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# Fruit Notes

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

Cornell Cooperative Extension  
Lake Ontario Fruit Program

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## Thank You to our LOF Summer Tour Sponsors

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# Practical Implications of Early- and Mid-Summer Water Stress on Tree Growth, Cropping, and Physiology

Alan N. Lakso, Terence L. Robinson, Luis Gonzalez, and Mario Miranda Sazo

The sunnier weather we experienced in June 2022 should have been good for photosynthesis and resulted in greater production of carbohydrates to support fruit growth compared to other years unless the hotter temperatures and lack of rainfall in late June/early July 2022 have induced water stress in the plant. This is the kind of situation where even with irrigation apples don't always size that well. We think it is because the high temps and high evaporative demands with the rather

high hydraulic resistance of apple roots, we get some significant stresses even with wet soil. The following Figure 1, modified from Mark O'Connell and Ian Goodwin in Australia, shows that increased afternoon vapor pressure deficit (VPD) creates greater stress in the plant. In a study we did with fruit growth monitors we found the fruit started to expand about 2 pm each day but with afternoon VPD's of 3 kPa even with irrigation the trees still experience stress and fruit growth is reduced.

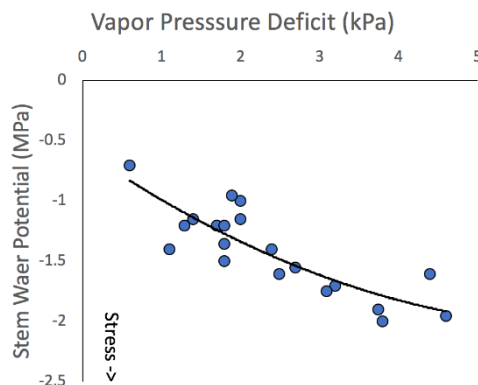


Figure 1. Relationship of increasing Vapor Pressure Deficit (increasingly drier and hotter air) on plant stem water potential (more negative values indicate more stress) in irrigated trees on sunny days. Modified from O'Connell and Goodwin, 2007.

This is the type of situation that we think **overhead misting or overhead nets** could help. Misting cools the tree to reduce transpiration, while nets reduce radiation and transpiration. We have not conducted this kind of physiology research in NY, but with the types of droughts and heat like 2016, early 2018, early 2020, and this year, it might be well worth trying in the future. We are currently conducting a project with the support of USDA-Specialty Crop Research Initiative (SCRI), and New York Farm Viability Institute (NYFVI) to use the new apple micro-tensiometers and the fruit growth gauges to monitor the plant stress (stem water potential) and in relation to real-time fruit expansion to see if we can avoid reductions in fruit growth during stress periods.

One practical approach to managing water stress is to use summer pruning or hedging to reduce tree leaf area during droughts. One of our former students (Kuo-Tan) found that fairly heavy summer pruning reduced tree transpiration and caused less water stress. We were surprised, thinking that the interior leaves would just increase their transpiration, but if they were in the shade for very long, they lose some gas exchange capacity, so they don't use as much water as young exposed leaves we removed. This does also reduce photosynthesis, but if water stress is a greater problem it may be worth it, assuming there is no loss by sunburn. Always tradeoffs.

## How Water Stress Affects Apple Trees

Whenever the water-use demands of a tree can't be met due to dry soil or sunny, hot dry conditions, stress will develop.

**Timing of Water Stress:** Growth processes by **cell division** are **more sensitive to water stress** than processes such as cell expansion, storage and photosynthesis or transpiration. Consequently, water stress that develops in the **spring and early summer** can have dramatic effects on vegetative growth, fruit growth and fruit set because early-season shoot growth and early development of fruits are primarily by cell division processes. If the drought develops early in the season there will be a reduction in vegetative growth which will reduce leaf area and possibly canopy light interception. Crop load may also be reduced by early stress that may affect fruit size potential and final set, leading to lighter crop load. These responses can change future water requirements later in the season.

