



“Fruit Facts” – Saturday, June 24th, 2023
Mario Miranda Sazo, Janet van Zoeren and Anya Osatuke

Plan to attend second virtual orchard meetup about water stress this coming Thursday June 29 @7pm EST

The virtual meetups are titled ‘Managing the Uncontrollable’: Over the past decade growers have been forced to confront wildly vacillating winter temperatures, uneven and often excessively heavy precipitation events, and extreme temperatures coupled with extended droughts.

When: Thursday June 29

Time: 7:00-8:30pm EST

Invited speakers:

- Dr. Kristen Hannam (Agriculture and Agri-Food Canada, Summerland, BC, Canada)
- Dr. Alan Lakso (Professor Emeritus of Cornell University)

Invited grower panelists representing different fruit production regions in North America:

- Steve Brown - Happy Valley Orchards, British Columbia, Canada
- Kyle Rasch - Tom Rasch & Son Orchards, Michigan, USA
- Tom Ferri - T&K Ferri Orchards, Ontario, Canada
- Randy Hart - Hart Apple Farms, New York, USA
- Garret Henry - Douglas Fruit, Washington, USA
- Steve Frecon – Frecon Farms, Pennsylvania, USA

How to attend: Meeting via Zoom, preregistration is not required to attend. Simply go to <https://bit.ly/2023-virtual-meetup> to join a few minutes prior to the start of each meeting.

Last meetup will be from 7:00-8:30pm EST: Thursday July 13 (heat stress)

Thursday June 29th Twilight Meeting at Cornell AgriTech, Geneva NY

Tree Fruit & Small Fruit Twilight Meetings AND lightning talks by grad students!

Where: Jordan Hall at Cornell AgriTech, 630 W North St, Geneva, NY 14456

Schedule:

At 6:30pm, join grad students doing apple research as they present their work in a lightning talk format

At 6:45pm, DEC credit sign in begins

From 7:00-8:30PM, join specialists Janet van Zoeren, Anya Osatuke, and Anna Wallis for a conversation about fruit and berry phenology and pest management

Snacks and light refreshments will be served. **1.5 NYS DEC credits** will be offered.

We hope to see you there!

To Do Today

- **First fruit size/weight evaluations to estimate when to start ‘Honeycrisp’ fruitlet collection for peel sap analysis in WNY in 2023:** Early this week on Tuesday June 20 we randomly selected 40 clusters from a Honeycrisp block in Wayne County (lake site) and measured fruit diameter (mm) and fruit weight (gr/fruit). Only one cluster/tree was collected. Average fruit diameter and fruit weight (for the biggest 40 fruitlets, review table 1) were **31mm** and **15gr/fruit**, respectively (for visual references a golf ball measures 42.12mm in diameter, review below pics). Please notice that a total of 130 fruitlets from the 40 clusters were evaluated and only averaged 22mm in diameter and 7gr/fruit on June 20. At this time of the year, fruitlets can grow at a rate of 1-1.5 or until 2-2.5grs/day (under very low crop load conditions, hot weather, and with ideal soil moisture conditions to satisfy tree evapotranspiration needs). A few key points to consider as growers will be finishing hand thinning of Honeycrisp trees at some point next week:
 - Growers should **target an average fruit weight of 55-60 gr/fruit for the Cornell peel sap analysis**
 - A few inland sites with a very low crop load could be averaging more than 20-25 gr/fruit by today Saturday (6/24)
 - Premier Honeycrisp fruitlets can be heavier than regular and colored strains of Honeycrisp at this time of the year
 - We urge growers to monitor their blocks and collect samples at the optimal fruit weight as we approach the ideal timing for best peel sap results and future recommendations.
 - Due to the multiple effects of crop load (low/medium/high), tree health due to the May 18 frost or not, vigor, rootstock, and current soil moisture conditions as affected by soil types (accumulated rains @1-4inches from June 9-16, plus the forecasted rains expected for this weekend and next week), Honeycrisp fruit weight can vary considerable by the end of next week.
 - Please review a coming statewide peel sap article in our CCE LOF newsletter describing this year’s efforts. Call us if you need any assistance with sample collection method or have any doubt next week (Mario, cell 315-719-1318; Craig, cell 585-735-5448).

