

Volume 14 Issue 17

FRUIT NOTES

Lake Ontario Fruit Program



July 10, 2014

Request and Use the Young Apple Thinning Gauge for Strict Crop Load Management of High-Value Apple Cultivars Mario Miranda Sazo



This tool can help you adjust proper crop load management to optimize early cropping and tree growth of new high-density apple orchards. By using this tool now during hand thinning, you will be able to measure TCA (Trunk Cross- sectional Area) and more precisely determine the final crop load for your young apple trees. Just hold this gauge along the tree trunk at a distance of **one foot from the ground**. Then match the trunk diameter to a half-circle on the gauge and read the corresponding pair of numbers to determine the appropriate final fruit number per tree. For each pair of numbers (please see **H182/G274** as shown in this picture), the smaller number (**H182**) represents the recommended final fruit number for biennial varieties such as Honeycrisp and Fuji (**H**), while the larger number (**G274**) represents the recommended crop load for more annual varieties such as Gala, Empire, McIntosh, Delicious, etc. (**G**). The gauge comes with instructions for use and 10 optimum crop loads for different trunk sizes.

Honeycrisp: This apple is **highly biennial** with trees cycling between low crop load and high crop loads. Crop load appears to have a dominant effect on 'Honeycrisp' fruit quality. If crop load is too high then (1) fruit size is reduced, (2) fruit quality is poor, and (3) crop value is reduced. If crop load is too low) then (1) yield is low, (2) fruit size is too big, (3) storage disorders are increased, and (4) crop value is reduced.



Cornell University Cooperative Extension

Lake Ontario Fruit Program in Wayne, Orleans, Niagara, Monroe, and Oswego Counties <u>http://lof.cce.cornell.edu</u>

Deborah Breth Area Extension Educator Team Leader, Pest Management 585-747-6039 dib1@cornell.edu

Alison De Marree Area Extension Educator Production Economics 315-573-8881 amd15@cornell.edu

Craig Kahlke - Newsletter Editor Area Extension Educator Fruit Quality Management 585-735-5448 cjk37@cornell.edu

Mario Miranda Sazo Area Extension Educator Cultural Practices 315-719-1318 mrm67@cornell.edu

Building Strong and Vibrant New York Communities

Diversity and Inclusion are a part of Cornell University's heritage. We are a recognized employer and educator valuing AA/EEO, Protected Veterans, and Individuals with Disabilities.

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.

This cultivar requires **precise** and **early** crop load management for optimum floral return and fruit quality. We expect, if needed, you already finished early hand thinning of this cultivar at the 30-32 mm fruit size stage by utilizing the CU thinning gauge this season. Now is the time to begin return bloom sprays for next 2015 year (review the return bloom spray article in this newsletter).

NY1 and NY2: With young trees (planted in 2013 or earlier) that have a crop, the unsupported terminal portion of the leader above the last wire

should be defruited for maximum shoot growth and good lignification during years 2, 3 and 4. Interestingly, the wrapping of the leader around a vertical wire stabilizer works, supports the leader, and encourages new growth above where it is supported by a tie at the trellis wire.

For NY1 trees which had moderate or poor growth in the first year or were planted on a weak rootstock, these trees should be de-fruited in year 2 (and in very few cases in year 3) because fruits will outcompete with overall tree and shoot leader growth for carbohydrates and water. NY1 trees planted this year should not carry a crop.

Planning Ahead with Midsummer Grasses

M. Miranda Sazo and S. A. Hoying

Note: For more details on how to improve the soil health of your future orchard, please review Carol MacNeil's article published by CCE-LOF newsletter, Vol 14, Issue 2, May 14, 2014.

Growers who are planning to plant a new orchard site (or a replant site) next year can consider the use of cover crops before planting an orchard. Their benefits are numerous. When used they can: (1) improve organic matter, (2) break up compaction layers in the soil profile, (3) suppress weeds, and (4) control erosion. We recommend the use of sudangrass (see Table 1), but several other cover crops can be used. A more complete list of cover crop options can be found at the web site prepared by Thomas Björkman

(<u>http://covercrops.cals.cornell.edu/</u>). This tool was originally designed for vegetable growers, but is still very useful for fruit growers as well.