Water stress that develops more typically in midsummer will have less effect on vegetative growth and less effect on fruit yield, as canopy development and fruit set are complete or nearly so by summer.

**Effects of Water Stress on Vegetative Growth:** Since adequate water is needed for cell turgor to drive expansion growth of apple leaves and stems, shoot growth is sensitive to water deficits. Detailed measurements of shoot growth rate in relation to plant water stress indicate that shoot expansion is almost linearly reduced by declining midday stem water

potentials showing increasing stress (Figure 2). Although mature leaves can osmotically adjust to maintain turgor, **apple shoot tips do not**. Therefore, **shoot-tip turgor and growth will decline directly with declining water potentials**. Fruit and roots have been shown to adjust osmotically for turgor maintenance.

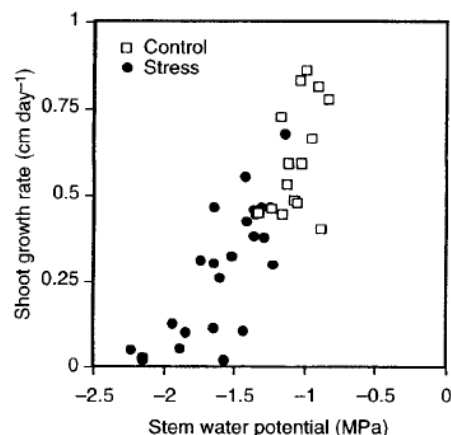


Figure 2. Relationship of extension-shoot growth rate to variations in midday stem water in apple trees as affected by drought stress (M. Al-Hazmi and A. Lakso, unpublished data). The more negative the potential the greater the stress.

#### Effects of Water Stress on Fruit Growth and Development:

Water stress reduces several aspects of fruit growth. Fruit set in the first weeks after bloom appears to depend on maintenance of an adequate rate of fruit growth. Therefore, reductions in fruit growth during the early cell-division period can reduce both fruit set and the potential for good fruit size at harvest, although these early-season processes are often complete before severe stress develops. The effects of water stress on fruit development appear to be more severe if the stress occurs during the cell-division period (3-4 weeks after full bloom). Reductions in growth during cell division are manifested over the remainder of the season, even if water is abundant later (Figure 3).

Some years ago, we conducted a study of early water stress on fruit growth of potted Empires. We stopped watering the trees in the cell division period for 10-12 days then re-watered all season. In 1994 the stress did not develop until after cell division, and we saw some initial size reduction, but it recovered by harvest. In 1995 the stress was earlier, and so it presumably reduced cell numbers and even with good water for the rest of the season the final size was reduced. We believe that this year (2020) we might see a range of situations like this with varying times of stress starting depending on soil reserves and rainfall.

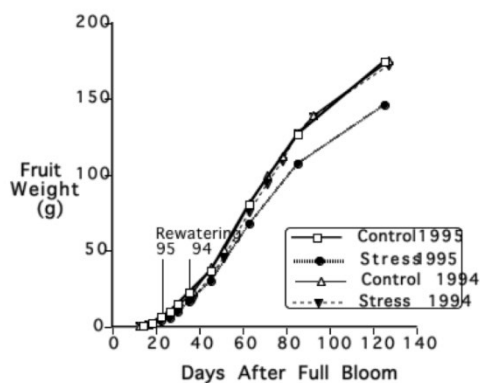


Figure 3. Apple fruit growth as affected by short-term water stress during cell division (1995) or after cell division (1994) on seasonal fruit development (M. Al-Hazmi and A. Lakso, unpublished data).

**Summary:** Generally, sunlight affects carbohydrate supply while temperature affects more the demand for that carbohydrate. The balance of carbohydrate supply to demand is important to fruit development and thinning as we have learned. The tree can be in balance with less sunlight if it is cool as both supply and demand are reduced. Conversely, the tree can also be in balance in sunny warm conditions as both supply and demand are increased assuming there is no drought. The worst situations are cloudy and hot weather and warm nights, as demands increase but the supply is not only reduced by lower light but also the heat can reduce photosynthesis even further. Hot, dry conditions where VPD is high can lead to significant water stress as discussed above.

