



The longer days and slightly warmer conditions makes one think that spring might be somewhere in the not-too-distant future. Of course, the sudden shifts in conditions are a more familiar sure sign that it is actually already spring. Regardless, the arrival of the April Hort Snacks should be indication enough.

In this edition, you'll find a few reminders about (not) pruning Elms, sharing your direct market fruit/vegetable prices and save-the-dates for upcoming stuff. You'll find links to presentations from recently completed workshops, webinars and events, in case you missed them. You'll find the usual smattering of articles and information tidbits, including some insects and diseases and an updated Saskatoon berry bloom/bud stage pest management chart.

Over the winter, in response to some questions (self-posed) about the true economics of different orchard set ups, a study was carried out to compare a start-up orchard against a fully-operational orchard and a whole host of different structural models, including rejuvenation of an older orchard. A link to the report is included in this edition, for your information.

At the end of March, we bid a fond farewell to our friend and colleague, Dustin Morton, as he moved on to new, grand adventures. His input into this newsletter will be greatly missed. Fortunately (or unfortunately, it depends) I'll still be around to keep things chugging, so feel free to send questions, comments, ideas, thoughts, suggestions or input via email or phone at any time. And here's to a great growing season. May it happen!

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## **FEATURED (on-line) RESOURCE**

### **Diseases and Pests of Vegetable Crops in Canada**

- This resource document has been a staple in many homes, fields, classrooms and offices for decades
- Available on-line, for FREE (as chapter PDFs)

<https://phytopath.ca/publications/diseases-of-vegetable-crops-in-canada/>

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

### *Strawberries*

- Plan plant pickup, field layout, planting labour
- Remove straw mulch when new growth appears (centre of crown)
- Application of some nitrogen (as growth commences - 10-20 lbs actual N/acre – end of April or early May)
- Herbicide application (e.g. Devrinol) prior to bloom, if it was not applied in the fall
- If planting both June bearers and Day-neutrals, plant Day-neutral strawberries first, as soon as you can work the land (maybe 3<sup>rd</sup> week of April).
- Deblossom newly planted June bearers for season
- Frost protection of June bearers (if required)
- Replenish bare or lightly covered spots with straw mulch

### *Raspberries*

- Thin florican raspberry canes and remove winter damaged material
- 2<sup>nd</sup> application of nitrogen (month end?) (20-40 lbs actual N/acre)
- Herbicide application (e.g. Devrinol), if it was not applied last fall
- Mowing to ground and removing last year's cane growth from primocane-type raspberries

### *Saskatoon Berries*

- Pruning / Thinning
  - Dead, diseased, low-spreading branches, branches larger than a Loonie – before bud break
- Complete pruning for rejuvenation / regeneration, if not completed

### *Black Currants*

- Prune branches over 4 years old (can be done on a rotational basis)
- Application of nitrogen fertilizer at end of month (or early May), starting in 3<sup>rd</sup> year – ~50 lbs/ac actual N

### *Vegetables*

- Depending on the crops that you are growing, you might start your transplants for those that require 6-8 weeks to grow.
  - Delay / stagger seeding to allow for hardening and multiple planting dates
- Depending on your production systems and equipment, prepare fields and lay plastic mulches
- Make pre-planting incorporated herbicide applications at mid or end of month for registered crops (follow label instructions for timing and rates)
- Plant earlier, cool season crops (depending on weather conditions)

### *General*

- Soil sampling / testing, if this was not done in the fall
- Finalize planning of plant layouts
- Plan your advertising timing
- Solidify your summer schedule – planting, spraying, irrigation, etc.
- Planning of marketing schedule
- Irrigation (as necessary)

### *Pest Monitoring / Management*

- Begin scouting for insect pests and diseases
- Strawberries
  - Start scouting for strawberry clipper weevil, when temperatures exceed 18°C
- Raspberries
  - Application of lime sulphur fungicide (22%) for spur/cane blight control
- Saskatoon berries
  - Application of Decis at green tip to bud elongation stage
- Black Currants
  - Make insect control applications at bloom

## 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.

**REMEMBER – Alberta's Elm Pruning Ban is in place from April 1<sup>st</sup> to September 30<sup>th</sup>**

[www.stoppeded.org](http://www.stoppeded.org)



## Upcoming Conferences / Workshops

### April 2018

- Explore Local Webinar – Farm Direct Marketing Trends in Alberta  
Apr 4, 2018 – [Register](#)
- Explore Local Webinar – The Alberta Employment Standards Code and You  
Apr 18, 2018 – [Register](#)
- Canadian Produce Marketing Association (CPMA) Conference & Trade Show  
April 24-26, 2018 – Vancouver Convention Centre – Vancouver, BC  
<http://convention.cpm.ca/>

### May 2018

- No events are listed at this time

### June 2018

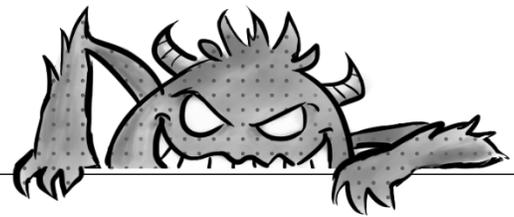
- U of S Fruit Program Annual Plant Sale  
June 1, 2018 – Horticulture Field Lab – Saskatoon, SK  
[www.fruit.usask.ca/extension.html](http://www.fruit.usask.ca/extension.html)
- 15<sup>th</sup> International Conference of the European Industrial Hemp Association (EIHA)  
June 12-13, 2018 – Maternushaus – Cologne, Germany  
<http://www.eiha-conference.org/>
- Greenhouse Canada Grower Day 2018  
June 20, 2018 – Holiday Inn – St. Catharines, ON  
<http://www.greenhousecanada.com/grower-day/>