Table 1. ‘Honeycrisp’ fruit sizes (mm) and fruit weights (gr/fruit) at a block evaluated in Williamson, Wayne County (lake site) on Tuesday June 20, 2023.

cluster	Biggest Honeycrisp fruitlet/cluster	
	caliper (mm)	weight (g)
1	32.45	16.92
2	26.22	8.53
3	36.44	25.38
4	34.88	20.47
5	28.85	11.33
6	28.15	11.55
7	30.57	14.86
8	30.03	13.25
9	33.97	20.33
10	20.26	4.76
11	32.8	18.8
12	31.58	14.51
13	31.98	17.89
14	30.82	14.76
15	32.35	16.34
16	26.35	11.53
17	31.37	16.16
18	33.64	18.99
19	33.02	18.31
20	25.18	8.05
21	31.13	13.27

22	30.4	15.05
23	30.43	12.22
24	31.75	14.45
25	30.86	16.31
26	23.89	7.69
27	21.85	5.8
28	28.95	10.84
29	31.78	16.83
30	32.93	17.85
31	31.18	14.18
32	33.63	17.83
33	38.17	23.86
34	27.43	8.82
35	33.95	18.97
36	32.37	15.49
37	35.47	21.49
38	33.57	18.97
39	33.55	19.15
40	28.43	10.47



- **We recommend that you count total fruit per tree on 5-10 representative trees** in each block and reduce fruit number (via hand thinning, ideally with a platform) to the most profitable crop load (your targeted fruit number per tree). Hand thinning will be necessary in blocks where final fruit set (desired number of fruit/tree at harvest) is still relatively high in the tops of the trees.
 - Early hand thinning will help somewhat to mitigate biennial bearing in Honeycrisp, where floral initiation is earlier than the rest of the cultivars. Please review the recommendations for return bloom sent in previous Fruit Facts
 - Early hand thinning will also improve fruit size in small-fruited varieties like **NY-1 and Gala**.
 - Take advantage of your platforms to get hand thinning done quickly and more efficiently this season.

- **Avoid the common mistake of excessive crop loads in years 2 to 4 which leads to too little tree growth** (varieties differ in their biennial bearing tendency and this must be incorporated into the crop loads allowed on young trees).

Cultivar ¹	Growth Habit	Biennial bearing tendency	Crop load per tree after hand thinning
Honeycrisp ²	Weak growing cultivar	Biennial	2 nd year: 12-18 apples 3 rd year: 20-35 apples 4 th year: 40-70 apples
Fortune, Fuji, Golden Delicious”, Jonagold, Mutsu, Spy	Strong growing cultivar	Biennial	2 nd year: 16-20 apples 3 rd year: 25-40 apples 4 th year: 65-80 apples
Gala, Empire, Mac, Rome, Idared	Medium growing cultivar	Annual (more reliable bearer)	2 nd year: 20-25 apples 3 rd year: 30-50 apples 4 th year: 80-100 apples

¹ 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 because fruits will outcompete with overall tree and shoot leader growth for carbohydrates and water.

² Please remember that hand thinning in Honeycrisp should start not later than @ 38-42mm. It is critical and should be done for good return bloom next year.

