



ORCHARD NETWORK

For Commercial Apple Producers

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Orchard Management

Ready for Bloom?

Leslie Huffman, Apple Specialist, OMAFRA, Harrow

Apples will be blooming early this season, and so talk to your beekeeper soon. Pollination is a critical task in your orchard, but only the bees can do it for you. The best you can do is order enough hives to do the job, and treat them well when they are in your orchard. Here are some pollination facts to consider:

- Larger apples result when pollen is sourced from more than 1 cultivar.
- Each bloom requires 8 - 24 visits by pollinators.
- A well-designed orchard reduces the number of bee visits required.
- Bees only move across 3 to 4 rows, especially in higher density plantings.
- Pollen tends to travel only a few trees down the row.
- Be aware that triploid cultivars like Mutsu, Jonagold do not provide viable pollen, so a third cultivar must be interplanted.

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ORCHARD NETWORK

May, 2010

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This issue of the **Orchard Network Newsletter** was compiled by Client Service Representative, Patti Arts, OMAFRA, Kemptville

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How to get the most from your pollination dollars:

- Request strong, healthy colonies, especially if cool temperatures return.
- Provide 2 - 3 honeybee colonies/ha for satisfactory pollination.
- Protect beehives from cold winds. Group the hives together in a sunny, sheltered area. Use a natural windbreak or erect a temporary one with straw bales or orchard bins.
- Situate the colonies so that the morning sun warms the entrance.
- Provide fresh water especially if the bloom season is dry. Float sticks in a shallow tub to allow bees to land without drowning.
- Avoid contaminating open water that may attract bees eg. puddles near the sprayer loading area.
- Work with your beekeeper to deliver hives just as bloom begins, and remove them before post-bloom sprays are needed
- Avoid bee poisonings at all costs – by your actions, and your neighbours.

Using Apogee - Soon!

Leslie Huffman, Apple Specialist, OMAFRA, Harrow

What Apogee is:

- plant growth regulator (PGR) registered on apples since 2005
- active ingredient - prohexadione-calcium
- registered by BASF and marketed by Engage-Agro

What Apogee does:

- reduces terminal shoot growth
- inhibits gibberellins (plant hormones that control cell elongation)
- trees have same number of shoots, but shoots are thicker with shorter internodes

Why use Apogee:

- reduce shoot growth by 20–60%
- reduce dormant and/or summer pruning time
- improve sunlight penetration into canopy
- Improve fruit colour
- improve spray coverage
- reduce the incidence and severity of fire blight on shoots,

Note: Apogee does not reduce blossom blight infections

How to use Apogee:

- **First application:** when new shoots are 2.5-5 cm (1-2") long – timing may differ between cultivars

Note: This first application timing may occur in late bloom or petal fall

- **Rate:** depends on the size and vigour of your trees.
 - for medium to high vigour - 45 g product per 100 L (125 ppm)
 - for low to medium vigour - 27 g product per 100 L (75 ppm)
- **Repeat applications:** Usually 2 applications are used – maximum of 4 applications can be used at 14–21 day intervals. Required: when
 - more growth control is needed
 - protection against shoot blight is an objective
 - growing season is long
 - crop load is light
- **Maximum seasonal rate:** 5.4 kg/ha of Apogee.
- **Coverage:** Thoroughly wet the canopy. Application rate of 1000L water/ha is the dilute rate and can be adjusted for Tree Row Volume.
- **Adjuvants:** Include Agral 90 to improve uptake. For hard water, add AMS fertilizer (high quality, greenhouse grade).

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Tips to maximize effects of Apogee:

- Don't be late. Response is drastically reduced if first application is later than 5 cm shoots.
- Ensure there is sufficient leaf area for Apogee to be translocated into the leaf.
- Apogee is non-toxic to bees. The first application can be made before bees are removed from the orchard.
- Use Apogee on fire blight-sensitive, high-value, and/or vigorous growing cultivars.
- Try Apogee on terminal bearing cultivars such as 'Cortland', 'Golden Russet' and 'Northern Spy', for a positive change in tree habit
- Leave some trees unsprayed – and flag them – to compare results. Record the pruning times compared with untreated trees.
- Direct sprays where vigour needs to be reduced: tops of vigorous trees and to the lower parts of small taller trees

Precautions when using Apogee:

- Apogee may cause fruit cracking in Empire and Stayman.
- Apogee may increase fruit set, especially at concentrations above 125 ppm, so thinning programs may need to be more aggressive.
- Do not tank mix with calcium sprays to avoid tank precipitate, clogged nozzles and screens, and reduced tree response.
- Apogee does not control fire blight blossom infections.

