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Fruit Notes

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Cornell Cooperative Extension
Lake Ontario Fruit Program

Volume 21 Issue 8 June 2, 2021

Our Summer Tour is Green-Lighted!

Craig Kahlke, CCE-LOF

LOF is excited to inform our stakeholders that we will be having a summer tour in 2021. Thanks to eased restrictions due to continued decreases in COVID infections and many millions of New Yorkers getting vaccinated, Cornell is following New York State's guideline for outdoor public meetings (see article below for the new guidelines). So, mark your calendars for Thursday, August 12, - LOF Summer Tour featuring Wayne County. We are in the early planning stages and will be reaching out to potential sponsors shortly. Stay tuned for more info about the tour.

Cornell Outdoor Meeting Policy

Based on the updated guidance from New York State Forward and the CDC due to improving COVID-19 infection and vaccination rates, Director Watkins is supportive of revising the CCE regional ag team outdoor field meeting (including open-air, well ventilated barns) guidelines at this time. Effective June 1, 2021, the size limit for field meetings will be increased from 25 to 500 consistent w/ the NYS and CDC guidelines. Masks are only required for unvaccinated attendees, and they also need to maintain 6' social distance during events. The "honor system" will be used for determining who needs to wear masks and maintain social distance. All attendees will be required to sign in and provide contact information should follow up contact tracing be necessary. There are no restrictions on the time limit for events and food may be provided.

New Recommendation for Return Bloom Sprays Applied in 2021 for Good Repeat Bloom in 2022

Dr. Terence Robinson, Cornell

For many years we have recommended four summer sprays spaced 10 days apart beginning on June 21 (longest day of the year) of either 10ppm NAA or 1pt of Ethrel. This timing is usually when fruits are 25mm in diameter. This program has worked well for many biennial varieties like Fuji, Golden Delicious, Macoun, Jonagold and Delicious. However, with Honeycrisp this four-spray program has been inconsistent in inducing return bloom. Some years there is a significant improvement in return bloom from these summer sprays but in other years there is no improvement in return bloom.

The reasons for this inconsistency have been unclear but our recent work points to two

important reasons why the summer return bloom sprays do not consistently work for Honeycrisp.

1. Work done by Poliana Francescato in my lab while I was on leave showed that flower initiation for Honeycrisp occurs much earlier in the season than for other varieties. The peak period of flower initiation is 45-55 days after full bloom. For WNY with an average bloom date of May 5, the peak period of flower initiation is mid-June to late June. Thus, starting the summer sprays of Ethrel or NAA at an earlier date would better overlap with the date of flower initiation. It appears that the traditional timing of summer sprays is too late.



2. In some years the number of flower clusters and initial fruit number is very high. If the seed number per fruit is also high resulting in a large number of seeds on the tree, then return flowering is strongly inhibited by the gibberellins produced in the seeds. Under this scenario the flower initiation stimulating properties of Ethrel or NAA are counter balanced and completely negated by the excessive GA level in the plant. In other years with fewer initial flower clusters or with lower seed count per fruit then the total GA load in the plant from a more moderate number of seeds per tree allows the NAA or Ethrel sprays to stimulate flower initiation.

These clues have led us to emphasize 1) precision pruning for Honeycrisp to reduce the initial flower bud load to no more than 1.8 times the target fruit number. This avoids having an excessive number of seeds producing too much GA to inhibit flowering. 2) We have also emphasized bloom thinning and petal fall thinning to reduce the fruit number to the target number very early in the season to ensure that at 45 days after full bloom when flower initiation occurs, there are not too many fruits, seeds and GA in the tree.

We now introduce a new recommendation to begin the series of summer return bloom sprays of

