



ORCHARD NETWORK

For Commercial Apple Producers

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ORCHARD MANAGEMENT

What's Pruning Got to do with Becoming Globally Aware

John Gardner, Apple Specialist, OMAF, London

Well not much if you're trying to make a direct connection. Indirectly of course they are related, as any cost factor is in producing apples or apple products. Any component and/or business today in North America is connected one way or another to the global economy. Not only do we have to be aware of what's going on in our own backyard but also we've got to know what's happening in everybody else's backyard at the same time.

It's pretty easy to get into a conversation these days about the value of currency and changes in the balance of power in the global economy. Canadian exporters have had a great advantage trading south of the border for several years now.

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We don't have to look back too far to remember that roughly 2 dollars U.S. would buy the equivalent of 3 dollars in Canadian goods and services. This relationship has made our products look very affordable by importers in the U.S. for some time now. However, things have changed dramatically in the last few months.

Economists in the U.S have decided their dollar was too valuable for the type of economic recovery they envision. They have engineered a devaluation by making the acquisition of U.S. dollars easier in terms of their cost through interest rate adjustments. For Canadian agricultural exporters, including the Horticulture sector going to the U.S. with various products, the effect has already been felt. Other benefits of a devalued currency to the country doing the devaluing include an easier time paying off debt, if the debt is incurred in the same currency in which the devaluation has occurred.

An accepted view by many is that the U.S. economy is attempting a recovering from a long period of mediocre performance and weakening position as a global trading partner. The U.S. trade deficit with China at the end of last year was approaching 0.1 trillion dollars. It makes you wonder what the Chinese are able to get onto the store shelf in the U.S. The answer is a mind-boggling array of consumer and industrial goods. Low cost consumer goods look great to the average consumer in North America as long as the individual doing the purchasing has a paycheck coming in from a business that has a future.

There are some strange things going on as world super powers adjust to and take advantage of the reality of a global economy. Many business sectors in the U.S. are involved in an "outsourcing revolution" in order to stay competitive on world markets. Low-end manufacturing; knowledge industries and the high tech sector are looking globally for the best and least costly inputs. Would you believe this year, close to a quarter of a million U.S. tax returns will be processed in India. Some in India claim it has the largest and best-educated workforce in the world to go along with an economy growing at a rate of 6% annually. As tree fruit growers and apple growers, our ability to outsource inputs for the purpose of keeping costs down is limited.

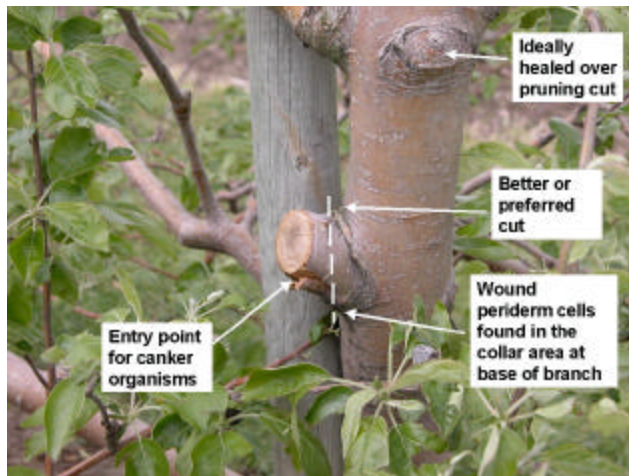
I did hear recently that some economists say that the Chinese economy is headed to be the largest in the world within a decade. This thinking could likely be well supported with the discovery of foreign currency reserves, which I would speculate that China is accumulating at a pretty good rate these days.

In reading about Bruce Barritt's recent discoveries abroad, China turns out to be far more formidable than Bruce had imagined. Their apple capabilities include production of huge volumes of quality product that can be stored using modern storage technology and transportation infrastructure that is improving as we speak. Based on the strength of the Fuji plantings in China, Bartlett pear is no longer the most widely planted tree fruit cultivar in terms of acreage on a global scale. The late Dr. Gus Tehrani used to say that Bartlett pear was the most widely planted tree fruit cultivar in terms of acreage worldwide.

Another outstanding trend worldwide is the apparent domination of the retail sector by the "Supermarket". This phenomenon is now integrated firmly in the culture of countries like Korea, France, South Africa, the United States, Canada and China. In Mexico 3 out of every 10 pesos is spent at WalMart. This domination synchronizes perfectly with the appearance of 1 billion new middle-class consumers worldwide. This group is largely responsible for the evolution of retail powerhouses. The top 250 retailers worldwide have sales around 2.7 trillion U.S. These retail giants appear to be setting their own standards of excellence regarding quality assurance and traceability of the various products they sell.

Getting back to a few comments on pruning and training. There is always a risk in pruning before trees have accumulated their maximum winter hardiness in Ontario. Pruning cuts in the winter are essentially dehardening of the area where the cut is made. Maximum tree hardiness factor normally occurs in the 3rd or 4th week of January. The depth of snow in some areas will definitely slow down crews that are out there already. Watch the cleanness of cuts carefully. A lot of wood rotting cankers get started from infection through cuts that are too ragged and have no chance to heal. The cells responsible for healing over a wound are located in the collar area of the base of a branch (see photo above). If a canker gets started, it can supply inoculum and spores for various fruit infections during the later part of the growing season.

Best pruning management practices include working on trees that have less value early in the winter months when the risk is much higher



for tree injury from the timing. The most valuable blocks of trees are normally saved for March through early May pruning. Best advice is to prune for quality not quantity. Ontario produces approximately 0.04 % of the worlds' supply of apples. In Ontario, the average well maintained bearing orchard probably has several fold more fruit buds than is needed for good potential crop volume.

Surround® WP Crop Protectant to be included in Publication 360 Fruit Production Recommendations - for Sunburn and Heat Stress

John Gardner, Apple Specialist, OMAF, London

Last summer was the 3rd year in which we were involved in some detailed studies of the performance of Surround WP on apple in Ontario. Based on some very favourable results from the previous year on Crispin (Mutsu) fruit finish, we decided to experiment with this product on 3-year-old Golden Delicious during the 2003 season.

We already had some good evidence of the effectiveness of Surround in controlling various insect species from the work of Hannah Fraser and others. As well, the general look of the foliage of treated trees was much superior at the end of the 2002 season. Combining the added effects of insect control, fruit finish and canopy health, we felt it was a natural progression to look at a cultivar (Golden Delicious) so highly dependent on finish and so susceptible to skin finish problems.

The work this past year was done with the full cooperation of Engage Agro out of Guelph. During the 2002 growing season, we found that Surround had significantly reduced cullage of fruit due to

various fruit finish problems including blister spot and shoulder russet, when added to a recommended treatment regime for that cultivar. This was documented in a controlled experiment on Crispin (Mutsu) in Middlesex County.

The reason we decided to zero in on Golden Delicious this past year was because of its difficulty with finish under average conditions here in Ontario. We used established 3-year-old Smoothee™ strain of Golden Delicious (a.k.a. “Gibson Golden”) for this trial. As it turned out, the 2003 growing season was one in which Golden Delicious would typically have a higher probability of showing russetting due to the cool wet conditions during the spring. The spring of 2003 was also unusually difficult in terms of the number of scab infection periods.

Surround WP was added to the regular spray program with all trees receiving Promalin as a treatment for russet control. Sprays of Surround were started in early June after the thinning sprays showed results. The Surround treatment regime was added to the growers regular program of insecticides, fungicides and growth regulators. Promalin was not isolated in this experiment. All trees were irrigated as needed.

A total of 5 sprays of Surround WP were sufficient to maintain a particle film over the crop and canopy for the entire summer. The last spray of Surround went on during the 3rd week of August. The first 2 sprays were at the high rate while the last three were at a maintenance rate. Overall, it was surprising how well the Surround stayed on the trees. I would have to conclude that in the absence of repeated heavy rains that this product has surprisingly good retention and redistribution properties.