Help! I Need A Food Safety Audit - Where Do I Start?

Sandra Jones, On-Farm Food Safety Program Lead, OMAFRA, Guelph

Your buyer has asked for a food safety audit so now what do you do?

First, obtain a commodity-specific Canadian Horticultural Council's (CHC) On-Farm Food Safety manual and read it. These manuals can be obtained through your commodity association or if you purchase packaging material, you are automatically a member of the Ontario Fruit and Vegetable Growers Association and are eligible to access the CHC manuals at minimal or no cost. Contact CHC National Office at (613) 226-4880 ext 217 or kmackimmie@hortcouncil to get a username/password to download a copy of the CHC manual from the CanadaGAP website (www.canadagap.ca/). CHC has manuals for

- Potatoes
- Tree and Vine Fruit
- Leafy Vegetable and Cruciferae
- Small Fruit
- Combined Vegetables

• Greenhouse Production

Go through the manual step by step. Pay special attention to the record keeping templates. You do not need to use the specific templates but you do need to record all the information on these forms in your own records.

You do have a choice to use another food safety manual but be aware that you will be audited against a CHC developed food safety checklist. It will be your responsibility to ensure you are meeting the requirements outlined in the CHC manuals.

Next, go on to the CanadaGAP website www.canadagap.ca/ and enrol in the certification program. There are a number of different certification options. Usually your buyer will guide you to which certification option to use. For an individual producer, you can have a fixed audit cycle every 4 years or a random audit cycle. You also must choose your Certification Body – either QMI-SAI Global or Guelph Food Technology Centre. You should call the Certification Body (CB) and ask about their base audit rate, costs for additional audit hours on-farm and costs for auditor travel expenses to determine which CB works best for you.

Download a copy of the Audit Checklist (under Tools on the CanadaGAP website) and review the document before the audit. This checklist is what the auditor will use to evaluate your operation. Make sure you understand what is being asked so that you can be prepared. The audit should be done during the production cycle, as close to harvest as possible or at a time when the auditor can get a good picture of your practices. Preparing for an audit can be a bit nerve racking but keep in mind that the purpose of an audit is not to fail you. And if this helps relieve some of that anxiety- at the CHC Annual General Meeting this past March, a progress report of the CanadaGAP program over the past year outlined the average audit score was 91 per cent.

Biofumigant Cover Crop Project Begins

Anne Verhallen, Soil Management Specialist, OMAFRA, Ridgetown

This spring marks the beginning of a new project looking at using biofumigant cover crops during apple orchard renovation for replanting, and in tomato production. Chemical fumigants are expensive and are under close environmental scrutiny. Biofumigant options like cover crops and organic amendments such as manure or compost offer some potential to suppress nematodes and disease complexes in apple and tomato production systems.

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As part of the project, several apple replant sites will be established with cover crop this spring. A full suite of soil analysis will be collected on fertility, nematodes, disease pests and soil health. Mustard and pearl millet cover crops will be grown over the summer and worked into the soil. Apple trees will be planted in 2011 and the early growth monitored to determine the impact of the biofumigant treatments.

We will keep you abreast of the project through updates in this newsletter. For more information on this project contact:

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Postharvest

Effects of SmartFreshSM on the Quality of 'Honeycrisp' Apples during Storage

Dr. Jennifer DeEll, Fresh Market Quality Program Lead, OMAFRA, Simcoe

During the past several years, the effects of postharvest SmartFresh (1-MCP) treatment on the quality of 'Honeycrisp' apples during storage have been investigated.

Results from this multiple year study suggest that SmartFresh can have beneficial effects on certain fruit quality attributes of 'Honeycrisp'.

SmartFresh-treated 'Honeycrisp' had significantly lower internal ethylene concentration (IEC) and higher soluble solids content (SSC) and titratable acidity during storage. After 6 months of storage in air or controlled atmosphere at 3°C, SmartFresh-treated 'Honeycrisp' averaged 4-54 ppm IEC, 13.4-13.8% SSC, and 503-510 mg malic acid per 100 ml of juice, whereas similar non-treated control fruit averaged 100-130 ppm IEC, 12.2-13.2% SSC, and 369-480 mg malic acid.

