FRUIT NOTES
Lake Ontario Fruit Program

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Affordable Health Care Act Will Effect ALL Farms

A. De Marree

You have probably heard that if you have less than 50 employees, the Affordable Health Care Act (ObamaCare) will not affect you – **NOT TRUE!** The act is complex and confusing in many arenas (one example: in how it calculates FTE's -full time equivalents) – growers need to pay attention. This article is only to raise your general awareness and to encourage you take advantage of ANY webinars or workshops offered by health insurance companies to help you better understand the act and how it will impact your business.

All employers will need to provide specific written notice about the Health Exchanges between October 1, 2013 and March 30, 2014 and at the time of hiring. All employers also need to be concerned about the Discrimination portions of the Act – you will not be able to offer different levels of health care coverage to different classes of employees.

All employers need to know how to calculate their FTEs. The calculations must be done on a monthly basis with separate calculations for full time employees (130 hrs./mo.) and part-time employees (total all hours of employees under 130 hrs./mo. – then divide by 120 to arrive at part-time FTEs). Leave fractions for each month. Below is an example from a 165 acre farm with 151,000 bushels of fruit in 2011 (normal to big crop year for some farms):

2011	# of Employees working 130 hrs./mo.	Employees working < 130 hrs/mo. Monthly Total Hrs	Part-time Tot/120 hrs	Total FTE's
Jan	6	85.00	0.71	6.71
Feb	7		0.00	7.00
Mar	5		0.00	5.00
Apr	2	284.50	2.37	4.37
May	8	161.50	1.35	9.35
June	8	234.75	1.96	9.96
July	8	87.25	0.73	8.73
Aug	8	462.50	3.85	11.85
Sept	27	156.50	1.30	28.30
Oct	29	32.75	0.27	29.27
Nov	2	3,144.00	26.20	28.20
Dec	2	377.65	3.15	5.15
		Total of all months>		153.89
		Avg. Annual FTE's >		12.82

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This example is provided for informational purposes only, please do not assume another 165 acre farm would have the same annual FTE's. Each farm will be different based on the types of fruit & labor intensity involved. For 2014 there are some special rules that allow employers to choose which 2013 months you may use to calculate your FTE's.

Most fruit farms will have 25 employees or less. Employees of these farms could go to the Exchanges for insurance, have many choices and be subsidized by the government. Employers with 25 workers or less may decide not to offer any health insurance to allow their employees to have more choice and avoid having to provide insurance for all employees working (more than 130 hrs./mo.) after 90 days.

Should a law be passed allowing overtime pay after an 8 hour day, FTE's would likely go up. Growers need to be aware of the implications of this act in planning for future costs and strategies to increase labor efficiency.

This article has covered only a very small fraction of the complexity of the Affordable Health Care Act – some of the rules are still being written (ex. Discrimination sections). If your health insurance carrier offers any educational sessions concerning this act – I encourage you to become informed – **it affects EVERYONE!**

Prebloom Nutrition Management of Apples

M. Miranda Sazo and L. Cheng

Prebloom nutrition management plays an important role in the regulation of growth, fruit set, pollen germination, and fruiting. Here are a few things you need to know about boron and zinc when developing a pre-bloom nutrient management program for your orchards in the 2013 growing season.

Boron shortages frequently occur in orchards, particularly on coarse-textured soils and during dry seasons. Leaf concentrations of 30 to 50ppm boron are required for normal tree performance. When boron is inadequate, various types of corking disorders may develop in or on the fruit. Shortages of boron are associated with impaired growth or dieback of roots and shoots, premature ripening of fruit, and accentuated preharvest fruit drop. Fruit set may be reduced on trees low in boron because of abnormal flower development, poor pollen germination, and/or reduced growth of pollen tubes. Low boron levels are often associated with calcium deficiency problems.