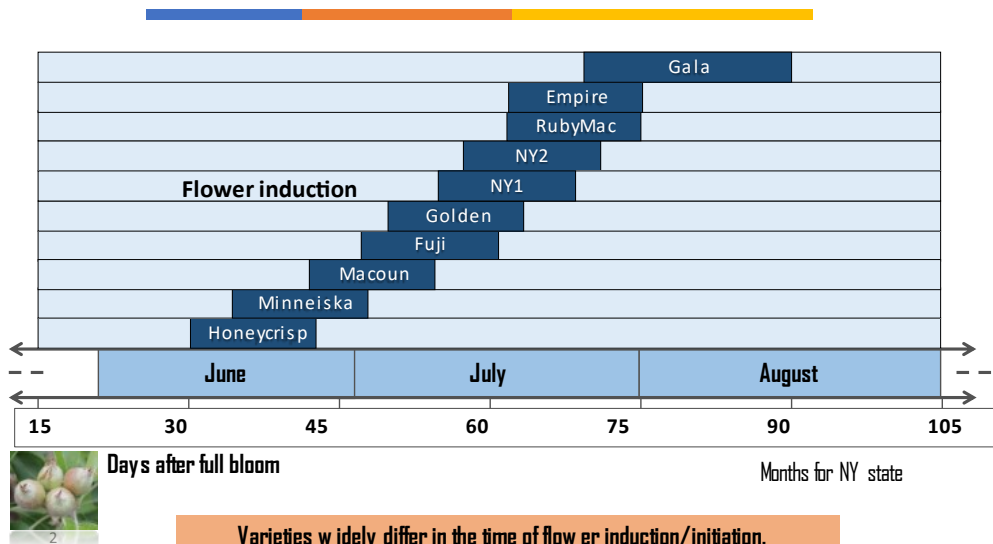
Ethrel or NAA on Honeycrisp earlier in the season beginning at the 16mm fruit size stage. For strongly biennial varieties (Honeycrisp and Fuji) we suggest 4 sprays at 10-day intervals of Ethrel beginning when fruits are 16mm (probably next week in WNY) The first 2 sprays should be at a low rate of ½ pt/100 and last 2 sprays at a higher rate of 1 pt/100). In addition, once the 4 sprays of Ethrel are completed, we recommend applying 2 more sprays of 10ppm NAA at 10-day intervals.

This new recommendation comes with strong caution. Ethrel is a powerful thinner from full bloom until fruits are 18mm. Its effects are very powerful when temperatures are above 80°F. Thus, there is some risk of thinning action when the first Ethrel spray for return bloom is applied at 16mm fruit size. To minimize the risk of thinning at this time we recommend that it only be applied when temperatures are below 80°F.

This new recommendation of early Ethrel sprays is most important during the “on” year and will help ensure repeat bloom in the following year. Its success depends on not having an excess number of seed on the tree since the high GA load from excessive number of seeds will overwhelm the flower inducing properties of Ethrel. Thus, strict attention to precision pruning and precision thinning to achieve the target fruit load early in the season will be key to success.



Timing of Flower Initiation in Apples



Impact of NYS Overtime Law on NY Fruit Growers – Tell Me Your Story

Mark Wiltberger

Cornell's Dyson School and NYS Ag and Markets – in conjunction with several CCE business management regional specialists, including myself – are conducting a study this summer to see what the impact of the changes in ag labor regulations (overtime for ag workers, day of rest, etc.) has had on farm income and farm viability in NYS. I will be conducting interviews with fruit growers to document the impact that growers anticipate. Part of the study will be to analyze payroll records to understand the impact of overtime. The other part is to have a conversation with you to understand the other ways the changes in the regulations could impact your business.

The Farm Labor Wage Board will be meeting before the end of the year to decide again whether to change the overtime threshold from 60 hours to a lower threshold – in the past, thresholds of 50 hours and 40 hours have been considered. Fruit growers are potentially affected significantly by lower overtime thresholds because of the intensity of labor required, especially at harvest. Participating in this study is an opportunity for you to communicate the impact of labor regulations on your business.

All data collected will be confidential – no individual data will be attributable to a specific

farm. The only requirement is that you have ag labor on your payroll. A diversity of farm businesses are sought after – for example, farms that sell wholesale through marketing desks or direct-to-retail such as farm markets, or have other lines of businesses that are run with the help of ag labor. This study is intended to provide better data to the Board and the Legislature.

In 2017, Jennifer Ifft and Matt Wells conducted a study on the impact of proposed (at the time) overtime legislation on apple farms (<https://blogs.cornell.edu/treefruitbusiness/resources/workforce/>). This study showed a significant increase in labor costs for farms when thresholds were lowered to 50 or 40 hours per week. The current study would update some of these numbers for the actual legislation and the current workforce climate with a greater diversity of farms, and document the other ways farms perceive the impact, such as the scarcity of farm labor and workforce flight to other states.

This is a chance to provide information to help your business and the NY fruit industry. If you are interested in participating, please contact me at mw883@cornell.edu or 315-272-8530.