- **For the sudangrass, or sorghum-sudangrass, seeding recommendations we sent early this week, we would also like to suggest (as recommended by Dr. Deborah Aller) that there is an opportunity to mix the sorghum sudangrass with cowpea or sunnhemp to get some nitrogen into the soil and maximize the sudangrass biomass this season.**
 - If you have any doubt about this new recommendation and/or how to get the best use of cover crops during pre-site preparations this summer, don't hesitate to contact Dr. Aller to da352@cornell.edu and/or call 631-902-1582
- **De-shooting of on-farm nursery trees should have already started by now in WNY:** Average tree height is above 30-32 inches and de-shooting should be targeted below 24-26 inches height. Please do this as soon as you have the time and labor available for nursery work.
- **You can improve soil water holding capacity and nutrient availability by improving your soil organic matter content for more sustainable apple production:**
 - Organic matter tends to act like a **sponge**, holding water and nutrients in the soil and releasing them slowly over time. Soil scientists report that for every one percent of organic matter content, the soil can hold 16,500 gallons of tree-available water per acre of soil down to one foot deep
 - **Increased water holding** is an important characteristic in our soils of Western NY. It is even more crucial in blocks without trickle irrigation. At the beginning of this 2022 summer, a mature spindle tree needs around 4-5 gallons of water per day to keep up with tree evapotranspiration needs. Water stress can lead to small-sized fruit and calcium disorders, like bitter pit in Honeycrisp. Young trees need only small @ 2-3 gallons/tree/day, 2-3 times per week, but frequent doses of water for additional tree growth this year
 - **Soil organic matter acts like a bank for soil nutrients.** Think of each of the negative charges on an organic matter particle like a **parking spot** for a nutrient ion. Cationic nutrients, such as calcium (Ca²⁺), are parked and ready to be knocked out into the soil solution where tree roots can access them. Root exudates from tree's rootstocks help "knock" nutrients into solution by trading these nutrients (such as calcium) with hydrogen ions. The higher the cation exchange capacity (CEC), the more of these parking spaces for nutrients are present in the soil. More nutrients can then be held instead of being washed away into deep soil layers where trees cannot access them.
 - Organic matter not only banks nutrients but also supplies **nitrogen through mineralization**. Organic matter contains about five percent nitrogen, and two to four percent of this is mineralized every year. For example, a soil with three percent organic matter can make available sixty pounds of nitrogen per acre every year (as long as soil organic matter is maintained).

- **Know the Water Holding Capacity of your soils if you receive good rains at your site, hopefully this weekend/next week!:** Under hot weather conditions, mature trees can use until one inch of water a week or even more. It depends also on soil type and rooting depth. Clay and loamy soils will hold more water than sandy soils (see next table).

Soil Type	Inches of Water per Foot of Soil Depth
Clay	2 - 2.5
Loam	1.5 – 2
Sand	1 – 1.5

