FRUIT NOTES
Lake Ontario Fruit Program

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Precision Chemical Thinning – An Update on Fruit Measurement Studies

T.L. Robinson and M. Miranda Sazo

The results of fruit diameter measurements made by several cooperating NY grower and consultants after petal fall thinning sprays around May 19th or 20th show that the sprays provided significant thinning on Gala and Honeycrisp but that additional thinning is still needed. In these blocks where fruit size was measured on day 3 and day 8 after the thinning spray, Gala and Honeycrisp fruit set on mature trees was reduced by about 70% (Table 1), however the target is to reduce fruit set by 90%. Thus substantial thinning on Gala and Honeycrisp still remains to be done. This suggests another spray in these blocks. These results suggest what might be done in similar blocks with excellent bloom and set. Of course, you know best conditions on your farm and how individual blocks respond to thinners.

The high temperatures which are forecasted are creating a moderate carbohydrate deficit which suggests reduced rates depending on how high the temperatures go. If temperatures reach 90°+ then we suggest delaying thinning sprays until temperatures moderate. Since the weather forecasts change regularly and that affects the apple carbohydrate thinning model, we suggest that growers check the model each day but especially immediately before spraying to get the best estimates of thinning effect. If the forecasted conditions aren't achieved then the thinning prediction will be wrong. This is one of the risks of having a model using forecasted data and then having growers not check it regularly.

The carbohydrate model is now available on the web at the NEWA website http://newa.cornell.edu under the crop management tab. Run the model before each thinning spray and adjust thinner rates based on the recommendation in the last column of the table. The four very simple steps are: (1) Go to the NEWA Apple Carbohydrate Thinning Model Page, (2) Choose a station and click "Continue", (3) Enter your green tip (@ April 16-17) and full bloom dates (@ May 7-8) and click "Calculate", (4) Move the scroll bar on the right to find today's date on the table. The last column gives the recommended adjustment in thinning rates for today based on the model. Again, the model is limited by the accuracy of the forecasted temperatures and sunshine, which change daily.

We have a large crop this year which will require an aggressive thinning effort to reduce crop load to the target number. We suggest a 2 or 3 spray program beginning with a petal fall spray followed by a 12mm spray and if needed a 18mm spray. Most of the petal fall sprays were applied between Friday May 17 (inland sites) and Monday May 21 (lake sites). The next spray should be applied this week. This must be applied between the rain showers and on a day that is cooler than 90°F. When calculating rates begin with the suggested full rate of thinner (For hard to thin varieties, either 3oz NAA + 1pt Sevin/100 gal TRV dilute basis or 64 oz Maxcel + 1pt Sevin/100 gal TRV dilute basis; For easy to thin varieties either 2oz NAA + 1pt Sevin/100 gal TRV dilute basis or 48 oz Maxcel + 1pt Sevin/100 gal TRV dilute basis) and adjust up or down based on the carbohydrate model results. However, if temperatures are above 90° do not thin.

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Cornell Cooperative Extension provides equal program and employment opportunities. NYS College of Agriculture and Life Sciences, NYS College of Human Ecology, and NYS College of Veterinary Medicine at Cornell University, Cooperative Extension associations, county governing bodies, and U.S. Department of Agriculture, cooperating.

Every effort has been made to provide correct, complete, and up-to-date pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly, and human errors are still possible. These recommendations are not a substitute for pesticide labeling. Please read the label before applying any pesticide.

In summary, we have a lot of confidence in the carbohydrate model but the high temperatures forecasted for the next few days lead us to be cautious. Thus despite the model we think growers should use slightly reduced rates (15-30%) for the next few days. If it really gets to the 90's then we delay thinning until temperatures moderate.

Table 1. Chemical thinning recommendations for 8 field studies conducted as part of a precision chemical thinning group effort during May 2013 in NY State.