Zinc is involved in the regulation of growth and fruiting. It is an essential element in the production of growth-regulating hormones within the tree. Shortages of zinc are prevalent in the Northeast and deficiencies may be evident in various ways: weak shoot growth, poor fruit set, reduced size and color of fruit are some of the symptoms. Zinc has also been shown to influence the degree of cold hardiness of trees and frost hardiness of flowers.

The micronutrients boron and zinc are important for fruit growth and development. In addition to soil application, foliar spray of Solubor is a very effective way to supply boron to fruit. For zinc, foliar spray is the only economical way of providing this element to apple trees.

Zinc chelate and Solubor can be tank-mixed with urea. However, Solubor should not be tank-mixed with any pesticides contained in water-soluble plastic packages because it inhibits the dissolution of the plastic. Also, Solubor should not be tank-mixed with oil. Because Solubor also increases spray water pH, pH of the tank mix should be tested and adjusted with a suitable acidifying agent if Solubor is used with pH sensitive pesticides.

Table 1. Suggested corrective program when leaf analysis shows nutrient deficiency or deficiency symptoms are observed. Match fertilizer applications to specific nutrient deficiency.

Timing	Foliar Sprays	Ground applications
Prebloom period	Two sprays of tank mixed 1 lb of Solubor, 3 lbs of urea, and Zn-EDTA at label rate per 100 gallon, one at ½" green and the other at tight cluster to pink.	Apply 40 to 60 lbs of actual nitrogen/acre to soil.

Planning for Pink Pests

Art Agnello

The weekend gave us a foreshadowing of early summer weather, and we're due for some more this week, so most areas should be within hailing distance of pink bud by the weekend. It's therefore not too early to be thinking of pink bud insect management needs now, so as not to be caught off guard in case we get into one of our famous leapfrogging scenarios.

First, if San Jose scale is a concern and you have yet to do anything to head it off, there is still a limited window of suitable management tactics available before foliar development progresses too far to permit effective coverage. If you are intending to use oil, a 1% spray through tight cluster can be quite effective provided you're able to thoroughly cover the wood surfaces. Insecticidal options include Centaur (34.5 oz/A), Esteem (4-5 oz/A), Lorsban (4EC or Advanced at 1.5-4 pt/A; or 50WP at 3 lb/A) or Supracide 2EC at 3 pt/A). Remember that you are limited to only 1 application of Lorsban in apples per season, whether prebloom as a foliar or trunk spray, or as a postbloom trunk application.

The pests of greatest concern at pink bud are usually rosy apple aphid (RAA), oriental fruit moth (OFM), and tarnished plant bug (TPB), with European apple sawfly and plum curculio waiting in the wings. OFM has just made its entrance in the Hudson Valley, so it will not be too long before biofix is established in a number of plantings statewide. Debbie Breth reports no OFM in traps over the weekend; just a few imposters. In blocks with a history of OFM infestation, 1 or 2 traps checked at least weekly will help indicate the timing and relative size of the first generation population this year. What should be the response when the numbers start building?

In a normal year, the average temperature ranges tend to result in very little egg hatch during pink and bloom, as this usually holds off until petal fall. If we end up with sufficient egg hatch before actual bloom, a pink application of an internal worm material like Altacor, Belt or Delegate would be an option; although this is earlier than we would normally expect to need them, these products would also address codling moth, which would not be far behind an early OFM hatch. For growers wishing to save these A-list products until after petal fall, a B.t. product would be another option from pink to bloom. Regardless, these "what-if" scenarios underscore the value of using (and frequently checking) pheromone traps to set the clock on OFM and CM development in specific blocks. These first flights of the season give us the best opportunity to get on top of internal worm control, because timing and development of the different stages only gets more complicated (i.e., less synchronized) as the season progresses.