## Mental Snacktime – Concern

- “Human progress is neither automatic nor inevitable... Every step toward the goal of justice requires sacrifice, suffering, and struggle; the tireless exertions and passionate concern of dedicated individuals.” – Martin Luther King, Jr.
- “Consult not your fears but your hopes and your dreams. Think not about your frustrations, but about your unfulfilled potential. Concern yourself not with what you tried and failed in, but with what it is still possible for you to do.” – Pope John XXIII
- “Concern yourself more with accepting responsibility than with assigning blame. Let the possibilities inspire you more than the obstacles discourage you.” – Ralph Marston
- “Concern should drive us into action and not into a depression. No man is free who cannot control himself.” – Pythagoras
- “A leader must be a good listener. He must be willing to take counsel. He must show a genuine concern and love for those under his stewardship.” – James E. Faust
- “Just as a cautious businessman avoids investing all his capital in one concern, so wisdom would probably admonish us also not to anticipate all our happiness from one quarter alone.” – Sigmund Freud

## In Case You Missed Them – HortSnacks-to-Go: 2017/2018 Winter Webinar Series

- Oct 16, 2017 – [Prairie Hardy Fruit Breeding](#) – Dr. Bob Bors (U of Saskatchewan)
- Oct 30, 2017 – [Eye-Tracking Technology & Garden Centre Marketing](#) – Dr. Bridget Behe (Michigan State University)
- Nov 20, 2017 – [Using Biocontrols in Field Scale Fruit & Vegetable Crops](#) – Ronald Valentin (Bioline AgroSciences)
- Dec 18, 2017 – [Soil Fertility & Soil Health](#) – Dr. Kate Congreves (U of Saskatchewan)
- Jan 15, 2018 – [Challenges and Successes of Larger-scale Greenhouses in Alberta](#) – Eric Doef (Doef’s Greenhouses)
- Jan 29, 2018 – Growing Season Extension = Growing Sustainability – Dawn Boileau (Sunrise Gardens) – **Coming Soon**
- Feb 12, 2018 – [Creating a Leaderful Good Food Movement in Detroit](#) – Devita Davison (FoodLab Detroit)
- Mar 12, 2018 – [Crunching the Numbers on Biocontrols in Bedding Plant Production](#) – Graeme Murphy (biological control solutions)



## **OPEN FARM DAYS: SAVE THE DATE**

**August 18-19, 2018**

The deadline for farms to register to participate is May 31. Similar to last year, farms can choose which day(s) they would like to participate (Saturday, Sunday, or both). Open Farm Days is a catalyst for stimulating economic prosperity by promoting the Alberta agriculture story. Last year’s event had over 20,000 visits and \$146,000 in on-farm sales at over 100 participating farms and 22 farm-to-table culinary events.

Interested farms can learn more by emailing [openfarmdays@gov.ab.ca](mailto:openfarmdays@gov.ab.ca) or by calling 780-638-4302.

Online registration will open soon at

[www.albertafarmdays.com](http://www.albertafarmdays.com)



# 2018

## Webinar Series March - April



To register please visit our website at

[www.explorelocal.ca/webinars](http://www.explorelocal.ca/webinars)

or

[online](#)

**March 9 , 2018 – 9 a.m. MST**

### **Image-Driven Marketing**

Photographer and communications professional Bri Vos will demonstrate how to create and use images to draw customers in and strengthen your online marketing. Bri will touch on composition and characteristics of a strong photo, online resolution requirements, Facebook and Instagram analytics tools, online marketing strategies and much more.

**April 4, 2018 – 9 a.m. MST**

### **Farm Direct Marketing Trends in Alberta**

Research tells us that in Alberta 78% of consumers made at least one purchase at a farmers' market in 2016. The value of food purchased at farmers' markets and farm retail exceeded one billion dollars and accounted for about 10 per cent of Alberta's annual household food expenditure. Join Mimi Lee to learn the key drivers for the increase in direct marketing sales and see recent statistics comparing direct marketing farms in Alberta with those in other provinces.

**March 28, 2018 – 9 a.m. MST**

### **No Fear Farm Finance**

What money do you have to invest in your local food business? What type of financing fits your business? How much credit should you carry? Join Ron Lyons as he demystifies the finance puzzle that many small agri-food producers, processors and local food entrepreneurs face as they grow their businesses.

**April 18, 2018 – 9 a.m. MST**

### **The Alberta Employment Standard Code and You**

With Alberta Labour opening a new office focusing on changes to the Employment Standards Code, this is your chance to learn how the changes will affect you as a local food business. Join Patricia Tolppanen to discover more about the Alberta Employment Standards Code.



**Growing Forward 2** 

A federal-provincial-territorial initiative

**Alberta**   
Government

**Canada** 

## Prepare Yourself for the Change from Growing Forward 2 (GF2) to Canadian Agricultural Partnership (CAP)

Starting April 1, 2018, programs under the new Canadian Agricultural Partnership will open in stages. To learn more about the various programs, their requirements and their open/close dates, visit and subscribe to receive program updates on the new CAP website ([www.cap.alberta.ca](http://www.cap.alberta.ca)). If you were subscribed on the GF2 website, you'll have to subscribe again, due to FOIP rules.

The majority of the programs are now merit-based, rather than first-come-first-served, although there will likely be intakes for each program. Not all programs will be open at once and there are different programs under each of the 5 pillars. More information on each of the pillars and programs will be available as they start to open up or get ready to open.

### Alternative Prairie Orchard Models report

Over the past couple of years, there has often been a question as to whether starting a new orchard is a good financial move or whether a different model might make more sense. With changes in markets, economies and other factors, it is important to understand how a particular model measures up and what the return on investment might be.

In 2017/2018, an economic study was undertaken to compare a start-up orchard with a fully operational "going concern" orchard, to establish a baseline comparison. These models were then compared with 8 other models, ranging from co-operatives, crops shares, rejuvenation scenarios, etc. While the information used was formed around Saskatoon berry economics, with a little tweaking, these model comparisons could be used for any prairie fruit crop.

[Click here to see the full report](#), which included assumptions, comparisons, summary and detailed tables.

### Berry & Vegetable Price Survey – Second Call!

Having price information is valuable for people of all experience levels, to use as a reference against your own pricing and to compare against when calculating your cost of production and setting your prices.

Each year, I put a call out to producers, asking them to share what they were charging for their fruit and vegetable crops the past season (both u-pick and pre-pick for FM), as well as any price changes that they anticipate for the coming season. From that, I assemble average prices (as well as the range) to share with the industry. It is coming up on that time of year again, as experience has shown that earlier is better for everyone involved.

