

Orchard Outlook



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Tree Fruit Specialist at Perennia

Dear Growers and Industry Colleagues,

This spring has been a difficult one due to a challenging personal situation in my life. After careful consideration, I have made a decision to relocate back to Ontario at the end of the summer to be closer to family and friends. My final day with Perennia Food & Agriculture Inc. will be Friday, August 25th. Please know this has been strictly a personal decision and is not a reflection on Perennia or the agricultural industry in Nova Scotia both of which have been a joy to work with.

I can absolutely say that the past 5 years with Perennia and in Nova Scotia has been an amazing experience both professionally and personally. I have gained so much working with many of you skilled and progressive producers and I feel truly fortunate to have worked with such a great industry group that is so focused on constant improvement. Keep it up. I must say that after dozens of presentations, workshops, and grower meetings, many on-farm trials, nearly 100 Orchard Outlook newsletters, hosting several visiting industry experts, recovery from a major fire blight epidemic, being involved in several NSFGA Annual Conferences and Orchard Tours, hosting the International Fruit Tree Association Conference in 2015, and facilitating the initial development of an automated fire blight/weather modelling network – it has been a very productive time indeed!

My experience with Perennia, and in Nova Scotia, and particularly the Annapolis Valley and its tree fruit industry will leave many fond memories and friendships for me. That being said, I am very much looking forward to heading in a new direction in life and exploring the many opportunities that exist in this world.

Know that Perennia remains committed to continuing to support the development of a vibrant tree fruit industry in Nova Scotia. I am working with staff at Perennia on developing a job advertisement for a tree fruit specialist to replace my position which should be posted very shortly.

Looking forward to continuing to work with you over the next 3 months.

Sincerely,

Chris

Bud Development

Most apples are at or closing in on petal fall/calyx with the exception of the later varieties and in the later areas (Figure 1). Pear fruitlets are developing quickly and stone fruit is at or past the shuck split/fall stage.



Apple: Full Bloom to 8 mm



Pear: Petal Fall/Calyx to 10 mm



Peach: Shuck Split



Plum: Shuck Fall



Sweet Cherry: Pea Sized Fruits

Figure 1: Tree fruit buds observed on May 30th, 2017 in the Kentville/Greenwich area.

Degree Day Accumulations

Degree day accumulations from March 1st to May 30th is close to the 5- and 10-year averages for this point in the season (Figure 2).

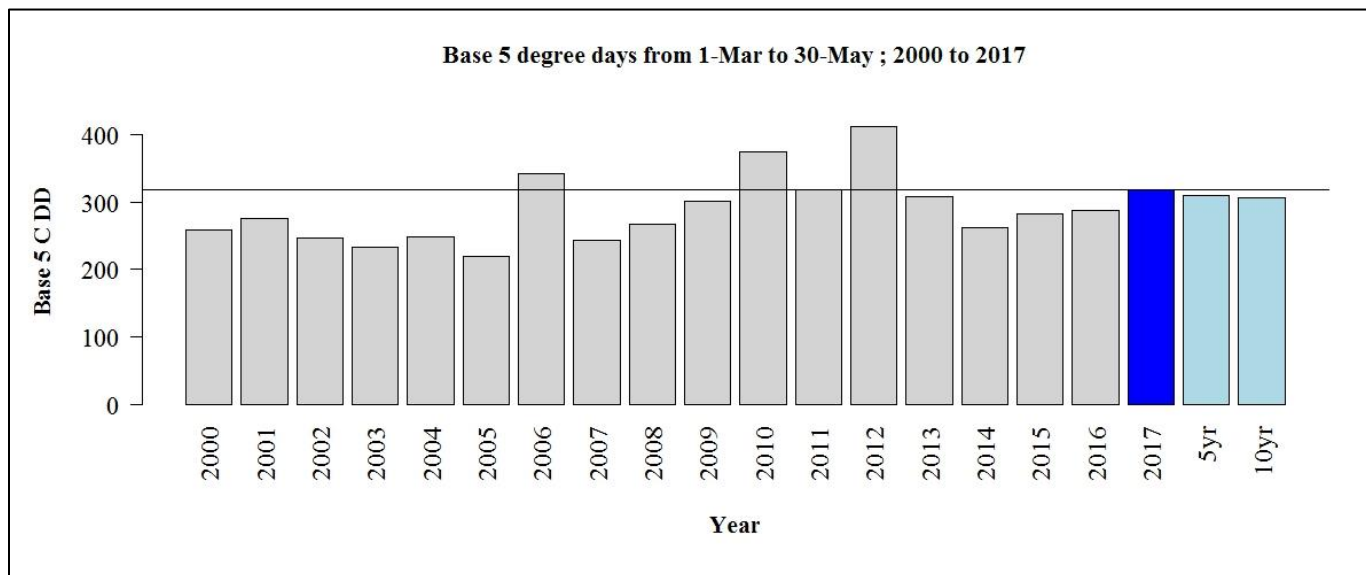


Figure 2: Degree day accumulations from March 1st for the past 18 seasons. Provided by Jeff Franklin (AAFC).