The drought complicates things. If the stresses that developed in the trees in the last 4-6 weeks were

enough to reduce photosynthesis, then fruit growth rate was reduced. **Monitoring fruit growth** during droughts is a very useful tool in any case as it integrates a lot of such competing factors.

Finally, it is essential to have irrigation for tall spindle plantings to ensure tree establishment and maximize fruit size at any given crop load. Water stress at any time of the season reduces fruit growth rate with permanent loss in fruit size, which is difficult to recover later. Also, very dry soil conditions can reduce the availability of nitrogen, phosphorous, potassium, calcium, and boron to tree roots.

We hope some of the rains we got on Wednesday night will help to mitigate the negative effects of the 2022 drought on fruit size and yield. Good luck the rest of the 2022 season!

## **Today Thursday July 14 at 7pm (EST) is the Fourth and Last Nationwide Virtual Meetup about Labor and AG-Technologies – You can still register!**

The link to the one-page flyer is here:

[https://rvpadmin.cce.cornell.edu/pdf/event\\_new/pdf96.pdf](https://rvpadmin.cce.cornell.edu/pdf/event_new/pdf96.pdf)

Please join us and heard from a group of scientists describing a series of **AG-technologies** that they have trialed at their respective research facilities and at grower farms. Invited speakers are **Ines Hanrahan** (Washington Tree Fruit Research Commission), **Yu Jiang** (Cornell AgriTech), **Long He** (Penn State University) and **Matt Whiting** (Washington State University). In the last meetup (June 30), we discussed with growers the use of computer-vision/fruitlet counting technologies and other promising technologies for irrigation, nutrition, harvesting technologies, payroll apps, etc.

**Tonight, we will ask some of the following questions to the scientists:**

- How do you see the future and these technologies fitting in?
- What should growers focus on? What will be most impactful?
- Which will be the easiest to adopt?
- What do you think growers need to learn/know to adopt these things?
- What do workers need to be trained on?
- How should we be designing systems for the adoption of technology?
- What do you see are the biggest limitations for the growers to adopt these technologies?
- How can technologies be made accessible to smaller operations?

Please register for the last meetup here:

[bit.ly/orchardmeetups](https://bit.ly/orchardmeetups)

## **Sunburn Protection**

Mario Miranda Sazo

**Sunburn: Apples Become Susceptible to Sunburn at about 38 – 40 mm fruitlet diameter – or Roughly Golf Ball Size:** Sunburn can be caused by either heat or light, or both. When caused by heat, ambient air temperature is not as important as fruit surface temperature. Each variety has its own fruit surface temperature threshold for sunburn to occur. Some varieties, like Cripps Pink,

require a very high FST – something like 120° F. Other varieties have a much lower threshold. For example, sunburn occurs on Cameo when the FST reaches 115° F. Many of the newer managed varieties appear to have an even lower FST threshold, Minneiska appears to be one of those as does Smitten.

**Types of sunburn:** Sunburn caused by light can be from UV-A, UV-B, or both. There is also another type of sunburn called photo-oxidative sunburn that is caused by sudden exposure to light, as occurs after hand thinning, mechanical pruning, summer pruning, or re-positioning limbs by tying.

**Best methods for preventing sunburn:**

- The use of shade cloth. This reduces both heat and light exposure.
- Overhead evaporative cooling in combination with Raynox. The cooling prevents / reduces sunburn caused by heat, and the Raynox prevents / reduces sunburn caused by both heat and light.
- Best is overhead evaporative cooling by itself, but this is only effective for sunburn caused by heat.

**Sprayable protectant materials:**

These basically come in two categories – **particle films like Surround (Kaolin clay)**, and the **calcium carbonates like PurShade**. There are others as well, but these all work by creating a whitish film on the apple that reflects both heat and light. These will typically reduce sunburn incidence by up to 50%. The problem with these is that they do leave a heavy white film on the apple that can be very difficult to remove from the fruit on the packing line, especially from the stem bowl and calyx where brushes can't reach. Also, bi-colored apples do not color well under these coatings. Under heavy splotches and droplets, the fruit develops a mottled appearance.

