

Orchard Outlook



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Fruit Development

Fruitlets of earlier cultivars are up beyond the 20 mm range while later cultivars and later areas are 12-14 mm range (Figure 1). Pear fruitlets also beyond 20 mm, while stone fruits are all in the rapid growth phase.



Apple: 12-25 mm



Pear: 16-25 mm



Peach: 1" length



Plum: 1" length



Sweet Cherry: Beginning to yellow

Figure 1: Tree fruit buds observed on June 20th, 2017 in the Kentville/Greenwich area.

Degree Day Accumulations

Degree day accumulations from March 1st to June 20th remain above the 5- and 10-year averages for this point in the season (Figure 2).

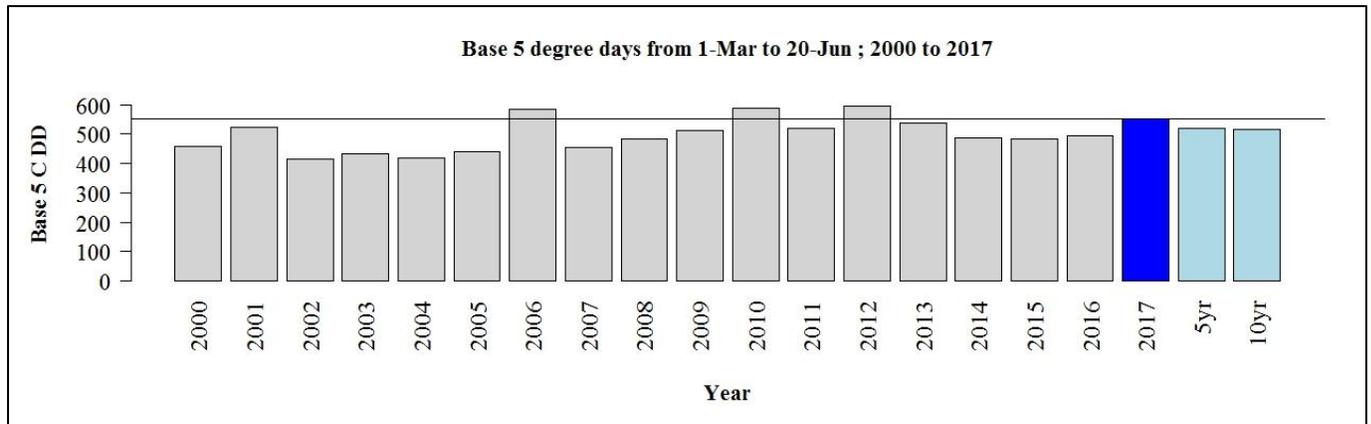


Figure 2: Degree day accumulations from March 1st for the past 18 seasons. Provided by Jeff Franklin (AAFC).

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

- About 6% more plant development heat units compared to the 5-year average.
- About 11% more plant development heat units compared to 2016.
- About 9% more insect development heat units compared to the 5-year average.

Diseases

Apple & Pear Scab

One secondary scab infection period was recorded this week at Kentville AAFC. Wetting began at 8:00 pm on Friday, June 16th and lasted until 4:00 pm on Saturday, June 17th for a duration of 20 hours at an average temperature of 13.5°C resulting in a secondary conidia infection where primary infections have become established. Primary infections are visible in some commercial blocks. There have been a total of 13 scab infection periods to date this year which has given plenty of opportunity for scab infections to occur where fungicide protection has not been adequate.

If you do not have primary lesions showing up in the orchard by now, it would be reasonable to begin considering reduced fungicide rates (where labels allow) and longer intervals of fungicide sprays if the orchard is clean of scab and the weather remains dry – which has not been the case so far this year.

The application of a fungicide to reduce apple scab spread after an infection event acts as a means of selection for resistance and should be avoided as much as possible. However, where an infection period has resulted in primary infections, growers may wish to consider applications for the purpose of “burning out” scab (reducing secondary spore production). Dodine can be effective as a post-symptom product to arrest scab infections – products are Syllit or Equal. These products should be mixed with a full rate of protectant, and preferably Captan for secondary diseases, for best efficacy as well as resistance management.

Syllit 400 FL – 5.3 L/ha, Equal 50 WP – 3.25 kg/ha

Powdery Mildew

New powdery mildew infections are being observed where flag shoots were present. Check the underside of curled leaves for the powdery mycelium growth. Non-bearing trees, newly planted orchards, and nurseries should be protected from powdery mildew and apple scab. The impact of powdery mildew on bearing orchards at this point is minimal but infections can impact extension growth on young trees.

