's Outdoor Farm Show**
Sept 12-14, 2017 – Woodstock, ON
www.outdoorfarmshow.com
- **CanWest Hort Expo**
Sept 27-28, 2017 – Tradex – Abbotsford, BC
www.canwesthortexpo.com
- **Potato Europe 2017**
Sept 13-14, 2017 – Emmeloord, Flevoland, Netherlands
<http://www.potatoeurope.com/>

October 2017

- **Canadian Greenhouse Conference**
October 4-5, 2017 – Scotiabank Convention Centre, Niagara Falls, ON
www.canadiangreenhouseconference.com
- **PMA Fresh Summit International Convention & Exposition**
October 19-21, 2017 – Ernest N. Morial Convention Center, New Orleans, Louisiana, USA
<http://www.freshsummit.com/>
- **ISA Prairie Chapter – Prairie Possibilities**
Oct 22-24, 2017 – Moose Jaw, SK
<http://www.isaprairie.com/2017-annual-conference-moose-jaw>
- **Essentials of Selling Local Food (SEE POSTER)**
Oct 24, 2017 – Wildwood Recreation Complex – Wildwood, AB
To Register – call Registration Desk – 1-800-387-6030
- **Getting into Farming**
Oct 26, 2017 – Airdrie Ag Centre – Airdrie, AB
To Register – Registration Desk – 1-800-387-6030

November 2017

- **Canadian Food & Drink Summit 2017: Measuring Performance, Taking Stock, Inspiring Action**
Dec 5-6, 2017 – Calgary TELUS Convention Centre – Calgary, AB
<http://www.conferenceboard.ca/conf/foodsummit/default.aspx>
- **Saskatchewan Green Trades Conference & Tradeshow**
Nov 7-9, 2017 – Saskatoon Inn, Saskatoon, SK
<http://www.saskgreenhouses.com>
- **Potato Growers of Alberta Annual General Meeting**
Nov 14-16, 2017 – The Sheraton – Red Deer, AB
www.albertapotatoes.ca
- **Green Industry Show & Conference**
Nov 16-17, 2017 – BMO Centre at Stampede Park, Calgary, AB
Pre-conference Workshops
Nov 15, 2017 – Calgary, AB
www.greenindustryshow.com

Don't Forget – Hort Snacks-to-Go webinars start up mid-October, running 1-2 per month, October to March.

Agri-tourism and Farm Direct Marketing Bus Tour

Tour Stops:

Happy Acres U-Pick
Shady Lane Estate
Leaman Exchange



Featuring:

- Startup, family-run businesses doing innovative things on smaller farms in rural Alberta
- Ideas and inspiration for diversifying, adding value, and attracting people to your own farm
- A delicious local food lunch and artisan winery tour
- An experienced agri-tourism coach
- Learnings from the Open Farm Days Coaching Program
- Opportunities for networking, sharing, and discussion



Registration Information

Date: **Monday, September 11, 2017**
Spruce Grove/West Yellowhead Region
Registration deadline – September 6

Time: **9 a.m. - 6 p.m.**

Cost: **\$25.00** (includes lunch and refreshments)

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

1-800-387-6030

For further information, please contact Colin Gosselin at 780-968-3518 (dial 310-0000 for a toll-free connection) or colin.gosselin@gov.ab.ca.

Bus pick-up and drop-off point will be in the Spruce Grove area. An alternate drop-off point in the Wildwood area is possible.



invites you to:



Essentials of Selling Local Food

This one-day workshop is for people interested in learning more about selling food direct to consumers and potentially transitioning into retail sales.

Content for the Day

Setting the Stage

- Learn about the local food opportunity and the different farm direct marketing channels, their benefits and challenges.
- Discover the scope of the retail market, market drivers and the pros and cons of accessing the retail market opportunity.

Overview

- Meet the Agriculture and Forestry specialists available to assist you as you establish your food business.
- Hear about the regulations that apply to your food business.
- Alberta Health Services will share the Food Regulation requirements as well as safe food handling practices.
- Learn everything you need to know as you assess the retail food market.
- Receive insights into the Yellowhead County Local Food initiative.

Registration and Information

Date: Tuesday, October 24, 2017

Time: 8 a.m. - 4 p.m.