Cultivar/Farm	**Initial number of clusters/fruitlets per tree (averaged from 5 trees)**	**Current number clusters/fruitlets after bloom and/or petal fall spray(s) as May 28, 2013**	**Current set (% fruitlets/tree) after thinning spray(s)**	**Target fruit number per tree**	**Chemical thinning recommendation**
Gala (young tree)/Abbott Farms	146 clusters (or 729 fruitlets)	224 fruitlets	30.7%	111 fruits	Spray again
Honeycrisp (young tree)/Abbott Farms	210 clusters (or 1050 fruitlets)	414 fruitlets	39.4%	61 fruits	Spray again
Gala (mature tree)/Orchard Dale Fruit Farms	235 clusters (or 1175 fruitlets)	328 fruitlets	32.5%	135 fruits	Spray again
Gala (mature tree)/Ledge Rock Farms	488 clusters (or 2440 fruitlets)	748 fruitlets	30.6%	231 fruits	Spray again
Honeycrisp (mature tree)/ Sandy Knoll	225 clusters (or 1125 fruitlets)	321 fruitlets	28.6%	65 fruits	Spray again
Gala (mature tree/Sandy Knoll	470 clusters (or 2350 fruitlets)	578 fruitlets	24.6%	135 fruits	Spray again
Gala (mature tree))/Lamont Fruit Farm	200 clusters (or 1000 fruitlets)	375 fruitlets	37.5%	80 fruits	Spray again
Honeycrisp (mature tree)/Lamont Fruit Farm	200 clusters (or 1000 fruitlets)	213 fruitlets	21.3%	60 fruits	Spray again

Nutrient Management in Apple Orchards for the 2013 Growing Season

L. Cheng and M. Miranda Sazo

Nutrient management plays an important role in determining tree growth, apple yield and quality. Due to the light crop last year, most blocks have snow ball bloom this year, and a potentially heavy crop. Depending on how good a thinning job you do this week, this potentially heavy crop will have an impact on nutrient management this year. Here are a few things you need to keep in mind when

developing a nutrient management program for your orchards in the 2013 growing season.

Nitrogen: Our work with Gala has showed that the highest demand for nitrogen is from petal fall to the end of shoot growth. During this period, both rapid shoot growth and fruit cell division require substantial amount of nitrogen. We estimated that the total annual requirement for nitrogen by high density Gala trees is about 50 lbs actual nitrogen per acre, 70% of which occurs from bloom to the end of shoot growth. Our work also showed that, to grow good size and high quality Gala, leaf N level should be between 2.0 to 2.2%, which corresponds to dark-green foliage. To meet the tree nitrogen demand, we recommend making a nitrogen application between budbreak and petal fall as a regular ground application. In a heavy crop year, providing enough nitrogen to the trees is important for encouraging a little more vegetative growth to support the crop as heavy cropping decreases tree growth. So, if leaf analysis last year showed a need for nitrogen application, but you have not applied any nitrogen by now, please do so soon. This is because, for the same amount of fertilizer N, the later you apply the higher the fruit nitrogen status will be at fruit harvest. However, if you use fertigation, you should target the period from petal fall to end of shoot growth. In addition, since spur leaves account for most of the canopy surface early in the season, they would get a larger share of the foliar applied nitrogen to support fruit cell division. Therefore, foliar N application at petal fall and early cover sprays is a good way to supply nitrogen to the young fruitlets and spur leaves. We recommend using foliar urea application at petal fall, first cover, and second cover at a rate of 5 lb. urea per 100 gallons on blocks that had marginal N status last year. Urea can be easily tank-mixed with most fungicides and insecticides, but cannot be mixed with oil. We recommend dilute sprays, but if you have to make concentrate sprays, do not concentrate over 3X.

Potassium: Of the macronutrients required by apple trees, K has the highest concentration in fruit and more than two thirds of the total tree K requirement is found in fruit. As a result, fruit harvest removes significant amounts of K from orchards. Based on our data obtained on Gala/M.26 trees, 80 to 85 lbs of K is removed at a fruit yield of 1500 bushels/acre, which is about 100 lbs of potash (K_2O)/acre. With an anticipated heavy crop, the tree will need more potassium this year. So, if your tree K level was marginal in last year's leaf analysis, you need to apply a higher than average amount of potassium this year if you have not done so. Fertigation is a great way to deliver potassium. If you use fertigation, target the period from petal fall to a couple weeks before harvest. Our work on Gala/M.26 showed that apple trees have a constant demand for K from bloom to fruit harvest.

Boron and Zinc: They both are important for fruit growth and development. In a heavy crop year, fruit growth requires more B and Zn. In addition to soil application, foliar spray of Solubor is a very effective way to supply B to fruit. For Zn, foliar spray is the only economical way of providing this element to apple trees. We recommend applying Zinc chelate at the label rate and Solubor at 1 lb per 100 gallons at petal fall and the first cover or second cover to promote early fruit growth. 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.