Fire Blight

I have yet to observe new fire blight infections this year, however, there is the odd report of some fire blight from overwintering cankers being noted. If blossom blight occurred in your orchard this spring, symptoms should now be apparent. If you begin to observe blossom blight infections and have not yet made any Apogee treatments to the infected and/or neighbouring blocks, you may wish to treat these areas with Apogee immediately to provide some resistance to shoot blight infection in 10-14 days. An application of a copper product could help give some immediate protection while the Apogee begins to work. Antibiotic products such as Streptomycin or Kasumin will not give curative activity to visibly established infections.

With the presence of blossom blight infections, secondary inoculum is assumed to be present in the orchard for subsequent shoot blight infection. It is still slightly early to be seeing new shoot blight infections. These symptoms will be developing over the next week where bacteria is present from primary infections.

Growers can begin scouting orchards for the presence of blossom and canker blight. Young orchards with a history of fire blight infection is the preferred place to begin. Where the number of infections is light and can be manageably pruned from the orchard, removal on a dry day and discarding in the row middles will help reduce secondary inoculum production. Removal by pruning should not be attempted where the number of infections would make the chance of accidentally spreading fire blight very high.

With the presence of ooze a possibility in the orchard, work only in dry conditions in blocks with fire blight as ooze is spread much more easily during wet conditions!

Continue to monitor new plantings for bloom. With the summer weather pattern settling in, it can pretty much be assumed that any new flowers are at risk of blossom blight infection. Remove blossoms on young trees or make a preventative application prior to predicted wetting events to prevent possible blossom infections.

Nectria (European) Canker

Fire blight strikes can often be confused with *Nectria* (European) canker infections. I have observed several *Nectria* twig blight strikes in orchards this week. *Nectria* twig blight is very often found on bourse shoots of a cluster where a fruit was picked last fall with the stem left on the tree (Figure 3).



Figure 3: Nectria twig blight (also called European canker) can resemble fire blight strikes.

Symptoms of Nectria twig blight include wilted shoots and shepherd's crooking, similar to fire blight. However, Nectria shoot blight usually begins from the base upwards, and there is never ooze present. Nectria infections also often typically have orange coloured fruiting bodies near the base of last year's clusters.

In comparison, shoot blight from fire blight usually begins from the tip down, usually bacterial ooze is present, and the midvein or petiole of the leaf appears symptomatic before the leaf blade.

Nectria infections should still be pruned and discarded where found but it is not nearly as aggressive as fire blight.

Brown Rot

After shuck fall, fungicide applications for brown rot should be maintained until June drop in cherries and pit hardening in peaches which occurs early to mid-July in Nova Scotia. Fruit again become susceptible to brown rot infections in the final 3 weeks before harvest. This means that early peaches can be susceptible to brown rot infections nearly all season. Remember to check pre-harvest intervals on these products.

Insects

Codling Moth

Kentville AAFC reached the 100 DD°C base 10°C mark on Monday for the early biofix date of June 7th, meaning application timing for the egg hatch products has been reached. The earlier areas can begin treatments for codling moth if needed now. The later biofix date for mid to late developing areas is June 12th and degree day accumulations are expected to reach the 100 threshold by Friday, meaning these areas can begin codling moth treatments at the end of the week. With all the rain forecast for the weekend however, one may have to begin Thursday to get something on ahead of an extended wet period, if spraying won't be possible for several days.

The treatment timing for egg hatch products (Assail, Calypso, Delegate, TwinGuard, Confirm, Intrepid, Altacor, and Exirel) is 100 degree days Celcius from biofix. The product Rimon has ovicidal activity and

should be applied a bit earlier, usually around 60-80 degree days, and this timing is past in most areas. For organic production, codling moth Granulovirus should also be timed for egg hatch around 100 degree days. A comparison of codling moth products is provided below (Table 1).

Control of codling moth with Imidan is typically slightly later at 140 degree days after biofix. This is predicted to be the beginning of next week for those intending to use Imidan. Note Imidan is more costly than some of the other products available and has much stricter requirements on REI. Perennia trials have observed good efficacy of Group 28 Insecticides which also have better rainfast characteristics than Imidan with similar or lower cost (**Error! Reference source not found.**). Consider getting experience with alternative chemistries if you have relied on organophosphates for codling moth control.

There is no need to consider obliquebanded leafroller or apple maggot activity of the first insecticide for codling moth as these pests are not at the correct stage for treatment.

Thresholds for treatment were traditionally 40 moths per trap. However, based on high value varieties, thresholds have moved towards 10-20 moths per trap.