To date heat accumulation since March 1st is (Figure 2):

- About 2% more plant development heat units compared to the 5-year average.
- About 11% more plant development heat units compared to 2016.
- About 3% fewer insect development heat units compared to the 5-year average.

Diseases

Apple & Pear Scab

A single scab infection period was recorded this past week at Kentville AAFC. Wetting began at 8:00 pm on Thursday, May 25th and lasted until 10:00 am on Saturday, May 27th for a duration of 38 hours at an average temperature of 8.8°C resulting in a heavy primary infection.

An estimated 99% of the seasonal ascospore load has matured to date. Consistent light wetting events have also meant that ascospores have been released just as quickly as they have developed. However, Eric Bevis (AAFC) confirmed Monday that fallen leaves examined under microscope still contain mature ascospores, so primary scab season is still not yet finished. While examining unsprayed McIntosh trees on Tuesday, active scab lesions were now apparent (Figure 3). They are on the oldest cluster leaves and are a result of the early infection periods back in very late April or first week of May. Now that primary lesions are present, secondary spores called conidia will begin to be produced to cause secondary scab infections during wetting events. If your fungicide protection for the early scab infection periods was not adequate, lesions will soon be apparent. As ascospores are still around, your fungicide program should still be geared towards primary scab season.



Figure 3: Primary scab infections on unsprayed McIntosh leaves on May 30th.

Powdery Mildew

Petal fall is the second most important fungicide timing for powdery mildew control aside from tight cluster/pink. A third and final fungicide application for powdery mildew at petal fall will typically adequately control the disease in bearing orchards for the remainder of the season. Young, non-bearing trees where shoot growth continues well into the summer may need further powdery mildew sprays to prevent terminal infections.

Fire Blight

The warm temperatures causing a spike in EIP over the Victoria day weekend have not returned and based on the forecast, it looks like a single antibiotic application will be sufficient in most established orchards this season. If an infection event did happen on the 19th of May when EIP reached 182 and a light wetting event occurred, blossom blight symptoms are only partially developed at this point. It will be another 2 weeks likely before these would become visible in the orchard at current temperatures if infections did take place.

Newly planted trees are or will be coming into bloom over the few weeks, continue to monitor Maryblyt models for risk to newly planted orchards. If hand blossom removal is practical, consider removing the blossoms entirely to prevent possible blossom blight and also fruitset. If this is not feasible, consider treating these orchards with an antibiotic if EIP indicates a potential infection risk during bloom.

Once again, monitor Maryblyt through the online weather and disease modelling website AgWeather Atlantic: <http://atl.agrometeo.org/indices/maryblyt/000F>. By using AgWeather Atlantic, you are able to select from 6 weather stations in the Annapolis Valley: Greenwood, Morristown, Grafton, Kentville, Port Williams, and Medford. To use the model then you need to select an approximate green tip date and enter your first bloom date of your earliest blooming variety and click Apply. Then AgWeather Atlantic will retrieve the weather data from that

station and integrate the current weather forecast from Environment Canada to provide you with a Maryblyt model output for that location. Select 'Spray' to indicate which days to consider spraying in order to manage the Epiphytic Infection Potential (EIP) and control blossom blight infection events. The data is fully editable on AgWeather Atlantic if you wish to enter your own numbers then click Apply and rerun the model.

Fire Blight – Shoot Blight Management & Apogee

Advanced orchards are already at the later application timing for ideal control of shoot growth and shoot blight prevention with Apogee. If you are intending to use Apogee for either of these reasons, the first application should be on by the time new shoot growth reaches 5 cm length. See last week's Orchard Outlook for more information on Apogee.

Brown Rot

With all stone fruits now in shuck to shuck fall, fungicide protection from brown rot should be maintained, especially during periods of warm, wet weather.