Registration deadline: October 17, 2017

Location: Wildwood Recreation Complex
5530 50 St, Wildwood



Cost: \$23.75 + GST

Lunch and refreshments provided
Payment options: Visa, MC or cheque

Register by October 17 at
<https://eservices.alberta.ca/essentials-of-selling-local-food.html>
or call 1-800-387-6030

GST exempt or AF employee? Please call 1-800-387-6030 to register

For more information:

Delores Serafin
Alberta Agriculture and Forestry
780-427-4611 (dial 310-0000 first for toll-free access in Alberta)
delores.serafin@gov.ab.ca

Getting into Farming Information Session *For the Aspiring Farmer*

Session topics include:

- Overview of Agriculture
- Business Planning
- Personal Assessment
- Financial
- Land
- Resources/Education

Thursday, October 26, 2017

Airdrie – Agriculture Centre

97 East Lake Ramp NE, Airdrie, AB

Time

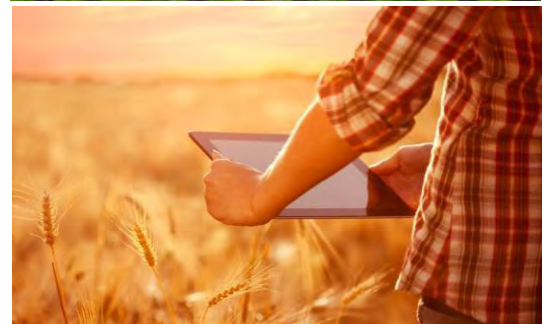
9:00 a.m. to 3:30 p.m.

(registration starts at 8:30 a.m.)

Cost: \$25/person (includes lunch)

Registration deadline: October 23, 2017

***To register call the Agriculture and
Forestry Ag-Info Centre
at 1-800-387-6030***



North American Strawberry Growers Association (NASGA) Summer Bus Tour 2017

Each year, the North American Strawberry Growers Association (NASGA) organizes a summer bus tour somewhere in the USA or Canada, typically in the temperate growing regions. Over two days, participants visit a number of operations that have a component of their operation dedicated to strawberries, as well as other fruits and vegetables. Operations also include those that are connected in some way (e.g. basket makers, packing plants, nurseries, etc.). There are great opportunities to network and pick the brains of fellow producers from across the USA and Canada (and occasionally other places).

In 2017, NASGA visited the Minneapolis/St. Paul, Minnesota area, visiting long-time NASGA members around central Minnesota, and some other growers over into western Wisconsin (jokingly referred to as "Eastern Minnesota").

The following are some of the things that were observed, learned, heard or picked up during the tour.

Day 1

Stop #1: University of Minnesota's Horticulture Research Centre – Chaska, Minnesota

The University of Minnesota Horticulture Research Centre was established in 1908 to research, breed and select plants that can survive the "frigid" winters. Over the years, they have released a number of notable crops, including the Honeycrisp apple.

The focus of this stop highlighted their work with breeding hardy grapes, alongside work to create a Minnesota wine industry. They showed a sort of vertical approach to producing wine, with the breeding, selecting and agronomic side of the program completely connected to the wine-making side.

At the site, they work mainly with three *Vitis* species, along with a couple of others. They take cross pollinations between quality varieties and hardy stock, generating about 10,000 seeds per years, of which 7,000-8,000 are germinated in the greenhouse, with 4,000-5,000 being planted out into the fields. They screen for disease resistance as a primary criterion, as well as other indicators, such as vine growth, etc. They are now using Marker Assisted Selection technology to increase their efficacy. They evaluate selections for 2-3 years in the field and then move into a lab setting.

Over the past years, they have released Frontenac (1996), Edelweiss, Swenson Red, La Crescent (2002), a sport mutation called Frontenac Gris, Marquette (2006) and Itasca (2017). The process can take years. Itasca took 14 years to reach release.

<https://mnhardy.umn.edu/varieties/fruit/grapes>

On the production side, they tolerate broadleaf weeds, as grapes are very sensitive to 2,4-D herbicides. They have minimal pressure from Spotted Winged Drosophila (SWD), largely due to the thick skinned nature of the grapes. They do have issues with hail, birds and Japanese Beetles. Flea beetles are also a major issue, as they attack the developing buds. For weeds, they do a lot of spot spraying with glyphosate or contact herbicides, going slowly and carefully.

In the wine lab, they go from clusters of grapes through to a finished wine. The key with wine is to keep things CLEAN, COOL and FULL. They weigh fruit, take pictures and do visual evaluations prior to pressing the fruit in a couple of ways (depends on the type of fruit). Samples are kept for further evaluation at a later date. The juice is filtered and then the wine is made in small bottles to reduce the impact of any spoilage or testing. An acre of grapes will produce approximately 2-5 tons of fruit, producing about 750-780 bottles. A grower might get US\$1500-2000/ton of fruit.

Photos by Robert Spencer



Red and White
Grapes on vine



Viticulture program managers



Enology (wine making)
equipment and winemaker

NASGA Summer Bus Tour 2017 continued...