- **Increased water holding capacity is an important characteristic for high yields of high quality fruit in Western NY:** It is even more crucial in blocks without trickle irrigation.
 - At the beginning of this 2023 summer, a mature spindle tree needs around 4-5 gallons of water per day to keep up with tree evapotranspiration needs.
 - Water stress can lead to small-sized fruit and calcium disorders, like bitter pit in Honeycrisp.
 - Young trees need only small @ 2-3 gallons/tree/day, 2-3 times per week, but frequent doses of water for additional tree growth this year.
 - Focus irrigation on small-fruited varieties like Gala and continue “babysitting” NY1 with frequent but small amounts of water applied at least 2-3 times per week, providing 2-3 gallons per tree as minimum.
 - New Honeycrisp plantings (and those local ‘ellepot trees’ produced by Jacob Wafler and soon to be planted this summer) without trickle should be watered with tanks and a hose, 2-3 times per week (same amount of water/tree as previously suggested).
 - Please remember that any lack of rainfall coupled with a heat can affect growth of a weak tree and fruit growth rate at this stage.
 - **Remember, if irrigation fails, fails nutrition (including the needed soil calcium uptake for Honeycrisp!).**
- **Fire blight strikes** are starting to show up in problematic blocks. Keep an eye out for those any time you or your crews move through the orchards.
 - **If you find strikes, you will always want to cut those out.** Recent research conducted by a multi-state team of researchers, including Kerik Cox, has shown pretty conclusively that both tree death and prevalence of fire blight strikes increases if you leave the strikes in the orchard (you can watch a recent webinar hosted by Michigan State University where these findings are discussed at https://mediaspace.msu.edu/media/June+13%2C+2023A+Fire+Blight+Webinar+Series+/1_egieгимw; for example see minute 8).
 - **If you find actively oozing shoots**, consider applying a labeled liquid copper (i.e. Previsto, CS 2005, Cueva, Badge SC) product to dry out the ooze.
 - **In blocks with a high amount of strikes**, you may want to consider applying prohexadione-calcium (i.e. Apogee, Kudos) at the highest rate for the planting (6-12 oz/100 gal, or 3-6 oz/100 gal for young orchards). This will shut down shoot growth, but may save the tree. **Allow 5 days for the product to take effect, then prune out any shoot blight strikes.**
 - Contact me if you’d like a sample sent in for resistance testing, or if you’d like to discuss fire blight management options for your orchard blocks.
- **Summer diseases** such as **sooty blotch and flyspeck, black rot, white rot and bitter rot** are a main focus as we move into mid-summer.
 - The upcoming rains and humidity will make for ideal infection conditions for sooty blotch and flyspeck. According to the [NEWA model](http://newa.cornell.edu) (newa.cornell.edu), we are entering an infection period beginning tomorrow. However, if you input the date of your last fungicide application that was effective against SBFS you can get more targeted timing recommendations for your farm. Products that are effective for SBFS include **Flint Extra, Inspire Super, Luna Sensation, Merivon, Pristine, and Sovran**.
 - These products will also help manage black, white, and bitter rots.
 - **In general, fungicide covers for the rots go on every 14-21 days.**

- Be aware of **Marssonina leaf blotch**, which causes yellow leaves with small dark irregular blotches, followed by rapid defoliation (see image at right). Marssonina responds to similar conditions and fungicides as does apple scab, but often shows up later in the summer when you may have a gap in your fungicide program, or in varieties that are less prone to scab so may receive a limited spray program. There are no labeled fungicides for Marssonina in New York, but many of the products that you use for scab will also help manage Marssonina (especially effective products include Captan, Mancozeb, Luna Sensation, Luna Tranquility and Merivon). We don't expect to see a lot of this disease this year, but I have seen it in several blocks so want to bring it to your attention. If you see yellowing leaves and defoliation, let me know.



- **Woolly apple aphid** is also showing up in high numbers in certain blocks. Scout for colonies in the angle of a branch or twig crotch, or at pruning cuts. **Sefina** is a new product labeled in NYS for "suppression" of WAA. **Assail** (plus Regulaid), **Movento** (plus Regulaid), **Beleaf**, **Sivanto Prime**, **Senstar** (contains Movento), and **Diazinon** (if your market allows) are other recommended products.
- **Apple scab resistance testing is now available through the Cox lab.** If you have any block with scab showing up where you don't expect it to, and have reason to suspect fungicide resistance, give me a call and I will help you collect a sample to bring to Geneva for resistance testing.

Pear

- **Pear psylla** has been prevalent this year. For summer monitoring, examine ~ 10 recently expanded shoot leaves per tree on ~5 trees per block. The action threshold during the summer is an average of 1.5 nymphs per leaf. We recommend you **remove water sprouts** from your pears trees in late June in blocks susceptible or at threshold for psylla. If an insecticide is necessary, be sure to rotate products frequently – pear psylla can develop resistance quickly and we need to keep all our options available for as long as possible.
- **Fabraea leaf spot.** If you have had Fabraea in your peach block previously (note Bosc is especially susceptible), you will want to keep trees covered now through July 4th. Options include Topsin M, Ziram, Manzate and Syllit.