Treatment with **SmartFresh also significantly reduced the development of peel greasiness**, which can become a major problem in 'Honeycrisp' after harvest and during storage. Apples treated with SmartFresh exhibited slight or no greasiness, while those not treated developed severe greasiness after 6 months of storage.

Firmness of 'Honeycrisp' apples does not appear to be affected by SmartFresh treatment. However, softening of 'Honeycrisp' is slow because it maintains a crisp texture throughout storage due to maintenance of high turgor potential and cell wall integrity. Therefore, large differences in firmness between SmartFresh-treated

and non-treated fruit (typical of other apple cultivars) cannot be expected to occur in 'Honeycrisp'.

SmartFresh has little effect on the incidence of external physiological disorders in 'Honeycrisp'. **Soft scald was not consistently reduced by SmartFresh** in air-stored apples and there was no significant difference in soft scald of CA-stored fruit with and without SmartFresh in any year.

The biggest concern of utilizing SmartFresh treatment on 'Honeycrisp' apples is the apparent exacerbation of internal storage disorders. The incidence of soggy breakdown, core flush, and internal disorders were consistently higher in SmartFresh-treated fruit, regardless of storage regime. However, when SmartFresh treatment occurred during delayed cooling at 10°C then this effect was not present. Therefore, given that delayed cooling is a recommended commercial practice when storing 'Honeycrisp', the use of SmartFresh should not result in higher incidence of such internal disorders.

The occurrence of physiological disorders in 'Honeycrisp' varied year-to-year during the course of this study and no one disorder was observed in all years of study. It is well known that climate and growing conditions can influence the development of disorders.

In summary, SmartFresh treatment has some positive effects on the quality of 'Honeycrisp' apples during storage, such as reduced internal ethylene concentration, higher soluble solids content and titratable acidity, and less peel greasiness. However, there appears to be little effect of SmartFresh on the incidence of external disorders and without delayed cooling the incidence of internal disorders can be increased.

Acknowledgement

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The Fundamentals of Cleaning and Sanitizing

John Henderson, Risk Management Specialist, OMAFRA, Brighton

Unclean food contact surfaces provide an ideal environment for the growth of food spoilage or pathogenic micro-organisms, can be a source of chemicals or chemical residues, and may harbour physical hazards. Any of these may adversely affect the quality and/or the

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safety of food, especially apple products such as unpasteurized apple cider.

The terms “cleaning” and “sanitizing” are often used interchangeably. In fact, they are very different.

CLEANING

Cleaning is the removal of unwanted biological, chemical or physical materials (commonly called soils) from surfaces.

Factors affecting cleaner performance include:

- Time – contact time on the surface being cleaned
- Action – physical force exerted on the surface
- Concentration - amount of cleaner used
- Temperature – of the cleaning solution
- Water – quality of the water used to prepare the cleaning solution
- Individual – how well the person performs the cleaning operation
- Nature – the composition of the soil
- Surface – the type of material being cleaned

Only cleaning chemicals listed on the CFIA’s *Reference Listing of Accepted Construction Materials, Packaging Materials and Non-Food Chemical Products* database should be used in food processing areas. The list may be accessed at: <http://active.inspection.gc.ca/scripts/fssa/reference/reference.asp?lang=e>. The list’s database format allows users to search 25 categories by product or company name.

SANITIZATION

Sanitizing is treatment of a surface with a chemical or physical agent (e.g. heat) to reduce disease and/or spoilage-causing microorganism to levels considered safe for public health. On food contact surfaces, sanitation must reduce microbial populations by 99.999 percent (a 5 log reduction) and on non-food contact surfaces the microbial population must be reduced by 99.9 percent (3 logs) in 30 seconds.

Use those only sanitizing chemicals listed on the CFIA’s *Reference Listing of Accepted Construction Materials, Packaging Materials and Non-Food Chemical Products*. It may be accessed at: <http://active.inspection.gc.ca/scripts/fssa/reference/reference.asp?lang=e>.

Regardless of the cleaning or sanitizing chemical used, **always follow label directions.**

A cleaning and sanitizer supplier can be an important partner in your selection of the most effective and efficient cleaning and sanitizing supplies. Good suppliers know the right questions to ask and have the expertise to help you choose the most appropriate chemicals.

CLEANING AND SANITIZING STEPS

Effective cleaning and sanitation follows a sequence of steps. It is important that each step is fully completed before the next one begins.

1. Prepare Area

Begin by removing or covering any exposed food, ingredients or packaging material in the areas to be cleaned. Cover sensitive electrical equipment and other equipment that could be damaged by water.