**The other sprayable protectants are the Raynox brands:** These are a carnauba-based waxy matrix that filter light and reduce FST. These also typically reduce sunburn incidence by about 50%. These do not leave the

heavy white film residue, so fruit colors normally underneath, and there are no issues on the packing line. There are a couple of different formulations of Raynox – Raynox; Raynox Plus; and Raynox Organic. Regular Raynox requires the addition of a water conditioner, and it contains two emulsifiers – one of which is morpholine. Morpholine has a low or no MRL tolerance in many export markets, so a grower should check with his/her packer before using it. Raynox Plus needs no water conditioner, and uses a nonionic emulsifier so there is no morpholine to worry about. Same with Raynox Organic.

If growers have a hot spell coming up, it would certainly be worthwhile to get ahead of that with one of the sprayable protectants. While not as effective as starting the program earlier (apples become susceptible to sunburn at about 38 – 40 mm fruitlet diameter – or roughly golf ball size), it is better than doing nothing and should still provide enough protection to be worth the cost.

**A couple of tricks that can help:**

- If you have a tower sprayer that can apply from the top of the canopy down, those are more effective than traditional airblast sprayers because they apply the product where it is most needed.
- Also, if your rows are oriented North – South, you can spray only the west sides of the rows. Most sunburn comes from afternoon sun exposure, not morning.

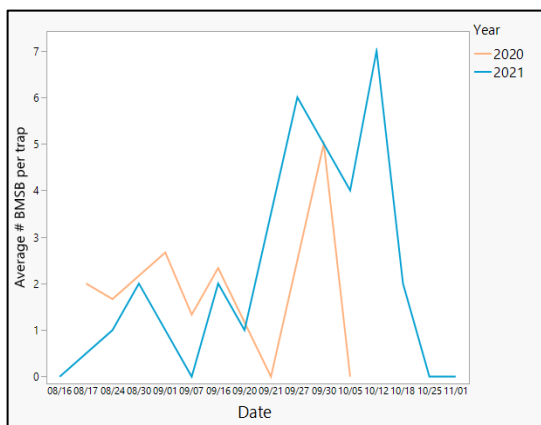
If you do apply sprayable protectants, they should be applied in the morning before ambient air temperature reaches 85° F. One application should last for a few weeks until the fruit grows through it

## Keep an Eye Out for Brown Marmorated Stink Bug

Janet van Zoeren and Monique Rivera (Cornell AgriTech)

The brown marmorated stink bug (BMSB), an invasive insect pest of apples, peaches, grapes, nuts, vegetable crops and more, has been on our minds and in our crops and homes for years now. Many growers I've spoken with in WNY are most familiar with this pest because of their habit of overwintering in homes and barns, often aggregated in large numbers. However, increasingly often, I'm speaking with growers who also see them or their damage in orchard blocks.

In both 2020 and 2021, our trapline caught relatively high numbers of BMSB and beginning earlier in the season than expected (see graph at right). At some locations we trapped over 10 stink bugs in a single trap in a week. The threshold is generally considered to be a cumulative **10 BMSB adults per trap** since the last spray (so if you trap 6 in a week, and then trap 5 the next week, it would be considered time to spray again).



BMSB damage can be difficult to identify, even minor stink bug symptoms at harvest can be much worse coming out of storage, and basically no visible symptoms show up for at least a week after feeding. Because of those factors, it is not well understood at this time how economically important BMSB feeding is in WNY apples, and how damage correlates to trap catch numbers. It is important to consider variety when prioritizing scouting time for BMSB. It has been previously shown that BMSB are more attracted to, and thus tend to damage more, Honeycrisp apples or varieties with Honeycrisp parentage. This is thought to



Tree of Heaven (*Ailanthus altissima*).

be due to the different volatile profile or scent of Honeycrisp as well as timing in the season (apples harvested later are more likely to coincide with times when BMSB is prevalent in the orchard). Another aspect of BMSB ecology to consider is if you have Tree of Heaven (*Ailanthus altissima*) on your property. Similarly, to BMSB itself, Tree of Heaven is an invasive to the United States from China and it is the preferred host of BMSB, which can increase pressure on your property. If you haven't already located and removed this host from your property, now is as good a time as any as it has recently been discovered that another invasive from China, the Spotted Lanternfly, also uses Tree of Heaven as its preferred host.

