



HORT MATTERS

OMAFRA Specialists in Horticulture and Specialty Crops.



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Wonderful Wind Protection Anne Verhallen, Soil Management Specialist

Thunderstorms and intense cold fronts have been bringing high winds into Ontario on several occasions this spring. How did your soil fare? If it was loose and bare for planting odds are you and the neighbours have been exchanging topsoil – an expensive activity. You’ve lost fertility, possibly pesticides and soil organic matter. Last year with some soil tests, a quick calculation showed that this was worth \$13 per acre per wind event, it’s probably considerably more this year with the increase in fertilizer prices.

So what to do? Early spring planted cover crops have been highly effective this year. Take a look at cover crop pictures below. Barley or oats at 1.5 to 2 bushels per acre, planted in early spring did the trick to protect tender, emerged seed corn and newly planted tomatoes recently. And the cost benefit? As this grower says, “There is no excuse for being blown out anymore!” Newer herbicides and use of the GPS systems to selectively till out the row area means a lot more options for wind control with cover crops.



Wind eroded fence row



Sand blasted seed corn



Shows carrots well established among a barley interseeded cover this spring



Tomato transplants happy in their killed barley wind strips

Helping Graminicides Work

Leslie Huffman, Weed Management Specialist (Hort)

Grass escapes often emerge in June and July. Here are some suggestions to maximize the performance of postemergent grass herbicides:

- Apply to actively growing grasses. The chemical needs to be absorbed into the grass and move to the growing tip.
- Use the correct rate for the type of weed. Generally the low label rate controls annual grasses, and the high rate is needed to control quackgrass.
- Apply at the susceptible growth stage of the weed. Annual grasses need to have 1 or 2 leaves emerged, and should be sprayed before the 6 leaf stage. Quackgrass generally has a shorter window, but needs at least 3 leaves emerged. Check the label for each grass species.
- Wait until a good flush of weeds has emerged. Grasses emerging after treatment will not be controlled.
- Use an adjuvant if labeled. Poast Ultra requires the addition of Merge, while Venture L has the required adjuvant included.
- Remember that broadleaf weed escapes will not be controlled.
- Note the preharvest interval:

Preharvest Interval (PHI) for Tree Fruit & Grapes (days)

Herbicide	Apples	Apricots	Pear	Cherry	Peach & Nectarine	Plum	Grape
Poast Ultra + Merge	25	25	25	25	25	25	NR
Venture L	NL	30	NL	NL	NL	NL	30

NR—Not registered

NL-not listed on label

Preharvest Interval (PHI) for Berries (days)

Herbicide	Strawberry	Raspberry & Blackberry	Blueberry	Cranberry	Currant & Gooseberry
Poast Ultra + Merge	25	37	15	60	NR
Venture L	30	30	30	NB	NR

NB - registered for non-bearing only

Preharvest Interval (PHI) for Vegetables (days)

Herbicide	Assure II	Excel Super	Poast Ultra	Select	Venture L
Asparagus		P	40		NL
Beans, snap	30		15		
Beets, red					
Cole crops		*	70		40
Carrots			49		50
Celery					
Cucumber			30		30
Garlic			50		
Ginseng					
Herbs (mints)			30		
Leeks					
Lettuce					
Vine Crops			30		
Onions		38	50	45	42-60
Parsnips					
Peas		75	30		
Peppers			30		
Potatoes		35	80	60	90
Rutabaga	30				45
Specialty Veg.			30		
Spinach			30		
Sugar beets	60-80		85		90
Sweet Corn					
Sweet Potatoes			30		
Tomatoes		55	60		60

NR - not registered, NL - not listed on label, P - postharvest

* Broccoli - 44; Cabbage - 35; Cauliflower - 43

Wildly Fluctuating Temperatures Affect Insect Flight Patterns

Hannah Fraser, Entomology Program Lead – Hort Crops and Kathryn Carter, Pome Fruit IPM Specialist

(Revised from “Oriental fruit moth: next generation or tail end of the first one?”, June 8, 2006, by Hannah Fraser, Neil Carter, and Kathryn Carter)

It seems that the fluctuating spring weather we've experienced this year has resulted in some difficulties in interpreting insect captures in pheromone traps and some confusion on where we are in terms of the generations of a few moth pests. One specific example we'd like to discuss this week is oriental fruit moth (OFM), but many of the concepts can also be applied to other moth pests.

Heat drives the growth and development of insects and mites. Insect growth and development can be inhibited at both minimum and maximum temperatures. Knowledge about the base temperatures required to drive development in specific insects has been used for decades to help optimize the application of pest control products. In addition to its influence on insect growth and development, temperature can have a profound effect on insect activity.