2. Rough Clean

Disassemble equipment placing parts on carts or racks, not on the floor. Use brooms, shovels, squeegees, etc. to remove as much soil and debris as possible. Remove debris from the area. In some areas (e.g. final product storage areas, this dry cleaning will be all the cleaning that is required).

3. Pre-Rinse

To remove visible soils, rinse all equipment and production areas with adequate volumes of low pressure potable warm water. Avoid use of high pressure washers that can create cross-contaminating aerosols and over spray. Remove resulting debris from the area. At this point, the walls, floors and equipment should look visibly clean from a distance.

4. Apply Cleaning Agents

Cleaners remove remaining soils (often invisible) and a portion of the micro-organisms present. Apply appropriate cleaners in an appropriate manner (see Cleaning above) to all surfaces of walls, floors and equipment. Always follow label directions. Pay special attention to hard-to-reach and “hot spot” niche areas including drains.

5. Post-Rinse

After the cleaner has been in contact with surfaces for the designated period of time, rinse all surfaces thoroughly with adequate volumes of low pressure water. This removes remaining soils and cleaning chemical residues.

6. Inspect

Thoroughly inspect all areas, equipment for cleanliness (use a flashlight in difficult to see areas). If dirty areas are discovered, re-clean as necessary beginning with Step 4.

7. Apply Sanitizer

Once all areas are declared clean, apply the appropriate sanitizer (see Sanitation above) to all surfaces of walls, floors and equipment. Follow label directions carefully. Sanitizers are designed to reduce microbial populations to safe levels. After allowing an appropriate period for the sanitizer to work (2 - 10 minutes), rinse, if required. Remove any standing water and allow all areas to air dry.

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A Few Final Tips

- A good pest control program greatly enhances the effectiveness of a cleaning and sanitation program.
- Create a “clean” culture. Make good sanitation practices a daily habit.
- For better, more consistent cleaning and sanitation results, create a written cleaning and sanitation program, train sanitation personnel and keep records.

Additional information on cleaning and sanitation is available in the Foods of Plant Origin (FPO) Cleaning and Sanitation Guidebook available on-line at: http://www.omafra.gov.on.ca/english/food/inspection/fs_food_plant.htm or from FPO Risk Management Specialists.

Crop Protection

Status of Codling Moth Susceptibility to Registered Insecticides, Guthion and Calypso

*Kristy Grigg, University of Guelph;
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Ian Scott, Agriculture and Agri-Food Canada;
Ron Harris, University of Guelph;
Kathryn Carter, Pome Fruit IPM Specialist*

In recent years, codling moth (CM) damage has been increasing in Ontario apple orchards. With higher than normal levels of CM damage not attributable to timing or coverage of insecticide sprays, Ontario apple growers are concerned that CM populations are developing resistance to organophosphorus (OP) and other insecticides. Of increasing concern is research from the U.S. indicating cross resistance between OP insecticides and alternative registered products (i.e., insect growth regulators and neonicotinoid insecticides). If this is the case in Ontario, it would leave growers with limited options for resistance management. Surveys are being conducted to determine if Ontario CM remain susceptible to two currently registered products: Guthion® (azinphos-methyl) and Calypso® (thiacloprid).

Throughout the 2008 and 2009 CM flight period, conventionally managed apple orchards in Essex and Norfolk Counties were selected for the collection of adult male CM. Minimal-spray orchards (<2 sprays/yr for 3+ yrs) were also surveyed in each county to provide assumed baseline insecticide susceptibility. Adult male CM were caught using delta traps and exposed to a diagnostic dose (DD) treatment with either acetone (control), the active ingredient of Guthion

(azinphosmethyl) at 250 ppm in acetone or the active ingredient of Calypso (thiacloprid) at 625 ppm in acetone. The DD was determined with dose-response data from direct contact bioassays with a laboratory-reared insecticide-susceptible CM strain. The dose for each compound that caused >95% mortality was designated as the DD. Adult CM direct contact bioassays indicated potential development of strain-tolerance to Guthion and Calypso in southern Ontario orchards (Fig. 1 & 2). Both products caused less mortality in orchard populations compared to the insecticide susceptible strains. However, Guthion was generally more toxic than Calypso.