This summer, in an ARDP funded research project in collaboration with Mike Basedow and Dan Donahue, we are going to assess late season damage by BMSB in apples throughout the state of New York. There are two parts to our research. First, we will be forcing damage from colony-reared BMSB of varying ages, by caging the stink bugs onto fruit with Honeycrisp parentage and documenting damage symptoms over time and after storage. Second, we are monitoring BMSB at eight orchards across the state, and then will conduct a damage assessment at harvest, to begin to address how trap catch numbers correlate to damage.

Right now, it is early in the season, but we've already caught a single BMSB in one of the orchards we are monitoring along the lake. Please help us out by letting me know if you see stink bugs in your orchards, and if you see any BMSB feeding damage as the season progresses!

## Herbicide Resistant Horseweed in New York and Possible Implications for Perennial Crop Systems

Lynn M. Sosnoskie, Cornell AgriTech

Horseweed (also called marestail) is a frequently occurring species in where it can be found growing in a variety of habitats including along roadsides, in field crop and vegetable operations, and in berries, grapes, and tree fruit. Often considered a winter annual, horseweed has a wide germination window and seedlings can emerge in the spring, summer, and fall. Herbicide resistance, particularly to glyphosate, is widespread in the US and has recently been identified in New York (see the 2022 summer issue of Fruit Quarterly <https://nyshs.org/fruit-quarterly/>). Many of these populations were collected from soybean systems

where glyphosate is frequently used for managing unwanted vegetation. Two New York populations, collected from a vineyard and an apple orchard in the Finger Lakes Region, were found to be susceptible to glyphosate but resistant to labeled rates of paraquat. Paraquat resistance in horseweed has been formally confirmed, previously, in Belgium (nurseries), Canada (peaches), Japan (orchards, grapes, roadsides, railways), California (almonds), Delaware (soybeans) and Mississippi (soybeans) (<https://weedscience.org/Home.aspx>).



Because of this finding, the Specialty Crop Weed Science lab at Cornell AgriTech in Geneva is interested in collecting seed, this summer and fall, from horseweed plants that escape weed control in tree fruit, berry, grape, and Christmas tree systems to better understand the distribution and degree of herbicide resistance in perennial crop production environments. Horseweed seed is wind-dispersed and resistance traits can be easily disseminated across the landscape. Growers should contact their local CCE specialist or Lynn Sosnoskie in Geneva ([lms438@cornell.edu](mailto:lms438@cornell.edu)) for assistance if they believe they have resistant horseweed

on their farms. For more information about horseweed identification, please see:

<https://blogs.cornell.edu/weedid/field-crops/horseweed/>.

This research was supported by Federal Capacity Funds awarded by the National Institute of Food and Agriculture, U.S. Department of Agriculture and managed by the New York State Agricultural Experiment Station (NYSAES), Cornell University, Geneva, New York, USA.



Horseweed seedlings growing in the greenhouse.



Horseweed rosette with long and linear, irregularly toothed leaves.



Bolting horseweed plant.



Suspected paraquat-resistant horseweed in apples.

## Hard Cider Summer Tour 2022

July 22 - 10am EST

- Designed for commercial apple and cider producers, all are welcome.
- Lunch will be included at Jordan Hall - catered by Lake Drum Brewing. Bring your own cider to share as you wish. Cups will be provided.
- Complimentary educational cider tasting will take place at Lake Drum and Star Cider Tasting Room.
- Register by July 15 to be guaranteed lunch and cider tasting.