Almost immediately or within 2-3 weeks of the first treatment of Surround WP we noticed the individual fruitlets were larger and more elongated than the trees without Surround WP. This relationship held until harvest on October 16th. Overall the untreated trees did not make up the difference in fruit size established by the end of June when compared to the treated trees.

Data was collected in mid October by harvesting the entire crop off 20 trees from each treatment regime. The trees were measured for trunk caliper and comparisons were drawn based on trees carrying similar crop load. The total number of fruit harvested was not different nor was the tree caliper between treated and untreated. In other words, the differences we saw were related to the

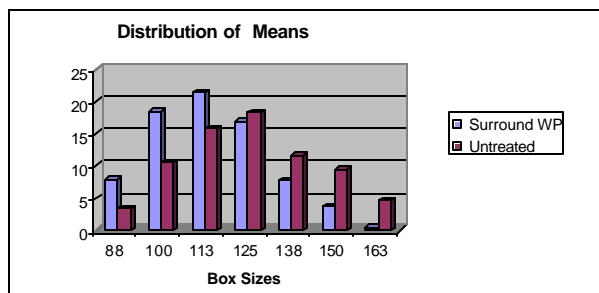
growth and development of the crop in the absence of vigour differences between trees. However, it became fairly obvious that by the end of the season the trees treated with Surround looked stronger with more fruit buds and greater net growth than the untreated trees. Quantifying this strength of growth will be a first priority during bloom in 2004.

Most outstanding in this experiment was the huge and distinct differences in rate of cullage and in the recovery of fancy fruit in the size category 113. Cullage was almost entirely the result of russetting and/or secondary scab infection. We harvested the equivalent (extrapolated) of 4.8 bins/ac. of fruit from the untreated and 5.5 bins/ac. from the treated rows. The untreated had a rate of cullage by weight of 46% and the treated had 10.6% by weight. What was truly remarkable was the general absence of secondary scab infection in the Surround treated trees accompanied by a very low rate of russetting.

The fruit size was characterized by close to 50% of the fruit in the Surround WP Crop Protectant treated trees being 3 inches and larger, while only 28% of the fruit in the untreated trees were 3 inches and larger. In the final analysis, we recovered the equivalent (extrapolated) of 4.8 bins of Fancy fruit from the Surround WP treated trees compared to 2.6 bins per acre from the trees receiving no Surround. We plan to continue studying the response of Golden Delicious and other cultivars to this type of treatment regime. One could speculate that the huge differences we saw in 2003 were the result of the treated trees being under less stress overall for the bulk of the growing season. Why the secondary scab or russetting fungi/yeast failed to infect where

FANCY FRUIT (> 3")

50% of the fruit from the Surround treated block were equal to or greater than 113 count size, while the untreated trees produced 28%



Surround WP was used in this experiment remains open to speculation and requires further work.

CROP PROTECTION

Calyx End Rot: A Rare Disease

Michael Celetti, Plant Pathologist – Horticulture Crops, OMAF, University of Guelph

Occasionally, minor apple diseases can cause problems for some growers. For example, calyx end rot, a minor disease in apples, was observed in a few Ontario, New York and Michigan orchards last year. The disease rarely occurs but probably caused up to 15-20% fruit loss in the few infected orchards. The susceptibility of apple cultivars to calyx end rot is not known, however, this disease has been documented to caused losses in McIntosh, Cortland, Paulared, Rome Beauty, Delicious, Honeycrisp, Milton and Macoun.

Symptoms first appear as a small grayish brown lesion on the blossom end of developing fruit and are often not noticed until June or early July (Figure 1). Infection actually takes place about a month earlier, around petal fall. As the lesion expands around the calyx, the adjacent fruit tissue becomes soft and slightly sunken. Often a red ring develops around the lesion, which makes infected fruit stand out from the green healthy non-infected fruit.



Figure 1. Light brown lesion on calyx end of infected immature McIntosh apples.

Based on the biology of the causal agent, there is a very narrow window for infection and disease development. Calyx end rot is caused by the fungus *Sclerotinia sclerotiorum* which, can infect and cause disease in over 360 species of plants including many common weeds. The pathogen over-winters as hard, black sclerotia just under the soil surface usually

around the base of infected weeds. In the spring, when soil moisture remains near field capacity for 10 days to several weeks and temperatures remain cool (11- 20°C), sclerotia germinate and produce tiny light brown mushrooms called apothecia. The apothecia have inverted cup-like caps that contain ascospores, which are forcibly ejected into the environment. These spores do not infect fruit directly but rather infect senescent, withered tissues such as flower petals during petal fall. The petals are colonized by the fungus, which gives the pathogen the energy to invade sepals and eventually the calyx end of the fruit. There is very little potential for further infection to occur after petal fall, since, the fungus does not produce secondary spores and therefore will not spread from infected apple to non-infected apple during the growing season. Once inside the calyx end, the fungus eventually colonizes the adjacent fruit tissue causing the rot symptoms observed. Infected fruit usually drop prematurely and the fungus may infect susceptible weeds it comes directly in contact with on the orchard floor. Eventually sclerotia are formed either on the colonized fruit or infected weed.

Last season, only the fruit produced by the secondary blooms were observed to be infected, whereas the fruit produced by the king and tertiary blooms in the same cluster were not infected, indicating the small window when environmental conditions were conducive for infection. A long wet period leading up to and during petal fall of the secondary blooms last year was perfect for sclerotia germination, apothecium development, spore release and petal infection.

The few orchards in Ontario observed to have calyx end rot also had an abundance of dandelions growing along the orchard floor. Dandelions are a very good host for the pathogen; in fact, *S. sclerotiorum* has been investigated as a potential biocontrol agent for dandelion management. The thick and dense canopy created by large populations of weeds as well as other ground cover, keeps the soil around the sclerotia moist for an extended period of time, at least long enough to allow them to germinate and produce the mushroom-like apothecia. Mowing the orchard floor, particularly in orchards with a history of calyx end rot, to keep vegetation short during the 10 to

14 days leading up to pedal fall, will allow soils to dry and reduce the environmental conditions required for sclerotia germination and consequent spore production.

Picking and removing infected fruit from the orchard during mid season thinning may also help in reducing inoculum from building up in the orchard. In the past, applications of a benzimidazole fungicide such as Benlate for scab control around bloom time protected senescent petals from infection and probably kept calyx end rot at bay. However, with the loss of Benlate for scab management in Ontario, apple growers may see a rise in this disease particularly in seasons following prolong wet and cool environmental conditions during blossom time.

Entry Points for Fruit Infections

John Gardner, Apple Specialist, OMAF, London

It is always quite surprising just how many different disease organisms can infect fruit in the pre- and postharvest period long after the battles with scab are done in the orchard. The problem with identifying the species of fungus responsible for these fruit rots is that a lot of the infections look very similar. As fruit matures on the tree it has an increasing ability to resist infection of some of the more common disease of apple like scab. However, other disease organisms like some species of *Botryosphaeria* can infect by spores germinating in and around lenticel cavities commonly found in the skin of the apple.

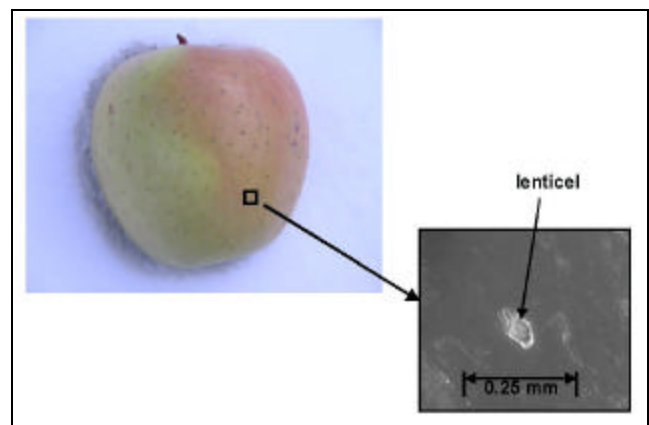
Other diseases, including mildew, can express their ability to infect the skin of apple during the last 2-3 weeks before picking. If it happens to be rainy and wet during those last weeks the fruit is on the tree, then conditions can be perfect for a variety of fungi to infect by way of mature lenticel cavities in the skin of the fruit. This is one way that various infections like bull's eye rot can get started. This infection is what I call "lenticel centered". Golden Delicious and varieties with Golden Delicious in their background are quite susceptible to lenticel centered infections.