Sudangrass and sorghum-sudangrass are midsummer grasses suitable for short, 8-10 week plantings. Sorghum-sudangrass is often referred to generically as Sudex. These grasses are the most heat and drought- tolerant cover crops typically grown in the Northeast. Sudangrass growth is easier to manage because the stems are narrower, it can be sown earlier than sorghum-sudangrass, and suppresses weeds better. These crops provide abundant root biomass, which is useful for increasing soil organic matter. Mowing encourages root growth. They suppress root knot nematodes and inhibit weed germination if densely sown.

A few management tips: (1) land preparation: prepare a clod-free seedbed. Avoid hard soil and wet spots. Do not plant just before a heavy rain, (2) seeding rate: 30 lbs/acre for biomass and nematode control, 50 lbs/acre for weed control, (3) seeding date: June through mid-August (sudangrass), July through mid-August (sorghum-sudangrass). These cover crops require warm soil to germinate, (4) maintenance: mow when 20-30 inches tall, leaving a six inch stubble. Two cuts in average can be conducted per season with sudangrass. Leave residue on the soil surface for weed suppression. Timely mowing is important because tall, fibrous plants are difficult to mow or incorporate, and (5) control: big crowns decompose slowly, making it difficult to prepare a seedbed for small-seeded crops. Incorporate sudangrass if planting something else in the fall. Otherwise, mow for winter-killed mulch on the surface and till in early spring. Tall, unmowed sudangrass will winterkill, but is difficult to manage in the spring.

Table 1. Ideal Steps of Orchard Site Selection and Preparation and the Use of a Midsummer Grass (sudangrass) for an

 Orchard Planting

Time	Spring	Summer	Fall
Year 1	Order trees	Soil testing	Deep plowing
Site selection	Drainage evaluation and minor	First lime application based on	
and	adjustments	soil sample interpretation	
Planning			
Year 2	Application of phosphorous	Plant cover crop (Sudangrass)	Deep plowing,
Primary site	more lime (if needed),	to add organic matter and	ripping
preparation	manure/compost	prevent weed growth	Fumigate (35
	Disc and rake	Mow @ 20-30" (at least 2 times	gallons/A of
	Herbicide	per season)	Telone C-17 or
		Seeding rate: 30-50lbs/acre	25 gallons/A of
			Telone C-35)
Year 3	Disc or rototill	Install irrigation lines	
Final preparation	Subsoil		
and planting	Install irrigation (mains)		
	Plant trees		
	Apply 1/4 lb of Calcium nitrate		
	after the soil settles. Apply		
	another ¹ / ₄ lb Ca nitrate 4 weeks		
	later after shoot growth starts		

Summary: By implementing the use of cover crops you will reduce erosion of topsoil from slopes and suppress weed growth. Proper site preparation will often involve significant disturbance of the soil in order to add amendments (lime, phosphorous), install drain tile, etc. If a cover crop is not established soon after soil work is finished for the year, rainfall and melting snow can result in a significant loss of topsoil from the site. Sowing a cover crop will also help to prevent the re-establishment of weeds that the grower has worked hard to eliminate from the site.

Note: The sudangrass technical information was excerpted/modified from "Cornell cover crop guide for sudangrass". Cornell University. 2pp. Ver. 1.100716 (Björkman, T. and J.W. Shail. 2010).