Water/irrigation: Dry fertilizers applied to soil cannot be taken up by the roots unless there is good moisture in the soil. This is true for all the nutrients, but particularly important from N, K, Ca, and B. Soil water status also affects the mineralization of organic matter, consequently the amount of nitrogen available for the trees. In addition, soil water availability affects fruit cell division and cell enlargement, thereby affecting the final fruit size. In a heavy crop year such as this year, providing irrigation to ensure water supply and nutrient uptake is essential for sizing the fruit to achieve high yield and good quality, especially if it turns out to be a dry year.

Calcium: For blocks that have a light crop this year due to low return bloom, frost damage or poor fruit set, adequate fruit Ca is critical for minimizing bitterpit development and other physiological

disorders. Ca accumulation occurs during the entire fruit growth period from petal fall to fruit harvest. In addition to having proper soil pH and maintaining "calm' trees, a foliar Ca spray program is essential for bitterpit susceptible cultivars such as Honeycrisp, Cortland, Jonagold, Mutsu and Northern Spy. We have been recommending the following Ca spray program: 3 to 4 cover sprays of 1 to 2 lbs of calcium chloride (78% $CaCl_2$) or its equivalent per 100 gallons (dilute basis) at 14-day intervals, beginning 7 to 10 days after petal fall, followed by 2 additional sprays of 3 to 4 lbs of calcium chloride (78% $CaCl_2$) per 100 gallons at four and two weeks prior to harvest. It's important to keep in mind that complete coverage of fruit is essential and more frequent sprays are more important than exact timing of sprays. Calcium chloride cannot be mixed with oil.

Start using the "Apple Irrigation Model" For Both New and Mature Orchards in 2013

T.L. Robinson, A. Lakso, L. Cheng, S. Hoying, M. Miranda Sazo, M. Fargione and K. Iungerman

Proper irrigation will be an important tool for maximizing tree growth and achieving optimum fruit size this year. Now is the time get your trickle irrigation system up and running. Start by checking the entire distribution system and emitters this week. This year, with the relatively dry spring, the application of water should begin in mid-May. We suggest starting irrigation now for new plantings and especially for the NY1 apple cultivar.

This year the proper amount of water to apply to both new and mature orchards can be determined by running the apple irrigation model found at the NEWA website (http://newa.cornell.edu) under the crop management tab. This model asks you to pick a weather station near your farm and then define whether the orchard is a 1, 2, 3 or 4 year-old orchard or a mature orchard (5 years old or older). When you click the "calculate" button, the model will report how much water should be added each day or each week to your orchard. As we go through the season, log into the NEWA website once per week and run the irrigation model, then add the proper amount of water to the orchard in two irrigations per week until mid-June. After mid-June, we suggest you add the proper amount of water in three irrigations per week.

With new high-density orchards, irrigation is essential for early tree growth. Feathered trees have a low root: shoot ratio (small root system compared with the top). In many cases, these trees undergo water stress shortly after planting, despite adequate soil moisture levels in the bulk soil. This is due to the damaged and small root system of a transplanted tree, which can't adequately support the large top without frequent irrigation. Feathered trees produce much more leaf area shortly after planting than unfeathered trees, which creates a high water demand before the root system can re-grow sufficiently to support the trees. We recommend growers install irrigation immediately after planting (within 4 weeks) when planting highly feathered apple trees, to prevent water stress and maximize first year tree growth. Once the trickle irrigation system is installed, the new trees need only small but frequent doses of water.

After planting, tree growth and the uptake of nitrogen can be improved with frequent low doses of nitrogen fertilizer delivered at least twice weekly through the trickle system (fertigation) for the first 10-12 weeks of the season. With fertigation, the nitrogen- which is dissolved in the water, moves rapidly with the water to the root zone and is readily available to the tree growth during the season to speed development of the canopy.

The source of nitrogen, which is most readily available during the first year, is calcium nitrate but other formulations of nitrogen, which are liquids, (URANs or CANs) are also are effective. With young non-bearing apple trees we suggest 60–100 lbs of nitrogen per season. Utilizing the weekly application strategy for the first 10 weeks of the season will require 6–10 lbs N per acre per week. With mature trees, we suggest from 20–40 lbs of nitrogen per season, which would be 2–4 lbs N per acre per week.

After the first 2–3 years, low nitrogen fertilization is desirable to keep the trees calm, with a balance between fruiting and cropping. Many mature high-density orchards receive excessive nitrogen fertilizer, which causes severe canopy management problems. "Soil strength" or fertility must be

considered when calculating the amount of nitrogen to apply to mature high-density orchards, especially with vigorous and poor coloring varieties. Many soils in New York produce 30–60 lbs/acre of nitrogen annually through nitrification. This is often close to the amount needed by mature high-density orchards. Excess fertility often results in excessive vegetative growth, delayed cropping and soft and poorly colored fruit.