These lenticel-centered infections can be as problematic as those infections that get started by other entry points on the apple. These other

entry points include puncture marks, unhealed stem ends and bruises on the surface of the apple. We normally think of the skin of the fruit as being very tight and waxy. In a greater sense, this is correct. However, the surface of the apple skin is dotted with lenticels.

To the human eye, these lenticels appear to be nothing more than a roughened dot on the surface of the skin. In reality, lenticels are a very distinct cavity that can have highly defined margins or very indistinct and rough fissure like corners and walls. These lenticels act as a portal of entry to the vast supplies of carbohydrates, carbon-based polymers and minerals contained in the flesh of the fruit. Below is a close-up of a lenticel showing its anatomical features and essentially its true character.

Lenticels function in many ways. They allow both water and gas exchange to take place while the fruit is actively growing on the tree. Without skin lenticels, the fruit would not survive a day in the orchard. These lenticels regulate such things as fruit temperature by allowing the escape of heat laden vascular moisture. We do also recognize that these same lenticels do offer a portal of entry for various fruit rotting disease organisms.



Getting Pesticide Information from the Web

Neil Carter, Tender Fruit and Grape IPM Specialist, OMAF, Vineland

If you are ever in need of pesticide labels or MSDS sheets for any product, the following websites will be useful. For both of these sites, you need Adobe Acrobat Reader, which I

believe is free to download from the web (a 'prompt' usually appears if you do not have it and further prompts walk you through the steps to download the program).

The first site is part of the Health Canada, Pest Management Regulatory Agency (PMRA) website, which has a reasonably up-to-date listing of pesticide labels. I literally use this site every day for fast access to label information. There is lots of other regulatory information on the PMRA site as well. To find the pesticide label you want, go to this site and follow the instructions below:

www.eddenet.pmra-arla.gc.ca/4.0/4.01.asp

Start by clicking on the 'search ELSE' button. On the next page, I usually ignore the 'search field' boxes and leave the 'registration status' in the default setting of 'registered'. Then make sure to click the 'marketing type' to 'commercial' or else your search will bring up a large number of products that are only suitable for domestic use. Finally, type the product name or active ingredient in the 'full-text' box and click 'Submit'.

A list of products will appear so look for the product that most closely matches what you wanted and then click on its number in the 'Reg #' column. The label will then appear in seconds. Once you get used to the layout of these pages, you can have access to a label in less than 30 seconds.

Labels are also available on the following site but I use it mostly for Material Safety Data Sheets (MSDS).

www.cdms.net/manuf/manuf.asp

This one is easier to use, just type in what you are looking for where it says 'Product (Brand name)' and click the search button. If you know the manufacturer, it is sometimes quicker to click on their name in the list on the search page and a list of their products will appear.

Mating Disruption in Ontario Apple Orchards

Kathryn Carter, Pome Fruit IPM Specialist, Simcoe

Research has shown that mating disruption (MD) is very effective in managing oriental fruit moth (OFM) populations in Ontario peaches; our direct experience regarding its efficacy in apples has until 2003 been rather limited. Population levels and damage to apple blocks observed in subsequent years has suggested that many production areas are faced with high pest pressure, a factor that can seriously jeopardize the success of MD. The use of MD requires low population levels of the target pest in order to be effective. As a result, it works best when used in conjunction with insecticides applied to help reduce initial pest populations.

This past season, trials were conducted in Ontario apple orchards to examine various pest management strategies' effectiveness at reducing OFM populations to manageable levels. In subsequent years, once insect populations have dropped to acceptable levels, mating disruption (in conjunction with an early season insecticide spray) will be evaluated for its ability to provide season long control of OFM in Ontario apple orchards.

Experimental Design

Three commercial orchards with low to moderate levels of OFM pressure were selected for this trial in Southwestern Ontario. Insecticide sprays for the 1st generation were applied 6-10 days after an upswing in OFM populations (based on pheromone trap counts) and 3-6 days after an upswing for subsequent generations. Isomate M Rosso pheromone twist tie dispensers were applied at a rate of 200 dispensers per acre on June 11th and 13th, 2003. Damage assessments were conducted following each generation to assess the efficacy of each of the treatments.

Table 1 - Programs for Managing OFM -Year One

	Program 1 (conventional program only)	Program 2 (conventional+MD)	Program 3 (Mixed Program)
1 st generation	Pyrethroid	Pyrethroid	Pyrethroid
2 nd generation	Assail	Mating disruption +Assail	Mating disruption
3 rd generation	Assail	Mating disruption+Assail	Mating disruption+assail
4 th generation	(Decis)*	(Decis)*	(Decis)*

Results

It should be noted that 2003 proved to be an excellent year in which to implement MD, as population pressure was quite low throughout much of the province; this unfortunately makes it rather difficult to see noteworthy differences in program efficacy. Nevertheless, the results are encouraging for MD.

There was complete trap shutdown in the mating disruption blocks at all sites. Traps in the conventional blocks still continued to catch low to moderate levels of OFM. The level of OFM damage observed in all of the treatments were well below 1-2%, the level above which concerns arise that the pest management strategy used may not be providing adequate control. All of the treatments tested provided effective management of OFM in 2003, and the use of any of these programs should help growers to manage OFM populations in Ontario apple orchards. There were no additional benefits from using conventional products in conjunction with mating disruption. Levels of OFM damage were extremely low in all of the experimental plots this year, and as a result, it is difficult to determine if one of the management programs is more efficacious than the alternatives.

Acknowledgements

Materials for this trial were provided by CBC (America) Corp., Dupont Canada. Thanks to Hannah Fraser, Neil Carter, Mike Morlock (Cargill AgHorizons), Kristen McGuire (Cargill AgHorizons), Colin Yates, and Fotios Zannas

Managing Oriental Fruit Moth as a Cross-Commodity Pest

Hannah Fraser, Entomology (Horticultural Crops) Program Lead, Neil Carter, Tender Fruit & Grapes IPM Specialist, and Kathryn Carter, Pome Fruit IPM Specialist

Fruit infestation by Oriental fruit moth (OFM) can result in devastating losses to producers of tender fruit and pomes. Management strategies are well-established for tender fruit, and are being developed for apples and pears. Several product chemistries including organophosphates, pyrethroids, and neonicotinoids are registered for use in Canada; when these are

coupled with mating disruption (MD) technology, growers can develop effective and sustainable pest management programs.

Over the last two years, we have discussed the virtues and limitations of mating disruption technology in several OMAF publications (Hort Matters, Tender Fruit Grapevine, Orchard Network Newsletter, factsheets, infosheets, webpages), not to mention at countless industry meetings and conferences. We will not go over these in detail here, but keep in mind that MD works best in large blocks, ideally when applied in expanded acreages or as part of a coordinated area-wide program. Mating disruption programs must include regular scouting, preferably overseen by an experienced consultant. The technology requires an initially low pest population; often this is achieved through the use of insecticides directed at first generation larvae, season-long management with insecticides in the previous year, or through a transition year using both MD and insecticides.

When you are considering using MD in your orchard, keep in mind that OFM are quite capable of flight. Even if you are managing OFM on your farm, females mated “off-site” can fly into your orchard and lay their eggs on your crop. Knowledge about your neighbour’s management practices can provide information on the “weak points” of your own. Reviewing a scenario or two may help in this regard.

Let’s assume that you are not part of an area-wide program, but are using MD to manage OFM in your apples (minimum 10 ac, continuous, “square” block). You also produce peaches, and have chosen not to apply MD in those blocks (or perhaps you managed the first generation with an insecticide and treated the remaining generations with Isomate M100, which lasts 75-80 days and will get your peaches safely to harvest, by early September). You applied an insecticide to manage the first generation in apples this year, and the Isomate Rosso product (120 days efficacy) you applied before the second generation emerged will get you through to harvest. So what is the weak point in this strategy? OFM can fly well into October, potentially causing late-season damage at or near harvest. You may not be worried about your peaches, because they are harvested by September. But if the last generation is not being managed in peach

blocks, any emerging adults can mate and potentially move into your apple blocks.