Suggested Return Bloom Strategies for Western NY Fruit Growers

Mario Miranda Sazo

Regardless of the thinning program used, biennial varieties should receive additional sprays of either NAA or Ethrel about 4-7 weeks after bloom in order to enhance repeat bloom. This summer program is useful for easy-to-thin biennial triploid varieties such as Jonagold and Mutsu and it is also useful for hard-tothin, strongly biennial varieties such as Honeycrisp, Fuji, and Golden Delicious. Fruit size is now 50-52 mm at inland sites and will be 48-50 mm in the next 3-5 days at lake sites. Once fruit size is 30 mm or more in diameter there is <u>little risk</u> of thinning by NAA or Ethrel. This season Dr. Robinson is recommending the use of Ethrel (0.5 pints/100 gallons or 1pt/Acre) for the first spray for Honeycrisp, Macs, and Macoun, and then switch to 3 sprays of NAA at 5ppm (2ounces/100gallon or 4ounces/acre). For late ripening varieties like Fuji, he recommends the use of Ethrel for the first two sprays and then switch to 2 sprays of 5ppm NAA. With pears he also recommends 4 applications of 5-7.5ppm NAA starting this week to stimulate flower bud initiation. He has only tested Ethrel on Bartlett and Bosc pears one year where Ethrel worked better than NAA on Bosc but it is likely to stimulate pre-mature ripening with Bartlett. Avoid return bloom sprays of Ethrel or NAA if temperatures get in the high 80's/low 90's since application of these materials in hot weather or just prior to multi-days of hot weather might contribute to leaf yellowing, early ripening, smaller fruit size, and/or yield loss if rates are high.

Black Stem Borer, Xylosandrus germanus

Deborah Breth, Art Agnello, Elizabeth Tee

The black stem borer was introduced from eastern Asia and first detected in NY in 1932. It has since been detected in most parts of the US. It is a general wood boring insect in the group called "Ambrosia beetles" with a huge list of suitable hosts including American Beech, Maple, dogwood, black walnut, oak, magnolia, and several other ornamental and forest species. But it has also been documented in apple and sweet cherry in 1982. We first detected black stem borer in 2013 in 6 sites in the Lake Ontario Fruit Region of NY, and have identified at least 6 more sites in 2014.

<u>Come to the summer tour to see this pest and what it</u> <u>can do to an orchard.</u> This is a serious pest in forestry, ornamental nurseries, and now high density apples! We have been trapping this insect in several sites across the region and there was a peak emergence in early June. The trap captures are tailing off compared to early June, but we continue to catch significant numbers. We have been dissecting the galleries in the young orchards and are finding eggs, larvae, and pupae, along with the adults that are taking care of the young. The research literature says there will be another emergence in late July- early August. We have nothing registered for control of these pests. The ornamental nursery industry where this is a serious pest relies on pyrethroids on a 2-week schedule which will certainly be a challenge in apples with concerns for mite control. Art Agnello, Kerik Cox, and I are working on this pest to better understand the biology and identify viable controls. If you see these pests call us so we can document the economic damage and continue work on this pest.

In the meantime, for newly planted orchards, do not be lax in insecticide applications for control of leopard moth, aphids, potato leafhoppers, and be diligent looking for the tiny 1 mm diameter holes in bark of small trees. If you find it, rogue the trees and burn them immediately since the tiny beetle will leave the rogued trees and return to the orchard and infest another tree.

Cruising Altitude

Art Agnello

Our summer once again seems to have bypassed the traditional July warming-up phases and jumped straight to August-like dog-days, complete with recurring afternoon pop-up thunderstorms. This type of weather pattern tends to benefit some insect pests and hinder others. The following is a brief rundown of some items to keep near the top of your "scramble" list, just to help prevent anything from boiling over.

Internal Leps

We are still generally in between the first and second flights for both codling moth and oriental fruit moth. The first brood CM hatch essentially ended last week, so most sites with traditionally heavy pressure from these pests should have already addressed first generation larval control needs. Look for the first captures of the 2nd flight for purposes of timing management sprays; we should note a definite uptick in trap numbers within the next 7–10 days, especially if the current hot spell continues.

Obliquebanded Leafroller

According to our developmental models, the first summer brood hatch should be anywhere from about 50-90% complete around the state this week. Orchards with historically high OBLR pressure should have received an application of a suitable material during the first part of July, so this week would be the latest possible time for such an application against the larvae of this brood if they haven't been attended to. Delegate, Altacor, Belt, Rimon and Proclaim are appropriate choices, particularly in cases where the larvae are a bit larger, and a B.t. product such as Dipel, or else the IGR Intrepid are also options, but these tend to be more effective when applied against the earlier stages. If you are applying Belt, Altacor or Delegate to control codling moth and oriental fruit moth, they will also be very effective against OBLR at this time. Regardless, we have found that this specific spray is the most critical for preventing fruit-feeding damage at harvest, so put this at the top of your list Apple Maggot

