

Apple Update: July 14th, 2017

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Crop Stages

- Apple fruitlets are increasing in size and are greater than 40 mm in diameter
- Terminal buds are starting to set across Ontario

Production

If you haven't started to apply calcium to varieties that are prone to bitter pit, like Honeycrisp, it would be beneficial to start now. Foliar calcium application can also reduce cork spot. Publication 360, Guide to Fruit Production recommends applying four times starting in mid-July at two week intervals. Calcium must contact the fruit for effective uptake, so make sure your water volume is sufficient to wet the entire tree. If you are applying calcium nitrate, do not apply later than the end of July as the nitrogen may reduce fruit quality and storability. Calcium chloride (77% flakes) can be applied June-August, but if applied too close to harvest there may be issues with fruit finish. For rates and other recommendations, see Publication 360 or consult the product label.

Diseases

The odd **fire blight** strike continues to show up here and there in some orchards; though pressure is overall very low this year. Actual (not predicted) weather data has been entered into the Cougar Blight model from April 19 - June 11, 2017 to determine the conditions for blossom blight during bloom across the apple growing regions of Ontario. Click [here](#) to see the animated maps. The periods for fire blight infection risk was different for most Ontario apple growing regions except for the period May 16- 21 when the risk was 'High' or 'Extreme/Exceptional' in most regions of the province.

Oozing cankers can still be found in the wet and humid weather (Fig 1). It is best to do any hand labour activities such as thinning, pruning or removing suckers in dry conditions in these blocks to avoid the potential spread of bacteria by workers or contaminated equipment. A single ooze droplet contains billions of bacteria while only a few hundred are needed to initiate a shoot infection.

With terminal set, the tree may start to wall off the infection where the active bacteria is, forming cankers which will overwinter and serve as inoculum next spring. Look for brown to purple cankers that often become sunken with cracked margins and prune well beyond the visibly infected area.

However, there is the possibility the bacteria within the tree will continue to move down to the roots. Symptoms of rootstock fire blight may not be apparent immediately but tree collapse can occur the following year. A number of orchards across the province have trees declining from rootstock fire blight that occurred during the severe fire blight outbreak last year (Fig 2). Little can be done to save the tree when the roots have been infected. It is best to remove the tree to reduce spread of infection to surrounding trees.



Figure 1. Amber ooze dripping from developing fire blight canker.



Figure 2. Tree collapsing from rootstock fire blight.

New **apple scab** lesions continue to spread on both fruit and leaves in orchards that experienced primary infection. A good scab fungicide program should continue in these blocks, consisting of captan rotated with products such as Pristine, Allegro and/or Granuflo-T for summer diseases.

Powdery mildew continues in blocks where new growth is still pushing. Once terminals harden off, mildew is no longer an issue. Watch young blocks closely as infection of succulent tissue will significantly impact vigour and growth.

The wet spring has created perfect conditions for ***Phytophthora root and crown rot***. Tree collapse as a result of this can be found in some blocks and will likely continue to develop into the fall. Orange to dark reddish brown cankers can occur around the graft union above the soil, below the soil or on the roots themselves (Fig 3). Most healthy trees can tolerate a certain amount of *Phytophthora*. However, trees that have been under stress are vulnerable. With the drought stress last year and the water-logged



Figure 3. *Phytophthora* root rot. Note the reddish-orange flesh of the roots.

spring, it is no surprise to now see trees declining quickly. This is confounding the tree collapse issues we are seeing across the province as *Phytophthora* can be confused with rootstock fire blight and Sudden Apple Decline (SAD) but management of these diseases are very different. Send a sample of the diseased roots or graft tissue to a qualified pest diagnostic laboratory for accurate identification.

If *Phytophthora* has been confirmed, there is no cure for this soil-borne pathogen once infection has become established in a tree. However, preventative treatments are available to limit spread. For non-bearing trees only, apply a soil drench of Ridomil Gold. Since this product only moves upward, do not apply as a foliar spray. For bearing trees, foliar applications of Aliette can be used. This product moves both up and down so will be taken to the roots.

Orange spore cushions (Fig 4) associated with ***Nectria* or European canker** have been found this week along with limb dieback (Fig 5). The strikes and cankers can often be confused with fire blight if the orange spore cushions have not developed; however, *Nectria* is not as contagious as fire blight. Typically a canker on a branch will not affect the rest of the tree and can be managed by simply pruning off the infected tissue. A canker on the main trunk though can result in the death of the tree if it expands or girdles the trunk. This spring has been ideal for development of *Nectria* as most infections occur when temperatures are 10-16°C and moisture is present.

Humid and wet conditions in many areas this week have made for ideal summer disease infection periods. Keep note of when the last scab fungicide was applied. With the heavy rains, residues may have washed off, leaving fruit unprotected from diseases such as **sooty blotch, fly speck, black rot** and **bitter rot**. Frog-eye leaf spot (black rot) can be easily found in many orchards. Signs of fruit rot are now developing.

Calcium sprays going on for bitter pit may have some suppression on bitter rot activity, as well. OMAFRA trials have found calcium chloride (83-87% Ca) plus 0.1% non-ionic surfactant applied to Empire every 10-14 days suppressed the incidence of bitter rot and significantly reduced the number of lesions per fruit compared to water alone.



Figure 4. Orange spore cushions associated with *Nectria* or European canker.