A similar problem arises when your neighbours don't manage all 3-4 generations of OFM.

One grower using MD for the first time this year reported that he had great success in his apples and peaches, but had some damage to his pears. As it turns out, he had managed the first generation with an insecticide, then had applied Isomate M100 to his entire farm for subsequent generations. He successfully harvested his peaches by the end of August, and then decided to treat the last generation of OFM in his apples with an insecticide, because he knew the Isomate M100 efficacy period had expired. But he took a chance with his pears, which were close to harvest, and left them unprotected – hence the damage to the crop in September.

Even if you use MD on your whole farm, you need to be aware that “unmanaged” females can migrate into your orchard through the season. This type of damage is most often associated with border areas, and provides a great case for coordination with neighbours and the adoption of “area-wide” programs. One solution, though not validated in Ontario, is to spray border areas with an insecticide (timed to coincide with regional activity and egg hatch), or to extend MD 20-40 m outside of the orchard you are trying to protect. In any event, do not leave your crop unprotected.

Exploring area-wide or extended acreage MD programs are well worth your while. Keep in mind, however, that not all areas are well suited to the technology. In some cases, growers may have to rely on evolving strategies that incorporate insecticides into IPM programs.

Editors Note:

In this issue we present the results of applied research efforts to manage OFM in Ontario apple orchards. For more information, contact the authors as indicated in the articles.

Managing Oriental Fruit Moth on

Apple with Pheromones:

Apple Growers + Cooperation = Success!

*Bernt Solymár, EarthTramper Consulting Inc.
and Jackie Bacsek, Norfolk Fruit Growers
Association*

In Norfolk County, OFM infested apples were first detected in an orchard near Walsh in 1998 and by 2002 the problem had spread to the majority of local orchards. Damage just prior to harvest in 2002 ranged from 5% to 70%. The Norfolk Fruit Growers Association (NFGA), with 22 members representing 60% of the acreage in Norfolk County, have been following an integrated pest management (IPM) program for over 20 years. Management tools of choice have typically included reduced-risk and more target-specific chemistries, with an emphasis on limiting the impact to beneficial insects and mites, wherever possible.

To preserve effective, sustainable IPM programs and protect pesticide-restrictive export demands, the NFGA Board of Directors decided to adopt area-wide mating disruption (AWMD) for management of OFM. Although the technology has been successfully applied to expanded acreages in Ontario peach orchards, it had not been validated in apples prior to 2003. The strategy requires co-operation between growers to cover all their acreage with pheromone dispensers.

The Ontario Federation of Agriculture, in partnership with the NFGA, applied for and received a \$75,000 grant from the **Ontario Trillium Foundation** to offset the full cost of Isomate M-100 pheromone dispensers, and to engage EarthTramper Consulting Inc. to help implement and coordinate the project. Twenty-one apple growers (representing over 1300 acres) participated in the project.

Growers applied one application of Decis at petal-fall and Isomate M-100 in early June and again in late July. Pest scouts monitored pheromone traps and helped conduct periodic terminal and fruit injury assessments. The results: a significant reduction in fruit damage from OFM at harvest time compared to the last 2 years (see Table 1). Every 1% reduction in damaged fruit can earn an apple grower an additional average \$480/acre. Apple growers

and the NFGA were thrilled with the results, since the program offers a cost effective, environmentally sound and sustainable alternative to the insecticide programs presently available (Decis and Assail).

In 2004, several other options are expected to be registered for management of OFM, including other mating disruption products such as Isomate Rosso (similar to M-100 but requiring only one application per year), a sprayable pheromone produced by 3M which offers extra

flexibility in application), and additional insecticides (e.g. Dow AgroScience's "Intrepid" methoxyfenozide and DuPont's "Avaunt" indoxacarb). These new tools will allow Ontario apple growers to further implement IPM-compatible strategies to combat this very significant pest of apple.

(To receive a full project report contact Bernie Solymár at 519-426-7124 or solymar@nornet.on.ca)

Table 1 - Incidence of and average damage levels from OFM in Norfolk apple orchards, 2001-2003

	2001	2002	2003
# of orchard blocks surveyed ¹	92	85	88
Total % orchard blocks with OFM damage present	48 %	72 %	7 %
Average % damage per orchard block	2.1 %	4.2 %	0.3 %

¹Note that in 2001 and 2002 pre-harvest assessments were conducted in mid-August – by harvest damage levels were, on average 2% to 3% higher. In 2003, pre-harvest assessments were conducted in mid-September.

OFM in Apples – CanAdapt Project 2003

Kathryn Carter, Pome Fruit IPM Specialist

OFM damage has been increasing in apple orchards over the past few years. Prior to 2003, mating disruption (MD) was the only tool available to apple growers for managing this pest. While mating disruption products provide growers with an excellent tool for managing OFM, they work best when used in conjunction with insecticides applied to either reduce initial populations and/or as a supplemental control in high-risk areas. Due to site requirements and block considerations, there may be production areas or specific farms where MD products cannot be successfully applied.

The registration of Decis (deltamethrin), and Assail 70 WP (acetamiprid) in 2003 has provided growers with valuable tools for managing OFM in apples; however, little information was available to growers on how to use these tools to develop an effective program for managing OFM. The goal of this project was to develop and assess four temporary strategies aimed at bringing OFM populations under control, using registered products readily available to apple growers, and to validate recommended timing of product application. As

new, IPM friendly products are registered for managing OFM (i.e. Intrepid, Avaunt etc.) they will be incorporated into these existing programs.

Spray strategies were tested at several commercial apple orchards throughout Southern Ontario. Insecticide sprays were applied 6-10 days after an upswing in trap counts for 1st generation, and 3-6 days after the upswing for subsequent generations with the exception of Intrepid (methoxyfenozide), which was applied at 600 and 800 DDC. Damage assessments for OFM were conducted for each treatment at all of the sites.

Overall, OFM damage levels were very low across the province this year. Low incidence of damage in all of the experimental plots makes it difficult to evaluate which of the spray programs was most effective in managing the target pest. There were no major differences in the amount of damage observed between the different programs at most of the experimental sites; however, at a few of the sites slightly higher damage levels were observed in the blocks treated with Assail for the 1st generation (Strategy 3).

The use of these strategies will help growers to reduce OFM populations in Ontario apple

orchards. As newer chemistries and technologies become registered, they will be incorporated into these strategies and a sustainable program for managing OFM will be

developed. Results of these efficacy trials can and should be compared to other complementary studies involving MD technology combined with insecticides.

Table 1 - 2003 Control Strategy for OFM Using Insecticides

Generation of OFM	Control Strategy 1	Control Strategy 2	Control Strategy 3	Control Strategy 4
1 st	Guthion	Decis	Assail	Decis
2 nd	Assail	Assail	Assail	Intrepid**
3 rd	Assail	Assail	Decis	Assail
4 th	Decis *	Decis*	Decis*	Decis*

* treatments for 4th generation were only applied in orchards where deemed necessary based on trap counts.

**product is not currently registered in Canada.

Funding for and support for this project was provided by: The Agricultural Adaptation Council, The Ontario Apple Growers' Steering Committee, The Apple Marketer's Association, Norfolk Fruit Growers Assoc., Northumberland Durham Fruit and Vegetable Growers Assoc., Lambton-Middlesex Fruit and Vegetable Growers' Association. The Essex County Apple Growers, Dupont Canada, Bayer CropScience, Dow Agrosciences, Cargill AgHorizons.

Problem Weed Series for Apples: Common Chickweed

*Leslie Huffman, Weed Management Specialist
(Horticultural Crops), OMAF, Harrow*

Problem weed: Common chickweed

Other names: *Stellaria media*, STEME, annual chickweed

Growth habit: Annual, or winter annual, prostrate stems which turn erect, holding opposite leaves that are mostly smooth with pointed tips. Chickweed prefers the cool temperatures of fall and spring, and some swear that it even grows under the snow! Its bright green colour is very distinctive.