Stop #2: Untiedt's Vegetable Farm – Waverly, Minnesota

The farm was started in 1971, and is run entirely as a family farm, with 2 daughters and sons-in-law involved in the operation, with the next generation on the brink of taking a role. They sell most of their produce direct to the public, using wholesale sales for the flexible parts of the harvest. They grow a bit in size each year. They have the original farm site, as well as some additional expansion farms.

They grow a very wide range of fruit and vegetable crops (50+), mostly to satisfy the needs of their large Community Supported Agriculture (CSA) program (1300 subscriptions). The bulk of the produce that was observed was grown under high tunnels. They have about 40 acres of high tunnels, growing multiple crops per season under them, as well as having other field crops (e.g. sweet corn, pumpkins, etc.). They have extended their season dramatically, using crop types and 3 or 4-season tunnels (4-season tunnels are heated using propane heaters). They have about 20 stands, as well as selling at a range of Farmers' Markets.

Their Day neutral strawberries (only Albion) are mostly sold through retail stands, with a little wholesale. They like the flavor and texture of Albion. They pick the fruit and send it directly from the field to market, without refrigeration. They have about 7.5 acres of high tunnel strawberries, as well as about 15 acres of June bearing strawberries (several varieties). SWD has been an issue for the last couple of years. They break their production into 3 parts, harvesting, then spraying and waiting 3 days to repeat it. The other 2 parts allow a cycle and an uninterrupted flow of fruit. They try to overwinter their DN in the high tunnels, but have had some issues with white grubs in some areas, resulting in some areas being replanted. They've also been working on some hydroponic strawberries, but have had some uniformity issues. For their crops, they do a weekly sap analysis. This allows them to see "where the plant is going" rather than the historic data that is provided by tissue analysis ("where has it been").

Tomatoes are sold to local retail, with more going to wholesale. All of their tomatoes are grown under high tunnels and yield much higher (60-65 ton/acre) than the state average (5 ton/acre) for field tomatoes. Tomatoes are grown in the soil, not bags or pots. All of their tomatoes are grafted, to improve height and disease resistance. They purchase them grafted now, as they found it complicated and challenging to get 100% take on the grafts. They've had issues with *Clavibacter* in the tomatoes, so they flag those that have it and work it last in the day.

Their high tunnels are generally all 3-season Haygrove tunnels. Because of the heavy snowfalls, they can't leave the tunnels covered in winter. They use backpack sprayers in the high tunnels, although they have a couple of small boom sprayers. They use biocontrols on the cucumbers in the high tunnel, but have had trouble with them in the strawberries in high tunnels. They also grow muskmelons and primocane and florican raspberries in the high tunnels. With the volume of high tunnels, it has been challenging to figure out where the water is going to go. They've installed drain tile underneath and it has paid for itself very quickly. Their 4-season high tunnels are heated in cold season and a number of them are white-washed to reduce the heating in summer. They follow a program of removing plant material, spading, spreading granular fertilizer, lay mulch and drip by hand. Covering the tunnels in spring can take up to 3 weeks, because of wind. They prioritize the crops that need covered first until it is all done. They also zone the tunnels for fertigation, to allow better control of the stages. They run at a lower crop density in the tunnels to try and get more air movement. They have honeybee colonies of their own on the farm (managed by someone specific from off-farm) and they introduce bee boxes in the flowering crops as well.

They grow a large crop of potted mums, as well as 20+ acres of 11 different varieties of apples. Having many crops under tunnels keeps things interesting. They hand plant most of the crops through the plastic or use transplants.

The majority of their labour are H2A workers. Some are Eastern European, some South African, but the majority are Mexican. They are provided with very nice living quarters. One house had geothermal heating and air conditioning. They've run into challenges with overtime limits imposed by Minnesota, resulting in some tough decisions about what gets done. They do lots with innovative equipment to reduce labour or increase efficiency. For example they have built harvest carts for raspberries, allowing them to bring out 20 flats at a time, rather than one at a time.



Photo by Robert Spencer

Ranges of 3 and 4-season (heated) high tunnel structures – mainly tomatoes of various kinds



High tunnel day neutral strawberries (Albion)



High tunnel day neutral strawberries, including pollinator bees introduced in boxes



Hydroponic strawberry high tunnels – still having the kinks worked out



Cucurbit crops (muskmelons, cucumbers, etc.) in high tunnels



Potted plants (foliage plants and Mums) produced for different seasons – they do different colours for fall, Halloween, etc.



Photos by Robert Spencer

NASGA Summer Bus Tour 2017 continued...