Depending on block history and personal philosophy, RAA and TPB can be annual challenges, puzzling but token annoyances, or else a complete flip of the coin. Do they occur, do they need to be treated, are they able to be controlled adequately, and does it matter if they're just ignored? These pests also have yet to indicate their potential for problems this season, although it's likely that rosies can be found already in some orchards, given enough inspection. It's possible to scout for RAA at pink, but this is often not practical, considering all the other hectic activity at this time. TPB is not a good candidate for scouting, and if the bloom period is prolonged by cool, wet weather, a pink spray is of little use. You'll need to decide for yourself whether this bug is of sufficient concern to you to justify treating.

We have seen few orchards in western NY where TPB control is warranted, simply because the most effective treatment has been to use a pyrethroid, which: a) kills predator mites, and b) still rarely lowers TPB damage enough to be economically justified. If you elect a spray of Ambush, Asana, Baythroid, Danitol, Pounce, Warrior or Voliam Xpress at pink for plant bug, you'll take care of rosy apple aphid (plus mullein plant bug and spotted tentiform leafminer) at the same time. If RAA is your main concern, you could elect a pink spray (non-pyrethroid options include Actara, Assail, Beleaf, Calypso, Esteem, Lannate, Lorsban, Thionex, Vydate, Warrior, or Voliam Xpress) if you have the luxury of a suitable application window. Once again, be sure to consider potential impacts on non-target species

such as beneficials, and be aware of your bee supplier's concerns about effects on pollinating bees.

Leafrollers are also out there, but only a portion of the population will be active at this time, so although you might get good control of any larvae you spray now, don't forget that the rest of the population won't be out (and susceptible to sprays) until bloom or petal fall, so it's probably better to wait until then to address this pest.

Finally, if mites normally need attention in a given block, and you haven't elected (or been able to use) a delayed-dormant oil application as a part of your early season mite management program, you'll be needing to rely on either: one of the ovicidal acaricides (Apollo, Savey/Onager, Zeal) available for use, whether before or after bloom; a rescue-type product after bloom (add Acramite, Kanemite, Nexter, and Portal to the above list) that can reduce motile numbers later on if they should begin to approach the threshold; or Agri-Mek, which falls somewhere between these two strategies. Like the true ovicides, Agri-Mek should also be considered a preventive spray, as it needs to be applied early (before there are very many motiles) to be most effective, generally within the first 2 weeks after petal fall. Recall that Proclaim is related to Agri-Mek, and also has some miticidal activity, if you expect to use it at petal fall for leafrollers. Parenthetically, as a reminder, Carzol is available, although it is restricted to no later than petal fall, so it may be of limited use in most programs. For any of the rescue products, the operational threshold (through June) is an average of 2.5 motiles per leaf (see the chart on p. 72 of the Recommends).

Using Disease Models for Controlling Fire Blight

D. Breth

It is time to be ready for fire blight blossom blight sprays starting at first bloom on Asian pears, followed by pears, Idareds, Gingergolds, 20 oz. which will be in bloom by early next week if the models predict a blossom blight infection with showers. I will be running fire blight models and will send out fire blight alerts as needed in Fruit FAX and as "text" messages if you let me know you want to receive the fire blight text alerts. ***Get some streptomycin on hand for bloom and wait for the call.***

There are several ways to stay in the loop for blossom blight alerts:

NEWA will be listing the results for Cougar blight based blossom blight risk predictions. Go to this website: http://newa.cornell.edu/index.php?page=apple-diseases. Select fire blight in the Apple diseases box, then location, and be sure to set first bloom date, and then hit calculate.

MARYBLYT 7 for Window is now available – free download. You can get it from http://www.maryblyt.com. This model assumes the abundance of inoculum. It will also predict the development of symptoms.

Cougarblight: Can be run as an excel spreadsheet; there is a new version which might identify more infections than the older version of CB. I have not identified differences in predictions comparing the Maryblyt and Cougarblight version 2000. If you need a copy of the old version of CB, please call Debbie. The advantage of having your own model is to allow you to adjust the temperatures up a couple degrees to accommodate warmer spots on your farm relative to the placement of the weather station published on NEWA.