Secondary Diseases of Apple

There are a number of secondary summer diseases on apples including:

- Bitter Rot (*Colletotrichum gloeosporioides*)
- Black Rot/Frog Eye Leaf Spot (*Botryosphaeria obtusa*)
- Caylx End Rot (*Sclerotinia sclerotiorum*)
- Dry End Rot (*Botrytis cinerea*)
- Sooty Blotch/Flyspeck (fungal complex)
- Brooks Spot (*Mycosphaerella pomi*)

These summer diseases of apple are all caused by various fungal organisms which overwinter in infected mummies from the previous season or as spores in cankers in the tree. Pruning piles near the orchard may also become a source of inoculum and should be removed/burned to reduce potential inoculum. These diseases generally infect during wetting periods similar to apple scab, however, usually their wetting period requirements are much shorter than scab. Fruit become susceptible to infection during and after bloom as the fruitlets develop. Sanitation and removal of infected mummies and prunings will help reduce inoculum sources of these diseases.



Figure 4: Black rot infection on apple.

A preventative fungicide program beginning at petal fall is also critical in controlling secondary diseases. In 2016, a number of Honeycrisp blocks had significant black rot infections (Figure 4). Captan/Maestro is the only multi-site fungicide for overall prevention of summer diseases with fair to excellent control ratings on all major secondary diseases. EBDC's and DMI's are weak or

ineffective on black rot. Aside from Pristine (which is highly rated for all secondary diseases), the Group 11 strobilurins Flint and Sovran are also quite strong on summer diseases as an alternative to captan. The Group 29 fungicide Allegro also offers control/suppression of most secondary diseases on apple and could be considered for a summer fungicide application. Under dry conditions, fungicide applications should be made at 10-14 day intervals for summer disease control.

Insects

A lingering bloom has meant delayed insect control in most apple orchards. With petals starting to finally disappear this week, the opportunity to begin the critical task of petal fall insect control will begin.

The petal fall/calyx period is a critical period for insect control in tree fruit with a number of pests that need to be addressed and often simultaneously. Insect management programs should be based on grower monitoring and/or scouting reports. The following table should assist with calyx insect control decisions (Table 1) in addition to the Pome Fruit Management Guide which can be found here: http://www.perennia.ca/wp-content/uploads/2015/09/2017-Pome-Fruit-Management-Guide-Final_s.pdf.

Table 1: Pesticides options for calyx stage of apples in Nova Scotia (revised June 2016) with input from Erika Bent (APM).

Insect Complex	Products and Rate per hectare	Ratings*and comments
1. Stinging bugs: Mullein Bug, Apple Brown Bug	Actara 315 g, Assail 160 g, Calypso 290 ml, Admire 380 mL, ** <i>synthetic pyrethroids</i>	Actara- 3 ; Assail – 3 ; Calypso- 3 ; Admire- 3 ; Synthetic pyrethroids- 4 but pyrethroids are disruptive to IPM programs;
2. Rosy Apple Aphid, Green Apple Aphid	Actara 160 g, Admire 230 mL, Assail 120 g, Calypso 145 mL, Closer 100-200 mL, Clutch 140 g, Sivanto Prime 500-750 mL, Twinguard 250 g	Each of these products is rated 4
3. Rosy Apple Aphid, stinging bugs	Admire 380 mL, Assail 160 g, Actara 315 g, Calypso 290 ml	Each of these products is rated 4 for aphids and for 3 stinging bugs
4. Obliquebanded Leafroller	Intrepid 0.75 L, Confirm 1.00 L, Delegate 420 g, Success 182 mL, Twinguard 500 g, Altacor 145 g, Exirel 0.5-1.0 L	Intrepid- 3 ; Confirm- 3 ; Delegate – 4 ; Success- 4 ; Twinguard – 4 ; Altacor - 4 ; Exirel - 4
5. Stinging bugs, Rosy Apple Aphid, and European Apple Sawfly	Assail 240 g, Calypso 290 mL	Stinging bugs – 3 ; Aphids – 4 ; European apple sawfly: Assail – 3 ; Calypso- 4
6. Winter Moth/Fruitworm and stinging bugs	** <i>synthetic pyrethroids</i>	**Synthetic pyrethroids are disruptive to IPM programs and their use should be avoided when possible.
7. Winter Moth, Leafroller and Fruitworm	Confirm 0.75 L or Intrepid 1.0 L, ** <i>synthetic pyrethroids</i> , Delegate 420 g, Success 182 mL, Twinguard 500 g, Altacor 145 g, Exirel	Intrepid - 4 ; Confirm- 3 ; **Synthetic pyrethroids, see above note. Twinguard – 4 ; Altacor - 4 ; Exirel - 4

