Fruit Notes

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

Cornell Cooperative Extension
Lake Ontario Fruit Program

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Understanding the Timely Use and Applications of Plant Growth Regulators Via an Orchard Tour on Friday June 29

Mario Miranda Sazo

This year CCE LOF have decided to organize the first '*Plant Growth Regulator (PGR) Orchard Tour*' of several research plots at the NYSAES in Geneva and at a few fruit farms with grower cooperators in Wayne and Orleans Counties from **8:30am to 5:00pm on Friday June 29**.

All Western NY growers, fruit consultants, industry representatives, and other extension educators are welcome to attend all, or some of the tour stop(s). During the tour, we will hear from two distinguished scientists on plant growth regular research and its practical applications to modern fruit production practices. During the last three years, Poliana Francescatto (Postdoc Research Associate, Dept. of Horticulture, NYSAES, Geneva) has significantly improved and developed an effective PGR research program at the NYSAES. Specifically, she has (1) developed new effective alternatives to carbaryl to make thinning programs more efficient, (2) investigated the thinning efficacy and understood the mode of action of new thinning agents, (3) developed and improved thinning treatments for new apple varieties such as NY1 and NY2, (4) developed practical PGR programs to manipulate floral initiation and promote annual bearing of Honeycrisp, Fuji, other challenging biennial apple cvs., and pear, and (5) explored and investigated the benefits of abscisic acid (ABA) on mitigating biter pit in Honeycrisp apples. She has also conducted an active and effective research program on defoliation of apple nursery trees, Geneva rootstocks, and evaluated the effects of mycorrhizal fungi. This year she authored a great extension article titled *"The Use of Plant Growth Regulators for Crop Load Management in Apples – Fruit Thinning and Flower Formation"* published in the last issue of Fruit Quarterly. Here Poliana describes, among many more things, her most recent findings on how PGRs can manipulate two of the most common practices: fruit thinning and flower formation. At the tour you will hear more about her current PGR recommendations for successful Honeycrisp growing and much more!

Distinguished 'PGR tour guest' Duane Greene (Professor, Stockbridge School of Agriculture, University of Massachusetts, Amherst, MA), has conducted more than 40 years of study on tree fruit, primarily involving plant hormones and plant growth regulators. Over the years he has studied vegetative growth control, flower bud formation, fruit set, fruit abscission and documented the effects that growth regulators may have on postharvest fruit conditions. Chemical thinning is an area that he has emphasized for over 30 years. Initially this involved traditional thinning studies but it soon evolved into more

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fundamental studies involving why fruit abscise, trying to understand why thinning is such a variable activity and then finally trying to devise a method to predict thinner response during a time period when fruit can be chemically thinned (this useful method included in our WNY precision chemical thinning efforts since 2013).

Tentative 2018 CCE LOF PGR Orchard Tour Schedule [1, 2]:

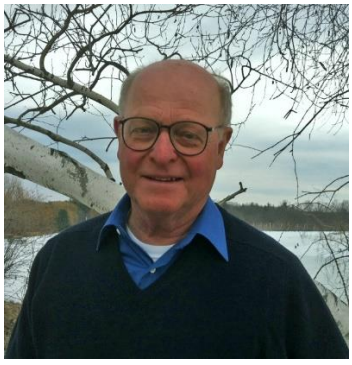
[1] A more complete and detailed tour agenda will be sent to growers via *Fruit Notes* newsletter and *Fruit Facts* the week of June 18.

[2] All, or just some of the on-farm research plots in Wayne and Orleans, will be visited during the tour to show best PGR results to tour participants on June 29. This may affect the final scheduling of the tour, including the location for the lunch stop. WNY growers are welcome to visit NYSAES and then drive to the rest of the tour stops, or just join the tour at their most convenient place in Geneva, and/or Wayne, and/or Orleans site(s). Stay tuned for final details of the tour while we are still in the middle of thinning and waiting for best research results the following ten days!

8:00am-8:30am: Park at Hedrick lot and/or Barton lot, NYSAES, Geneva (follow Cornell signs for meeting room location).
8:30am-10am: Several PGR talks by Poliana Francescatto
10:00am-10:15am: Drive to PGR research plots, NYSAES, Geneva
10:15am-12:30pm: Visit PGR research plots with Poliana Francescatto and Duane Greene
12:30pm-1:30pm: Lunch at the Pavillion, NYSAES, Geneva.
2-5:00pm: Drive and visit on-farm Cornell PGR research sites with Poliana Francescatto and Duane Greene. Potential on-farm research sites to be hosted by Cherry Lawn Farm, Zingler Fruit Farm, and Orchard Dale Fruit Farm (exact times and locations to be sent later).
5:00pm: Official adjourn of CCE LOF PGR orchard tour.

Please notice that **only lunch will be included during the tour to those who pre-register** at our CCE LOF website **starting next week on Wednesday June 13.**

CCE LOF would like to acknowledge the generous support of **BASF** and **Valent Biosciences** for bringing Professor Duane Greene to WNY and for covering lunch expenses for the tour, respectively.