Larvae were collected from damaged fruit and corrugated paper tree bands from one selected orchard in Essex County, ON during July & August 2009. As well, pre-diapause larvae obtained from a Quebec orchard in 2008 were reared in laboratory to the successive generation. Surface-treated diet bioassays with Guthion and Calypso were conducted using concentrations expected to cause 50% mortality (LC50) and 95% mortality (LC95), determined similarly to DD described above. Larval bioassays indicated potential development of strain-tolerance to Guthion and Calypso, particularly in the Quebec strain (Table 1). The Ontario strain had a slightly lower observed percent mortality than expected at the Calypso LC95 treatment only, whereas both products caused less mortality in the Quebec strain than was expected at LC50 and LC95 treatments.

Table 1. Percent mortality of codling moth larvae 48 h after exposure to Guthion and Calypso LC50 and LC95 treatments.

¹

Orchard ¹	Insecticide	N	% Mortality ²	
			LC ₅₀	LC ₉₅
Ontario	Guthion	59	57	91
	Calypso	50	NA ³	71
Quebec	Guthion	30 5	27	72
	Calypso	13 0	4	18

¹ Ontario (2009) and Quebec (2008) collection.

² Corrected for natural mortality using Abbott's formula.

³ NA = CM in insufficient number to be tested

Further studies are being conducted at the University of Guelph, Guelph, ON and Agriculture & Agri-Food Canada, London, ON with CM larvae to confirm above results, as well as test for susceptibility to newly registered products, Altacor® (chlorantraniliprole) and Delegate® (spinetoram), and the insect growth regulators Intrepid® (methoxyfenozide) and Rimon® (novaluron). Adult CM resistance surveys will be conducted again in the 2010 season. **If you have observed high CM trap**

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catches and/or fruit damage in your orchard within the past two years and are willing to co-operate with researchers by allowing the use of your orchards for CM collection, please contact Kristy Grigg, University of Guelph (kgriigg@uoguelph.ca) or Kathryn Carter, OMAFRA (519-426-4322 or kathryn.carter@ontario.ca).

Funding and technical assistance for this project is provided by Ontario Apple Growers, NSERC, Agriculture & Agri-Food Canada and OMAFRA. The researchers gratefully acknowledge the apple growers in Essex and Norfolk Counties for allowing the use of their orchards.

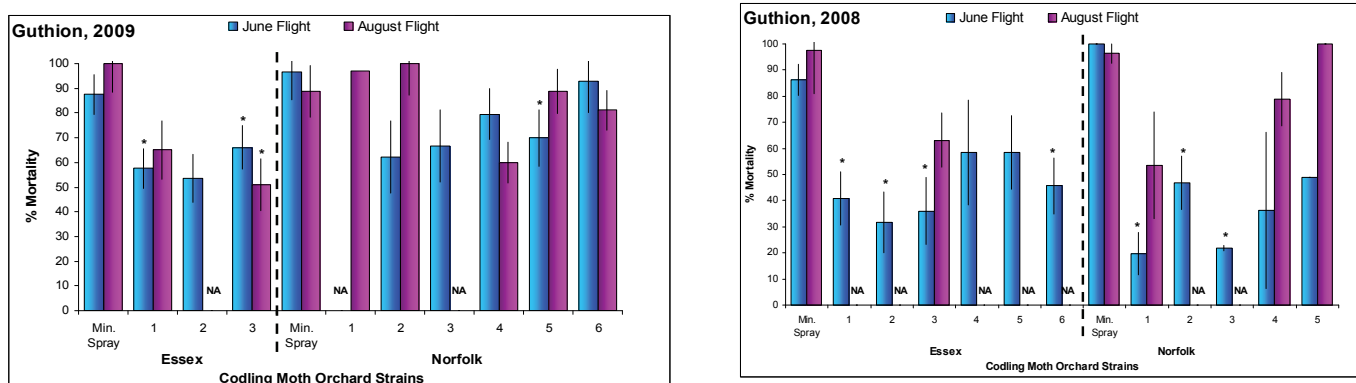


Figure 1. Male codling moth percent mortality at 48 h after Guthion treatment (250 ppm, a.i. azinphosmethyl) during 2008 and 2009 flight periods, Essex and Norfolk County. Corrected for natural mortality using Abbott's formula. Min. Spray = Minimal spray orchard, assumed insecticide susceptible strain; NA = CM in insufficient number to be tested, * significant difference