Figure 5. Limb dieback of *Nectria* or European canker.

Insects

The spray timings for the 1st generation of most significant moth pests are wrapping up across the province.

- **Obliquebanded leafroller** egg hatch is on-going in the latest regions. However, flight of this summer generation has been extended in many other areas past the degree day timing which suggests egg hatch could also be longer.
- Multiple covers have had to be applied for **codling moth** due to residue wash-off in the heavy and/or frequent rains.
- The second generation **oriental fruit moth** flight is picking up with spray timing quickly approaching in early regions.
- Peak flight for **dogwood borer** occurred early July for most areas and trunk sprays have begun in some high pressure sites.

Signs of damage from 1st generation oriental fruit moth and codling moth should be noted at this point including terminal flagging (Fig 6) or small entry holes at calyx or side of fruit with frass (Fig 7). Orchards east of Toronto and across to Georgian Bay may see similar damage caused by **European apple sawfly**; however, this damage occurred earlier in fruitlet development and has likely aborted with June drop.



Figure 6. Terminal flagging caused by oriental fruit moth.



Figure 7. Small entry hole on side of fruit with brown frass caused by codling moth.

The end of a generation is a good time to change pheromone lures in monitoring traps for oriental fruit moth, codling moth, obliquebanded leafroller and San Jose scale. Most pheromone lures have a lifespan of 6-8 weeks so changing lures per generation will ensure maximum effectiveness.

Apple maggot traps have been installed across the province and catch has begun. However, likely due to the cool weather, activity has been relatively low. With catch on yellow sticky boards, it is important to differentiate between male and female adult flies (Fig 8). Males generally begin emerging before the females, but by peak emergence (August), the sex ratio is about 1 to 1.

There is concern that the water-logged, loose soils will provide excellent conditions for apple maggot emergence this year. As well, pressure was relatively low in 2016 likely due to the dry weather. Emergence is closely linked to soil moisture – in dry years, pupae can remain in soil until environmental conditions become more favourable the following growing season. Many growers are anticipating we will see higher pressures this year.



Figure 8. Apple maggot flies. Note the rounded abdomen of the male (left) and pointed abdomen of the female (right).
(Photo: Dr. Rob Smith, retired, AAFC Kentville)

Timing for management depends on the type of trap. Sexually immature males and females are attracted to the yellow sticky boards, which mimic nectar sources. Insecticides are not needed until 7-10 days after first fly, particularly a female, is captured. Sexually mature females ready to

lay their eggs are attracted to red spheres, which mimic ripe apples and indicate an insecticide should be applied immediately as damage is imminent.

Apple leafcurling midge egg laying has begun. Leaf damage caused by this generation will likely start over the next couple of weeks. Overall, leafcurling midge pressure has been rather low this year across the province. It's possible the wet soils have knocked populations back.

Very little fruit damage caused by **San Jose scale** can be found. Although crawlers are still being caught on sticky tape, most of the generation would be forming a waxy covering so any control applied now would not be effective. The 2nd generation adult flight is still low but is expected to increase in coming weeks.

Aphid activity continues. In orchards with new growth, **green apple aphid** colonies have increased (Fig 9). Once the terminals have set, these populations should drop off. **Woolly apple aphids** are moving to the outside canopy and fruit clusters (Fig 10). It is time to reassess how Movento applied at scale timing performed. Woolly apple aphid populations can be suppressed by a number of natural enemies. Late season broad spectrum insecticides may impact the beneficials that are present in the orchard.



Figure 9. Green apple aphid on new terminal growth.



Figure 10. Woolly apple aphid on new apple shoots.

Potato leafhoppers are quite active (Fig 11). Hopper burn and leaf cupping can be easily found in many orchards (Fig 12). This is caused by a toxin in the leafhopper's saliva that blocks vascular system flow, preventing normal movement of water and nutrients to the affected area. In most high vigour blocks, leafhopper damage is manageable, particularly once terminals harden off. However, nursery trees and non-bearing blocks require control at first sign of injury.



Figure 11. Potato leafhopper nymphs on underside of apple leaf.



Figure 12. Hopper burn and leaf cupping caused by potato leafhopper.

Mite activity still remains relatively low. Some orchards are beginning to see **apple rust mite** populations building though little damage to report to date.

Re-Evaluations

The Pest Management Regulatory Agency (PMRA) has released two re-evaluation proposals in recent weeks which are outlined below:

- **Matador/Silencer (lambda-cyhalothrin):** Cancellation of all food crop and feed uses in Canada due to potential risks of concern from dietary and residential exposure. Consultation period is open for comment for 90 business days from June 23, 2017 to September 21, 2017. For more information, click [here](#).
- **Imidan (phosmet):** Phase out of all uses in Canada due to concerns for worker exposure during and post-application. Consultation period is open for comment for 90 business days from June 20, 2017 to September 28, 2017. For more information, click [here](#).

Grower comments on value of product, use pattern (eg., closed cab, border spray, etc) and availability of alternative effective control products or strategies is important during this re-evaluation process.

Events

The University of Guelph and Farms at Works are hosting a free event on August 9, 2017 in Alymer, ON called Farm Tour: Native Pollinator Habitat on Farms. This farm tour will explain and demonstrate how to encourage pollinator habitat on your farm, provide information about many of the services provided by pollinators and showcase native pollinators in action. To register, click [here](#).