A Tool for Forecasting Your 2021 Orchard Revenue

Mark Wiltberger

Estimating the revenue that this year's crop will generate is an essential step for sound financial planning for the coming year. Assessing the anticipated yield and return can help guide orchard management practices that determine crop load and fruit quality. Your forecast can be the beginning of this year's conversations with your buyers and sales desks to communicate the state of the crop you are expecting, and review their quality requirements. It is also important for cash flow planning by estimating when you will see cash coming through the door to pay for monthly expenses.

Forecasting your orchard revenue does not need to be overly complicated or require complex accounting software. I have created a one-page form for estimating your crop revenue, located here:

<https://blogs.cornell.edu/treefruitbusiness/resources/orchard-management/>. The form can be printed out and filled in by hand, or your estimates can be entered in the Excel spreadsheet version.

For an estimate of this type, keeping it simple and avoiding too much detail can make it easier to use for planning. Although every variety and block could be listed in the form, it may be easier to group all blocks of a single variety together.

The concept is this- for each variety, enter: the total acreage for the variety, the estimated yield, and the anticipated return per bin. From these values, the form will calculate for that variety: total production, total revenue, revenue per acre, revenue per bin, revenue per bushel, and revenue per pound.

To calculate useful “revenue per acre” values it is important to calculate acreage for each variety and block. The “Block Records” form and spreadsheet on the same Orchard Management Resource Page (<https://blogs.cornell.edu/treefruitbusiness/resources/orchard-management/>) can be a good starting point for documenting your acreage. Each row of the form records the information for a block and variety. There is a printable pdf version and an excel version of the Block Records worksheet.

The worksheet uses a formula to calculate the area. The acreage can be calculated by knowing the total number of trees and calculating the number of trees per acre using this formula:

Trees per acre = 43560 / (tree distance x row distance)

Acres = Total number of trees / trees per acre

For example, a 6’ x 16’ planting calculates to 454 trees per acre. If there are 1135 total trees, this is 1135 / 454 = 2.5 acres.

If you have questions on these forms or would like to provide feedback, please contact me at mw883@cornell.edu or 315-272-8530.

FSMA Inspection and On-Farm Readiness Review Updates

Elisabeth Hodgdon, CCE ENYCHP

Is your farm ready for a FSMA Produce Safety Rule inspection? As the growing season ramps up, the New York State Department of Agriculture and Markets is booking inspections and educational On-Farm Readiness Reviews around the state to see farm activities in action.

This year, all farms covered by the Produce Safety Rule are eligible for inspection. In 2019, NYSDAM prioritized inspecting large farms (produce sales exceeding \$500,000) and in 2020 inspected farms selling between \$250,000 and \$500,000 worth of produce. This year, the last group of covered farms, the smallest farms (\$25,000 - \$250,000 in produce sales), will be inspected for the first time. Inspections of farms following qualified exempt requirements will be scheduled at a later time to be determined. Routine inspections (second inspections) will be scheduled for large farms as need and schedules allow in 2021.

Farms of all sizes and exemption statuses are eligible to sign up for an On Farm Readiness Review this season. An On Farm Readiness Review is a free, confidential educational visit to the farm by a NYSDAM representative and CCE educator. The visit includes a walk around the farm to observe activities while having a conversation regarding food safety practices. At the end of the

visit, no notes or photos are taken off the farm. The farm is provided with guidance and resources to improve food safety prior to an official inspection; the OFRR itself is *not* an inspection. If you’d like to learn more and/or sign up for an On Farm Readiness Review, contact Steve Schirmer at (315) 487-0852 or steve.schirmer@agriculture.ny.gov

Still unsure whether your farm is fully covered, exempt, or qualified exempt? A good place to start is to take a look at your farm’s sales figures and use the “Coverage and Exemptions/Exclusions Flow Chart” on the FDA’s Produce Safety Rule website to see where your farm falls. Small farms selling less than \$25,000 worth of fresh produce are fully exempt. Farms selling less than \$500,000 of food (baked goods, milk, meat, hay and animal feed, etc.) are eligible for a qualified exemption based on the type of sales. These sales figures are adjusted for inflation and are currently \$29,232 and \$584,634, respectively. Note that due to the ongoing pandemic, the FDA is not enforcing qualified end user requirements for qualified exempt farms in 2020 or 2021 (or until announced otherwise).