Spreads by: Only by seed, flowering from early spring, and continuing all summer. Each plant can produce thousands of seeds, which germinate from a shallow depth (prefers no-till situations like orchards, vineyards and no-till). Seeds are long-lived in soil.

Reasons for concern: Germinates in the fall or early spring when herbicide residues are low; Grows thickly under trees; Peak growth during critical period for trees and vines; Hosts insect pests like tarnished plant bugs.

May be confused with:

1. Mouse-eared chickweed: which has a similar growth habit. However, the leaves of mouse-eared chickweed are more elongated and very hairy (like a mouse's ears!). Also mouse-eared chickweed is usually a perennial, forming dense patches. Mouse-eared chickweed has similar flowers but they are in compact groups, while common chickweed has single flowers.

2. Grass-leaved stitchwort that is sometimes called narrow-leaved chickweed. It is a close relative but is a perennial with a square stem and very long narrow leaves.

3. Thyme-leaved sandwort that has smooth leaves like common chickweed, but much smaller, with a bluish-green appearance. The stems look rougher and branch mostly from the base. Also the flowers are green (white for chickweeds).

Chemical control:

- Well controlled with spring burndown applications (Amitrol, glyphosate, Gramoxone, Ignite) when weeds are small.
- Soil-applied herbicides (simazine, Sencor, Casoron, linuron, Dual Magnum, Treflan, Devrinol, Kerb) usually control chickweed for 8-12 weeks.
- Mid-summer burndown herbicides can work well if coverage is adequate, and weeds are not too tall. Check for Tarnished Plant Bugs

first - chickweed is a good refugia and can keep them off the fruit.

- In orchards, 2,4-D Amine can be effective on common chickweed (but mouse-eared is mostly resistant), but use with care:
 - Wait for calm, cool conditions to avoid both physical drift and vapour drift.
 - Do not apply 2,4-D within 80 days of harvest.
 - Can be applied after harvest if late rains bring a new flush in August.
 - Avoid 2,4-D use around vineyards.

Cultural control: Mechanical control methods (cultivation, flaming, mulching) are very effective on chickweed if done early. Mowing needs to be done very close to the ground, as side branches will grow and flower from mown plants.

References and Pictures:

- Ontario Weed Gallery online
<http://www.gov.on.ca/OMAFRA/english/crops/facts/ontweeds/chickweed.htm>
- Publication 505, Ontario Weeds, p. 73

Resistant Weeds In California Orchards

Leslie Huffman, Weed Management Specialist (Horticultural Crops), OMAF, Harrow

California nut growers use glyphosate (eg. Roundup) to control weeds under their trees, similar to orchard growers in Ontario, and have generally been satisfied with the wide weed spectrum controlled at a reasonable cost. However, since the discovery of glyphosate-resistant ryegrass in 1990 in a few orchards, the possibility of selecting this problem in more orchards has been a concern.

Recent surveys have shown a low population of resistant weeds in 5000 acres of almond orchards. This is a fraction of their total acreage, but this shows a huge spread in just over a decade.

The recent reports of field crops with glyphosate tolerant horseweed (we call it Canada fleabane) from Maryland to Mississippi across to the mid-West are also of concern. Canada fleabane is a common weed in many Ontario orchards, and has actually developed resistance to Gramoxone (paraquat) in two orchards in Ontario.

These Roundup resistant weeds should be a red flag to orchard growers in Ontario. Although we have not identified glyphosate tolerant Canada fleabane or ryegrass in Ontario orchards, it can develop quickly if resistance management strategies are not used.

How can we prevent this problem? Orchard growers should continue to use a weed resistance management strategy:

1. Alternate glyphosate herbicides with herbicides with other modes of action, eg. tank-mix Roundup + Princep, or use Roundup for spring burndown, followed with Gramoxone or Ignite in June. It is best to rotate within the same year, but if this is not possible, alternating herbicide modes of action between years will help.
2. Use mechanical forms of weed control where possible. Cultivation, mulching, hoeing, or flaming have been used commercially with good results. In California, they are also using geese to eat weeds under trees (geese were effective weed control machines in Ontario strawberry fields before herbicides were developed).
3. Scout for weed escapes throughout the summer to identify which weeds are surviving your control efforts. Mapping these escapes over the years can help pinpoint problem areas and possibly the source of new weeds.
4. Practice good weed sanitation. Clean equipment before it comes into your orchards. Work in clean fields first, then move to weedy fields. Mow weed escapes and field edges before weeds go to seed.
5. Keep accurate and detailed records of herbicide use. If resistant weeds are identified, this can help alter your program to prevent further problems.
6. If suspicious weed failures are observed, collect samples to be tested for resistance.
7. Above all, be aware of the potential for weed resistance and watch for it in your fields.

Glyphosate is still a good choice to control weeds safely, efficiently and effectively, but like all pest management methods, it needs to be managed properly to maintain it as a long-term tool.

New Edition of Publication 75, Guide to Weed Control Available

Leslie Huffman, Weed Management Specialist
(Horticultural Crops), OMAF, Harrow

The fully revised 2004-2005 edition of this important reference will be available February 1, 2004. This reference book is a must for every grower, consultant and agribusiness staff working with crops. The new version contains 19 chapters of the latest recommendations for herbicides and adjuvants, as well as important information such as:

- Integrating herbicides with other weed management techniques
- The latest in application technology, such as air-assist nozzles
- Precautions and regulations for safe use and storage of herbicides
- Background information on herbicides & adjuvants, such as modes of action
- Special methods of weed control, like stale seedbeds, wipers, no-till, site preparation
- Managing weed resistance, including herbicide groupings
- Critical periods of weed control
- Plant-back intervals
- Intervals before rainfall

A special "Production Bundle" for Fruit and Vegetable growers is offered this year. New editions of Publication 363, Vegetable Production Recommendation, and Publication 360, Fruit Production Recommendations will be available this spring for \$15 each. You can purchase the "Production Bundle" of Pub. 360 or 363, plus Pub. 75, Guide to Weed Control (value \$10) - a saving of \$5. This is because the weed management information will only appear in Publication 75.

There are several ways to buy your new publications:

- Call or visit your local Resource Centre
- Call Government Publication Order Centre 1-888-466-2372 or 519-826-3100
- Visit our online Products Guide at www.gov.on.ca/OMAFRA/english/products/product.html

POSTHARVEST

Effect of 1-MCP on Postharvest Diseases of Apple

Dr. Deena Errampalli, Research Scientist,
Agriculture and Agri-Food Canada, Vineland,
Dr. Jennifer DeEll, Fresh Market Quality Program
Lead, OMAF, Simcoe, and
Dr. Dennis Murr, Professor, University of Guelph,
Guelph

In recent years, 1-MCP has shown tremendous potential in maintaining fruit quality in apples during storage. Blue mold (*Penicillium expansum*) and grey mold (*Botrytis cinerea*) are two important postharvest diseases of apples. Intensive and exclusive use of benzimidazoles has caused selection of thiabendazole-resistant (TBZ^R) pathogens in most packinghouses in the U.S., British Columbia and Ontario, causing an increase in the incidence of postharvest decay. The objective of this study was to determine the effect of 1-MCP on postharvest decay caused by TBZ^R *P. expansum* and *B. cinerea*.

During 2002-2003, fruit from four apple cultivars that had been treated with 1-MCP and stored either in air at 0-1°C ('Cortland' - 122 d; 'Delicious' - 90 d; 'Gala' - 100 d) or in CA at 2°C or 0-1°C ('Empire' - 128 d) were wounded and inoculated with either TBZ^S (P28-8AS) or TBZ^R (PS-1R) *P. expansum*, or TBZ^R *Botrytis cinerea* (BC-2). Following inoculation, fruit were incubated in a moist chamber and held at 4°C for 30 days for 'Cortland', 'Gala' and 'Delicious', and at 20°C for 6 days for 'Empire', after which time fruit were evaluated for decay. There was no significant difference in disease incidence between 1-MCP-treated and non-treated apples that had been wounded and inoculated with TBZ-sensitive or TBZ-resistant *P. expansum* or TBZ^R *Botrytis cinerea*.