For those readers that get this newsletter electronically, I will send out the formal request in a separate, direct email. I hope to publish the summary in the April 2018 edition of Hort Snacks (May at the latest). For those that get this by hard copy, please feel free to send in your information by mail, fax (403-742-7527) or give me a call.

The following is an outline of the type of information I need.

Crop	U-pick price	Pre-pick price	Farmers Market Price	Unit of measure for each market (e.g. per pound; per head/bunch)
Examples of Crops wanted	<b>Fruit</b> – strawberries, raspberries, Saskatoon berries, black currant, dwarf sour cherries, Haskap, chokecherries, other fruit; <b>Vegetables</b> – beets, carrots, radishes, rutabagas/turnips, corn, cabbage, broccoli, cauliflower, Brussels sprouts, kohlrabi, kale, spinach, lettuce (head and/or leaf), cucumbers (pickling, slicing), potatoes (baby, regular), rhubarb, peas, snap peas, snow peas, beans, tomatoes, onions, garlic, Swiss chard, winter squash, zucchini, pumpkins, etc.			

## Potato Pest Management Workshops 2018 - Topics and Speakers with PDFs of Presentations



- [The Impact of Pests on Potatoes](#) – (385KB) – Dr. Michele Konschuh – AAF
- [Late Blight](#) – (1182KB) – Dr. Michael Harding – AAF
- [Blackleg & Soft Rot](#) – (358KB) – Dr. Ron Howard – RJH Ag Research Solutions
- [Potato Psyllids](#) – [Link to video of presentation](#) – [Potato Psyllids](#) – (1017KB) – Dr. Dan Johnson – U of Lethbridge
- [Limiting Losses from Other Rots \(BRR, Pink Rot, Pythium Leak\)](#) – (345KB) – Dr. Ron Howard – RJH Ag Research Solutions
- [Wireworms](#) – [Link to video of presentation](#) – [Wireworms](#) – (2710KB) – Dr. Wim van Herk – Agriculture & Agri-Food Canada
- [Fusarium Dry Rot](#) – (370KB) – Dr. Michael Harding – AAF
- [Tuber Flea Beetles](#) – [Presentation](#) – (1041KB) – [Tuber Flea Beetles – Notes](#) – (503KB) – Scott Gillespie – Scott C. Gillespie Agronomy
- [Radar Pests](#) – (493KB) – Dr. Ron Howard – RJH Ag Research Solutions
- [The Role of Weeds in Pest Management](#) – [Link to video of presentation](#) – Dr. Pamela Hutchinson – U of Idaho
- [The Importance of Quality Seed Potatoes](#) – (324KB) – Deb Hart – Potato Growers of Alberta

Click on the presentation topics to be access a PDF version of the presentation. Please do not copy, distribute, or duplicate the presentation files, without first seeking and obtaining the consent of the presenter.



**Q: What is one insect pest/disease that you are concerned about that you are watching for?**

A: The only two pests over the last couple of years is slugs and aphids that have impacted my food forest.

A: Apple Curculio. It makes destemming more difficult as the larvae attach themselves to the base of the stem and the stems do not come off easily.

A: Root maggots in Cole crop and flea beetles

A: Late Blight in potatoes.

A: All of the blights.

A: Thrips

A: Botrytis is my main disease and for insects it's cabbage moth

A: Flea beetle. Hard to control without chemicals :(

A: Psyllids

A: Black knot fungus (*Dibotryon morbosum*)

A: Producing plant in the genus *Prunus*, I am concerned about the spread of black knot fungus.

A: Flea beetle

A: Lygus Bug

A: Pepino

A: This year it will be the Red Lily Beetle. I have hundreds of lilies!

A: Flea beetles, every damn year...

A: Fungicide

A: Shore flies and fungus gnats are a huge concern in young plant production for us. Aphids is close second they come out of "nowhere"

A: Tent caterpillars

A: Powdery mildew

A: Broad Mites aaaagggghhhhhh

A: Plutella (Diamondback Moth)

A: Colorado potato beetle

A: Aphids

A: Thrips and powdery mildew

A: Root maggots in Cole crops, weather-related, but common because of large canola acreage. Control?

A: SWD

A: Black knot on Saskatoon bushes

Next Month's ? → [What new piece of equipment did you invest in over the past 2 years? Why did you choose to invest in that particular equipment?](#)

## The Value of Pest Surveillance – Tips for Doing it on Your Farm

Each growing season problems arise that affect the health and productivity of various crops. Producers inevitably want to know what can be done about it. However, prior to correcting the problem it is critical to correctly identify the cause and quantify the problem. One of the keys to staying ahead of pest problems, be they insect, disease or weeds, is to having a firm understanding of the size and extent of the pest population. This is accomplished by making a point of watching for potential pests and then by asking many questions, with the purpose of gathering enough information to correctly understand the probable cause and then make decisions to fix the problem (or realistically reduce the problem or prevent more damage from occurring).

If something suspicious is observed, the process of diagnosing a problem is a process of elimination and can resemble peeling an onion. A series of increasingly detailed questions must be asked, with each question designed to reveal more information. The flow of questions may follow several courses, with the end result a clear grasp of all relevant factors. Failure to gather all pertinent information can lead to misdiagnosis. It is possible that information gathered in earlier questions might provide a clue to the cause of the problem. It is also possible that several factors may be related.

Scouting for potential problems should take place regularly, IN FIELD (not from the truck cab at 100 km/hr). It should be a systematic process, designed to gather information throughout the entire life cycle of the crop, across an entire field. Scouting should take place pre-seeding, pre & post-spraying and pre & post-harvest. It is also useful to be proactively aware of potential pests and scout more during periods of high risk for specific pests.

Surveillance has the purpose of trying to answer the following general questions:

- 1) What exactly are you dealing with?
- 2) When did the pests arrive or when did the symptoms manifest themselves?
- 3) Where are the pests in the crop?
- 4) How extensive is the problem? One plant? A whole row? Are there patterns?
- 5) How quickly is the problem spreading, if at all?
- 6) How established is the problem?
- 7) At what stage is the pest problem? In the case of insects, what life stage is showing up? In the case of weeds, what is leaf stage / size of them?