Just as there is a base temperature below which no development occurs in immature forms, there is also a minimum temperature required for activities including adult flight and searching for a mate. When it's too cold, adult OFM are not active in the orchard. They are not looking for mates; females are not laying eggs. But they are still out there. When temperatures rise, mated females get back to laying eggs. In addition, some of the overwintering generation that didn't quite make it to adulthood prior to things cooling down will continue their development and emerge to mate and lay eggs. These “late bloomers” represent the stragglers (sometimes in high numbers) that didn't make it to adulthood before the cool temperatures hit.

The result can be what is being reported in some tree fruit production areas this spring. It was warm, OFM flight was on the upswing and an apparent peak had, in some cases, been reached. Then things got quite cool, enough so for moth activity to cease. But it's been hot – really hot – over the last week. With several days of hot weather, adults are once again being caught in pheromone traps.

Many people have wondered if the “new” activity marks the beginning of the second generation of OFM. The answer is “no”. There haven't been enough heat units (degree days) accumulated for this to have occurred. OFM have a base development temperature of 7.2°C (45°F) and require an accumulation of about 550 DDC base 7.2°C (963 ± 46 DDF base 45°F) to go from an egg to an adult (generation time). As of last Friday, when the question came up, we hadn't reached that yet. So ... the adults that are being caught now represent the tail end of the overwintering generation. The same thing

happened in the spring of 2006 – we know, because we wrote a very similar article at this time two years ago and we've been able to borrow great deal from it!

It's during years such as 2008 that we need to stress the importance of using as many monitoring tools as possible. Pheromone traps will provide information on insect activity, but in order to understand what's actually happening at a population level will also require the use of degree-day models. Use available degree day models to help time insecticide sprays, but keep checking those pheromone traps (don't take them down too early) to track extended or unusual activity! While it can be tempting save time and money by not putting traps up for overwintering generations of OFM (since timing for sprays coincide with petal fall in apple), there can be some risks associated with this. If traps aren't up in the orchard to note delayed emergence important spray applications may be missed.

All of this can lead to challenges in management, and in some cases, additional insecticide sprays by the grower. If numbers being caught in traps haven't tapered off yet and the last spray was a couple of weeks ago, a second spray may be required to protect shoots and / or developing fruitlets. All growers should be aware of the residual activity for the pesticides they are using. Keep in mind that at this time of year, the trees will outgrow the residues quickly. If the pesticide has worn off, and traps are still catching a significant number of OFM (for arguments sake, let's say more than a third to a half as many as during the first peak), then a second application of insecticide should be applied. For resistance management, make sure that the 2nd insecticide application is the same product that was used for the first spray - don't rotate chemistries within a generation (rotate between generations instead).

Be aware that a split or bimodal peak in the overwintering generation usually translates to the same thing occurring in the second flight. For this reason, in areas where a bimodal peak (also called a “peak and shoulder”) has been observed, growers using insecticides to manage OFM should be prepared to apply two sprays to manage the second generation, as indicated by activity in pheromone traps during the next flight period. Growers who are using mating disruption for the management of OFM in apples and / or tender fruit have the luxury of not having to worry about this.

Lesser Peach Tree Borers Now Flying

Hannah Fraser, Entomology Program Lead - Hort Crops

OMAFRA staff are evaluating several types of mating disruption dispensers for managing clearwing borers in peach orchards and comparing these to conventional insecticide-based programs (Project runs from 2007-2009 in Niagara). As a result, we have pheromone traps up for both (greater) peach tree borer (PTB) and lesser peach tree borers (LPTB). Our first LPTB were caught on Friday, June 6th, 2008 (about two weeks behind 2006 and 2007). For those interested in managing these insects, read on!

Peach trees are subject to attack by two clearwing borers, the (greater) peach tree borer (*Synanthedon exitiosa*) (Figure 1) and the lesser peach tree borer (*S. pictipes*) (Figure 2). As their names suggest, moths from this group possess transparent wings with striking black markings along the margins and shiny black abdomens with faint yellow banding. These day-flying moths are often mistaken with wasps. While the moths are quite beautiful to behold, their larvae can cause considerable damage in orchards when left unmanaged.



Figure 1. Peach tree borer adult – note clear wings. Adult males have a wingspan of 25-28 mm. Males have faint yellow bands on 3rd, 4th 5th and 6th abdominal segments.



Figure 2. LPTB adult in trap. Adult males have a wingspan of 15-23 mm. Males have faint yellow bands on the 2nd and 4th abdominal segments. Banding patterns may be hard to see on trapped specimens. Examination of the scales below the antennae and in front of the eyes (under magnification) will reveal pale patches.