	0.5-1.0 L	
8. European Apple Sawfly	Assail 240 g, Calypso 290 mL, Altacor 215 g, Exirel 0.5-1.0 L	Assail – 3; Calypso – 4 Altacor - 4; Exirel - 4
9. European Red Mite	Acramite 851 g, Agri-Mek 750 mL + oil, Kanemite 2.1 L, Envitor 750 mL, Nealta 1 L	Acramite – 3; Agri-Mek – 3; Kanemite – 4; Envitor – 4; Nealta – 3;

European Apple Sawfly (EAS)

EAS will be the first pest that will need to be addressed after bloom as eggs were laid during the bloom period. The closer you are able to time an application of insecticide to petal fall, the more effective these products will be in controlling EAS damage.

Rosy Apple Aphid

Suzie Blatt (AAFC) notes rosy apple aphids and associated leaf curling can now be observed where populations are present at petal fall. Consider other insect control requirements in your selection for an appropriate insecticide if RAA control is warranted.

Plum Curculio

With stone fruits at shuck to shuck split, management for plum curculio (PC) should now be occurring. Overwintering adult PC's will move into stone fruits around shuck split and stay for up to six weeks. Mated females will deposit their eggs in the developing fruit leaving the characteristic crescent-shaped scar (Figure 4). Activity of PC is increased in temperatures above 16°C. **Treatment for PC should be applied before shuck split to obtain optimal control.** As this has already happened in early plums and some sweet cherries, these blocks should be treated ASAP if not already. A second application is usually needed about 12 days later. Insecticide options include neonicotinoids: Actara, Assail, Calypso, Clutch; pyrethroids: Ambush, Matador/Warrior, Pounce.



Figure 5: Plum curculio oviposition scar on the side of sweet cherry fruitlet.

Catfacing of Peach

Catfacing of peaches is caused by plant bug stinging. This stinging takes place around shuck split/fall and one to two insecticide applications may be required to reduce the incidence of catfacing. Apply one to two applications of one of the pyrethroids listed in the Stone Fruit Management Guide.

Pear Psylla

Applications of Agri-Mek (170-340 mL/ha) plus oil (10 L/ha) can now go on pear trees for pear psylla control. The closer the application is made to calyx the more effective it is in controlling psylla. Do not use Captan/Maestro as a fungicide for pear scab within 14 days of Agri-Mek + Oil application. Use another fungicide such as Aprovia, Fontelis, Sercadis, Flint, Sovran, or Pristine.

Black Cherry Aphid

Those growers that have plantings of sweet cherry should monitor for black cherry aphid which can interfere with terminal growth, especially on young trees. There are a number of insecticides noted in the Stone Fruit Management Guide.

Horticulture

Pear Thinning

This will be the week for chemical pear thinning as the fruits are growing rapidly.

In Nova Scotia, the old growth regulator Amid-Thin (NAD) had been the most effective thinner for pears but is no longer available. If you do have some Amid-Thin around, it is still registered. It works best when applied just after petal fall. The recommended rate of Amid-Thin is 10 to 20 ppm. 10 ppm = 120 g/1000L while 20 ppm is 240 g/1000L. Clapps Favorite is easier to thin than Bartlett thus a rate in the 10-15 ppm range should be used and 15-20 ppm for Bartlett.

Maxcel is the only commercially available product registered for thinning pears in Canada. It is registered for fruitlet thinning between 8-14 mm at a concentration of 50-200 ppm. Nufarm suggests a general rate of 5-6 L/acre of Maxcel for thinning pears in heavy set conditions. Daily maximum temperatures should be above 18°C for best activity of Maxcel.

There has not been much use of NAA for pear thinning in Nova Scotia and the product is not registered for thinning pears. NAA has not been a very consistent thinner for pears in Nova Scotia but some growing areas have been successful thinning pears with NAA applied within a week of petal fall. Sevin XLR is not effective on pear thinning and should not be applied. Note Harovin Sundown pear now called Cold Snap is considered to be more difficult to thin like Bartlett.

Apple Thinning

It is still a bit early on everything to check for fruit set, however, earlier developing varieties are showing folding up of sepals and swelling of the fruitlet indicating successful pollination and fruitset. While weather during bloom has certainly been variable, I expect there will be good fruitset wherever sufficient bloom was present. Early varieties have fruitlet diameters up to 8-10 mm at this point so fruitlet thinning applications could begin shortly on these varieties. I encourage growers to consider some earlier thinner applications in 2017, especially with reduced seasonal rates of Sevin XLR, so a second opportunity for chemical thinning may be possible if the first application(s) looks to be weak.