Stone Fruit

- **Sweet cherry** early varieties are starting to color up. Fruit can be fed on by spotted wing drosophila as soon as it begins to color/soften. We have not yet caught any spotted wing drosophila up along the lake, but it has been found in the finger lakes and in Eastern New York.. SWD trap catch will be reported immediately here as well as on the SWD blog (<https://blogs.cornell.edu/swd1/>). Stay tuned for updates on SWD!
- **Peach Diseases (rusty spot, bacterial spot, brown rot).** Captan, Miravis, Inspire Super, and Merivon will control brown rot and peach scab. Be sure to rotate active ingredients to delay resistance. The addition of a copper (i.e. Cueva) will help blocks with a history of bacterial spot.

On The Horizon

Leaf sampling collection for Honeycrisp will start next Thursday June 29-Saturday July 1st: In the last three years we have recommended that growers collect Honeycrisp leaf samples for nutrient analysis about one month earlier than traditionally suggested dates for other apple varieties in early to mid-August. This season the optimal timing for leaf sampling collection starts late **next week** in WNY. Specific dates for inland and lake sites may change based on crop load, rootstock choice, the onset/severity of zonal leaf chlorosis, etc. There are two reasons for this early leaf sampling:

- Honeycrisp trees typically stop their shoot growth by the third week in June, earlier than many other apple varieties.
- Development of zonal leaf chlorosis affects leaf nutrient concentrations, particularly leaf nitrogen status.

Good to Know!

Healthy soil just does a better job of producing healthy and productive fruit trees (the easiest, most dramatic way to improve any apple orchard is to keep/maintain/improve/nourish its soil): During the last two years a group of Cornell extension educators and scientists have been collecting paired soil samples from a healthy/productive/high fruit quality block versus an underperforming/low productive/low fruit quality block. In some cases, we have just compared very different fruit production areas of the same block or 'orchard zones' with a minimum of four rows. Through this long-term experimental approach, we are trying to understand why a mature apple block or zone can perform better than another block located at a very close proximity.

- The paired soil sampling 'comparison' is being done with Honeycrisp blocks of the same tree age, same scion/rootstock combination, same orchard/pesticide/nutritional management practices, etc.
- The assessment of whether a Honeycrisp block or zone is categorized as performing satisfactorily or performing poorly is being provided by the grower cooperator.
- This year more than 20 fruit farms will be sampled across the state in the Finger Lakes region, Long Island, Eastern NY, and the Lake Ontario Fruit region.
- Paired soil samples will be submitted for the CASH test, nematode analysis, root bean bioassay, XRF (heavy metal), and pesticide analysis.
- New this year are the collection of bulk density cores as shown in the below middle picture.
- Last Friday June 16 (see below Figure 1) we collected soil health samples and Honeycrisp leaf samples (without leaf chlorosis) at several farms in Wayne County with grower collaborators N. Morgan, D. Mason, D. DeBadts, T. Furber, M. Hermenet, and C. Bailey.
- This year we are adding a new set of soil samples that will be collected at the end of August/early September to evaluate soil arthropod activity (collembola populations).
- **Plan to attend the coming WNY fruit summer tour on Friday July 28!** Partial results of this year (and from previous seasons) will be summarized and presented by Dr. Deborah Aller (Cornell Soil Health Program) at the Furber tour stop during the Western NY Fruit Tour on Friday July 28. At the same stop, grower Ted Furber will be also discussing his cover crop experience and the successful use of tillage radishes in row strips that have been helping him to reduce the weed pressure in new apple orchards.



Figure 1. The Cornell soil health sampling team poses for a picture (left picture) at the end of the day in Wayne County on Friday June 16 (from left to right are Liz Tee (CCE LOF), Mario Miranda Sazo (CCE LOF), Deborah Aller (Cornell Soil Health Program), Anna Wallis (NYSIPM), Janet van Zoeren (CCE LOF), and Sadie (Janet's dog). Picture in the middle shows Debbie and Liz when collecting a soil sample for bulk density. Right picture proudly shows Debbie and Mario collecting a soil sample at an orchard site with ideal soil structure – abundant pores and channels – to carry both water and air (please notice the soil with excellent structure/stability to promote tree growth).

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