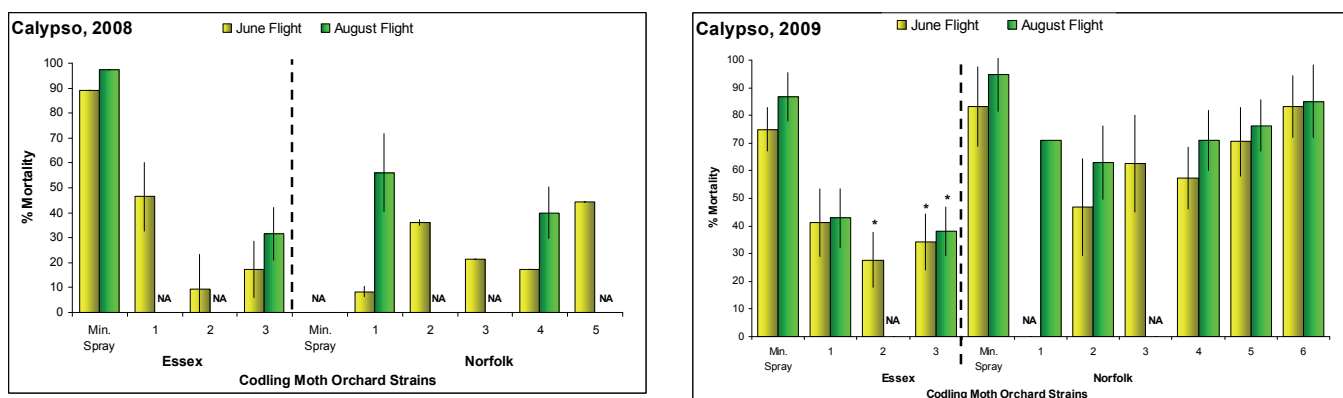


Figure 2. Male codling moth percent mortality at 48 h after Calypso treatment (625 ppm, a.i. thiacloprid) during 2008 and 2009 flight periods, Essex and Norfolk County. Corrected for natural mortality using Abbott's formula. Min. Spray = Minimal spray orchard, assumed insecticide susceptible strain; NA = CM in insufficient number to be tested, * significant difference

Research Update - Crop-Adapted Spraying

Dr. Jason S.T. Deveau, Application Technology Specialist, OMAFRA, Simcoe

Growers have long expressed concern about the consistency and practical relevance of pesticide label recommendations. Fundamental to the issue is the assumption that the spacing and volume of the test planting, and the foliar and branching density of the canopy, is representative of the grower's orchards. As a result, differences in application methodology and any morphological differences between test orchards and the grower's orchards cannot be assessed from the label.

Given orchard variability, fixed minimal product rates may not be appropriate in Canada's apple orchards; even those labels that present a range of rates do not often guide the grower in their selection. Studies using single product rates have demonstrated that larger trees receive lower deposits per unit leaf or fruit area than smaller trees. This supports the concept that the volume and product rate has to increase and be re-distributed over an increasing canopy to achieve

equivalent coverage between canopies. For smaller trees, studies have demonstrated a diminishing increase in deposit with increasing volumes (as described in the previous example), which argues against excessive volumes.

A simple and effective system has been developed for orchard airblast operators to consistently adjust carrier volume and/or rates in relation to the canopy. The concept of matching carrier volume and product rate to a growing leaf area within a canopy, or to variation between canopies, combined with the correct calibration and orientation of the sprayer is Crop-Adapted Spraying (CAS).

The Crop-Adapted Spraying model is currently being tested in a Simcoe orchard. One sprayer has been calibrated to match the canopy throughout the growing season and to apply optimized rates of product. The other sprayer will continue to follow the grower's standard spray schedule. Control and treatment trees are being scouted weekly for insect and disease, and spray coverage will be analyzed early and late in the season.

If successful, this model will allow growers to determine the optimal carrier volume and product rate for any orchard, reducing issues of over-application and run-off.

Stay tuned!

Integrated Management of Calyx End Rot

Michael Celetti, Plant Pathologist Horticulture Crops Program Lead, OMAFRA, Guelph

Calyx end rot on apples is an increasing problem in the past few years. The disease is caused by the fungus *Sclerotinia sclerotiorum* (also cause of white mold in other crops such as carrots, lettuce, beans, canola, potatoes and tomatoes). The pathogen has a very large host range, including weeds such as dandelion. The disease can be confused with Dry eye rot (caused by *Botrytis cinerea*, which occurs later in the season) and with Black rot calyx infections.

