Summer Diseases of Apple: To Spray or Not to Spray

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To spray or not to spray, that is the question for summer disease control in apple and pear, especially during a dry year. Summer diseases of pome fruit can significantly reduce the quality and marketability of fruit. Severe disease is favoured by cool wet springs, with extended periods of wetness from summer rains, and cool weather prior to harvest. But what is the risk of these diseases causing significant damage during this dry season?

The two most important summer diseases of apple and pear in Ontario are:

- Sooty blotch caused by the fungi *Gloeodes pomigena*, *Peltaster fructicola*, *Geastrumia polystigmatis*, *Leptodontium elatius*
- Fly speck caused by the fungus *Schizothyrium pomi* (*Zygophiala jamaicensis*).

Sooty blotch appears as brown or green blotches on the outer skin of the fruit. These blotches are in fact dark, tiny fruiting structures of the fungi, all connected with a loose, profusely branched thread-like fungal growths. On the other hand, flyspeck appears as small, shiny black dots that cluster in groups of a few to about 100 (Figure 1). These dots are the sexual fruiting structures, also connected by inconspicuous thread-like growth. Neither of these fungi penetrates the epidermis, growing superficially on the surface. The result is dirty looking fruit, unappealing to consumers. Both diseases have similar biology, occur around the same time and can be managed the same way.

Both diseases overwinter on branches of wild woody plants, in addition to apple and pear. Infection and disease development are favoured by extended periods of wet, humid weather during late summer. Although wet weather has been sporadic so far, the development of these diseases can still occur quickly if favourable conditions occur.

Fly speck produces ascospores (they will be the primary inoculum released next spring from before bloom until 10 days after petal fall). This is similar timing for apple scab spore release. Fungicides such as Flint or Sovran applied for apple scab in the spring also control fly speck primary infections. Unlike apple scab, very few of the fly speck ascospores would reach the small developing fruit in the spring. Regardless, these spores do reach alternative wild hosts near orchards, and will initiate infections that produce secondary inoculum. This secondary inoculum is blown from the alternative hosts into the orchard throughout the summer. Look for these diseases on fruit in border trees in close proximity to wooded areas. The fungi do not grow well, if at all, when temperatures reach above 29°C. Researchers in North Carolina have shown that 270 hours of accumulated wetness either due to rains or dew is required to produce symptoms of fly speck. This was verified in trials conducted by Cornell University researchers in 2003. Because of our warm spring and early summer temperatures, any spring infections may not show up until the weather turns cool and wet in late summer.

Dr. Dave Rosenberger, plant pathologist at Cornell University, calculated that the initial infection on wild hosts requires 270 hrs of leaf wetness in the spring, and that an additional 270 hours of fruit wetness in mid-summer is required for fruit infection. This means that a grand total of 540 hours of wetness after petal fall are required before symptoms actually appear in the orchard. During a dry year, fungicide sprays are not necessary for summer disease control until later in July.
To spray or not to spray for summer disease this year is still a good question. Last year was a cool, wet summer, with ideal conditions for summer diseases to buildup on alternative hosts. The overwintering inoculum on wild hosts was likely higher than in previous years. Although conditions have not been conducive for summer diseases so far this season, and symptoms may not show up until mid August, a registered fungicide at the end of July will ensure protection of fruit. Poor summer disease control is usually a result of poor spray coverage. Spray coverage for summer fungicides is better when fruit are smaller and limbs are not bent with fruit loads. A fungicide application at the end of July will also help prevent powdery mildew, black rot and white rot.

A single application in late July may provide season long control of summer disease during a dry year. However, an application at the end of July followed by another application 3 weeks later is a safer strategy. If more than 5mm (2 inches) of rain falls after the second application, another application may be necessary in early September, particularly on varieties that won’t be harvested until late September. So keep an eye to the sky to decide if a third fungicide application is necessary.