### AGENDA

**10:00 AM: Stop one: Star Cidery (Canandaigua Location)**

**3365 East Lake Road, Canandaigua, New York 14424**

Visit with cidemaker and co-owner, Cortni Stahl to learn about their cidemaking

process. From juice to packaged cider she will walk you through their apple selection and downstream processes as you tour their production and tasting room facilities.

Travel time: 30 minutes

**11:30 PM: Stop two: USDA Germplasm Collection**

**630 West North Street, Geneva, NY 14456**

Ben Gutierrez (USDA-ARS) describes the mission of the USDA's apple germplasm collection. Greg Peck shares an update on his lab's work to assess accessions within the germplasm collection for their potential use for the cider industry.

**12:30 PM: LUNCH at Jordan Hall and Tours of Cornell Agritech Craft Beverage Lab**

**630 W North St, Geneva, NY 14456**

Following lunch at the Jordan Hall pavilion, Chris Gerling, Cortni Stahl and the Cornell Craft Beverage Institute will walk participants through the Craft Beverage Analysis Lab, the Vinification & Brewing Lab and the Fruit & Vegetable Processing Pilot Plant.

Travel time: 10 minutes

**2:15pm PM: Stop three: Red Jacket Orchards**

**957 Canandaigua Road, Geneva, NY 14456**

Visit with Brian Nicholson who will give a tour of the juice facility and discuss their production processes and then Matt Murphy will give a tour of the nursery and orchards.

Travel time: 10 minutes

**4:00pm Final Stop: Cider Pub Crawl with Lake Drum Brewing and Star Cidery**

**Lake Drum Brewing 16 E Castle Street, Geneva, NY 14456**

Star Cider Tasting Room 495 Exchange Street, Geneva, NY 14456

*Participants will use their personal vehicles to get from location to location and can join us for whichever stops they are interested in seeing.*

*If you have any questions, please contact Greg Peck at [gmp32@cornell.edu](mailto:gmp32@cornell.edu) or Scott Ramsey at [scott@scottramsey.net](mailto:scott@scottramsey.net)*

**Register here:**

<https://vegetableipm.securepayments.cardpointe.com/pay?total=5.00>

## **SWD Blog Survey – Tell Us What You Think**

We'd love to hear from you to learn what you think about the SWD blog and its value to your operation and work. The Cornell SWD blog delivers trap catch information generated by the monitoring network. Several counties are now at sustained trap catch. We need your input on the usefulness of the SWD blog posts.

Please take a few minutes to complete our [Value of the SWD blog](#) Qualtrics survey

about the SWD blog. This will help us improve our information delivery! Here is the direct URL to the survey.

[https://cornell.ca1.qualtrics.com/jfe/form/SV\\_3IOcXAL2ysRBSBM](https://cornell.ca1.qualtrics.com/jfe/form/SV_3IOcXAL2ysRBSBM)

Thank you for providing your perspectives on the usefulness of the SWD blog posts.

## **Don't Forget to Pre-Register for LOF's Summer Tour Featuring Orleans County!**

We have an excellent tour planned for Tuesday, August 9<sup>th</sup>! See the last FN issue for full description of all tour stops. Or go to:

<https://lof.cce.cornell.edu/event.php?id=1669>

The use of technology in precision crop load management will be highly featured on several stops. In addition, pest/disease management and horticulture will also be covered. There will also be a berry stop (blueberries). The tour begins with registration and

programming at the first stop at 8 AM and finishes at the final stop at approximately 4:45 PM. An ice cream social is being planned immediately following at the last stop. 1.75 NYSDEC credits will be offered in categories 1A, 10, and 22.