Stop #3: The Berry Patch – Forest Lake, Minnesota

This farm first started with strawberries in the early 1970's, as an investment club (owned by partner families). The current owner started as a hired manager and has been present for 40 years. He is the 50% owner of the farm now. The land was sold during peak land prices and is now rented back on a long-term lease. Raspberries and blueberries and other crops have been added (and removed) over the years. At present, it is running at about 6 acres of strawberries, 2 acres of raspberries and 8 acres of blueberries.

A short time before harvest was supposed to start in 2017, a severe hail storm went through the area, producing major winds and massive hail, stripping the plants and making a mess. They had no crop, but have regrouped. This farm works closely with the University of Minnesota and does things like Integrated Pest Management (IPM).

They are a typical strawberry farm, with 2-3 acres of matted row June bearing strawberries planted each year, cropped for 3 years and then rotated out for 2-4 years. They have 4 main varieties, but are trying new ones. They do have some issues with white cockle. Raspberries are mainly Nova, with some Prelude. They use a high intensity trellis system. Blueberries are a number of different half-high and hardy highbush varieties. They soil test regularly, as they had managed to drop their pH to 3.8 through continuous use of ammonium sulfate fertilizers.

All that they produce is sold on-farm, with most of the strawberries, all of the raspberries and blueberries being u-pick. They track customers by looking at the deposit books and matching zip codes. They are listed on the Minnesota Grown directory and have an e-newsletter, an automated phone line and use other tools.

Stop #4: Pine Tree Orchard – White Bear Lake, Minnesota

Originally purchased by parents in 1958, the orchard started at 25 acres and is now over 300 acres. At present, it is run by 6 adult children, with each responsible for a different special interest. They grow and market apples and strawberries, as well as pumpkins and corn for the corn maze.

The entire farm is deer fenced. They also invested in an audio deterrent system, which cost about \$1500, but paid for itself in 1 year. Everything they grow is sold on the farm in some form, whether fresh or processed in some form.

They have many different types of apples, including some of the special U of Minnesota variety called Tango Fancy, which can only be grown in limited numbers outside Minnesota. They have used different root stock for their trees, but they really like G11, as it is resistant to apple replant disease and performs well. Apples are trained along wires and are drip irrigated.

They use wagons to bring people to the fields, in groups of about 20-25, which makes it easy for a single greeter to manage them. Their wagons are built on school bus frames.

They have a lot of grass to mow, which takes a long time.



Photos by Robert Spencer



During the hailed out season, other than making future decisions, they designed and built a harvest or field aid machine, used for picking, deblossoming, derunning, etc. Workers can work for hours without unnecessary strain. Breaks are recommended every hour or so, to prevent dizziness. Workers lie face down in the U-gap (right side) and put their feet under or on top of the round rail.



Pine Tree Apple Orchards sales building is full of demonstration stuff, bakery, etc.



Beautiful landscaped areas off of the parking lot



Portable/modular fencing – can be assembled to create barriers where required



Trailers (built on school bus frames) are used to take groups of customers to the fields/orchards



A new strawberry field

Audio scare sound system – have a range of sounds, but is VERY effective



Minnesotans are very serious about their apples. Those produced at the U of Minnesota, like this one, “Tango Fancy”, have restrictions on growing outside the state. They tend to be high quality and are valuable. E.g. Honeycrisp

Apple in orchards are trained on wires

Photos by Robert Spencer

NASGA Summer Bus Tour 2017 continued...

Day 2

Stop #1: Govin's Meats and Berries – Menomonie, Wisconsin

The Govins started out in dairy and hospitality, but have transformed into a diverse and interesting operation. They are all about the experience on their farm.

They offer both u-pick and pre-picked strawberries and some other veggies, including 3 acres of pumpkins. They have about 6 acres of Jewel PYO strawberries, plus 1.5 acres of sweet corn, which they sell east, due to low prices west. They have a corn maze and other fall activities starting late September. They sell custom lamb and chicken cuts. In recent years they've added a highly successful interactive lambing weekend, which consists of a birthing barn, which brings out about 12,000 people. They also have The Weddin' Barn (old Jersey dairy barn and a 3 bedroom house) that runs on weekends through May to October. They also breed Great Pyrenees dogs for protection of the livestock and for sale.

The wedding barn costs twice as much in time and cost as expected. They supply a sound system to tie into, but don't do catering and booze.

The corn maze is geared to middle school and college-aged audiences, not younger. It is a very hard 11 acre maze. They have a corn and pumpkin cannon, which sometimes hit the highway. They use the Corn Maze company for their maze.