Wondering about rainfall and insecticide activity? The following article is well worth reading from Dr. John Wise of Michigan State University on rainfastness of various insecticide classes:

http://msue.anr.msu.edu/news/rainfast_characteristics_of_insecticides_on_fruit

Some highlights discussed:

- A drying time of 2-6 hours is sufficient for most insecticides to stick the product to the leaf or fruit.
- Neonicotinoids are an exception to the above and up to 24 hours is need for optimal penetration.
- Rainfall of 25 mm (1 inch) or more is generally sufficient to remove most residues required for product efficacy on codling moth including Neonicotinoids (Assail, Calypso), IGR's (Confirm, Intrepid, Rimon), and organophosphates (Imidan). This will require re-application of the insecticide to adequately protect fruit.
- Spinosyns (Delegate, TwinGuard) and Diamide (Altacor, Exirel) insecticides are more rainfast than other products, however, will require application with 50 mm (2 inches) of rainfall.

Table 1: 2017 Control Options for Codling Moth

Product	Rate & Max # Applications	REI	Application Timing	Other Pests	~ Cost (\$/ha)
Organophosphate – Group 1B Insecticides					
Imidan 70 WP	2.68 kg/ha Max 5 Apps.	7-30* days	140 Degree Days °C After Biofix	Leafrollers	150
*Additional PPE required for hand-thinning activities within 30 days of application.					
Neonicotinoid – Group 4A Insecticides					
Assail 70 WP	120-240 g/ha Max 4 Apps.	6 days (hand-thinning)	100 Degree Days °C After Biofix	Aphids	112-223
Calypso 480 EC	290-440 mL/ha Max 3 Apps.	12 Hours	100 Degree Days °C After Biofix	Aphids, Leafhoppers, Mullein Bug	88-133
Spinosyns – Group 5 Insecticides					

Delegate 25 WG	420 g/ha Max 3 Apps.	12 hours	100 Degree Days °C After Biofix	Leafrollers	190
Group 4C + Group 5 Insecticide Premix					
TwinGuard	500 g/ha Max 2 Apps.	12 Hours	100 Degree Days °C After Biofix	Leafrollers, Aphids	264
Benzoylureas – Group 15 Insecticides					
Rimon 10 EC	0.93-1.4 L/1000 L Max 4 Apps.	12 Hours	60-80 Degree Days °C After Biofix		83-124
Diacylhydrazines – Group 18 Insecticides					
Confirm 240 F	1.0 L/ha Max 4 Apps.	12 Hours	100 Degree Days °C After Biofix	Leafrollers	132
Intrepid 240 F	1.0 L/ha Max 2 Apps.	12 Hours	100 Degree Days °C After Biofix	Leafrollers	131
Diamides – Group 28 Insecticides					
Altacor 35 WG	145-215 g/ha Max 3 Apps.	12 Hours	100 Degree Days °C After Biofix	Leafrollers	79-117
Exirel 100 SU	500-750 mL/ha Max 4 Apps.	12 Hours	100 Degree Days °C After Biofix	Leafrollers, Aphids, Leafhoppers	100-150
<i>Cydia pomonella</i> Granulovirus – Not Classified					
Cyd-X SU Virosoft SU	250 mL/ha	12 Hours	80-100 Degree Days °C After Biofix		

Mites

It is generally early for miticide applications yet with the exception of Agri-Mek. Growers that would like to use Agri-Mek (170 mL/ha) plus oil (10 L/ha) for mite control have about 6 weeks after petal fall to apply the product. That being said, it has been noted that residual mite control with Agri-Mek in combination with spray oil is greater from spray deposits on newer leaves compared to older leaves, so it would be best to apply it by the end of the month. Remember to avoid Captan/Maestro in your cover sprays for a minimum period of 7-14 days before/after an Agri-Mek + oil application. Use another fungicide from the Pome Fruit Management Guide.

Check your scouting reports to see if there is a treatable population. There are a number of miticides that can be used for summer mite control including Acramite, Kanemite, Nexter, Envidor, and Nealta. Note Acramite, Kanemite, and Nealta do not control apple rust mite.

Aphids

Both Rosy Apple Aphid (**Error! Reference source not found.**) and Green Apple Aphid colonies are expanding quickly where present. Check the terminal growth for the presence of Rosy and Green Apple Aphid colonies. An aphid control treatment is recommended if 10% of terminals are infested. The list of products for aphid control is long: Actara, Admire, Assail, Calypso, Clutch, Closer, Sivanto Prime, TwinGuard, Beleaf, Movento, and Exirel.

Horticulture

Apple Thinning

The chemical thinning window has closed on early blocks and cultivars at this point. Many mid to later blooming cultivars may still be able to be treated with fruitlet thinners. Size differential is becoming apparent and weaker fruitlets are beginning to abort in early areas (Figure 4).



Figure 4: Honeycrisp fruitlets showing large size differential. Laterals dropped off easily with light pressure indicating they were in the process of aborting.

Calcium (Ca) Sprays

The goal of Ca sprays is to increase the concentration of Ca in the fruit and reduce the incidence bitter bit at harvest and during storage. Honeycrisp and Northern Spy are quite sensitive to bitter bit. Large fruit of cultivars like Cortland, Gravenstein, and Jonagold are also susceptible. Young trees typically have worse problems with bitter pit. The downsides of Ca sprays are possible advanced maturity and leaf burn resulting in reduced yield and size in some cases.