**Pre-registration is required for lunch counts. Please pre-register here:**

[https://lof.cce.cornell.edu/event\\_preregistration\\_new.php?id=1669](https://lof.cce.cornell.edu/event_preregistration_new.php?id=1669)



## Mark Your Calendar

|                               |   |
|-------------------------------|---|
| Meeting Title                 | 2022 Virtual Orchard Meetup Summer Series<br>Orchard Efficiency: Labor and Technology   |
| Date                          | Final meetup tonight – Technology with invited experts panel is July 14.  |
| Time                          | 7:00-8:30pm EST   |
| Location                      | Meeting via Zoom<br><a href="#">Register Here</a> or by following this link <a href="https://bit.ly/orchardmeetups">bit.ly/orchardmeetups</a>   |
| Cost                          | Free  |
| Contact for Info/Registration | Mario Miranda Sazo (cell 315-719-1318; mrm67@cornell.edu)   |
| Brief description of Meeting  | Webinars will showcase growers and other specialists leading the development of these aspects of the industry. We will hear about their experiences managing the current challenges and participating in novel solutions. <b><u>These will be recorded and posted to LOF's YouTube channel when they are available.</u></b> |
| Meeting Title                 | Hard Cider Summer Tour 2022   |
| Date                          | Friday, July 22 <sup>nd</sup>   |
| Time                          | 10 AM – 5 PM  |
| Location                      | Finger Lakes Region, 5 stops, including lunch (12:30 PM at AgriTech) and several educational cider tastings during the tour.  |
| Cost                          | Suggested donation only \$5, thanks to our sponsors!  |
| Contact for Info/Registration | Preregistration required: <a href="https://vegetableipm.securepayments.cardpointe.com/pay?total=5.00">https://vegetableipm.securepayments.cardpointe.com/pay?total=5.00</a>   |
| Brief Description of Meeting  | See article in this issue.  |
| Meeting Title                 | 2022 Postharvest Reviews: Session 1. Pre- and postharvest factors affecting the quality of 'Gala' and recommendations for this year's harvest and storage season.   |
| Date                          | Thursday, July 28   |
| Time                          | Noon.   |
| Location                      | Zoom  |
| Cost                          | Free  |
| Contact for Info/Registration | Zoom link forthcoming. Craig Kahlke, <a href="mailto:cjk37@cornell.edu">cjk37@cornell.edu</a> , 585-735-5448.   |
| Brief Description of Meeting  | Dr. Chris Watkins will present his latest postharvest research with Gala, along with recommendations. This is targeted at growers and storage operators.  |
| Meeting Title                 | 2022 LOF Summer Tour  |
| Date                          | Tuesday, August 9 <sup>th</sup>   |
| Time                          | All day   |
| Location                      | Orleans County  |
| Cost                          | Free, thanks to our sponsors  |
| Contact for Info/Registration | Preregistration required for lunch counts:<br><a href="https://lof.cce.cornell.edu/event_preregistration_new.php?id=1669">https://lof.cce.cornell.edu/event_preregistration_new.php?id=1669</a>   |

|                                      |   |
|--------------------------------------|---|
| <b>Brief Description of Meeting</b>  | See article in the last issue or go to: <a href="https://lof.cce.cornell.edu/event.php?id=1669">https://lof.cce.cornell.edu/event.php?id=1669</a>   |
| <b>Meeting Title</b>                 | Annual Cornell Hemp Field Day   |
| <b>Date</b>                          | Thursday, August 11   |
| <b>Time</b>                          | 8:00am-3:00pm   |
| <b>Location</b>                      | Cornell's AgriTech Campus in Geneva, NY   |
| <b>Cost</b>                          | \$25 per person, deadline is August 1. Registration is open here: <a href="https://app.certain.com/profile/form/index.cfm?PKformID=0x3321695d3c1&amp;&amp;varPage=register">https://app.certain.com/profile/form/index.cfm?PKformID=0x3321695d3c1&amp;&amp;varPage=register</a>   |
| <b>Contact for Info/Registration</b> | Dr. Daniela Vergara, Emerging Crops Specialist, CCE Harvest NY, <a href="mailto:Dv255@cornell.edu">Dv255@cornell.edu</a> to discuss sponsorship opportunities and benefits.   |
| <b>Brief description of Meeting</b>  | The focus this year includes hemp genetics and breeding, pest management, and grain and fiber production, including demonstrations of combine harvesting and baling. This hands-on field day will have interactive workshops offering DEC credits on the use of pesticides and disease management. Digital ag applications and an introduction of the USDA hemp germplasm repository will also be included. Full agenda here: <a href="https://hemp.cals.cornell.edu/2022/07/05/registration-open-for-cornell-hemp-field-day-aug-11-geneva-n-y/">https://hemp.cals.cornell.edu/2022/07/05/registration-open-for-cornell-hemp-field-day-aug-11-geneva-n-y/</a> |
| <b>Meeting Title</b>                 | NASGA Summer Tour   |
| <b>Date</b>                          | August 16 <sup>th</sup> -17 <sup>th</sup>   |
| <b>Time</b>                          | All day   |
| <b>Location</b>                      | South central Ontario, Canada   |
| <b>Cost</b>                          | \$150-325   |
| <b>Contact for Info/Registration</b> | <a href="https://www.nasga.org/n-american-strawberry-growers-summer-tour.htm">https://www.nasga.org/n-american-strawberry-growers-summer-tour.htm</a>   |
| <b>Brief Description of Meeting</b>  | See article in our last newsletter for full agenda and tour stops.  |