They've discovered that in order to keep the crows and gophers out of the baby pumpkins (not eat the seeds), they dribble 2 rows of field/grain corn on the surface alongside the pumpkin rows.

In their strawberries, they drip irrigate, because the high iron water that they have affects the sugars in the berries if they sprinkle irrigate.



Pumpkin fields at Govin's

Photos by Robert Spencer



Play areas, including mini-golf, bounce pads, etc.



Corn maze designs from past years



Great Pyrenees dogs are bred and raised for protecting the livestock – expanding into breeding to sell puppies, to help pay for the cost of them

NASGA Summer Bus Tour 2017 continued...

Stop #2: Red Cedar Valley Farms – Menomonie, Wisconsin

The original farm started in 1988, with a second owner coming on in 1992. The current owner has been in place for 4 years, but started working on the farm since 1998. The owner has a couple of brothers that help on the farm.

They do about ¼ of their business as u-pick, with ¾ as ready-pick. They have about 36 acres but run a 4-5 year rotation, with 4-5 years as cover crops. They have about 8-11 acres of strawberries for picking each year, which is down from the past, but they are cutting back to 7-8 acres next year, as they can't get the pickers to handle more than that. They could sell more fruit than they have, but they can't get the workers to do it.

Of their ready pick production, 25 percent goes to wholesale, with the rest going to 6 roadside stands that they have set up in several cities within 1 hour of the farm. Picked fruit is not cooled, but is taken straight to the stands within 6 hours of picking. They use suburbans that have shelves in the back, which hold pails, table, signage, etc. They use about 600-5 quart pails per day for 6 roadside stands. Customers can pick up orders at the farm, if they call ahead, but it is a limited quantity.

Roadside stand sites are picked based on several factors, including ease of permitting within a city and how well they sell. They prefer to use paid sites rather than free ones, as they get advertising and good partnerships out of them. Sites that sell well (at least 10 pails an hour) are maintained. They pay their sellers by the hour, based on the years with the farm (up to a maximum).

Pickers are paid by the pail, so the amount that they make per hour depends on their picking speed. Generally, most people can make decent money if they are adequate. Their labour is all local. A number of years ago, they had upwards of 150 Mung (Asian culture) workers, but now they run about 40 percent Mung to 60 percent high schoolers. Their ideal number of pickers is 40-60 now. Pickers are supervised in groups of 10-15. Each picker has their own name on their buckets, which helps for quality control. Pickers can walk on, with forms filled out that day. They keep a list of former pickers and call them back each year. In their 3-4 week season, they pay twice, about every 10 days.

Buckets include a \$0.50 deposit. U-pickers get a lower cost if they bring their own. Pails are washed as a part of a big fun activity at the end of the season. They provide ice cream and a water fight and pickers come and wash the pails. They continue with the pails because of tradition.

They try different varieties every year, but they mainly grow Jewel, Galletta and Annapolis. They had issues with Anthracnose this year, more so on Jewel. They speculate that it was because they baled straw next to the fields on a really hot, dry windy day, which produced lots of dust.

Photos by
Robert
Spencer



Strawberries fields at Red Cedar Valley Farms

Distinctive pails are used for picking, either by u-pickers or ready-pickers. Each pail is marked with picker's name, for quality assurance and payment.



A fleet of suburban are used to deliver pails to roadside stands – each is equipped with racks for fruit

NASGA Summer Bus Tour 2017 continued...

Stop #3: Afton Apple Orchard – Hastings, Minnesota

The current owners bought the orchard in 1989, with the farm being over 300 acres now, with major expansions and changes. They do almost everything themselves. They grow strawberries, raspberries, pumpkins and 14 varieties of apples. They have about 30 acres of strawberries, 8 acres of fall-bearing raspberries (6 varieties) and lots of apples, most of which are u-pick.

Their on-farm experience features a massive playground, including Straw Mountain, Retread Hill and Johnny Combine. This grew from a single picnic table and tire swing. They recently put in 2 miles of 8 foot high deer fence and have over 5 miles of road on the property, which has allowed them to host various road races. They have a petting zoo with all of their own animals. They have about 12,000-15,000 school kids that visit each year.

Most of their apples are u-pick, with them charging an admission to the orchard, which helps to cover the costs of all of the stuff that is needed. They run 8 hay wagons in a loop.

They recently went to a Raven spray system, which does all of the adjustments for you (speed, rate, volume, etc.) and has definitely paid for itself. They also have lots of custom-made equipment. They have a mobile food stand, in the shape of a red barn. There is a strawberry building near the fields, which serves as a sales building. They spray for Japanese beetle, but don't spray for SWD until about a week before opening.