However, in wounded non-inoculated 'Empire' apples variable natural decays were observed. With the exception of apples stored in air, a higher percentage of decays were observed in 1-MCP-treated apples than the apples not treated with 1-MCP. The apples treated with 1-MCP had a higher percentage of disease incidence of blue mold caused by TBZ-sensitive, TBZ-resistant *P. expansum*, and grey mold caused by TBZ^R *B. cinerea* than apples not treated with 1-MCP. Treatment with DPA and ReTain had no significant effect on the decays caused by TBZ-sensitive, TBZ-resistant *P. expansum*, and by TBZ^R *B.*

cinerea. Also, there was no significant interaction between 1-MCP and ReTain, or 1-MCP and DPA on disease incidence. A second year study on the effect of 1-MCP on postharvest diseases of apples is in progress.

Commercial SmartFresh (1-MCP) Trial on Apples in Canada

Dr. Jennifer DeEll, OMAF, Simcoe

SmartFresh™ is a powder that, when mixed with water in a proprietary generating system, releases the volatile active ingredient 1-methylcyclopropene (1-MCP). The product is marketed by AgroFresh Inc. (Rohm & Haas), which is based out of Spring House, Pennsylvania. 1-MCP is an ethylene action inhibitor, which effectively delays the ripening of climacteric fruits such as apple. It has the ability to enhance the maintenance of fruit firmness and titratable acidity, prevent superficial scald development during storage, reduce chilling disorders and peel greasiness, reduce internal ethylene production and fruit respiration, and protect produce from external sources of ethylene.

Generally, SmartFresh is applied as a gas to apples in a closed chamber. Effective application depends on fruit maturity and cultivar, whereas the effective concentration of 1-MCP on apples varies widely with cultivar, temperature, and time of application. More mature apples show less response to 1-MCP. Some cultivars like McIntosh may need a higher concentration because they produce higher amounts of ethylene than other cultivars. Apple cultivars vary widely in ethylene production - early season cultivars generally produce higher levels than late season cultivars. However, a low concentration of 1-MCP may be as effective as a higher concentration if the low concentration is applied over a longer duration.

During the last couple of years, SmartFresh has been approved for use on apples in the United States, United Kingdom, New Zealand, South Africa, Mexico, Chile, Costa Rica, Argentina, and Israel. Unfortunately, **full registration is still pending in Canada**. However, in response to several letters received by storage operators in Ontario from export buyers (in the UK) requesting that SmartFresh be used on their apples in order to prevent loss of market share to competing companies, **a research permit was granted by the PMRA (66-RP-03) to allow SmartFresh treatment at five commercial apple storages in Canada for the 2003 harvest season**. Treatment

was limited to a maximum of 20 rooms for all sites, and a maximum total of 6500 tonnes of apples could be treated under the permit. All treated apples must be exported. It was decided via the Apple Working Group of the Canadian Horticultural Council that four of the locations would be in Ontario (17 treated rooms) and one in Nova Scotia (1 treated room), based on export volume. Dr. Jennifer DeEll (OMAF, Simcoe) is the research project coordinator for this Canadian commercial SmartFresh trial, and Jennifer Ayres has been hired as a research assistant.

Results to date confirm the **extreme importance of apple maturity** on the efficacy of SmartFresh treatment. For example, 'Empire' apples harvested at optimum maturity (internal ethylene <1 ppm, starch index <5) and treated with SmartFresh maintained fruit firmness equivalent to that at harvest (16.3-18.4 lb) following 2 weeks at room temperature (~22°C), while similar non-treated apples lost ~5½ lb of firmness. In contrast, 'Empire' apples harvested over-mature (internal ethylene >1 ppm, starch index >5) and treated with SmartFresh did not always maintain firmness equivalent to that at harvest following 2 weeks at room temperature. Quality evaluations of treated and non-treated fruit are continuing throughout the winter and spring, as the commercial storage rooms treated with SmartFresh are opened.



Photo 1: Apple storage room ready for sealing and SmartFresh treatment.

Interactions of 1-MCP and Low Oxygen CA Storage on Apple Quality

*Dr. Jennifer DeEll, OMAF, Simcoe
Dr. Dennis Murr, University of Guelph*

The objective of this research has been to investigate the interactions of 1-methylcyclopropene (1-MCP) and low oxygen controlled atmosphere (CA) storage on apple quality. 'McIntosh', 'Empire', 'Gala', and 'Delicious' apples harvested for two consecutive years at optimum maturity for long-term storage were treated either with 1 ppm 1-MCP or without 1-MCP at 0°C for 24 hours. After treatment, 'McIntosh' and 'Empire' apples were placed into standard CA (3.0% O₂ + 2.5% CO₂ for 30 days then 4.5% CO₂ thereafter, and 2.5% O₂ + 2.5% CO₂ for 'McIntosh' and 'Empire', respectively) at 2½ to 3°C, and four low oxygen regimes (1% and 0.7% O₂, each with or without 0.7-1% CO₂) at either 2½ to 3°C or 0°C. 'Gala' and 'Delicious' apples were also placed into standard CA (2.5% O₂ + 2.5% CO₂) and the low oxygen regimes, but only at 0°C. Within a specific CA regime, apples treated with 1-MCP were 1 to 2 lb firmer than comparable apples after mid- or long-term storage (120 or 240 days, respectively). Lowering the oxygen and the presence of CO₂ did not consistently improve firmness, as **many apples treated with 1-MCP exhibited the highest firmness regardless of gas concentrations during storage**. Firmness of certain cultivars in specific CA regimes was influenced by 1-MCP, gas concentrations, and storage temperature. Ethylene, CO₂, and volatile production were generally lower in apples treated with 1-MCP, held at lower temperatures, and in low oxygen with CO₂, although there were some interactions of these factors. Overall, 1-MCP reduced the incidence of superficial scald, but increased core browning and CO₂ injury, and interacted with the CA regimes to influence internal breakdown. These results suggest that in combination with 1-MCP both standard and low oxygen CA recommendations require revision, since in certain cultivars there was no further quality benefit from combining low oxygen CA regimes with 1-MCP. More detailed results will become available in late spring.

Postharvest Issues with 'Honeycrisp' Apples

Dr. Jennifer DeEll, OMAF, Simcoe

'Honeycrisp' is being extensively planted in Ontario and consumer demand continues to increase. This apple cultivar has outstanding flavor characteristics and can remain crisp for several months during storage. However, there are several major maturity and storage problems associated with 'Honeycrisp'. These include (in somewhat order of severity):

- 1) Bitter pit – more than 50% of apples in some years and at some locations may be unmarketable due to bitter pit
- 2) Soft scald – up to 100% of the apples may develop soft scald during storage under certain conditions
- 3) Variability in fruit coloration – attractive red blush, coarsely-striped, poorly-colored, and/or blotchy coloration; suggests multiple strains of 'Honeycrisp' may already exist in commercial plantings
- 4) Uneven maturity – fruit mature very unevenly, so multiple harvests are necessary
- 5) Immature apples – fruit from over-cropped trees may never mature and thus remain of poor eating quality; fruit harvested too early never develop varietal flavor and remain almost tasteless

Researchers at Cornell University have been investigating these challenges with 'Honeycrisp' for the past few years. The following summary highlights some of the research results and recommendations from the various scientists.

Watkins et al.