Fire blight blossom blight models are not black and white decision-making tools. They are only as good as the weather data that is entered. Do the high temperatures of the weather station match the high temperatures in your orchards? All orchards have variable temperatures depending on sunshine and wind, perhaps with warmer spots because it is sheltered from the wind. Look at the locations in your orchards where you have a concentration of fire blight. Does it appear to be a warm spot out of the wind? A low spot where dew might settle? You should protect these areas earlier when we are just approaching a high risk situation. Or add a couple degrees each day for the high

temperature. There is always room for interpretation and that is usually where we make our mistakes.

Here are the things I use to make my blossom blight risk decisions avoiding previous trials by fire. If you keep the threshold set as the defaults in the model, it will predict a high risk of infection if the degree hour threshold has been met. I do not pay any attention to the temperature the day of the wetting event in the Maryblyt model since we have had situations where we had plenty of heat building up to the wetting event, it turned cold, but we still got infections. Were they blossom infections? If you have enough inoculum and a wetting event, we can get blossom infections as we do when researchers do artificial inoculation when the weather is cool. If we have met the degree hour threshold, and no wetting event is forecasted, I look carefully at other possible sources such as a leaf wetting event from dew during the night, or a fungicide application, and I will lean toward a streptomycin spray. Just a reminder that I reported a German study (E. Moltman) showed 52% of flowers were infected at 64-75F and 6% at 61F after spraying with 0.1 mm if water which cannot be effectively measured by a leaf wetness sensor.

Fire blight text alerts: if you know how to text with your phone, you can text Debbie at 585-747-6039 to get on the FB alert list. ***If you are enrolled in the LOF program*** with your partner county CCE office, we will send you a short blossom blight alert based on the risk predictions of the models. We need to know your cell phone number and phone carrier to send a text message to you.

Fruit FAX will be sent more often during apple blossom to report the risk of blossom blight infections.

2013 Guidelines for Fire Blight Management in New York

Streptomycin- K. Cox, H. Aldwinckle, D. Breth, J. Carroll

Resistant strains of the fire blight bacterium, *Erwinia amylovora*, (SR Ea) were identified from 4 farms in Wayne and Ontario counties in late 2011. In 2012, SR Ea was detected (in mixed populations with sensitive Ea) on 7 more farms. Because of this, the following counties in NY; Wayne, Ontario, Monroe, Orleans, and Niagara are considered 'High Risk Areas' for streptomycin-resistant fire blight in 2013. In these 'High Risk Areas' streptomycin may provide less than adequate control of blossom infection. Prohexadione-Calcium (Apogee) should be effective against SR Ea shoot infections.

The 2012 season did not prove to be a disaster with heavy economic impact caused by fire blight and it is unlikely EPA would look favorably on an emergency use Section 18 for kasugamycin (trade name Kasumin), an effective alternative antibiotic to streptomycin. Kasugamycin is still in the pipeline for EPA Section 3 registration but it is not yet registered for 2013. Kasugamycin would give excellent blossom blight control of SR Ea as well as regular fire blight. The following guidelines are provided for control of fire blight without use of kasugamycin.

*Oxytetracycline must be applied before infection occurs. Therefore, monitor fire blight forecasts and heed CCE alerts carefully when using oxytetracycline. Use Fireline at 12 oz./100 gallons dilute rate, or Mycoshield at 1 lb./100 gallons dilute rate. Data from university field research trials suggest that different formulations of the same antibiotic active ingredient may perform differently in the field. Consult with a specialist before choosing the product for your operation.

**Copper must be applied before infection occurs. Therefore, monitor fire blight forecasts and heed CCE alerts carefully when using copper. Copper may cause fruit russet. Hydrated lime may be used to safen copper. An example would be Badge SC at rate of 0.75 to 1.75 pints /acre buffered with 1-3 lbs. of hydrated lime for every 2 pints of Badge to minimize fruit finish damage.