It is always handy to have a nice, comprehensive government/professional pest surveillance program in place, which covers a wide area, and has all of the necessary resources and pieces. However, these programs aren't as common anymore. The pest problems aren't going away, so it falls to producers to try and stay abreast of the various pest issues on the farm. There are a few simple principles that you can follow to at least take the edge off of the pest surveillance problem.

- 1) **Assign someone specific to watch for pests** – train them appropriately and then make it a part of their daily work schedule to “wander” around the entire farm, or at least in specific crops, keeping a watch out for, and a record of, specific pest problems.
- 2) **Know which pests are likely to be problems in your crops and when they or signs/symptoms of them might show up** – You can always watch the crops for anomalies and oddities, but some pests are going to be there, so have a plan for watching for them.
- 3) **Consider using traps (pheromone or attractant) or sticky traps on the fringe of your crops to catch things that are moving in** – this works well for flying insects or those insects that can be lured. Make sure the traps are checked regularly.
- 4) **Have a marker system to indicate where pests have been found** – this makes it easier to return to that spot and see what changes are occurring.
- 5) **Keep records** – This would include location information, dates, a basic indicator of the size of the population or the problem on that date, observed signs/symptoms, etc.
- 6) **If you find something, take a few good pictures** – these can be shared along with other relevant information that you collect, to help in diagnostics
- 7) **Collect a sample** – send the sample in to a diagnostic lab via your Ag fieldman or your friendly neighborhood government representative.

Surveillance doesn't have to be complicated, but it should be regular and consistent. Making your way through the crops you grow on a regular basis will help you to catch things early, which gives you a better shot at effectively managing them in the future.

## Currant Fruit Fly

*Euphranta canadensis*

### Crops Affected:

Black, red and white currants, gooseberries

### Life Cycle:

- Adult is a small fly, pale to dark yellow in colour, with a banded pattern on the wings
- Adults emerge around mid-May to early June
- Adults lay 1 egg under the skin of the each developing green fruit, with egg laying lasting for up to one month. Each female can lay up to 165 eggs over her lifespan
- Surviving eggs hatch within approximately 1 week, and feed on the seeds within the berry for approximately 2 weeks
- Larvae go through 3 instars over the course of their development. Late instars drill a hole in the fruit to breathe
- Infested fruit (fruit that have an egg placed under the skin) will ripen and drop prematurely; some fruit will remain on the tree
- Mature larvae leave the fruit and drop to the ground to pupate in the soil close to the base of the plant

### Symptoms:

- Infested fruit may contain maggots

### Monitoring:

- Adult flies can be found out of direct sunlight on leaves at the centre of the plant. Shaded plants will have more flies than plants in sunny locations
- Adults can be found where fruit are occurring
- Yellow sticky traps baited with apple maggot attractant can be hung within the bush at fruit level from green fruit to early harvest to monitor adult numbers.
- Examine dropped fruit for the presence of whitish eggs under the surface of the skin
- Egg-laying sites may have a slight brownish discolouration around the wound

### Management:

- Regular, daily collection and removal of fallen fruit may result in a gradual reduction in the number of flies
- Cultivation of soil beneath bushes will disturb soil and expose pupating larvae to potential predators
- Pick fruit late to avoid maggoty fruit
- Later maturing varieties are preferred by CFF
- Apply registered chemicals to control adults – consult label for details

### In the News / Articles Worth Reading:

- [Expert roundtable: To feed growing global cities Dutch companies need a different mindset](#)
- [Potato Production and Climate Change](#) – SpudSmart article
- [From strawberries to apples, a wave of agriculture robotics may ease the farm labor crunch](#) – CNBC article
- [Got Aphids? Call in the Reinforcements With Banker Plants](#) – Entomology Today article
- [Fast food of the future](#) – HortiDaily article
- [Organic Management of Spotted Wing Drosophila](#) – eOrganic video

### In the News / Articles Worth Reading:

- [Oxygen level in water: an underestimated factor in plant growth](#) – HortiDaily article
- [Technology Will Change the Face of Horticulture Within 20 Years](#) – Greenhouse Grower article
- [Stop wasting time peeling your vegetables](#) – HortiDaily article
- [This hospital built a farm on its roof](#) – HortiDaily article
- [Incredible pollinating animals– other than bees](#) – ZME Science article
- [Vegetable specialists now deliver to people's homes using Yape](#) - video

## Entomosporium Leaf & Berry Spot

Causal Organism: *Entomosporium mespili*

Crops Affected: Saskatoon berries

Disease Cycle:

- High humidity / precipitation and warm temperatures
- Spore dispersal is triggered by precipitation
- Flourishes from early-May through mid-July
- Optimal temperatures for development are 20-26°C
- Affects leaves of succulent new shoots and berries (immature to mature)
- May overwinter on fallen leaves & twigs (not proven conclusively)
- May also be present on twigs and branches

Symptoms:

- Most serious disease of Saskatoon berry
- Infected fruit is downgraded or becomes unmarketable
- Infection of greater than 6% of fruit surface area is considered unusable by processors

### Leaf Symptoms

- Small, angular brown spots
- Spots may grow & join together, with a yellow halo
- Leaves may turn yellow & may fall off if petioles are infected
- Severe defoliation can reduce productivity

### Fruit Symptoms

- Watery, greyish lesions
- Fruit may become discoloured, disfigured, shrivelled or cracked
- Fruit stalks may become infected

Management:

- Ensure adequate air circulation
  - Pruning
  - Orchard orientation
  - Careful consideration of plant stand density
  - Control weeds
- Apply water to the soil surface (not sprinkler applications)
- Apply preventative fungicide sprays
- **Fungicide Spray Timing**
  - Flowering stages = White Tip, Petal Drop, Green Fruit (varies with product)
  - Make 1<sup>st</sup> application after first rain event that occurs 1+ days after flowering (when petals open up)
  - Connected to spore dispersal
- Fungicide Selection
  - Chemistry/efficacy of products varies somewhat
- Remember the Pre-Harvest Interval (PHI) as this sets limits on application timing



Entomosporium lesions – varying degrees – mild (top) to severe (bottom)



Severe Entomosporium infection resulting in cracking and desiccation of fruit

## Saskatoon Berry Bud and Bloom Stages – Pests and Pest Management Options

Every year, Saskatoon berry producers are faced with the challenge of preventing and managing pests in their orchards. These pests (whether disease or insect pest) occur naturally in wild stands and, at this point, are essentially present in most orchards on the Prairies. Many of these pests can be tough to recognize or locate in an orchard, as they lurk in hard to reach areas. Management can be challenging, as the most sensitive or most effectively controlled stages are only active for short times. Most controls are protective or preventative, rather than curative.