Their corn maze is 50 acres, in 3 phases. They do different events and themes. They have a shooting range that is used by local law enforcement for training. It was purchased to ensure they could control access to it. When the corn maze is open, the shooting range isn't, but they shoot apples at the targets.

All of the equipment have female names, and are jokingly referred to as the owner's mistresses.



2016's corn maze design – portion of proceed donated



New 8-foot deer fence – 2 miles



Comfy seating around store



Shooting range, including sniper tower



Mobile "red barn" food shack down by the strawberry fields – sell range of stuff



Unique playground, including Johnny Combine, Retread Mountain, giant swing and giant chair



Photos by Robert Spencer



Strawberry fields



Fall raspberry fields

NASGA Summer Bus Tour 2017 continued...

Stop #4: Gertens Greenhouse – Inver Grove Heights, Minnesota

This multi-faceted greenhouse/garden centre/nursery business has been running for almost 100 years and has changed a great deal. The 4th generation is currently working on the farm. They have approximately 100 acres in greenhouses, garden centre and nursery sales area, commercial landscaping supplies, etc. They grow the majority of the items that they sell. They have several sites and run year round. The different businesses are owned by different family members.



Photos by Robert Spencer



Gertens features a massive indoor sales area, perennial, annual, nursery and other sales areas. Everything is nicely laid out and tidy.

Moving carts from upper production greenhouses requires a safety rail that all carts attach to from managing the steep hill



Flat filling and planting area, off of the production greenhouses



Production greenhouse range



More production greenhouses

End-of-Season Checklist for Managing Late Blight

In recent years, late blight has, at times, been confirmed in parts of Alberta and has then spread through various regions. With the intent of returning to late blight-free status, increased awareness efforts have been instituted in both the industry and the public. Everyone was encouraged to increase early and season-long monitoring of fields, gardens and greenhouses in order to protect crops from late blight, as well as have a quicker response to any perceived infections.

As the 2017 season wraps up, spore traps used by the Potato Growers of Alberta (located throughout the province) indicated the presence of late blight spores, however there were no samples submitted for testing. It is recommended that all growers of potato or tomato (commercial or home garden) take specific steps to prevent the carryover of disease into future years, as a number of valuable crop industries in Alberta could be impacted by repeated outbreaks.

In the late parts of the growing season, ensure that plants die down quickly using top-killing treatments such as chemical desiccant (diquat) or mechanical treatments.

At the end of the growing season, gardeners should dispose of all above-ground plant materials (stems and foliage), whether infected or not, either by burial, freezing or composting. The purpose is to ensure that living tissues do not survive the winter and will break down completely, thus preventing carryover of the late blight pathogen. Avoid placing infected materials in uncovered compost piles as spores may be produced and spread the disease to nearby plantings of susceptible crops. Piles may be covered with a tarp until the materials have frozen and are completely dead.

Since tubers represent the primary method of disease carryover in potatoes in Alberta, every effort should be made to prevent the survival of infected tubers. Recognize that some of the recently prevalent strains of the late blight pathogen are more aggressive on tubers. Carefully grade and sort harvested potato tubers in an effort to remove any infected tubers. Commercial seed growers should be prepared to further grade seed tubers in the spring, and mancozeb-based seed treatments should be applied to try and protect developing crops from seed-borne late blight.

Culled tubers should be disposed of in such a way as to encourage them to breakdown over winter. Culled tubers can be fed to livestock or may be chopped, incorporated and buried, or can be placed in covered piles until they freeze completely. Ensure that potatoes do not volunteer (grow in another crop).

The late blight pathogen normally cannot survive away from living tissues. While the disease can survive for a time on tomato fruit, spores will not carry over on tomato seed. The disease can be introduced on living tomato transplants that are brought in from areas where late blight survives the winter.

In Alberta, the late blight pathogen does not survive or overwinter in the soil, so growers should not worry about re-infection by planting in or adjacent to a field where late blight has occurred, provided there are NO surviving tubers that could reintroduce the disease through infected volunteer plants. However, rotating between locations is always recommended, whenever possible, to prevent the build-up of other diseases.

All growers should take the time to assess the past growing season and the level of risk of late blight infection or re-infection that they will face for the next growing season. Determine where disease might have come from and put preventative measures in place to protect against infection. It is in EVERYONE'S best interest to manage late blight, as this is a community disease. It is also critical that everyone take an active role in submitting suspect material to improve detection and management.

If you have questions regarding identifying or dealing with late blight, or wish to submit a sample for testing, please contact 310-FARM (3276) for assistance. For more information on late blight, consult the following document – [FAQ – Late Blight of Potatoes and Tomatoes](#).