GUIDELINES FOR ALL AREAS

1. All fire blight cankers should be removed during winter pruning. Remove all trees with fire blight on the central leader or main trunk. Infected wood should be removed from the orchard.
2. Copper sprays should be applied at green tip.
3. CCE alerts and disease model forecasts for fire blight infection periods should be heeded, and suggested materials sprayed promptly.
4. When blossom infection is forecast, apply a tank mix of either
   a. oxytetracycline* in combination with streptomycin at 8 oz./100 gal dilute or 1.5 lbs./A,
   b. or, 8 oz./100 gal dilute or 1.5 lbs./A of streptomycin in combination with a bloom time rate of a registered copper** product.
5. Prohexadione-Calcium (Apogee) applications for shoot blight should be seriously considered, especially on highly-susceptible varieties where fire blight is established in the orchard starting at 1-3 inches of shoot growth.
6. Fire blight strikes should be pruned out promptly and destroyed.
7. If severe blossom blight occurs regardless of the timing of a streptomycin application, contact CCE for SR Ea testing, listed under "Sample Submission" below.
8. If you need to interplant apple trees in existing orchards where fire blight was observed; wait until late fall, so the bloom on the new trees will be synchronized with the established trees.
9. If fire blight symptoms appear, collect samples for streptomycin resistance screening so you can plan your management program. Contact CCE for SR Ea testing, listed under "Sample Submission" below.
10. No quarantine will be imposed if SR Ea is found in your orchard.

ADDITIONAL CHEMICAL USE GUIDELINES FOR HIGH RISK AREAS (with confirmed SR Ea)

1. Follow general recommendations (above) ***except for the following differences***.
2. Never apply streptomycin without another active ingredient effective against fire blight. To reiterate, when blossom infection is forecast, apply a tank mix of either
   a. oxytetracycline* in combination with streptomycin at 8 oz./100 gal dilute or 1.5 lbs./A,
   b. or, 8 oz./100 gal dilute or 1.5 lbs./A of streptomycin in combination with a bloom time rate of a registered copper** product
3. Prohexadione-Calcium (Apogee) sprays should be applied at the highest labeled rate at 1-3 inches shoot growth. Apogee will not be effective if applied after you see fire blight symptoms.

GUIDELINES FOR ON-FARM NURSERY PRODUCTION

1. Collect budwood from orchards where fire blight is not established or from a neighboring farm without fire blight.
2. Limit streptomycin applications to 2-3 per season. These should be timed according to a disease forecast model prediction or CCE alert.
3. When fire blight pressure is high and shoots are actively growing, apply copper at the lowest labeled rate to prevent shoot blight.
4. Before conducting tree management tasks in nursery, apply a copper product at the lowest labeled rate and observe the labeled REI.
5. When working in the nursery, field workers must wear clean clothing, and should wash hands and disinfect working tools often.
6. Any pinching or leaf twisting should be done on dry sunny days with low relative humidity, after the REI of a copper application has expired.
7. If fire blight is found in the nursery, completely remove the infected trees including the root system, and place them in

trash bags between rows. Subsequently, remove the culled trees from between the rows and discard them. Under no circumstances should unbagged infected trees be pulled between nursery rows when trees are wet, otherwise fire blight will be spread down the rows.

8. Control potato leafhoppers in nursery using a registered neonicotinoid product.
9. Maintain weed control through cultivation. Apply registered post-emergence herbicides using a shielded boom. There are some residual herbicides registered for use in nurseries.
10. When trees have reached the desired height, consider applying the lowest labeled rate of Apogee to slow growth and reduce susceptibility to shoot blight.
11. Manage nitrogen levels to balance tree growth and fire blight susceptibility.