- Major factors that have been implicated in soft scald development include over-maturity of fruit at harvest, climate (dull, cool, wet summers), light crops, large fruit, and vigorous soils.
- Soft scald (and soggy breakdown) increased with exposure of fruit to storage temperatures of 33 F (0-1 C), especially those from late harvest dates
- Storage at 42 F (5-6 C) controlled soft scald (and soggy breakdown) but also resulted in higher decay and less acceptable flavor

- DPA did not prevent soft scald development in fruit stored at 33 F (0-1 C) but did control it in fruit stored at 37 F (2.5 C)
- One week delay at 50 F (10 C) prior to storage controlled soft scald development (and soggy breakdown), but bitter pit incidence was substantially increased
- Fruit firmness was not affected by storage temperature, DPA treatment, 1 week delay at 50 F prior to storage, or shelf-life of 7 days at room temperature
- No consistent association of internal ethylene concentration to harvest date and soft scald incidence was found
- Starch may be a useful guide to over maturity
 - suggest a starch index of 6 (Cornell chart of 1 to 8) as a cut-off to harvest fruit for long-term storage
- Storage temperature of 38 F (3-4 C) recommended
- For best post-storage eating quality, fruit should be harvested with a minimum firmness of 13.5 lb and at least 13% soluble solids

Rosenberger et al.

- Early harvest, delayed cooling, and warmer storage temperatures favor the development of bitter pit
- Calcium chloride (CaCl₂) provided the best control of bitter pit
- CaCl₂ sprays alone did not control bitter pit on light-cropping, immature trees
- Solubor™, Flint™, and Messenger™ in combination with calcium did not further improve bitter pit control
- Appears to be exceptionally susceptible to black rot and white rot, which may be more problematic if cooling after harvest is delayed or warmer storage temperatures of 38 F (3-4 C) are used in order to reduce soft scald
- Especially susceptible to blue mold (*Penicillium expansum*)
- Tender skin and stiff stems contribute to a high incidence of stem punctures and such fruit are highly likely to develop blue mold when exposed to water- or air-borne *P. expansum* spores
- Good sanitation is the only approach for minimizing losses to blue mold

- Keep fruit away from bins and storage areas that are contaminated with *P. expansum*
- Apples should not be run through a postharvest drench treatment because recycling drench water redistributes spores of *P. expansum* to fruit wounds

Robinson and Watkins

- Fruit from heavy cropped trees are more mature – produced more ethylene, softer, lower acidity, and higher starch ratings
- Fruit from trees with higher crop loads were softer and had higher incidences of soggy breakdown (not soft scald), but also had lower incidences of bitter pit, senescent breakdown, storage rot, and superficial scald
- Crop loads above 10 fruit per cm² of TCA resulted in more poor size, poor color, and poor flavor, which not improve in storage, although they tended to have the least storage disorders
- Moderate crop loads of 7-8 fruit per cm² of TCA resulted in poor return bloom and mediocre fruit quality
- Crop loads around 5 fruit per cm² of trunk cross-sectional area (TCA) appear optimum, resulting in good fruit color and soluble solids, and medium acidity
- Warmer storage temperatures resulted in more bitter pit, senescent breakdown, and storage rot, but less soft scald, soggy breakdown, and superficial scald

For more details, please see the Fall 2003 issue of the NY Fruit Quarterly, available at the following web site:

<http://www.nysaes.cornell.edu/hort/fq/>

Dr. Chris Watkins will be speaking on February 18th at the **Ontario Fruit and Vegetable Convention** at Brock University in St. Catharines during the apple sessions. His presentation in the morning session (10 a.m.) will be *'Honeycrisp' – battles with bitter pit, soggy breakdown, and soft scald*, while his presentation in the afternoon session (3 p.m.) will be *Trials and tribulations with 1-MCP – a New York experience*.

DPA Has No Effect on Postharvest Control of Blue Mold of Apple with Fludioxonil

Dr. Deena Errampalli, Research Scientist, Agriculture and Agri-Food Canada, Vineland station

Blue mold of apple, caused by *Penicillium expansum*, can cause severe losses in stored apples under favourable conditions. In recent years some of the isolates of *P. expansum* have developed resistance to MERTECT (thiabendazole, TBZ). A time course experiment was conducted to test the efficacy of different concentrations of a reduced-risk fungicide, SCHOLAR (fludioxonil) and diphenylamine (DPA, an antiscalding agent) for control of blue mold caused by TBZ-resistant *P. expansum*. Wounded and *P. expansum* inoculated 'Empire' apples were treated with fludioxonil and DPA, and stored for 4.5 months at 4EC in a common storage. Apples were evaluated every 30 days after the treatment and disease incidence was recorded. The efficacy of the fludioxonil decreased with time. At higher concentrations (600 µg/ml), fludioxonil gave 100% control of blue mold for 3 months and an increase in the disease incidence was observed after 4 months. This reflects the effectiveness of the fludioxonil as a postharvest treatment. DPA neither negatively nor positively interacted with the postharvest fungicide, fludioxonil. While TBZ was effective against blue mold caused by TBZ-sensitive isolates of *P. expansum*, TBZ was not effective against blue mold caused by TBZ-resistant isolates. In these experiments SCHOLAR was used experimentally, and is not registered for postharvest treatment on apples in Canada and cannot be used commercially.

Unpasteurized Apple Cider Seminars in Review

Two Unpasteurized Apple Cider food safety seminars were completed in November. Approximately 50 participants representing 31 cider operations attended the seminars, where subjects such as the recently completed OMAF baseline study and food safety issues, such as patulin and sanitation, were discussed.

Following the presentations, a cider mill was toured in each location with production and sanitation issues discussed.

At the end of the seminars issues raised by producers were reviewed. Information relating to these will be distributed to producers as soon as available. It is hoped that the seminars will be held on a yearly basis. For additional information on the seminars and materials presented or if you have any questions on cider, please contact John Henderson at (613) 475-5175 or the Food Safety Extension Advisor in your area.

ANNOUNCEMENTS

Apple IPM Workshops for Ontario Apple Growers

February and March 2004

OMAF will be holding one-day apple Integrated Pest Management (IPM) workshops throughout the province in 2004. The goal of these workshops is to give growers current in-depth information on IPM in apples. They will run in conjunction with OMAF's "Optimizing Sprayer Performance and Understanding Spray Residues" one-day workshop and will compliment the Ontario Apple Integrated Fruit Production (IFP) Workshops to be held in December and January sponsored by the Apple Working Group of the Canadian Horticultural Council.

The Apple IFP workshops will provide a general overview of the National IFP program. In comparison, the IPM workshops focus on changing pest dynamics, new chemistries, and disease management.

Apple IPM Workshop Session Topics

- The evolution of IPM
- The limitations and benefits of using degree day models
- Pheromone trap counts what do they mean?
- Pesticide Families and resistance management strategies
- Orchard weed management
- Managing diseases in apple orchards

- Cross commodity pests – what you need to know
- Managing fire blight

The workshops will be from 9:00 a.m. through to 3:15 p.m. They will be held in various different apple growing regions throughout the province. The workshops will be held on the following dates.

February 11 - Woodstock
 February 23 - Simcoe
 February 26 - Brighton
 March 10 - Leamington
 March 17 - Georgian Bay

These workshops are sponsored by **N. M. Bartletts, and UAP**. Registration is free and lunch will be provided. Please contact the Agricultural Information Contact Centre at 1-877-424-1300 to register for the workshops, so that we can make arrangements for lunch.

Apple Program at the OFVC

Wednesday, February 18, 2004 as part of the Ontario Fruit and Vegetable Conference (Feb 18th and 19th) Brock University, Walker Complex

Don't miss this one. The complete Conference program is available by going to:
www.fruitandveggie.com/

Session Title: Apple
 February 18, 2004
 Chairperson: John Gardner, Apple Specialist, OMAF, London
Walker Complex Room 204

9:30 – 10:00 am
 Cultivar Trial Highlights
 John Gardner, Apple Specialist, OMAF, London

An overview of cultivar and selection traits based on result from provincial trials at several distinct apple growing regions of Ontario will be presented.

10:00 – 10:30 am
 Honeycrisp – battles with bitter pit, soggy breakdown and soft scald! (or why don't we give up)
 Dr. Chris Watkins, Cornell University, New York

Honeycrisp is a new apple variety for New York and has been earning wonderful returns for many growers. It has unique flavour and texture characteristics that consumers respond very positively to. However, Honeycrisp is not an easy apple variety to grow, being susceptible to bitter pit, soggy breakdown and soft scald. Factors that increase risk, and control methods for these disorders, will be presented.