Lesser peach tree borer (LPTB) and (greater) peach tree borer (PTB) are site specific pests. While historical wisdom suggests that PTB is more common in Niagara and LPTB a problem in Essex/Kent, both species may occur in mixed populations. Recent work in Niagara indicates LPTB populations are causing economic damage in some peach orchards. Damage is caused by larval feeding on callus tissue, which is formed by the cambium around and over wounds. Consequently, their feeding interferes with the tree's natural defence system, exacerbating previous injuries and allowing entry by other pests or pathogens. If left uncontrolled, trunks and limbs can be girdled, resulting in the death of the affected limb or the tree.

Peach tree borers typically attack the roots and the trunk near the soil line (although I have detected them on the trunk and occasionally in scaffold cankers). They seem to be more common in young plantings, where infestation of whips by a single larva can result in tree death. Lesser peach tree borer larvae take advantage of previously damaged plant tissue (cankers, pruning scars, winter-injury, other insect damage) to establish themselves. They are found under the bark of injured trunks, scaffold limbs or branches, and are commonly associated with cankers. Signs of infestation include frass (insect excrement) at the soil level and in or around cankers. The frass appears as rusty brown granular material that is often mixed with ooze in cankers (Figure 3). Digging around the frass and ooze will often reveal a feeding larva (Figure 4). At this time of year, as moths are beginning to emerge, it is not uncommon to see pupae or pupal cases sticking out of damaged areas.



Figure 3. Frass and ooze in canker.

The general biology of both pests is similar. Both species overwinter as larvae, completing development the following spring/summer before emerging as adults. However LPTB overwinters anywhere from a tiny second-instar larva to a large, mature sixth instar larva. Because of the variable stages

of development of overwintering larvae, emergence of the LPTB adults is not synchronous and can occur over a very long period, from late May to late September, without any obvious peaks. Monitoring in Niagara indicates PTB adults emerge later than LPTB adults, usually by early to mid-July, and their flight continues into September. A peak is not always evident. Adults mate shortly after they emerge and females lay eggs soon thereafter. A single female is capable of laying hundreds of eggs. Eggs hatch within 7 to 10 days, depending on the weather, and larvae begin feeding under the protection of the bark.



Figure 4. Clearwing borer larva.

Pheromone traps for both species are commercially available and should be placed in the orchard mid-May, before the anticipated onset of flight. If you're not certain which pest(s) dominate in your orchard, traps can also help you to determine where to direct efforts in terms of timing insecticide applications. Traps for LPTB should be hung in the tree at a height of approximately 1.5 m off the ground, at the location where most mating activity occurs. Traps for PTB should be placed lower on the tree, closer to the ground. The pheromone for LPTB is species-specific and should not trap other species of clearwing moths (in contrast, the pheromone for the GPTB will also trap dogwood borer and some other clearwing moths). With that being said, proper identification of captured insects is essential, as other moths and other insects may inadvertently end up in pheromone traps (Figure 5).

Insecticides are generally applied shortly after flight begins (either species), timed to coincide with first egg hatch (not peak activity), about 7-10 days after the first moths are caught in pheromone traps. Thiodan / Thionex (endosulfan) (up to 3 applications) or Sevin (carbaryl) are registered for both LPTB, and should be applied so that thorough coverage of the trunk and lower limbs is accomplished. Thiodan / Thionex are registered for PTB. Remember, the female moths will search for even very small wounds, and the larvae

are protected once they enter the tree, so good coverage is critical. A hand gun is suitable for smaller plantings; an air-blast sprayer can accomplish the task with the lower nozzles open, high water volume and slow driving speed. Two or three applications at 5-10 day intervals are needed in areas with a history of high pressure – remember that these moths are active pretty well all season. Keep preharvest intervals in mind when selecting insecticides (PHI is 15 days for endosulfan; PHI is 1 day for carbaryl on peach or 5 for apricots). Avoid spraying the fruiting area. All new trees should have an endosulfan dip before planting. Note that the residual activity of registered insecticides does not provide coverage for protecting trees against infestation when considering the length of pest activity.

Insecticides can help deal with borers if applied correctly, but don't forget about the importance of maintaining vigorous, healthy plants and preventing mechanical injury - these practices can help deny entry into peach trees. It is also helpful to prune out broken limbs and limbs with previous borer damage.

Isomate P is registered for use in managing PTB, but is not considered effective for managing LPTB (in contrast, Isomate LPTB, which is not yet registered for use in Canada, can manage PTB when applied at a higher rate). Mating disruption products can provide season-long management of clearwing borers. We'll keep you posted on the results of our demonstration trials with mating disruption products Isomate P (PTB), Isomate Dual (both species) and Isomate LPTB (added in 2008) and their performance relative to insecticides.



Figure 5. Relative size of PTB, LPTB and dogwood borer (pest of apples).