Monthly Webinar Series to Start Next Week:
Applicable to All WNY Growers Interested About Digital Agriculture

Mario Miranda Sazo

As part of the 'Efficient Vineyard Project' led by Cornell faculty Terry Bates and his Lake Erie grape extension group led by Tim Weigle, there will be a great educational opportunity to go over the various technologies and techniques involved with precision viticulture starting **next week on Tuesday June 12** (many of them very applicable to orchard management!). I know many WNY growers are interested in precision agriculture and we think many of the topics will cross commodities. WNY fruit growers are more than welcome to join grape growers (from NY and all over the US) via a **series of webinars** to begin next week. This is just the start of a new kind of strategic collaboration effort for digital agriculture to benefit all NY grape and fruit growers.

CCE LOF is currently partnering with other CCE regional extension programs (grape, vegetable, and field crops) to launch a new initiative via a Digital Agriculture Professional Working team (or soon to be called DA PWT). More information about this joint effort across multiple commodities and their implications for NY fruit growers will be disseminated the following months!

One million vineyard acres across all sectors of the U.S. grape industry have large spatial variations in soil, vine growth, and fruit yield. The goal of the Efficient Vineyard Project is to deliver an innovative, science-driven, and approachable precision viticulture platform to measure and manage sources of vineyard variation. This webinar series will break down the project and show the various tools and techniques used to accomplish the goal of creating Efficient Vineyards (or Super Intelligent Orchards in Western NY!).

Upcoming Webinar:
June 12, 2018 1:00PM EST
#1 – Precision Viticulture at a Glance
This webinar will provide background and scope for the rest of the webinar series as well as straight-talk on how applying Precision Viticulture (PV) can take the guess work out of vineyard management and how a short-term investment in PV can increase profitability, efficiency and sustainability.
Hosted by: Jackie Dresser and Kevin Martin

To register for this webinar, click here.
https://cornell.zoom.us/webinar/register/WN_98dBbBK5QPqWzA-DA_IlXg

These Efficient Vineyard Webinars will be presented monthly from now until fall of 2019. Registration allows you to have access to all of the webinars. You will be sent email reminders as the next webinar approaches with the content for the month. Format for these webinars will be 15 minutes (1:00-1:15PM) at the beginning for sign on and open discussion, followed by 30 minutes for the presentation (1:15-1:45PM) and concluding 15 minutes for Q&A (1:45-2:00PM).
We hope you will join us!

Strawberry Harvest & Storage/Shipping Considerations

C. Kahlke

Strawberry harvest will be underway shortly. Thus now is a good time to discuss handling of the fruit associated with harvest and post-harvest activities. Strawberries are among the most perishable of all fruits, and thus it is critical that marketing channels are open before harvest starts. Strawberries are extremely susceptible to bruising, and rough handling at harvest and during any time thereafter will encourage fungal growth and decay. It is critical that personnel be trained in the careful picking and handling of fruit. In addition, fruit quality declines as the season progresses, so the highest quality fruit will be earliest in the season. With varying degrees of ripeness in single plantings, it is also extremely important that the fruit is harvested as near peak ripeness as possible.

Worker Hygiene

From a food safety standpoint, (microbial contamination with the potential to cause foodborne illness) strawberries, raspberries, and blackberries are considered high risk. One reason is because often the last person to touch the fruit prior to it being eaten by the consumer is the picker, as postharvest on-farm washing soon after harvest reduces shelf-life considerably in soft berries. Therefore, proper worker hygiene training is critical. Workers should ALWAYS wash their hands before entering the fields, and before/after eating and during breaks, prior to re-entry into fields. This should be an enforceable rule. Workers should be trained in proper hand-washing techniques, and always use soap and potable water, with single-use paper towels. There should be no smoking or eating in the fields, and there should also be designated areas for breaks/lunches (these can be on the edges of harvest fields but not between the rows). For more information and to order proper worker hygiene training materials, please go to http://www.gaps.cornell.edu, and click on Educational Materials.

Strawberries Destined for Direct Markets

Since most strawberry markets in the Northeast are consumed very close to the farms in which they are produced, many growers lack and may not need the cooling methods and storage facilities used by long-distance shippers such as those employed by the production areas in California and Florida. Direct market channels are ideal for many growers in the Northeast, as fruit loss is further accentuated from shipping from the farm to wholesalers, and from the wholesalers to retail markets. By bypassing wholesale shipping, fruit loss due to bruising and fungal decay can be reduced by an average of 20%. For optimum quality, it is critical that direct market fruit is harvested at or very near peak ripeness. Top quality strawberries should be fully ripe, with a uniform red color, be firm, flavorful, and show no signs of decay or disease.

Temperature is the single most important factor affecting shelf life of strawberries.

If cooling down to the recommended 32 F is an issue for growers, research shows that strawberries held at 50F storage at high humidity will benefit storage life greatly as compared to room temperature storage. In addition, strawberries at 50F tend to retain their color and glossy appearance better than berries stored at 32F. Many direct-market local growers claim approximately 90% of their strawberries are consumed the day they are harvested, thus in these cases, it is very critical that the berries be at peak ripeness. The berries are most often harvested in morning only when field heat is low, are usually then shipped out to markets on refrigerated trucks the same morning, reach the retail shelves by afternoon, and are bought and consumed within a day or two.