RECOMMENDATIONS FOR NEW PLANTINGS (1-2 years)

1. If possible, plant varieties grafted on fire blight-resistant rootstocks.
2. Trees should be carefully examined for fire blight infections before planting. Infected trees should be discarded. Samples should be submitted for strep-resistance testing. Contact CCE for SR Ea testing, listed under "Sample Submission" below.
3. Immediately after planting, and 14 days later, a copper application should be made. Ensure that soil has settled to avoid phytotoxicity to roots.
4. Trees should be scouted at 7-day intervals for fire blight strikes until July 31st. Infected trees should be removed as described above. Plantings also need to be scouted 7-10 days after hail or severe summer storms. The NEWA disease forecasting model for fire blight newa.cornell.edu/index.php?page=apple-diseases can assist by providing an estimate of symptom emergence following a storm or other trauma event. Also scout the planting at the end of the season (mid-September).
5. If possible, remove flowers before they open. New plantings may have considerable numbers of flowers the first year, and blossom removal may not be practical. If practiced, the blossoms should be removed during dry weather and before there is a high risk of fire blight infection.
6. Trees should receive an application of copper at a stage equivalent to bloom. Observe the labeled REI before blossom removal.
7. To protect any remaining bloom, apply one of the following tank mix options:
   a. the highest labeled rate of copper** prior to infection,
   b. or, oxytetracycline* in combination with streptomycin at 8 oz./100 gal dilute or 1.5 lbs./A,
   c. or, 8 oz./100 gal dilute or 1.5 lbs./A of streptomycin in combination with a bloom time rate of a registered copper** product.
8. **Samples of any infections observed after planting should be submitted for strep-resistance testing** – see contact information below. Infected trees should be removed entirely in these high density orchards.

SAMPLE SUBMISSION INSTRUCTIONS

If you see symptoms of fire blight, please call any of the contacts below to come and collect a sample. If you do not want to leave the infection in the orchard, collect the sample including a healthy part of the plant, place it in a plastic bag and keep it in a cold place until it can be picked up by one of the persons below who will come and collect samples and take data on the situation. The bacteria will not be viable for long if left in the back of the truck.

Debbie Breth, Tel: 585-747-6039, email: dib1@cornell.edu
Juliet Carroll, Tel: 315-787-2430, email: jec3@cornell.edu
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Contents:

The "Variable Rate" Precision Factor for Apple Orchards in NY State

Patrick L. Clark, Helena Chemical Company
(edited by M. Miranda Sazo and L. Cheng)

The goal of precision orchard management is to identify and aide in the management of apple orchard variability. Just as no two people are alike, no two apple orchards are the same. There are many factors that make an orchard unique and can directly affect the health and yield potential of that individual orchard; such as soil texture. Soil texture (percent of sand, silt, and clay) relates to factors that have a major impact on productivity, such as: water holding capacity, cation-exchange-capacity (CEC), topsoil depth, and nutrient-use efficiency. Traditionally, soil texture is identified using a soil type map which broadly depicts where textural classes are located. However, a new and more precise technique is available through a service called HyGround® that maps the varying soil textures throughout an orchard using electrical conductivity measurements. Electrical conductivity (EC) is the measurement of how much electrical current a soil can conduct. It's an effective way to map soil texture because smaller soil particles such as clay conduct more current than larger silt and sand particles. Essentially, EC mapping can precisely locate varying soil textures throughout a given orchard.

The HyGround® process involves an EC machine traveling at regular intervals throughout the orchard returning one data point per second, the data is then used to create EC management zones. Now, soil sampling sites can be placed according to variability and geo-referenced for mapping. Next, the soil analysis data will be imported into proprietary software to create surface maps of the soil properties within each EC management zone. Finally, a variable rate (VR) recommendation can be created to precisely apply the amount of product throughout the orchard at the rates needed at exact placement to address the variability. For example, a VR lime recommendation that is based on varying pH ranges within an orchard allows for the application of lime to be precisely delivered at the rate needed to adjust the pH accordingly. As a result, a consistent target pH could be achieved through the orchard maximizing nutrient availability.