Adults made their first appearance in Geneva last week, and should begin showing up in traditional high-pressure sites elsewhere around the state this week. Stings and larval tunneling would first be detected in early and favored varieties such as Ginger Gold and Honeycrisp, particularly in the Hudson Valley. If you aren't monitoring in specific orchards and haven't yet made preparations for a protective spray against AM (and aren't using Delegate or Altacor for OBLR, both of which have some activity on AM), prudence would suggest attention to this pest. Hanging a few volatile-baited sphere traps on the edge of susceptible plantings can provide valuable insight on when (and whether) immigrating flies are posing a threat. Growers on a Delegate or Altacor program for leafrollers/internal leps should get some protection against moderate AM pressure. For those not using Imidan in their cover sprays, Assail and Calypso will both provide excellent control of apple maggot as well as internal leps.

of priorities if OBLR has distressed you in the past. Woolly Apple Aphid (from Jim Eve) Individual nymphs have started to become noticeable in Wayne Co. as they make their way up into the canopies of infested trees, although no actual aerial colonies have yet been seen. This would be a prudent time to begin a preventive spray program for this pest in blocks with historically high pressure. Quoting from the June 9 issue's overview of treatment options: 'WAA is resistant to the commonly used organophosphates, but other insecticides are effective against WAA, including Diazinon and Thionex, and some newer products such as Admire, Assail, Beleaf, or Movento may offer suppression (for Movento and Assail, addition of a non-ionic surfactant or horticultural mineral oil will improve activity). Good coverage to soak through the insects' woolly coverings is integral to ensuring maximum efficacy. Additionally, a Lorsban trunk application for borers made at this time will effectively control any nymphs that might be contacted by these sprays.' But if you used a Lorsban (chlorpyrifos) prebloom, a chlorpyrifos trunk spray is not an option.

Focus on Food Safety Series – Part 4 Selected Case Studies of Foodborne Illness Outbreaks in the US & Europe Craig Kahlke & Betsy Bihn

Due to lack of space, you'll find the previous (part 3) article in this series, in the LOF newsletter, Vol 14, Issue 10, April 30, 2014. To summarize the major produce-associated foodborne illness outbreaks that have occurred over the past 50 years is not possible within the scope of this newsletter, so only three will be highlighted here. Table 1 lists a "Top 10" US & Europe Foodborne Outbreaks Related to Produce" along with several other resources that are listed at the end of this publication to provide a more comprehensive look at foodborne illness outbreaks. In addition, a nice publication entitled "Ranking the Risks: The Top 10 Pathogen-Food Combinations with the Greatest Burden on Public Health" can be found at this link https://folio.iupui.edu/bitstream/handle/10244/10

22/72267report.pdf.

Three Produce-Associated Foodborne Illness Outbreaks

2006 E.coli 0157:H7 outbreak associated with

spinach. In September 2011, news of this outbreak hit the media like a storm as the FDA's original recommendation was for consumers to stop eating spinach until the source of the outbreak was identified. Finally the source of the outbreak was traced to one large field in California. The outbreak investigation identified risks that included field intrusion by feral pigs, surface water contaminated by animal feces used for irrigation, and adjacent land use included cattle grazing. This outbreak resulted in at least 276 consumer illnesses and 3 deaths attributed to the tainted produce.¹ Thirtyone people ended up suffering hemolytic uremic syndrome, a serious condition often resulting in kidney failure, with many more suffering bloody diarrhea and dehydration. The hospitalization rate for this outbreak was over 50%. In response to this outbreak, some of the largest grocery chains sent a letter to the farmers' associations, giving them 6 weeks to come up with a plan to prevent problems like the E. coli O157:H7 outbreak from happening again. The result was the Leafy Greens Marketing Agreement, which set strict GAPs standards for the production and postharvest handling of fresh leafy greens in CA and AZ. The West Coast spinach industry is just now recovering from the impact of this outbreak as spinach consumption trends return to pre-2006 levels. For the US, this was the "game changer" in regards to public awareness of produce associated foodborne illness outbreaks and industry awareness of the pain and suffering of those affected as well as the liability and financial losses to the produce industry as a whole.