Strawberries Destined for Long-Distance Markets

For strawberries that are being transported beyond local markets, there are two factors that impact on maximum shelf life potential. First, the fruit will hold up better if they are harvested at the white tip stage, rather than fully ripe. Second, cooling is critical. As soon as harvest occurs, it is imperative that field heat is removed from the fruit. It is recommended that cooling is started within an hour of harvest. Ideally, 32F forced-air cooling with high humidity (90-95% RH) is recommended. Refrigeration without forced air can also be used; however, shelf-life will be shortened. Proper forced-air cooling removes field heat from fruit in 90 minutes or less, while simple refrigeration without forced air can take 7-9 hours. Proper ventilation around, below, and above the fruit is essential for removing field heat quickly. Covering containers with plastic prior to cooling, and not removing plastic until berries are at room temperature for several hours after reaching market shelves will prevent condensation buildup on the inside of the bag and delay fungal growth. It is estimated that for each hour delayed in cooling the fruit results in reducing shelf life of fruit by one day.

Following field heat removal, shipping on refrigerated trucks to market destinations is essential. If cold storage will be limited at market destination, as stated in the section on direct marketing, research shows 50F storage at high humidity will benefit storage life greatly as compared to room temperature storage. If all precautions are taken from harvest to cooling to storage, shelf life from harvest to market and on the consumer's table can be up to 10-14 days maximum for strawberries, but likely averages more like seven days in the Northeast. For growers interested in exploring the potential of longer distance markets, including more information on how to set up an inexpensive forced-air cooling system for berries and many other types of perishable produce, please contact Craig Kahlke at 585-735-5448, or email at cjk37@cornell.edu.

Acknowledgments – I wish to thank the late Jim Coulter, Marvin Pritts and Chris Watkins for their help in providing information for this article.

Wanted – Sweet Cherry Growers 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-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 two 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

Mark Your Calendars

Meeting title	**2018 CCE LOF PGR Orchard Tour**
Date	Friday June 29
Time	8:30am-4pm
Location	Touring 2-3 farms in Orleans (TBA) And/or, touring plots at the Geneva Research Station (TBA)
Cost	Free, thanks to our Sponsors. Sponsors, online sponsorship here: https://lof.cce.cornell.edu/sponsorship.php
Brief description of meeting	There will be a tour of commercial orchards and/or research plots to understand how plant growth regulators affect vegetative, reproductive, and fruit growth of apple with invited speakers Duane Greene and Poliana Francescatto.
Registration/Contact for information	See newsletter article this issue. Registration open on our website ~ June 13. In the meantime, please contact Mario Miranda Sazo, cell 315-719-1318, mrm67@cornell.edu

Meeting Title	**LOF Summer Tour**
Dates	Thursday, July 12
Time	All Day
Location	Wayne County
Cost	Free, Thanks to our Sponsors. Sponsors, online sponsorship here: https://lof.cce.cornell.edu/sponsorship.php
Brief description of meeting	Annual tour featuring cutting edge farms
Registration/ Contact for information	TBA, Stay tuned to our website and newsletter

For additional information about upcoming events and registrations visit our website at

http://lof.cce.cornell.edu

Mark Your Calendars

Meeting Title	LOF Young Growers Tour
Dates	August 2-4
Time	Depart (via bus) WNY Thursday morning, travel home Saturday AM
Location	Adams County Region, Pennsylvania
Cost	TBA, subsidized by sponsors. Sponsors, online sponsorship here: https://lof.cce.cornell.edu/sponsorship.php
Brief description of meeting	See more details last newsletter. Annual tour to other commercial tree fruit production regions for future farm owners and leaders
Registration/ Contact for information	TBA, Stay tuned to our website and newsletter. For more info or to be put on the Young Growers email list, contact Craig at cjk37@cornell.edu, 585-735-5448

Meeting Title	Western NY Hard Cider Tour
Dates	Monday, August 6
Time	All Day
Location	2 Farms and 1 nursery in Wayne County, ending (optional) with a tasting at Müllers Cider House, Rochester.
Cost	Orchard Tours and Lunch Free with Pre-registration
Brief description of meeting	Come visit the orchards of the first NY growers of European and American Hard Cider varieties.
Registration/ Contact for information	TBA, Stay tuned to our website and newsletter. For more info or to be put on the Cornell Hard Cider list, contact Craig at cjk37@cornell.edu, 585-735-5448

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

Fruit Notes

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Fruit Specialists

Craig Kahlke I 585-735-5448 I cjk37@cornell.edu
Team Leader, Fruit Quality Management

Areas of Interest: Fruit Quality and factors that affect fruit quality before, during, and after storage,

Mario Miranda Sazo I 315-719-1318 I mrm67@cornell.edu
Cultural Practices

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

Tessa Grasswitz I 585-261-0125 I tg359@cornell.edu
Integrated Pest Management (IPM)

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

Mark Wiltberger I 315-272-8530 I mw883@cornell.edu
Business Management

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

For more information about our program visit us at lof.cce.cornell.edu