For those who are familiar with the Produce Safety Rule and have taken the Produce Safety Alliance

Grower Training Course, you may recall that the water and soil amendment subparts of the Produce Safety Rule are subject to change. No updates regarding finalized water and soil rules have been released at this time.

If you have questions regarding your farm's coverage status, you may contact Steve Schirmer,

(315) 487-0852 or steve.schirmer@agriculture.ny.gov, or your region's NYSDAM produce inspector for assistance. Additionally, CCE is available to assist you with resources and guidance in improving food safety on your farm. Contact Craig Kahlke (585-735-5448 or cjk37@cornell.edu) for more information.

Post-emergent (Burndown) Herbicide Damage – Signs and Symptoms

Janet van Zoeren (CCE-LOF), Mike Basedow (CCE-ENYCHP) and Lynn Sosnoskie (Cornell)

Herbicides can damage any part of the tree – shoots, roots, leaves, flowers and fruits – which can lead to stunted or distorted growth, reduced yield, and decreased winter hardiness. Of course, you already know that herbicides are specifically intended to kill plants. However, unintended herbicide contact with orchard trees can and does happen in a variety of ways. For example, soil-applied herbicides can move into the root zone via leaching. Residual herbicides may be deposited on leaves, flowers or fruit if disturbances, like mowing, cause treated soil particles to become airborne. Spray tank contamination is a route for directing herbicide residues directly onto sensitive tissue. Herbicides may also come into contact with trees via spray drift or volatilization.

Spray drift vs. volatilization.

Herbicide drift occurs during the application process and is the physical movement of spray droplets onto non-target tissues. This unintentional contact may lead to significant plant injury as well as reduced weed control (because target weed species do not receive the optimal herbicide dose). Drift is most likely to occur when applications are made under high wind speeds and conditions that increase turbulence, when travel speeds are faster, and when droplet/particle size is small (which may be affected by spray pressure, small nozzle orifices, and conditions that result in droplet evaporation such as high temperatures and low humidity), among other factors. Inversions, which may be accompanied by calm conditions, may also facilitate spray drift.

Volatilization occurs when the pesticide itself changes from a solid or liquid form into an air vapor. Even if the original application landed on

the intended target, volatilized herbicides can spread off-target. Herbicides are most likely to volatilize when the products are applied to non-absorbent surfaces (like rocks or concrete) and air temperatures and humidity are high. Note that not all products are volatile. The volatility of a product may be listed on the label or can be found through an online search. Note that the specific formulation is key in determining risk of volatilization – for example, some 2,4-D products have a high risk, whereas others have a low risk, depending on their formulation. If in doubt, you can always contact any of us for help determining the volatility of a product.

Symptoms/identification.

Any herbicide, if applied incorrectly, can damage your trees. Knowing the symptoms that herbicide active ingredients cause can help you determine which active ingredient may be responsible for observed injury. For example:

Glyphosate injury appears as yellowing between leaf veins (usually beginning at the base of leaves), stunting of new growth (due to shortened internodes, which is referred to as a 'witches broom'), and leaf cupping, curling and distortion. Because glyphosate is a systemic product that is translocated to meristems, symptoms may not be observed immediately after application. Glyphosate is not volatile, so tree injury from this product will occur during application or due to accidental particle drift.

Glufosinate injury is similar to glyphosate (leaf yellowing, leaf crinkling and distortion, and stunted growth), but may also include necrotic spots on the

leaves. Some symptoms (like leaf burning) may occur within a few hours of application while others may develop over the course of several days. Glufosinate injury can be enhanced when the weather following application is sunny and humid.

2,4-D is also a systemic herbicide, which is translocated to sensitive growing meristems. Injury often first appears as leaf cupping and curling, along with stem disfigurement or excessive lengthening of shoots. Within a few weeks you may see yellowing of growing tips, wilting, and eventual necrosis of growing shoots.

Paraquat most consistently appears as necrotic spotting of leaves, which can develop quickly following herbicide application. Other symptoms may include leaf yellowing, crinkling, and wilting, which, within a few days, can lead to complete leaf necrosis.

There are a couple of websites with excellent pictures of herbicide damage. Visit and bookmark: the [University of California Herbicide Symptoms](#) page and the [OMAFRA Apple IPM Herbicide Gallery](#). The 'new' Weed Scientist at Cornell University, Dr. Lynn Sosnoskie, has been tentatively approved for a grant to develop an online gallery of herbicide injury images across New York's specialty crops starting in fall of 2020, so look for updates about its progress.