Pest Notes

D. Breth

Codling moth biofix has been set for May 15 in high pressure sites inland, and May 17 for high pressure sites closer to the lake. In orchards with moderate populations, biofix is set for May 20. We have accumulated 120 (May 17 biofix) to 150 DD50^{o}F (May 15 biofix) as of May 29 in sites with high populations (sites with trap counts in the 50's and damage last year!). The forecast shows that we will accumulate another 100 degree days in 4 days in inland sites and 5 days closer to the lake. If no Rimon at petal fall, we want to apply the first CM spray at 200-250 degree days base 50^{o}F (<u>should be completed by Jun 1 in high pressure sites</u>, <u>completed by Jun 3 in sites with a biofix for May 20</u>) using Assail (5-8 oz./acre for internal leps), Calypso (6-8 oz./acre), Delegate (4.5 – 7 oz./acre), Altacor (3-4 oz./acre), Belt (3-5 oz./acre), Imidan (3 lb/acre), or a high rate of Voliam Xpress (12 oz./acre will provide equivalent of 3 oz. of Altacor) or Voliam Flexi. This is also the same timing for the granulosis virus products including Carpovirusine, Cyd-X, or Virosoft. If Rimon was used at petal fall for leafrollers and codling moth, you can wait until 350 DD50F^{o} to apply the next insecticide for codling moth hatching larvae. Rimon (20-40 ounces/acre) has a Special Local Need Label for codling moth and is most effective if applied prior to egg deposition or shortly after – 50-100 days after first sustained trap catch. We are well past that window in high pressure sites. Use the higher rates for high populations of leafrollers or codling moth. Rimon can be used as the first spray for the second generation of CM and OBLR, but only one application per season in NY.

This is **<u>critical spray timing</u>** even if you installed mating disruption pheromones this season. Missing the first egg hatch timing for the first generation of codling moth will result in a larger population for the second generation! Using Sevin for thinning will not control codling moth! Be sure to use the appropriate rates per acre for codling moth for these materials and be sure you can get **<u>good spray coverage</u>**. Relying on pyrethroids for codling moth control, in my experience, has not provided adequate control for the first generation. If you had no damage from CM last year, and traps counts stay low for this first flight (less than 5 moths per trap per week), you can wait until 350 degree days base 50^{o}F.

It is time to hang up obliquebanded leafroller traps to mark biofix (first sustained catch) and determine the proper timing for this pest. Timing for this pest will usually line up with control of the second peak of egg hatch for codling moth in late June and early July. Stay tuned.

Wanted – Sweet Cherry Interested in Extending Shelf Life & Marketing Window

Craig Kahlke

Craig is looking for any size sweet cherry growers to continue to test modified atmosphere packaging (MAP) that can extend sweet cherry shelf life up to 6 weeks. This is passive, inexpensive packaging that does not need any gases pumped in. The sweet cherry liners hold 10-20 pounds of fruit. If you farm in a partner LOFP county, Craig will be available for on-farm visits to give instructions in use. If you are outside the 5-county Lake Ontario Fruit Program territory, you can still try the sweet cherry liners – the instructions are relatively simple and the MAPs could be shipped anywhere or picked up in Western NY. The cherry liners are inexpensive- only about 50 cents each. You can try just a few if you want; there is no need to buy a whole 250-liner box. The sweet cherry liners have extended shelf life by 5-6 weeks in firmer cherries such as Hudson, Sam, and Schmidt, and by 4 weeks in some other varieties

compared to 2 weeks maximum for control fruit. If you have a glut of certain varieties and you want to try extending your market, it is easy to test the MAPs with as little as 50 pounds of fruit. For more information please contact Craig at 585-735-5448 or cjk37@cornell.edu.

Hand Thinning Meeting June 10 - Precision Crop Load Management

M. Miranda Sazo and T. L. Robinson

We invite you and your employees to attend a hand thinning field meeting for precision crop load management (with/and without the use of motorized platforms) scheduled for **Monday June 10, 3-5pm** in Wolcott, NY**.** We will learn about the benefits of early hand thinning for Honeycrisp and Gala and how more precise hand thinning techniques can be accomplished in trellised orchards. The Cornell young tree thinning guide to adjust crop load will be available for those growers who still don't have one. Come to learn a simple procedure to reduce fruit number per tree to a targeted and profitable number, so you can get a better impact on your bottom line this year. We will also discuss the benefits of precision irrigation management and will introduce the new "Apple Irrigation Model" for both new and mature orchards that can be found now at the NEWA website (http://newa.cornell.edu) under the crop management tab. See the Apple Irrigation Model article elsewhere in this newsletter.