2008 US salmonellosis outbreak associated with peppers and (originally) tomatoes. In the spring and summer of 2008, the rare Saintpaul serotype of Salmonella enterica caused at least 1442 cases of salmonellosis in 43 states throughout the US.² It was the largest reported salmonellosis outbreak in the United States since 1985, and the largest caused by produce in the last 50 years. There were at least 257 reported hospitalizations linked to the outbreak, leading to at least one death, and the outbreak may have been a contributing factor in at least one additional death. At first, the major uniting factor in the illnesses seemed to be fresh, raw tomatoes but the pathogen could not be isolated from tomatoes. This complication in identifying the origin and commodity associated with the outbreak severely impacted the tomato industry since sales and consumption dropped dramatically as the traceback investigation continued. As the investigation widened, raw jalapeno & serrano peppers, along with cilantro and bulb onions were also implicated. Finally the Saintpaul serotype of S. enterica was isolated from fresh raw jalapeno at a distributor on the Texas-Mexico border.³ The FDA later found samples of the outbreak strain of Salmonella in samples of serrano peppers and groundwater at a Mexican farm. There is much more to this complex story, but it highlights both the impact to public health as well as the impact to the produce industry was identifying the source of contamination is delayed. A good summary can be found in this CDC update at this link: http://www.cdc.gov/salmonella/saintpauljalapeno/index.html

2011 US listeriosis outbreak associated with

cantaloupes. In the summer and fall of 2011, the United States saw an outbreak of listeriosis caused by the pathogen *Listeria monocytogenes* associated with cantaloupes from Colorado. Although the outbreak began in July, illnesses were still being reported in December, due to the long incubation period of this pathogen in some individuals. When the outbreak was over, thirty people had died and 128 were sickened in 28 states, making it the second deadliest recorded U.S. outbreak since the CDC began tracking outbreaks in the 1970s.⁴ The FDA found positive samples at a broker of the cantaloupe that linked them to one farm (Jensen Farms) in a cooperative of Eastern Colorado cantaloupe growers. Subsequently, the FDA found positive Listeria samples at Jensen farms packing facility, including on brushes in the washing equipment that was originally designed for potatoes. Lack of proper sanitation of this equipment, allowed the L. monocytogenes to become established within the equipment and subsequently contaminate cantaloupes that moved through the washer. It is not clear how Listeria was first introduced into the equipment, but Listeria was found in cull piles in nearby fields, in standing water under the packing equipment, in palleted fruit in a refrigerated cooler awaiting shipment, and in fruit in consumers' refrigerators. It is important to note that Jensen farms received a 96/100 score in an early season Primus food safety audit, so the growers likely thought their food safety program was well implemented and effective at reducing risks. In hindsight, this outbreak highlights many lessons including the importance of equipment sanitation and the risks that Listeria monocytogenes presents in fresh produce operations. In addition, it provides many points for discussing the value of third party audits as well as the importance of the competence and training of auditors. For more information, please see the CDC's last update at http://www.cdc.gov/listeria/outbreaks/cantaloupesjensen-farms/.

We would love to have your suggestions, so please email Craig at <u>cjk37@cornell.edu</u> to suggest article topics or share your thoughts about how Cornell Cooperative Extension can help improve the implementation of produce safety practices in New York.

Figure 1.	"Тор 10"	US & Europe Foodborne Outbreaks Related to Produce	ce
Notes* se	e below		

#	Location	Pathogen	Produce	Year	Illnesses	Deaths	See Footnotes linked to our website below
1	US-CO, CA, WA, Canada	E.coli O157:H7	Apple juice (unpasteurized)	1996	>70	1	A
2	N. America (NE OH & SW PA)	Hepatitis A	Green Onions	2003	>339	4	В
3	N. America	E.coli O157:H7	Spinach	2006	>275	3	С
4	N Amer 43 states, plus Canada	Salmonella enterica	Jalapeno & serrano peppers	2008	>1,400	1-2	D
5	Germany & 15 other countries	E.coli O104:H4	Sprouts	2011	>3,950	53	E
6	US – 28 states	Listeria mono- cytogenes	Cantaloupe	2011	>145	30	F
7	US- Oregon	E.coli O157:H7	Strawberry	2011	>15	1	G
8	US-24 states	Salmonella spp.	Cantaloupe	2012	>260	3	Н
9	US- Arizona	E.coli O157:H7	Lettuce	2013	>90	none	I
10	US- NY- Washington County	E.coli O157:H7	Drinking water	1999	>1,000	2	J