With moderate temperatures and the forecast for cloudy weather I wouldn't expect there to be any periods of major carbohydrate deficits. Normal thinning rates will likely be adequate. Note thinning with Maxcel is suggested to occur with daily high temperatures of greater than 18°C for the day of application and the following 2-3 days. At a minimum, a daily high of 15°C is recommended. NAA is a more consistent thinner under cooler conditions in my experience. If daily highs are forecast to be consistently below 15-18°C, use an alternate thinner or delay Maxcel application to a warmer weather window.

As always, assess fruit set in your own orchard before making any decisions on products and rates.

Charlie Embree (AAFC-retired) and Douglas Nichols (formerly of NSFGA) prepared a very useful table and tips for chemical thinning in Nova Scotia. This has not been updated since 2013 but is still very relevant and helpful as it is based on trial work done in NS. See last week's Orchard Outlook for the attachment. However, please note the recent changes to Sevin XLR below:

CHANGES TO SEVIN XLR MAXIMUM APPLICATION RATE:

For the 2017 season, Sevin XLR has a maximum yearly application rate of 3.22 L/ha for trellised orchards and 2.15 L/ha for non-trellised orchards. In cultivars that were typically thinned with combinations of Sevin XLR & NAA or Maxcel with a rate of Sevin exceeding these new yearly maximums, you may need to consider increasing the rate of NAA or Maxcel slightly to compensate for a lower rate of Sevin XLR.

Chemical thinning is one area where one often encounters rate suggestions in PPM. For information on how to prepare PPM sprays, see the following Perennia factsheet:

<http://www.perennia.ca/wp-content/uploads/2015/09/Spray-PPM-for-Web.pdf>

For further information on chemical thinning and thinners, see the factsheet Thinners and Growth Regulators for Fruit Trees:

<http://www.perennia.ca/wp-content/uploads/2015/09/THINNERS AND GROWTH REGULATORS FOR FRUIT TREES.pdf>

To defruit young trees, a suggestion from Michigan was to use a combination of Sevin XLR at 2.5 L plus Maxcel at 5.0 L per 1000 L of water. A few litres of oil can also be added as a spreader sticker to this combination. A grower in Nova Scotia has tested Sevin XLR at 2.0 L plus Maxcel at 4.0 L plus 2 L oil plus Agral 90 at 0.5 L in 500 L/ha of water with good results to strongly thin young trees. Apply between petal fall and 8-10 mm. A second application can be done before

18 mm if additional thinning needed. NAA can also be used to defruit young trees but tree stress from NAA and reduced growth may result.

- **Bees**
 - Honey bees should be moved out of the orchard as soon as possible at petal fall to allow calyx insecticide applications.
- **Grafting**
 - Bark slipping is at the ideal stage for topworking trees.
- **Weed Control**
 - Herbicide application should be maintained to minimize competition in the orchard. The critical period of weed control extends 30 days after bloom on mature orchards and through July in young blocks.
- **Mowing**
 - Regular mowing of the orchard floor will help minimize dandelion competition with tree fruit flowers during bloom, minimize insect flushes from the ground cover after mowing, and conserve soil moisture as conditions become dry.
- **Tree Planting/Trellis**
 - Prune and support newly planted trees as early as possible after planting to ensure maximum first year growth.

Events & Notices

2017 International Fruit Tree Association Study Tour in Michigan – Registration Open

Considering joining IFTA in Michigan this summer from July 16-July 18th for the 2017 IFTA Summer Study Tour. Our theme for the 2017 IFTA Summer Tour is:

Tree Fruit Excellence – Innovation and Success

The 2017 IFTA Summer Tour offers another fantastic educational opportunity and provides quality networking time with colleagues old and new. With visits to prime fruit-growing areas of Belding, the South Ridge, the North Ridge and Michigan State University, you'll be able to see and experience all aspects of tree-fruit production.

You'll learn how Michigan tree fruit growers are investing in new ways to remain competitive and deliver high-quality fruit to consumers at home and around the world. Discussions will touch on tree training, chemical thinning, precision thinning, frost protection, vigor management and managed varieties, among many other topics.

Network with fellow growers as you discover why Michigan is one of the world's leading tree-fruit growing areas and a seat of tree-fruit innovation.

See <http://www.ifruittree.org/Events/2017-Study-Tour> for more information.

This Orchard Outlook has been published with the input of the Orchard Outlook Committee.