Most chemical controls are recommended to be applied at specific botanical stages of the Saskatoon berry, which coincide with specific points within pest life cycles or are timed to provide a window of protection for sensitive plant parts. These stages are somewhat generic, but can be used as a guide for effective chemical control application.

The following is a general outline of the different stages of leaf and flower bud development, from bud break through to fruiting, with associated pests and registered chemicals. It should be noted that the rate of development through these stages can vary, depending on seasonal weather conditions and regional climatic influences, and as such, pictures and information should only be used as a general guide. While specific products may be applied at a number of different stages, pesticide labels should be carefully consulted for appropriate application rates and the number of applications that are allowed per season. Application costs should also be considered as well as whether the control product is actually required.



**Dormant Bud Stage**

**NOTE – Listed pesticides are registered for application at the various times indicated, however, producers should consider all relevant factors when making application decisions. Not all applications will be required each season.**

Pests that may be controlled at this stage	Chemicals registered for use at this stage	Other comments
Saskatoon Bud Moth (egg stage), leaf rollers	Bartlett Superior 70 Oil (Dormant Oil) • General Cleanup spray	Apply before or after bud break (this stage or silver tip stage) • Max 1x application/year
<i>Entomosporium</i> Leaf & Berry Spot	Kumulus DF (80% sulphur) Microthiol Disperss (80% sulphur)	Apply at bud break & at 10-14 day intervals • May be applied at bud break and at 10-14 day intervals (1 day PHI) • Do not apply within 30 days of mineral oil application • Max 8x applications/season
Bacterial Blight ( <i>Pseudomonas syringae</i> ) - suppression	Serenade MAX / ASO / OPTI (Biofungicide - <i>Bacillus subtilis</i> )	Apply before fall rains & again during dormancy



**Silver Tip Bud Stage**

Pests that may be controlled at this stage	Chemicals registered for use at this stage	Other comments
Saskatoon Bud Moth (egg stage), leaf rollers	Bartlett Superior 70 Oil (Dormant Oil)	Spray before bud break (apply at dormant or silver tip stage) • Check bud axils for eggs • Max 1x application/year
<i>Entomosporium</i> Leaf & Berry Spot	Kumulus DF (80% sulphur) Microthiol Disperss (80% sulphur)	May be necessary if moderate to severe infection in previous year • May be applied at bud break and at 10-14 day intervals (1 day PHI) • Do not apply within 30 days of mineral oil application • Max 8x applications/year



Pests that may be controlled at this stage	Chemicals registered for use at this stage	Other comments
Saskatoon Bud Moth (SBM laying eggs; hatching larvae) Tarnished Plant Bug (wintering TPB adults feeding on fruit buds) Other Plant Bugs	Decis 5.0EC / Poleci 2.5EC (deltamethrin 50g/L / 25g/L)	1 <sup>st</sup> Decis application <ul style="list-style-type: none"> <li>• May be effective as late as tight cluster stage</li> <li>• 21 day PHI</li> </ul>
Saskatoon Bud Moth	Matador 120EC / Warrior (lambda-cyhalothrin 120g/L / 122g/L)	1 <sup>st</sup> of 2 possible applications <ul style="list-style-type: none"> <li>• Max 2 applications</li> <li>• 21 day PHI</li> <li>• 10-15 days between applications</li> </ul>
<i>Entomosporium</i> Leaf & Berry Spot	Kumulus DF (80% sulphur) Microthiol Disperss (80% sulphur)	May be necessary if moderate to severe infection in previous year <ul style="list-style-type: none"> <li>• May be applied at bud break and at 10-14 day intervals (1 day PHI)</li> <li>• Do not apply within 30 days of mineral oil application</li> <li>• Max 8x applications/year</li> </ul>

**NOTE – Listed pesticides are registered for application at the various times indicated, however, producers should consider all relevant factors when making application decisions. Not all applications will be required each season.**



Pests that may be controlled at this stage	Chemicals registered for use at this stage	Other comments
Saskatoon Bud Moth	Decis 5.0EC / Poleci 2.5EC (deltamethrin 50g/L / 25g/L) <ul style="list-style-type: none"> <li>• Delayed timing for SBM control (see Green Tip Stage)</li> </ul>	Green tip stage is the preferred stage for application <ul style="list-style-type: none"> <li>• 21 day PHI</li> </ul>
<i>Entomosporium</i> Leaf & Berry Spot	Kumulus DF (80% sulphur) Microthiol Disperss (80% sulphur)	May be necessary if moderate to severe infection in previous year <ul style="list-style-type: none"> <li>• May be applied at bud break and at 10-14 day intervals (1 day PHI)</li> <li>• Do not apply within 30 days of mineral oil application</li> <li>• Max 8x applications/year</li> </ul>



**Tight Cluster Stage**

Pests that may be controlled at this stage	Chemicals registered for use at this stage	Other comments
Saskatoon Bud Moth	Decis 5.0EC / Poleci 2.5EC (deltamethrin 50g/L / 25g/L) <ul style="list-style-type: none"> <li>Delayed timing for SBM control (see Green Tip Stage)</li> </ul>	Green tip stage is the preferred stage for application <ul style="list-style-type: none"> <li>21 day PHI</li> </ul>
<i>Entomosporium</i> Leaf & Berry Spot	Kumulus DF (80% sulphur) Microthiol Disperss (80% sulphur)	May be necessary if moderate to severe infection in previous year <ul style="list-style-type: none"> <li>May be applied at bud break and at 10-14 day intervals (1 day PHI)</li> <li>Do not apply within 30 days of mineral oil application</li> <li>Max 8x applications/year</li> </ul>