Please click here for the footnotes to the table above that links to more info about individual outbreaks in the table above. <u>http://lof.cce.cornell.edu/submission.php?id=232&crumb=food_safety|food_safety</u>

Additional References

- 1. FDA Statement on Foodborne E. coli O157:H7 Outbreak in Spinach, 10-6-06. <u>http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/2006/ucm108761.htm</u>, accessed 5-8-14.
- 2. Centers for Disease Control and Prevention, <u>http://www.cdc.gov/salmonella/saintpauljalapeno/index.html</u>, accessed 5-2-14.
- 3. Behravesh CB , Mody RK, Jungk J, Gaul L, Redd JT, et al. 2011. 2008 Outbreak of Salmonella Saintpaul infections associated with raw produce. *N Engl J Med Mar* 10;364:918-927.
- 4. FDA, Final Update on Multistate Outbreak of Listeriosis Linked to Whole Cantaloupes. 1-9-12. http://www.fda.gov/Food/RecallsOutbreaksEmergencies/Outbreaks/ucm272372.htm#final

Lake Ontario Fruit Program Cornell Cooperative Extension 12690 State Rt. 31 Albion, NY 14411

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CCE-LOF SUMMER TOUR - JULY 24

The 2014 Lake Ontario CCE Summer Fruit Tour will take place on July 24, and will feature New Technology in the Orleans/Niagara Co. Fruit Industry. The stops and topics include:

- Kast Farms, Lattin Rd., Albion Gala, NY1, & NY2 plantings, economics, and management, including de-fruiting techniques; weed control in young trees; managing fire blight in young trees (Deb Breth, Alison DeMarree, Kerik Cox, Terence Robinson, Mario Miranda Sazo).
- Pettit Farms, Bates Rd., Medina Black stem borer invasions; low vigor in NY1 & Honeycrisp (Deb Breth, Art Agnello, Terence Robinson).
- Ledge Rock Farms, Gravel Rd., Medina NY1 & NY2 tall spindle plantings; precision chemical thinning (Terence Robinson, Mario Miranda Sazo).
- Vizcarra Vineyards At Becker Farms, Quaker Rd., Gasport Lunch and visit with sponsors and exhibitors. See equipment displays. Oscar & Mindy Vizcarra will share the history of farm & market, winery and brewery. Juliet Carroll will give an update on spotted wing drosophila in berries and tree fruit.
- New Royal Orchards, Rt. 31, Gasport new SDHI fungicides for scab and mildew; phytotoxicity demo with tank mixes; protecting sweet cherries from rain with Voen and other canopies (Kerik Cox, Deb Breth, Mario Miranda Sazo, Terence Robinson, and Greg Lang Michigan State)

There is no charge to attend, thanks to Sponsor and Donor support, but <u>please pre-register by July 18</u> (585-798-4265 x26; or <u>krh5@cornell.edu</u>; or on LOF website: <u>http://lof.cce.cornell.edu/</u> Don't forget to register for the <u>Retirement celebration</u> to follow the summer tour for Alison DeMarree and Steve Hoying. July 24 at 5 PM at Leonard Oakes Estate Winery, Medina, NY. \$25/person. See details to register at <u>http://lof.cce.cornell.edu</u>.

Save the Dates- July 22 & 23, Worker Protection Standards Mock Inspections in Wayne & Ontario Counties

The Department of Environmental Conservation, Bureau of Pest Management, will be conducting two Worker Protection Standard (WPS) mock inspections. The first will be on Tuesday, July 22, 2014 from 1-3 PM at De Marree Fruit Farms, located at 7654 Townline Road, Williamson, NY. The second WPS mock inspection will be conducted at the Geneva Agricultural Experiment Station, on Wednesday, July 23, 2014 from 10 a.m. - 12 p.m. No preregistration is required. Pesticide Applicator recertification credits will be offered.