Symptoms: Calyx end rot first appears as a slightly sunken, circular tan-brown/grey lesion around the calyx of developing fruit, especially on king fruit. The lesions are dry, unless secondary pathogens (eg. bacteria) enter through the wound. Expanding lesions tend to grow in one direction, appearing off centre, often with a dark border and/or a red halo (Figure 1). Lesions become a tan brown rot and the infected fruit often drops prematurely. Infected fruit eventually crack where hard black resting structures called sclerotia develop.

Life Cycle: After the fruit rots, sclerotia are released from rotten fruit, and remain on the orchard floor for several years. The following season, under prolonged wet soil

conditions, such as those in 2009, the sclerotia germinate to produce tiny funnel shaped mushroom-like structures called apothecia. The apothecia eject spores that infect the delicate flower petals. Fortunately the spores cannot infect the fruit directly. Once the flower petals become colonized, the fungus grows from the petals into the developing fruit.

Management: Successful disease management depends on weather, reducing alternative hosts and manipulating the environmental conditions that favour sclerotia germination. Several days of wet soil conditions and mild temperatures (11-15°C) encourage sclerotia to germinate and produce apothecia.

Carrot researchers showed that trimming leaves to open up the canopy, allowing the soil to dry out quicker, reducing germinating sclerotia, spore production and disease. New equipment designed specifically for trimming carrot leaves between rows is now being developed, and leaf trimming at row closure is now a standard recommendation for white mold control in carrots.

Applying this principle to reduce infections in apple orchards means encouraging soil drying by keeping the grass short until petal fall to reduce sclerotia germination. Managing dandelions and other broadleaf weed hosts will also prevent the build up of sclerotia population in the orchard.

There are no fungicides registered in Ontario specifically for calyx end rot on apples, however, some of the new scab fungicides may also protect petals from *Sclerotinia* infection when applied during bloom. As with any fungicide, application must occur prior to infection for best results. The best time to scout for this disease is in mid-late June or early July. Infected fruit should be hand thinned and removed from the orchard since throwing infected fruit onto the orchard floor will result in more inoculum for future years.



Calyx End Rot Expanding lesions tend to grow in one direction

Apple Scab Update

*Kathryn Carter, Pome Fruit IPM Specialist,
OMAFRA, Simcoe*

It is an early season this year and we are about 3 weeks ahead of schedule in most areas of the province. Currently we are at the pink stage of apples, and most growers have already applied several fungicide sprays. Fungicide sprays in most areas were initiated around the beginning of April. Apple scab lesions become visible on foliage and fruit in about 9 days at 20° C or 14-21 days if the average temperatures are 12 C or lower. As a result we are expecting lesions to appear on unsprayed trees in the near future. Initially these lesions can be very difficult to see, so scouting and maintaining adequate fungicide coverage is very important.

Recently, there has been some confusion about when scab spores are released. During an infection period the greatest number of spores that are released usually occur at the beginning of the infection period, since this is the time when there are the greatest number of mature spores in the orchard. However, throughout the infection period spores will continue to mature, and will continue to be released. So it is important the fungicide residues remain adequate throughout infection periods to protect the leaves and the crop.

For primary infection periods in low inoculum orchards (orchards without scab last year) scab infection periods that begin after dark, are not included as an infection period. However primary infection periods that start during the daylight and continue through the evening, are still counted. For high inoculum orchards wetting periods are included regardless of the time of day that they occur (evening or daytime). Secondary infections occur when splashing rain spreads conidia developed from primary scab lesions on leaves. Secondary infections can occur day or night and should be calculated from the beginning of the wetting period regardless of the time of day.

Resistance to strobilurins (Flint, Sovran, Pristine) and sterol inhibitors (SI's) (Nova/Nustar) has been documented in apple scab populations in several Ontario orchards. Unfortunately there are no projects evaluating levels of fungicide resistance in apple scab populations in Ontario this year.

When applying fungicides remember that in terms of fungicide residues and rainfall as a general rule of thumb:

- <1 inch of rain since the last spray will not significantly affect residues.
- 1-2 inches of rain will reduce the residue by ½. Reduce the number of days until the next spray by ½.
- Over 2 inches of rain since the last spray will remove most of the spray residue. Re-apply a fungicide as soon as possible.

Fungicides should never be applied as eradicants, this only encourages the development of resistance. If apple

scab is present in your orchard, that safest bet is to keep the crop protected for the remainder of the season. Don't rely on kickback activity of fungicides, research has shown that the development of resistance to some fungicides (SI's), can reduce the kickback activity of other fungicides (strobilurins).