**White Tip Stage**

Pests that may be controlled at this stage	Chemicals registered for use at this stage	Other comments
<i>Entomosporium</i> Leaf & Berry Spot	Kumulus DF (80% sulphur) Microthiol Disperss (80% sulphur)	May be necessary if moderate to severe infection in previous year <ul style="list-style-type: none"> <li>May be applied at bud break and at 10-14 day intervals (1 day PHI)</li> <li>Do not apply within 30 days of mineral oil application</li> <li>Max 8x applications/year</li> </ul>
<i>Entomosporium</i> Leaf & Berry Spot – suppression	Switch 62.5WG (cyprodinil 37.5% / fludioxinil 25.0%) Cyproflu (cyprodinil 37.5% / fludioxinil 25.0%)	Apply during early bloom – can be applied when petals start to show or earlier (if disease is present) <ul style="list-style-type: none"> <li>Max 3x applications/year</li> </ul>
<i>Entomosporium</i> Leaf & Berry Spot	Fitness / Jade / Prozol / Topas / Propi Speed / Propi Express / Propi Super / Tilt 250E / Mission 418 EC / Bumper 432EC (propiconazole 250, 418 or 432g/L)	Persistent cool, wet weather <ul style="list-style-type: none"> <li>1<sup>st</sup> of max 3 applications</li> <li>Apply to point of runoff</li> <li>38 day PHI</li> </ul>
Saskatoon Berry / Juniper Rust	Funginex DC (triforine 190g/L)	Spray to point of drip <ul style="list-style-type: none"> <li>60 day PHI</li> </ul>
Coincidental control of Brown rot	Pristine WG (boscalid 25.2% / pyraclostrobin 12.8%)	Apply prior to disease development <ul style="list-style-type: none"> <li>7-14 day interval</li> <li>Max 4x applications/year (2 recommended)</li> <li>29 day REI / 0 day PHI</li> </ul>
Oblique-banded leafroller; spanworms; winter moth Other leafrollers	Success / Success 480SC / Entrust 80W Naturalyte (spinosad 480g/L / 80%); Entrust Insecticide (spinosad 240g/L) Confirm (tebufenozide 240 g/L) Intrepid Insecticide (methoxyfenozide 240 g/L) Exirel (cyantraniliprole 100g/L)	Apply at time of egg hatch or to small larvae <ul style="list-style-type: none"> <li>7-10 day intervals</li> <li>Max 3x applications/year</li> <li>3 day PHI</li> <li>Apply higher rate for larger larvae</li> <li>Larvae may become more exposed as buds flush</li> </ul>

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Pests that may be controlled at this stage	Chemicals registered for use at this stage	Other comments
Saskatoon Bud Moth Tarnished Plant Bug Other Plant Bugs Saskatoon Sawfly Hawthorn Weevil Apple Curculio	Decis 5.0EC / Poleci 2.5EC (deltamethrin 50g/L / 25g/L) • Toxic to most pollinators	2 <sup>nd</sup> of 3 allowed applications • Apply to both sides of orchard rows • Apply prior to 25% bloom • 21 day PHI
Fireblight – suppression	Bloomtime Biological FD Biopesticide ( <i>Pantoea agglomerans</i> )  Kasumin 2L (Kasugamycin 2.00%)	Make 1 <sup>st</sup> of maximum 2 applications at 15-20% bloom • 0 day PHI  Begin applications at bloom and continue every 3-7 days
<i>Entomosporium</i> Leaf & Berry Spot	Kumulus DF (80% sulphur)  Microthiol Disperss (80% sulphur)	May be necessary if moderate to severe infection in previous year • May be applied at bud break and at 10-14d intervals (1 day PHI) • Do not apply within 30 days of mineral oil application • Max 8x applications/year
<i>Entomosporium</i> Leaf & Berry Spot – suppression	Switch 62.5WG (cyprodinil 37.5% / fludioxinil 25.0%) Cyproflu (cyprodinil 37.5% / fludioxinil 25.0%)	Apply during early bloom – repeat after 7-10 days • Max 3x applications • 10 day REI
<i>Entomosporium</i> Leaf & Berry Spot	Fitness / Jade / Prozol / Topas / Propi Speed / Propi Express / Propi Super / Tilt 250E / Mission 418 EC / Bumper 432EC (propiconazole 250, 418 or 432g/L)	May be applied as a late 1 <sup>st</sup> application if weather conditions are favourable for disease development
Saskatoon Berry / Juniper Rust	Pristine WG (boscalid 25.2% / pyraclostrobin 12.8%)	Apply prior to disease development • 7-14 day intervals • Max 4x applications/year (2 recommended) • 29 day REI / 0 day PHI
Powdery Mildew	Nova 40W (myclobutanil 40%)	Spray until drip • 1 <sup>st</sup> of max 3 apps/year • 14 day PHI Apply preventatively – 7-14d intervals
Powdery Mildew	Luna Privilege (fluopyram 500g/L) / Luna Tranquility (fluopyram 125g/L / pyrimethanil 375g/L)	Begin applications preventatively • 7-14d intervals • 1 day PHI
Botrytis Gray Mold ( <i>Botrytis cinerea</i> )	Luna Privilege (fluopyram 500g/L) / Luna Tranquility (fluopyram 125g/L / pyrimethanil 375g/L)	Begin applications at early flowering • 7-10d intervals • 1 day PHI
Phytophthora Root Rot (suppression)	Phostrol (mono & dibasic sodium, potassium & ammonium phosphites 53.6%)	Begin applications as flower petals begin to emerge • 14 day intervals



Balloon or Tube Stage

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Early Flowering Stage

Pests that may be controlled at this stage	Chemicals registered for use at this stage	Other comments
Saskatoon Bud Moth Tarnished Plant Bug Other Plant Bugs Saskatoon Sawfly Hawthorn Weevil Apple Curculio	Decis 5.0EC / Poleci 2.5EC (deltamethrin 50g/L / 25g/L) <ul style="list-style-type: none"> <li>Toxic to most pollinators</li> </ul>	2 <sup>nd</sup> of max 3 allowed applications <ul style="list-style-type: none"> <li>Apply prior to 25% bloom</li> <li>Apply to both sides of orchard rows</li> <li>21 day PHI</li> </ul>
Fireblight – suppression	Bloomtime Biological FD Biopesticide ( <i>Pantoea agglomerans</i> ) Kasumin 2L (Kasugamycin 2.00%)	Make 1 <sup>st</sup> of maximum 2 applications at 15-20% bloom  Begin applications at bloom and continue every 3-7 days