**What Insects Are Active in Peach Orchards Now?**

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There are many insects active in the average peach orchard right now, but most of them are beneficial or of no concern from a pest management standpoint. Here’s a quick review of the types of insects you will most likely notice when walking through an orchard. With the huge diversity of insects out there, you will certainly find many more if you look carefully! Most insect species are site-specific and can be very different even between adjacent orchards. Read “Notes on Insects and Mites” on pages 180 – 184 in OMAF Publication 360, *Fruit Production Recommendations 2004-2005* for more information on fruit pests.

**Grasshoppers:** Various species of grasshoppers are active and abundant in many orchards at present. These insects are readily identified by their well-developed hind legs which are adapted for jumping. Grasshoppers are typically defoliators. Although they will sometimes feed on damaged fruit on the orchard floor, they do not usually attack fruit on the trees.

**Japanese beetles:** There has been a large flight of JB this year which was expected after last year’s relatively wet summer. Adult female JB lay eggs in soil, and greater egg-laying success and larval survival occurs in wet seasons. The adult beetles, with their disconcerting ability to sound like wasps when flying by your head, as well as climbing into your clothing and scratching with their sharp claws (they do not bite you) are readily identified by their copper and green metallic colour and white tufts (Figure 1 – see the July 21, 2005, Issue 18 Volume 5 of *Hort Matters*). Although JB can damage many kinds of fruit and foliage, they prefer to dine on previously damaged (often bird-damaged) or over-ripe fruit. Most of their feeding has been confined to leaf feeding but late this week, hungry beetles were observed attaching harvestable fruit. If more than 5-10% of leaves are being damaged, or if the beetles are feeding directly on fruit that would otherwise have been marketable, an insecticide may be warranted. Imidan is labeled for JB on several fruit crops but be careful of pre-harvest interval times and make sure the pH of the spray water is between 5.5 and 6.5. Keep in mind that the flight period of this pest can be quite long; more JB will fly in after treatment and it may take some time to see the effects of a spray.

**Earwigs:** Earwigs can be distinguished from other insects by the presence of paired cerci, or forceps, at their posterior end. They are nocturnal and hide during the day (contrary to popular belief, they do not make a habit of crawling into people’s ears). European earwigs are present in many orchards but only become an issue when they are found inside split peaches. The insects are not causing any damage; they are just taking advantage of protected areas to live and feed.
Stink bugs: There are several kinds of stink bugs that may be found in orchards but they are usually in very low numbers and many species are beneficial predators. If you want to distinguish between stink-bug friends and foes, note that plant-feeding stink-bugs have a long, narrow, needle-like proboscis or “beak”, while those of predators are broad and sword-like. These shield-shaped bugs occasionally damage peaches (leaving a surface scar similar to plant bug or even leafroller feeding), but they are generally in such low numbers that they can be ignored. An invasive species – the brown marmorated stink bug – is of concern in New Jersey, Maryland, Delaware and Pennsylvania, but has not been reported in Ontario.

Tarnished plant bugs: TPB and other plant bugs are relatively easy to spot at this time of year especially in orchards where weeds are healthy. Look first on pigweed, but keep in mind that TPB has over 300 species of host plants. Peaches should be monitored twice weekly for signs of new TPB feeding – small water-soaked punctures that will later ooze and drip. Old damage appears as “cat-facing” (distorted fruit growth) or relatively small calloused or corky looking spots. More than 2% new damage at this time of year may warrant treatment, but with a second spray likely in most orchards for second generation oriental fruit moth, count on that to take care of most plant bug problems.

Oriental fruit moth: Well you won’t normally see OFM flying around the orchards, but if you are monitoring with pheromone-baited sticky traps, you should see these moths in the traps. The second generation flight has been quite prolonged according to monitoring in Niagara by KCMS. The advice on the Crop Pest Alert phone message (905-562-4345 or 1-800-610-7347) should be followed: a prolonged first generation has led to a long second generation flight and pyrethroids used for this pest are likely to have a shorter period of efficacy with the high temperatures we experienced in July.