The 2010-2011 Fruit Production Recommendations is now available and includes a section on apple diseases that includes the Mills table, and information on the activity of fungicides. Based on the Cornell model, we have accumulated 150-185 DDC in Norfolk/Brant (provided by the Norfolk Fruit Growers Assoc.) since budbreak on McIntosh to date (April 21). As a general rule, the end of primary infection period occurs at 418 DDC. After this time, if there has been sufficient rainfall, and scouting indicates that there are no scab lesions present, growers can reduce rates of fungicide applications and extend intervals between fungicide applications.

In summary, growers are doing a great job of managing apple scab so far. If we can make it through the primary infection period, managing this disease should be much easier. I am looking forward to a hot dry, disease-free summer.

Getting Set Up for Fruit Tracker

*Margaret Appleby, IPM Systems Specialist,
OMAFRA, Brighton*

Fruit Tracker is a unique recording keeping program that allows you to customize the program to reflect your own farm information: farm map, applicators, chemicals, equipment, buyers and suppliers.

Here are some key pieces of information to gather up when setting up your Fruit Tracker program.

Farm Map:

The most important piece of farm information to set-up and should reflect where you apply your pesticide and fertilizer but also which part of the crop you sell to various buyers. The map can be as detailed as you want it to be. You will need

- Farms (i.e. the Smith farm or the Jones Farm)
- Orchard blocks
- Acreage
- Variety
- Row numbers (optional)
- Tree numbers (optional)

Applicators:

You will need:

- Name and Initials used for reports
- Grower Pesticide Safety Certificate Number and Expiry date

Chemical List:

This section has been populated for you and you can customize this list with prices you are paying for these products.

You can add pesticides that may not be on the list. For new chemistry you will need

- Trade name
- Common name
- Formulation
- PCP number,
- Active ingredient,
- % active ingredient,
- Registrant code,

- EIQ number,
- Re-entry interval
- Pre harvest interval
- Chemical group number

Equipment list:

Tractor / sprayer combinations and date of calibration

Buyer list: Buyer name and reports needed

Announcements

New Resources for Apples

Be sure to add these to your reference library (The Ontario Apple Growers obtained funding from the Farm Innovation Program to provide their members with a free copy):

- **Ontario CropIPM:** available online at www.ontario.ca/cropipm or in CD format. New in 2010 is Apples and Onions. Also available (strawberries, sweet corn, tomatoes, peppers, vine crops, and brassicas)
- **Publication 310, Integrated Pest Management for Apples:** This manual was updated last year, but if you need extra copies, they can be purchased from Service Ontario or from OMAFRA offices for \$50 + GST
- **Fruit Tracker:** pesticide tracking software by the Eastern Ontario Fruit and Vegetable Growers Association, to make the task of pesticide record keeping easier. Map your farm block-by-block, choose which sprayer and which person did the application, and the drop-down menus to choose which pesticide was applied.
- **2010-11 Publication 360, Fruit Production Recommendations:** available in hard copy for \$20 + GST, or online at ontario.ca/crops.

IPM Scout Training

This annual workshop series by OMAFRA specialists provides in-depth training for scouts, consultants, agribusiness and interested growers. Learn how to look for and identify pests, with good scouting and reporting techniques.

Of special interest for Apple IPM Scouts will be:

- **Introduction to IPM Scouting** – for new scouts, includes WHMIS
Wednesday, April 28 – Guelph, 8:30-4:00
- **Apple IPM Scout Training** – pest biology, scouting, using Pub. 360 & 310
Thursday, May 6 – Simcoe, 9:00-3:00

There is no cost for these workshops, but lunch is on your own. Please pre-register so that adequate handouts can be prepared. 1-877-424-1300

IPM Scout training workshops are available for the following crops: Tomatoes & Peppers, Tender Fruit & Grapes, Cole Crops, Berries, Sweet corn, Peas & Beans, Vine Crops, Asparagus, Lettuce, Celery, Onions and Carrots, Ginseng and Potatoes. For more information, contact Margaret Appleby at 613-475-5850 or the Contact Centre at 1-877-424-1300. The Ontario AppleIPM training CD will be available to all participants that attend the apple session on May 6. This info will also be available online at www.ontario.ca/cropipm by the end of May.

Agricultural Information Contact Centre: 1-877-424-1300

E-mail: ag.info.omafra@ontario.ca

Northern Ontario Regional Office: 1-800-461-6132

www.ontario.ca/omafra