Full Flower Stage

Pests that may be controlled at this stage	Chemicals registered for use at this stage	Other comments
Insect pollination is considered beneficial for fruit set – pesticide application during flowering can significantly injure pollinators	No pesticides or fungicides should be applied during full bloom	<ul style="list-style-type: none"> <li>Insecticides are toxic to pollinators</li> <li>Some fungicides (e.g. sulphur) can have a repellent effect</li> </ul>



Petal Fall Stage

Pests that may be controlled at this stage	Chemicals registered for use at this stage	Other comments
Fireblight (suppression)	Bloomtime Biological FD Biopesticide ( <i>Pantoea agglomerans</i> )  Kasumin 2L (Kasugamycin 2.00%)	Make 2 <sup>nd</sup> of max 2 applications at full bloom to petal fall <ul style="list-style-type: none"> <li>0 day PHI</li> </ul> Begin applications at bloom and continue every 3-7 days
<i>Entomosporium</i> Leaf & Berry Spot – suppression	Switch 62.5WG (cyprodinil 37.5% / fludioxinil 25.0%) Cyproflu (cyprodinil 37.5% / fludioxinil 25.0%)	<ul style="list-style-type: none"> <li>Apply 7-10 day intervals</li> <li>Max 3x applications</li> <li>10 day REI</li> </ul>
<i>Entomosporium</i> Leaf & Berry Spot	Kumulus DF (80% sulphur)  Microthiol Disperss (80% sulphur)	May be necessary if moderate to severe infection in previous year <ul style="list-style-type: none"> <li>May be applied at bud break and at 10-14 day intervals (1 day PHI)</li> <li>Do not apply within 30 days of mineral oil application</li> <li>Max 8x applications/year</li> </ul>
<i>Entomosporium</i> Leaf & Berry Spot	Fitness / Jade / Prozol / Topas / Propi Speed / Propi Express / Propi Super / Tilt 250E / Mission 418 EC / Bumper 432EC (propiconazole 250, 418 or 432g/L)	Persistent cool, wet weather <ul style="list-style-type: none"> <li>2<sup>nd</sup> of max 3 applications</li> <li>Apply to point of runoff</li> <li>38 day PHI</li> </ul>
Saskatoon Berry / Juniper Rust		Apply prior to disease development <ul style="list-style-type: none"> <li>7-14 day intervals</li> <li>Max 4x applications/year (2 recommended)</li> <li>29 day REI / 0 day PHI</li> </ul>
Some coincidental control of Brown rot may be expected	Pristine WG (boscalid 25.2% / pyraclostrobin 12.8%)	
Botrytis grey mould ( <i>Botrytis cinerea</i> )	Serenade MAX / ASO / OPTI (Biofungicide - <i>Bacillus subtilis</i> ) Luna Privilege (fluopyram 500g/L) / Luna Tranquility (fluopyram 125g/L / pyrimethanil 375g/L)	Begin applications prior to first sign of disease <ul style="list-style-type: none"> <li>7-10 day intervals</li> </ul>

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Early Green Fruit Stage



Pests that may be controlled at this stage	Chemicals registered for use at this stage	Other comments
Hawthorn Weevil Apple Curculio <ul style="list-style-type: none"> <li>adult weevils and ovipositing curculio</li> </ul>	Decis 5.0EC / Poleci 2.5EC (deltamethrin 50g/L / 25g/L)	3 <sup>rd</sup> of max 3 allowed applications <ul style="list-style-type: none"> <li>Apply 5-10 days after petal fall</li> <li>Apply to both sides of orchard rows</li> <li>21 day PHI</li> </ul>
Saskatoon Bud Moth	Matador 120EC / Warrior (lambda-cyhalothrin 120g/l / 122g/L)	2 <sup>nd</sup> possible application (after petal fall) <ul style="list-style-type: none"> <li>Max 2 applications</li> <li>21 day PHI</li> <li>10-15 days between applications</li> </ul>
Powdery Mildew	Nova 40W (myclobutanil 40%)	Spray until drip <ul style="list-style-type: none"> <li>2<sup>nd</sup> of max 3 applications/year</li> <li>14 day PHI</li> </ul>
Powdery Mildew	Luna Privilege (fluopyram 500g/L) / Luna Tranquility (fluopyram 125g/L / pyrimethanil 375g/L)	Begin applications preventatively <ul style="list-style-type: none"> <li>7-14d intervals</li> <li>1 day PHI</li> </ul>
<i>Entomosporium</i> Leaf & Berry Spot	Kumulus DF (80% sulphur)  Microthiol Disperss (80% sulphur)	May be necessary if moderate to severe infection in previous year <ul style="list-style-type: none"> <li>May be applied at bud break and at 10-14 day intervals (1 day PHI)</li> <li>Do not apply within 30 days of mineral oil application</li> <li>Max 8x applications/year</li> </ul>
<i>Entomosporium</i> Leaf & Berry Spot  Saskatoon Berry / Juniper Rust	Fitness / Jade / Prozol / Topas / Propi Speed / Propi Express / Propi Super / Tilt 250E / Mission 418 EC / Bumper 432EC (propiconazole 250, 418 or 432g/L)	Persistent cool, wet weather <ul style="list-style-type: none"> <li>3<sup>rd</sup> of max 3 applications</li> <li>Apply to point of runoff</li> <li>38 day PHI</li> </ul>
Some coincidental control of Brown rot may be expected	Pristine WG (boscalid 25.2% / pyraclostrobin 12.8%)	Apply prior to disease development <ul style="list-style-type: none"> <li>7-14 day intervals</li> <li>Max 4x applications/year (2 recommended)</li> <li>29 day REI / 0 day PHI</li> </ul>
Botrytis grey mould ( <i>Botrytis cinerea</i> )	Serenade MAX / ASO / OPTI (Biofungicide - <i>Bacillus subtilis</i> ) Luna Privilege (fluopyram 500g/L) / Luna Tranquility (fluopyram 125g/L / pyrimethanil 375g/L)	Begin applications prior to first sign of disease <ul style="list-style-type: none"> <li>7-10 day intervals</li> </ul>