Corn Earworm

Causal Agent: *Helicoverpa zea*

Crops Affected: corn, tomatoes, peppers, plus a range of other crops

Life Cycle:

- Consists of 4 life stages, including adult (moth), eggs, larvae (caterpillar) and pupa
- Typically only a single generation per season in northern climates
- Adults are tan/yellow-brown-coloured moths which are approximately 3.5-4cm (1.25-1.5in) wide (wings spread out)
 - Several dark markings are visible on the forewings
- Adults overwinter as pupae in the soil (2-4in depth) in warmer climates and migrate north on wind patterns, arriving typically later in the season
 - Moths are night-flying moths, capable of moving long distances
- Eggs are laid singly, typically on the corn silks, with larvae hatching within about 3 days (ranging from 2-10 days, depending on temperatures)
 - A female can lay around 1000 eggs (on average)
- Larvae are striped, yellow/green/brown-coloured caterpillars with distinct stripes running the length of the body and tan heads
 - Larvae can reach up to 3.7cm (1.5in) in length at maturity
 - Larvae are cannibalistic, resulting in typically a single larva per ear
- Larvae feed almost exclusively around the ear tip, entering through to silk channel to feed on the kernels for approximately 1 month
 - Larvae feed from the tip of the ear/cob downwards as they grow, typically staying within the top 1/3 of the ear
- Fields with sequential plantings will have the most egg-laying activity on whichever plants have the most fresh silking plants

Corn Earworm larva picture
(following page)

Symptoms:

- Eggs are difficult to detect, as they have a similar colouration to fresh silk
- Larvae feed through the silks and into the top 1/3 of the ear, remaining in the ear, fouling it with frass
- Secondary impact can include infection by moulds or by secondary insects (e.g. sap beetles)
- Damage by larvae (and larval presence) is very difficult to detect without opening the ears

Monitoring:

- Black light or pheromone traps can be used to detect the presence and scale of a corn earworm infestation, in order to make control timing decisions

Management:

- Early planting can help to avoid susceptible/attractive stages when the adults arrive or when populations are higher
- Varieties that tend towards ears that tighter, with the shuck (or outer husk/covering) tightly closed (rather than ears with a looser shuck)
- Beneficial insects can help to reduce a population but will not provide economic levels of control
- The application of mineral oils to the silks of each ear can control the pest in organic situations, but is very time consuming and may result in reduced marketability if consumers are repelled by the oil residue
- Registered chemical controls must be applied regularly while fresh silks are present (to target hatching larvae)
 - Controls may be applied preventatively starting at 10 percent silking through to 90 percent of the silks being wilted down
 - Controls should be centred around the zone where ears are located, and should be of high enough pressure to penetrate to the silks
 - Apply controls in the evening, to prolong activity and increase efficacy
 - Once larvae hatch and enter the ear, they are essentially impossible to control

European Corn Borer

Causal Agent: *Ostrinia nubilalis*

Crops Affected: sweet corn, snap bean, potato, pepper, eggplant

Life Cycle:

- Adults are a 2.5 cm (1 inch) wide, light brown moth with dark wavy bands
- Larvae are a 3 cm (1+ inch) long grey/tan caterpillar with brown spotty plates
- Late instar larvae pupate in corn stalks in the spring and adults emerge late June to late July
- In corn:
 - Adults lay eggs in flat masses near the midrib on the undersides of leaves
 - Eggs hatch within approximately 1 week
 - Borers feed in leaf axils or developing tassel, then bore into the main stalk
 - Larvae stay in the stalk in a flimsy cocoon in an arrested state until spring
- May move into other crops from corn residues in field or adjacent fields where ECB was present

Symptoms:

- Leaves that emerge from the whorl have a row of small holes, where larvae have fed through them when they were rolled up in the whorl
- Some midrib breakage may occur as the leaves become bigger
- Tassels may break off due to larval boring
- Larvae enter the stalk and developing ears of corn
 - Feeding on ears affects ear development
 - Presence of larvae in the ears or larval feeding on the ears renders them unmarketable for fresh-market sale
 - Boring into stalks results in stalk breakage
- Most damage to ears and stalks is suggested to be due to 2nd generation strains, which typically are associated with specific regions in Canada (not Prairies)

Monitoring:

- Range of factors influence both population size and infestation
- Monitor for presence of adults at susceptible stages (depends on generation type and type of crop) – includes monitoring for leaf damage, egg masses, etc.