Ca sprays have traditionally been applied at two-week intervals starting in early July if you are applying four sprays or mid-June for six sprays. Where bitter pit is an annual problem and additional Ca is required, sprays can be continued up until harvest.

Newer recommendations have suggested beginning calcium sprays 1-2 weeks after petal fall (Cornell & Michigan State University Extension) using 1-2.5 kg of calcium chloride flake per 1000 L of water for 3-4 sprays before switching to higher rates of 4.5 kg per 1000 L of water for the later sprays.

Calcium chloride flake (77% Ca) is the most economical Ca material to use but also the highest risk for foliar burn and is corrosive to spray equipment. Other liquid calcium products or calcium nitrate may also be used to provide the same amount of elemental calcium per spray. The cost per unit of active ingredient will be higher with these products. If nitrogen levels are adequate, it is best not to apply additional nitrogen to the trees with calcium nitrate to avoid a reduction in colour development and possible storage issues. Do not apply calcium nitrate past July. Excessive nitrogen can also make bitter pit problems worse.

Ca has very low movement within the tree and needs to be applied directly to the fruit surface to be absorbed. Therefore, thorough coverage is important to cover developing fruit. Ca should not be applied as concentrate. Use higher volume sprays. It is recognized that ensuring adequate boron sufficiency and avoiding excess potassium can also aid in Ca uptake of the tree.

Calcium chloride is compatible with most wettable powder fungicides and pesticides including Captan when applied dilute, however, risk of leaf injury may be enhanced by Captan in some cases. Dissolve

calcium chloride in a pail first and thoroughly mix in the spray tank before adding other products. Incompatibility has been observed with Polyram, Epsom salts, and liquid or emulsifiable pesticide formulations in some cases. Also it should not be applied with Apogee.

Mowing

Regular orchard mowing will help conserve soil moisture as well as discourage the buildup of rodent populations.

Young Trees

Make an effort to get young trees properly trained (single leaders, removing forking of branches, exceedingly large diameter branches) to ensure the best and most uniform growth for your future orchard. Leaders should be securely tied to encourage growth and at minimum fruit on the top 60 cm of leaders should be removed if the planting still needs to reach the top of the trellis. Consider de-fruiting first and second year trees entirely.

First and second year trees could also benefit from a second nitrogen application in many cases.

Herbicide

It is especially important to maintain good weed control during June and July on young plantings which need to develop vegetative growth. Studies have shown that weed competition during this time can have a significant negative impact on early cropping of young blocks.

Events & Notices

Apple Maggot Eradication Program

Elizabeth Nichols is the Apple Maggot Eradication Technician again this year. The apple maggot overwinters as a pupa in soil and adults emerge from late June through September, with peak flight into commercial orchards in August. Emergence is closely linked to soil moisture levels—in dry years, some pupae remain in the soil until the following growing season.

Apple Maggot flies are strong fliers and field studies indicate they fly up to 3 km from alternative hosts. Thus, controlling alternative hosts including American hawthorn or wild apple trees within 300 meters of commercial orchards helps to reduce pressure from migrating flies.

Elizabeth is here to help growers control apple maggot so if you are aware of any hawthorn or wild apple trees within that 300 m radius, please contact Elizabeth at (o) 902-678-1093; (c) 902-670-3599; or enichols@nsapples.com.

Brown Marmorated Stink Bug

Researchers are on high alert for the Brown Marmorated Stink Bug which has damaged apple crops in the US. These pesky bugs have gone from 2 or 3 states in 2010 to 43 states in 2017, wreaking \$37m worth of havoc on the apple industry in the northeastern US alone. They have been found in B.C. and parts of Ontario as well as the Montreal corridor in Quebec. Researchers in the Atlantic Provinces have been keeping an eye out for the insect since 2012. At this time, there have been no captures in Nova Scotia or New Brunswick.

Nova Scotia has one type of stink bug already and if the brown marmorated bug was to do in Canada what it did in the US, it would become a real problem for agriculture, in particular, the tree fruit industry, earning it as much of a bad reputation as the apple maggot.

This stink bug has unique characteristics: distinctive white bandings on its legs and antennae, inward-pointing white triangles between dark markings along the edge of the abdomen, and a smooth edge along the pronotum or “shoulders.”

If you think you’ve found a brown marmorated stink bug, please contact Dr. Suzanne Blatt of the Kentville Research Station, at Suzanne.blatt@AGR.GC.CA. Dr. Blatt is asking all growers to be on the lookout for this pest.

Thank you for your attention to these destructive pests. We want to stay on top of them for the sake of our industry.

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.