Peachtree borer: Adults of this borer are active now and will be until September. Although one of us (Carter) caught one bare handed in an orchard on July 28, a far better monitoring method is to use pheromone-baited sticky traps if you have a history of this pest. Otherwise, inspect bases of trees for sawdust-like frass (insect excrement) in exuded gum, especially near wounds in the bark. A long dry spell followed by rain usually triggers increased emergence of this species. If you are using sticky traps, remember that several different types of clear-winged borer moths may be caught in those traps so it’s important to know how to identify them. Also, if you see dark-winged moths flying in the daytime, it is possible that you are seeing harmless look-alikes (such as the Virginia Ctenuchid moth) rather than peachtree borers.

European red mite: In a hot, dry season, we would expect outbreaks of ERM to occur, especially along dusty laneways. Indeed, some locations are seeing a noticeable build-up of this mite pest. Populations are site-specific and outbreaks localized in nature – which means that monitoring is important. Thresholds for ERM are not well established and would vary depending on the growing conditions, cultivar, number of beneficial mites and other predators present, and tree stress (e.g., peaches may tolerate 30 motile mites per leaf in September but would tolerate much lower numbers before harvest). Dormant oil used in the spring is still the best defense against ERM but if a miticide is needed during the growing season, note that preharvest intervals for miticides are 7 – 14 days.
Earthen water reservoirs for irrigation or other farm uses may be constructed above ground, below ground or a combination of above and below. Construction methods and size will depend on the water source for the reservoir and the volume of water required for the farm. Construction of above ground reservoirs is especially important as the failure of the reservoir wall could cause flooding and damage or even injury.

**When to hire a consulting engineer?**
The need to hire a consulting engineer will depend on the risk associated with your reservoir. These may be risks to other people and property, or the magnitude of the financial risk you bear for the construction of the reservoir. Very large and expensive construction projects are best designed by a consulting engineer as this will reduce the likelihood of failure of the reservoir. If the reservoir has a raised bank greater than 5ft it should be designed by an engineer. Reservoirs close to neighbouring properties, houses, roads, railways etc. should also be designed by an engineer because of the potential risk to people or property if the reservoir should fail.

**Location**
Ideally reservoirs should be constructed away from roads, railways, or other areas of public access. Reservoirs should also be located away from neighbours’ property or laneways and especially away from houses or buildings. Reservoirs should be constructed at least 50ft from municipal drains, in order to allow for maintenance on the drains. Fencing of the reservoir may be necessary if it is located in a highly populated area.

**Shape and dimensions**
All reservoirs should have inside walls with 2:1 slopes (or more gentle). Steeper slopes lead to bank failures. For raised reservoirs outside slopes should be 3:1 so that they can be vegetated and mowed. The top of the banks should be at least 10-16 ft wide so that they can be used for vehicle access or to use a boom mower.

**Leaks**
Reservoirs must have a clay lining of at least 15% clay in order not to leak. If soil with sufficient clay content is not available on-site it will have to be brought in or consider a synthetic liner.

**Erosion (weather damage)**
Before construction remove topsoil from construction area. After construction replace topsoil on outside banks of reservoir.

*Outside banks of reservoir must be re-vegetated after construction. This will reduce the potential for erosion of the banks.*
On the inside banks a band of armour stone should be placed around the reservoir at the high water level. This armour stone should be backed by a geotextile. This will reduce damage to the banks from wave action when the reservoir is full.

**Permits**

If you are planning to construct near a river creek or stream you will need a permit for construction from your local Conservation Authority (if you are in the designated flood plain).

In order to take water from any source (river, creek, ditch, well, pond, tile drains etc.) you require a **Permit To Take Water (PTTW)** from the Ministry of the Environment.

Your local MOE office may be contacted by calling:

- Kingston 1-800-267-0974
- Toronto 1-800-810-8048
- London 1-800-265-7672
- Thunder Bay 1-800-875-7772
- Hamilton 1-800-668-4557