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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. Copyright 2022. All rights reserved. No part of this material may be reproduced or redistributed by any means without permission. Cornell Cooperative Extension provides equal program and employment opportunities. **The Lake Ontario Fruit Program is a Cornell Cooperative Extension partnership between Cornell University and the Cornell Cooperative Extension Associations in Monroe, Niagara, Orleans, Oswego and Wayne counties.**

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

### **Contents**

Thank You to our LOF Summer Tour  
Sponsors

Practical Implications of Early- and Mid-  
Summer Water Stress  
on Tree Growth, Cropping, and Physiology

Today Thursday July 14 at 7pm (EST) is the  
Fourth and Last Nationwide Virtual  
Meetup about Labor and AG-Technologies  
– You can still register!

Sunburn Protection

Keep an Eye Out for Brown Marmorated  
Stink Bug

Herbicide Resistant Horseweed in New  
York and Possible Implications for  
Perennial Crop Systems

Hard Cider Summer Tour 2022

SWD Blog Survey – Tell Us What You Think

Don't Forget to Pre-Register for LOF's  
Summer Tour Featuring Orleans County!

Mark Your Calendar

Contact Us

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# ***Fruit Notes***

***YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE***

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## **Fruit Specialists**



**Craig Kahlke** | 585-735-5448 | [cjk37@cornell.edu](mailto:cjk37@cornell.edu)  
**Team Leader, Fruit Quality Management**

**Areas of Interest:** Fruit Quality and factors that affect fruit quality before, during, and after storage,  
**Crops:** Blueberries, Raspberries / Blackberries, Strawberries, Apples, Apricots, Cherries, Nectarines, Peaches, Pears, Plums



**Mario Miranda Sazo** | 315-719-1318 | [mrm67@cornell.edu](mailto:mrm67@cornell.edu)  
**Cultural Practices**

**Crops:** Blueberries, Raspberries / Blackberries, Strawberries, Apples, Apricots, Asian Pears, Cherries, Currants,  
Gooseberries, Nectarines, Peaches, Pears, Plums



**Janet van Zoeren** | 585-797-8368 | [jev67@cornell.edu](mailto:jev67@cornell.edu)  
**Integrated Pest Management (IPM)**

**Areas of Interest:** IPM of tree fruit and berry pests, biological control, and pollinators.  
**Crops:** Blueberries, Raspberries / Blackberries, Strawberries, Apples, Apricots, Asian Pears, Cherries, Currants,  
Nectarines, Peaches, Pears, Plum



**Mark Wiltberger** | 315-272-8530 | [mw883@cornell.edu](mailto:mw883@cornell.edu)  
**Business Management**

**Crops:** Apples, Cherries, Nectarines, Peaches, Pears, Plums

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**For more information about our program visit us at [lof.cce.cornell.edu](http://lof.cce.cornell.edu)**