Of course, not all mysterious damage is caused by off-target herbicide applications. Herbicide symptoms can be confused with damage caused by diseases, nutrition imbalance, drought, or winter injury. Some clues that herbicides may be a culprit include:

- Specific patterns of injury within the orchard block, such as damage predominantly in border rows, on one side of the tree, or only the outer leaves of the tree (drift shadows).
- Weeds showing similar symptoms near the orchard block, or between the orchard and suspected source of drift or volatilization.
- Symptoms that are consistent with recent herbicide applications made within or near the orchard.

To help identify herbicide damage (and if applicable, to help with insurance claims if drift is from an outside source), it is best to have a consistent way to keep records, both of all herbicide applications you make on your farm, as well as of any damage symptoms or other unusual things you notice while driving or moving through the orchard. Keep a pad and paper with you when scouting the orchard. If you see any unknown injury, jot down some notes if you notice any specific patterning, such as those described above. Be sure to document weather conditions at the time of and following application as well as details about travel speeds, nozzles used and heights, spray pressure, and weed density and canopy height.

Avoiding herbicide damage.

You can't always predict when herbicide drift or volatilization will occur, but you can decrease the likelihood.

- Do not apply under high temperatures (see labels regarding specifics for each herbicide). If an application is necessary during a prolonged hot spell, use herbicides that have a lower risk of volatilizing, if applicable.
- Keep the boom as low to the ground as possible to reduce the chance of herbicide hitting the trees, but high enough above target weeds to ensure good spray coverage.
- Plant windbreaks to prevent drift from neighbor's fields.
- Use shields or air induction nozzles when applicable, to reduce drift.
- Counterintuitively, drift can be worst both when there are strong gusty winds, but also when there is no wind. The best condition for an herbicide (or any) spray is a mild, consistent, predictable breeze.
- When allowed by the label, the use of an adjuvant may reduce the chance of drift for certain products.

As a side note, remember to read and follow the label for cleaning spray equipment, especially if you use the same sprayer for herbicides as you use for other pesticides. Water is not always sufficient to clean all herbicide residue out of the tank, which

can have disastrous consequences! Even when re-using equipment for another herbicide application, the residue may lead to a mix of products or adjuvants that are more toxic to the crop or more prone to drift or volatilization. Conversely, incompatible herbicides may congeal and clog sprayer components.

What to do if you do see herbicide injury?

The good news for orchard managers is that perennial plants, and especially trees, can often recover from significant single-time herbicide

damage. The larger biomass and longer life allow trees to dilute and translocate the product away from the most sensitive tissues.

Although less well-studied, chronic low-dose exposure may be detrimental to the overall health of the tree, making it more susceptible to insects, diseases, or other stressors.

In general, if you are concerned about herbicide damage to your orchard block, you can contact Janet van Zoeren (jev67@cornell.edu) or Lynn Sosnoskie (lms438@cornell.edu).

Mark Your Calendars

Honeycrisp Meetup Starts This Week – Thursday, June 3, 7-8 PM (4-5 Pacific Coast Time)

Virtual Honeycrisp Meetup - A three-part series of conversations about Honeycrisp

Researchers, extension specialists and grower panelists;

New York grower Rod Farrow; Michigan grower Chris Kropf and Washington grower Bruce Allen

Join us and bring your experience and questions!

Register to each date in the links below.

JUNE 3rd

CROP LOAD MANAGEMENT

[Register](#)

JUNE 17th

ROOTSTOCKS

[Register](#)

JULY 1st

NUTRIENT MANAGEMENT

[Register](#)

Facilitated by **B. Sallato** WSU Extension, **M. Miranda Sazo** Cornell Cooperative Extension, and **A. Wallis** MSU Extension. Supported by IFTA, USDA-SCRI Root2Fruit project and Good Fruit Grower. For more information visit <http://treefruit.wsu.edu/event/virtual-honeycrisp-meetup/2021-06-03/>

LOF Summer Tour – Featuring Wayne County

Thursday, August 12th. Cutting edge farms and research. Lunch provided. Stay tuned. See article on page 1 in this issue on new COVID guidelines.

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Fruit Notes

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

Fruit Specialists



Craig Kahlke | 585-735-5448 | 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
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
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
Business Management

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

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