We will also demonstrate mechanical sidewall shearing of the tall spindle to form a Tall Spindle Fruiting Wall.

Monday June 10, 2013 **Wafler Farms, Wayne County (3-5pm)**	Workshop hosted by Paul Wafler. Travel to 10748 Slaght Rd., Wolcott, NY 14590 and look for the Cornell Fruit Event signs.

Premier Apple Forum Program (DRAFT) 2013

Monday June 24, 2013

Noon- 1:00	Lunch
1:00- 1:05	Opening Remarks - Doug Grout, Chairman
1:05- 2:35	KEYNOTE SPEAKER - Jolene Brown "It's a Jungle Out There" Presented by AgroFresh
2:35- 3:00	Networking Break Sponsored by: Valent
3:00- 3:30	CROP ESTIMATE BREAK-OUT SESSIONS (by region)
3:30- 4:00	CROP ESTIMATE REPORT/ DISCUSSION
4:00- 4:30	Washington Report – Todd Fryhover, Washington Apple Com.
4:30- 5:00	Canadian Crop Report – Tom O'Neill, Norfolk Fruit Growers
5:00- 6:00	Social Hour
6:00	Dinner

Tuesday June 25, 2013

7:00- 8:00	Breakfast
8:00- 8:40	US Apple Updates - US Apple Staff
8:40- 9:10	Apple a Day Research - Dr. Robert DiSilvestro, The Ohio State University
9:10- 10:01	Plant Growth Regulators 101 – Jim Wargo- Valent
10:01- 10:07	Premier Apple Annual Meeting
10:07- 10:30	Networking Break
10:30- 11:00	Processing Report - Dave Cox, Knouse
11:00-11:30	New Innovations in Thermo-Fogging and Post Harvest fungicides for Decay Control – Dr. Richard Kim, Pace
11:30- 12:00	Marketing the 2013 Crop - Panel
Noon	Closing Remarks/ Adjourn

Premier Apple Cooperative, Inc.
Marketing Forum Registration Form

Best Western Plus, Carrier Circle
6555 Old Collamer Road, E. Syracuse, NY 13057

For hotel reservations call 315.437.2761
by May 30th and mention Premier Apple for the $86 group rate

Please return your Forum reservation form to Premier Apple by June 14th
If registration will be late – please call 440.670.2883 to make arrangements

I/We will attend the Marketing Forum in Syracuse on June 24-25, 2013

_____

_____

Total members _____ @ $125.00 $_____

Total non- members _____ @ $150.00 $_____

Total enclosed $ _____

The registration fee includes lunch, dinner and breakfast

Name_____

Contents:

Company_____

Mailing address_____

City_____State_____ Zip_____ County _____

Phone _____ Fax _____ E-mail _____

Thank You for Your Continued Support!!!

Lake Ontario Fruit Program
Cornell Cooperative Extension
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Save the Dates

June 3 – DEMONSTRATION of a *New* 3-ROW SPRAYER, Vandewalle Fruit Farm, Alton
4:00-5:00 P.M. *and* 6:30-7:30 P.M. See Issue 11 FN issue for more details

June 10 – Hand Thinning Meeting, 3-5 PM, Wafler Farms, see info this issue

June 24-5 – Premier Apple Marketing Forum, Syracuse – See program and registration info in this issue

July 16 – 17 - IFTA Summer Study Tour, Gettysburg, PA. Registration, itinerary, other info at https://ifruittree.site-ym.com/default.asp?page=2013StudyTour

August 1 – Summer Fruit Tour, NYSAES, Geneva- more info TBA

August 6 – Cornell University Storage Workshop, Ithaca, NY – Full Program coming in FN soon! This year's workshop, slated for August 6 in Ithaca, will feature an international, national and statewide cast. Our guest speakers include Dr. Angelo Zanella, who heads the post-harvest research group at Laimburg Agriculture Research Centre in Italy, and who will be presenting their work on DCA and ILOS, as well as their experiences with DPA. Other presentations will include Honeycrisp, and Empire and Gala browning by Jim Mattheis (USDA, Washington), Jennifer DeEll (Ontario Ministry of Agriculture and Food, Canada), as well as the Cornell team of Chris Watkins and David Rosenberger. Industry presentations include DECCO, PACE and Storage Control Systems. Registration materials will be available shortly.