10:30 – 10:45 am
 Oriental Fruit Moth – What didn't happen in 2003
 Kathryn Carter, Pome Fruit IPM Specialist
 OMAF, Simcoe

Discussion of projects on OFM in apples conducted throughout Ontario during 2003.

10:45 – 11:30 am
 Behaviour and Management of the Oriental Fruit Moth in Pennsylvania
 Dr. Larry Hull, Pennsylvania State University

The Oriental fruit moth (OFM), Grapholita molesta Busck, long considered to be a serious pest of stone fruits, has recently become a serious pest of apples throughout the eastern U.S. Penn State University scientists launched an intensive research program in 1999 to understand the reasons for this outbreak as well as to further investigate their biology, behaviour and management on this host. Work will be presented on the population dynamics and behaviour of OFM, phenology modeling, insecticide timing and decision making, and the use of pheromone mating disruption technologies for the control of this pest.

11:30 am – 2:00 pm
Lunch and Trade Show

Session Title: Apple
Chairperson: Dr. Jennifer DeEll, Fresh Market Quality Program Lead, OMAF, Simcoe
Walker Complex Room 204

2:00 – 2:30 pm
 Forecasting apple pests and physiological disorders in Quebec and Ontario
 Dr. Gaétan Bourgeois, AAFC, Quebec

Over the last few years, the bioclimatology and modelling team at Agriculture and Agri-Food Canada in Saint-Jean-sur-Richelieu (Que.) has developed and implemented several apple

forecasting models, such as models on insects, diseases, physiological disorders, and crop phenology. Based on a large set of data collected on many sites over the years, most models were updated. Ongoing research aims to validate these models in Quebec and Ontario. Preliminary results confirm the potential of these forecasting tools for daily decisions in the apple production system.

2:30 – 3:00 pm

“Making Money Growing Apples”

Panel Moderator Margaret Appleby, OMAF, Brighton

Murray Porteous, Lingwood Farms Ltd., Simcoe
Charles Stevens, Wilmot Farms Inc., Newcastle
Paul Frankis, Sugar Apple Orchards, Kingsville

3:00 – 3:30 pm

Trials and Tribulations with 1-MCP – a New York Experience with a Revolution on Apple Storage
Dr. Chris Watkins, Cornell University, New York

Factors that affect the effectiveness of 1-MCP, known commercially as SmartFresh, will be outlined with a goal of providing information about the benefits and limitations of this new and exciting technology. Recommendations that have been developed for New York storage operators will be provided.

3:30 – 4:00 pm

I.F.P. and the Canadian Initiative
Bernie Solymar, Canadian Horticulture Council

Integrated Fruit Production (IFP) is a whole-farm approach to apple growing that considers environmental stewardship, economic viability, on-farm food safety and social wellbeing. National IFP Guidelines have been developed for Canadian apple growers to provide a framework for sustainable apple production and eco-marketing ventures. Current activities include the delivery of national IFP workshops, development of methods to measure IFP adoption, and a public awareness campaign on how the nation's apple growers are providing safe and environmentally responsible fruit to Canadian consumers.

**Don't miss "Taste of Niagara" - Field House
5:30 p.m. - 9:30 p.m. on Wednesday
(free for pre-registrants)**

Sprayer Calibration Workshops

Protect your investment in agricultural pesticides and learn how to properly set up and calibrate your sprayer. The Ontario Ministry of Agriculture and Food has developed a workshop that discusses issues around pesticide residues and provides hands-on training with sprayer calibration.

Agricultural chemicals are effective in managing plant disease, insects and weeds. Producers follow regulations and use good agricultural practices to ensure the safe use of these products. Accurate calibration of sprayers:

- Are a component of Food Safety planning
- Are cost-effective and saves time (uses only the chemical you need without unnecessary applications)
- Prevent misapplication which can lead to repeat applications and plant damage
- Prevent environmental contamination

Come out and learn more about

- how Maximum Residue Limits (MRLs) for registered pesticides are determined,
- how to reduce your risk of exceeding MRLs,
- what each Government Agency and Ministries' role is in monitoring food products for pesticide residues, and
- how to calibrate your sprayer

Dates and Locations:

Thursday, February 12th Woodstock
Wednesday, February 25th Brighton

Thursday, March 11th Leamington
Thursday, March 18th Thornbury

Saturday, March 27th Prince Edward County

Friday, April 2nd Bradford
(note: this will be for boom sprayers)

Workshops will run from 9:00 am through to 2:00 pm. Registration is free and lunch will be provided. For more information, please contact Sandra Jones at 1 888-466-2372 (ext. 63289) or the Agricultural Information Contact Centre.

Please RSVP to Agricultural Information Contact Centre 1-877-424-1300 so that we may arrange numbers for lunch.

Weed & Sprayer Clinic Returns to the Ontario Fruit & Vegetable Convention

Leslie Huffman, Weed Management Specialist (Horticultural Crops), OMAF, Harrow

Due to popular demand, this clinic will be open during both days of this convention at Brock University in St. Catharines (February 18 & 19). Drop by to have your weed problems identified, and find out the latest in boom sprayer technology. Last year, growers were asking how to control specific weed problems and "new" weed problems were featured. You can bring samples in from your fields or examine the live specimens provided by Ridgetown College. Helmut Spieser will be demonstrating new sprayer technology for boom sprayers in fruits and vegetables.

We're looking forward to seeing you (and your weed problems) at this 2nd annual Weed & Sprayer Clinic.

Canadian Agricultural Income Stabilization (CAIS) Program

The province of Ontario has recently signed an agreement to implement the Agricultural Policy Framework (APF). This will provide a new approach to safety net programs for farmers. This new approach will consist of two programs, the Canadian Agricultural Stabilization (CAIS) program and Production Insurance. Production Insurance will be based on the current Crop Insurance program, but may also include coverage that addresses specific needs for additional commodities and products.

A series of local information meetings on the APF and CAIS programs are being planned for February and March. Watch for further details on dates, times and locations of those meetings.

-The Canadian Agricultural Income Stabilization (CAIS) program is part of the Business Risk Management pillar of the Agricultural Policy Framework. The CAIS program is designed to stabilize farm income.

-The Canadian Agricultural Income Stabilization (CAIS) program will allow Ontario farmers to protect their operations from large and small income declines. The CAIS program will direct government funds to producers by combining stabilization assistance (formerly NISA) and disaster assistance (formerly the Ontario Farm Income Disaster Program) into one program. The CAIS program is built on the philosophy that governments and producers share in the cost of replacing lost income. For smaller losses, producers and governments will equally share the burden. As losses deepen, the government's share increases to four times the amount the producer shoulders--or four dollars to every one dollar the producer contributes

For more information contact the CAIS Program: toll-free at 1-877-838-5144, Fax: 1.519.826.4334, E-mail: cais@omaf.gov.on.ca, Internet: www.omaf.gov.on.ca, CAIS Program, OMAF, 1 Stone Road W., 4th Fl. Guelph, Ontario N1G 4Y2

Pear Information Day

Tuesday, March 30, 2004

3:00 p.m.

Best Western Little River Inn, Hwy 3, Simcoe

Sponsored by: Kraft, St. Davids

Contact Ricarhd Matthie @ 905-262-4211, Ext. 236 to confirm attendance

Agenda Items:

3:00 pm - Introduction

3:00 pm - Kraft Expansion - Richard Matthie, OMAF

3:45 pm - Pear Production & Economics - Ken Slingerland, OMAF

4:00 pm - Pear Cultivars and Pollination - Dr. David Hunter, AAFC, Vineland

5:00 pm - Pear Insects and Diseases - Neil Carter, OMAF

5:30 pm - Wrap-up

5:45 pm - Dinner

7:00 pm - Tender Fruit Board Annual Meeting - Adrian Huisman, Executive Secretary, Len Troup, Chairman, OTFPMB