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Late Green Fruit Stage

Pests that may be controlled at this stage	Chemicals registered for use at this stage	Other comments
Powdery Mildew	Nova 40W (myclobutanil 40%)	Spray until drip <ul style="list-style-type: none"> <li>• 3<sup>rd</sup> of max 3 applications/year</li> <li>• 14 day PHI</li> </ul>
Powdery Mildew	Luna Privilege (fluopyram 500g/L) / Luna Tranquility (fluopyram 125g/L / pyrimethanil 375g/L)	Begin applications preventatively <ul style="list-style-type: none"> <li>• 7-14d intervals</li> <li>• 1 day PHI</li> </ul>
<i>Entomosporium</i> Leaf & Berry Spot	Kumulus DF (80% sulphur) Microthiol Disperss (80% sulphur)	May be necessary if moderate to severe infection in previous year <ul style="list-style-type: none"> <li>• May be applied at bud break and at 10-14 day intervals (1 day PHI)</li> <li>• Do not apply within 30 days of mineral oil application</li> <li>• Max 8x applications/year</li> </ul>
<i>Entomosporium</i> Leaf & Berry Spot Saskatoon Berry/Juniper Rust Coincidental control of Brown rot may be expected	Pristine WG (boscalid 25.2% / pyraclostrobin 12.8%)	<ul style="list-style-type: none"> <li>• May be applied at this stage rather than early green fruit stage – disease pressure related</li> <li>• 29 day REI / 0 day PHI</li> </ul>
Botrytis grey mould ( <i>Botrytis cinerea</i> )	Serenade MAX / ASO / OPTI (Biofungicide - <i>Bacillus subtilis</i> ) Luna Privilege (fluopyram 500g/L) / Luna Tranquility (fluopyram 125g/L / pyrimethanil 375g/L)	Begin applications prior to first sign of disease <ul style="list-style-type: none"> <li>• 7-10 day intervals</li> </ul>

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Red Fruit Stage

Pests that may be controlled at this stage	Chemicals registered for use at this stage	Other comments
<i>Entomosporium</i> Leaf & Berry Spot	Kumulus DF (80% sulphur) Microthiol Disperss (80% sulphur)	May be necessary if moderate to severe infection in previous year <ul style="list-style-type: none"> <li>• May be applied at bud break and at 10-14 day intervals (1 day PHI)</li> <li>• <i>Not recommended at late stages due to strong sulphur odours</i></li> <li>• Do not apply within 30 days of mineral oil application</li> <li>• Max 8x applications/year</li> </ul>
Botrytis grey mould ( <i>Botrytis cinerea</i> )	Serenade MAX / ASO / OPTI (Biofungicide - <i>Bacillus subtilis</i> ) Luna Privilege (fluopyram 500g/L) / Luna Tranquility (fluopyram 125g/L / pyrimethanil 375g/L)	Begin applications prior to first sign of disease <ul style="list-style-type: none"> <li>• 7-10 day intervals</li> </ul>



**Mature Fruit Stage  
(approx. mid-July) \***

*\* depending on season & location*

Pests that may be controlled at this stage	Chemicals registered for use at this stage	Other comments
<i>Entomosporium</i> Leaf & Berry Spot	Kumulus DF (80% sulphur) Microthiol Disperss (80% sulphur)	May be necessary if moderate to severe infection in previous year <ul style="list-style-type: none"> <li>• May be applied at bud break and at 10-14 day intervals (1 day PHI)</li> <li>• <i>Not recommended at late stages due to strong sulphur odours</i></li> <li>• Do not apply within 30 days of mineral oil application</li> <li>• Max 8x applications/year</li> </ul>
Woolly Elm Aphid – suppression Woolly Apple Aphid - suppression	Admire 240F (imidacloprid 240g/L) (systemic insecticide) Alias 240SC (imidacloprid 240g/L) (systemic insecticide)	Apply as a soil drench when 75-100% of aphid migration is completed (typically early to mid-July) <ul style="list-style-type: none"> <li>• 14 day PHI</li> </ul>
Botrytis grey mould ( <i>Botrytis cinerea</i> )	Serenade MAX / ASO / OPTI (Biofungicide - <i>Bacillus subtilis</i> ) Luna Privilege (fluopyram 500g/L) / Luna Tranquility (fluopyram 125g/L / pyrimethanil 375g/L)	Begin applications prior to first sign of disease <ul style="list-style-type: none"> <li>• 7-10 day intervals</li> </ul>
Spotted Wing Drosophila	Delegate Insecticide (spinetoram 25%)	Ensure thorough coverage <ul style="list-style-type: none"> <li>• 1 day PHI</li> <li>• Min 7 day intervals</li> <li>• Max 3 apps</li> </ul>

**Post-Harvest Stage  
(Late July – Early August) \***

*\* depending on season & location*

Pests that may be controlled at this stage	Chemicals registered for use at this stage	Other comments
Woolly Elm Aphid Woolly Apple Aphid	Orthene 75% SP (acephate) (systemic insecticide)	Inject with a probe 15cm (6 inch) from plant at 4 locations around each plant <ul style="list-style-type: none"> <li>• Apply 1x per season (mid-July to early August)</li> <li>• 11 month PHI</li> </ul>

**Dormant &/or Summer Applications – non-specific or variable stage**

Pests that may be controlled at this stage	Chemicals registered for use at this stage	Other comments
Aphids, mites, mealy bugs, scales	Vegol Crop Oil (canola oil 96%) Purespray Green Spray Oil 13E (mineral oil 99%)	Dormant and growing season spray <ul style="list-style-type: none"> <li>• Begin applications when pests appear – repeat at 7-14 day intervals as needed</li> </ul>
Aphids	Sivanto Prime (flupyradifurone 200g/L)	Apply as directed foliar spray ensuring thorough coverage <ul style="list-style-type: none"> <li>• 3 day PHI</li> <li>• Min 7 day intervals</li> <li>• Max 3-4 apps</li> </ul>
Septoria leaf spot (suppression)	Proline 480SC (prothioconazole 480g/L)	Apply when first observed; repeat at 10-14d intervals; 7d PHI

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