Management:

- Employ adequate crop rotations to non-host crops
- Fall ploughing or spring disking can be effective in killing many overwintering larvae
- Shredding plant residues after harvest can destroy larvae in corn stalks and stubble
- Natural parasites and predators will kill many borers but will not usually drop populations to below economic levels where ECB is a significant problem
- Chemical control applications should be directed into the plant whorl (pre-tassel) or the ear area (post-tassel) when damage is first observed and when larvae are abundant



Corn earworm larva

Photo by R.L. Croissant, Bugwood.org



European Corn Borer larva

Photo by Robert Spencer



Powdery Mildew

Causal Organism: *Erysiphe polygoni*, *E. cichoracearum*

Crops Affected:

Cruciferous crops, lettuce, peas, rhubarb, cucurbits, strawberries, Saskatoon berries, raspberries, black currants

Disease Cycle:

- Can't survive without host plant tissue
- Wide host range although each strain is very host specific
- Develops in the spring & fall
- Windborne spores are the main means of spread
- Warm, dry weather (15-27°C; inhibited by rainy, wet conditions) but conditions of high humidity
- Poor air flow and shade due to dense shelterbelts or dense plant canopies
- Cleistothecia (sexual spores) provide over wintering

Symptoms:

- Spread may not be noticeable until most of the field is infected
- Initially, may notice off-colour or talcum white spots developing
- White, powdery or mealy, patchy, mycelial growth on the upper (and sometimes lower – depends on crop) leaf surfaces and all above ground plant parts (suckers, growing tips, stalks, flower calyxes, fruit); patches grow together over time
- Leaves may gradually fade through shades of green and turn tan coloured; may be shrunken or die and abscise
- Infected strawberry leaves curl upwards and may have purplish underside
- Young raspberry canes may be distorted, shrunken, spindly and may die back
- Plants may be stunted and reduced yields may be observed
- Fruit may not mature and reach full size
- Winter hardiness of raspberries can be affected
- Mycelial growth on strawberry fruit does not have the watery soft rot associated with Botrytis
- Cleistothecia may appear as disease progresses – dark, pin-head sized appear in host tissues

Management:

- Avoid use of susceptible cultivars; use resistant cultivars if they are available
- Ensure rotation to non-susceptible crops
- Ensure adequate air flow and ventilation within orchard and crop canopy through adequate plant spacing, pruning to improve canopy ventilation and removal of any element that creates high humidity conditions
- Prune out, remove & destroy infected plant parts, shoots and suckers, if incidence is low
- Sanitation and removal of infested crop debris
- Control non-crop hosts plants (weeds, volunteers, etc.)
- Timely application of registered chemical controls (ensure rotation of chemical groups, if possible)
- Regular wetting of the leaves can reduce disease development (although should not be considered a guaranteed control)



Powdery mildew on cucurbit & strawberry – Photos by Robert Spencer

Downy Mildew

Causal Organism: *Range of species (Perenospora parasitica, P. farinose f.sp. spinaciae, P. rumicis, P. viciae, P. destructor, Bremia lactucae)* – dependant on host crop

Crops Affected: beets, spinach, cole crops, radish, rutabaga/turnip, lettuce, rhubarb, onion, garlic, peas

Disease Cycle:

- Affects a wide host range; species are specific to host; may be some specificity within host groups
- Development is favoured by cool, moist conditions; temperatures between 10-15°C and conditions with dew, drizzle or heavy fog
- Sporulation occurs within 4-8 days, depending on species and environmental conditions
- Spores spread by water splash or wind
- Disease may stay in a dormant or latent state for a period of time
- Overwinter / survival with oospores in soil, debris, plant parts, etc. – requires living host to grow and multiply

Symptoms:

- Symptoms can occur at any growth stage
- Initial symptoms include small angular, pale yellow / yellow areas on the upper leaf surface and fluffy, white or grey, patchy mycelial mat on the under surface
- Lesions enlarge and turn tan and papery
- Systemic invasion can result in yellowish, and then greyish-black, necrotic tissues
- Some crops (particularly root crops) can get an irregular, internal discoloration projecting downwards from the crown or soil line
- Onions (and other bulb crops) have a greyish velvety growth on leaves that may appear purplish when full of spores; leaves may turn pale and yellow and then die
- Spores may be produced on the lower leaf surface

Management:

- Regular rotations out of specific host crops can reduce inoculum levels significantly
- Plant into fields with good soil and air drainage
- Bury debris and crop residues deeply to accelerate breakdown; dispose of cull piles quickly
- Use disease-free planting material and seeds
- Keep fields free from weeds
- Apply protective fungicide sprays at appropriate times (typically early)
- Resistant cultivars may be available
- Ensure plants are free from stress (nutrient, moisture, etc.)



Downy mildew – Photo by Doon Pauly