A partnership between Cornell University and the CCE Associations in these five counties: Monroe, Niagara, Orleans, Oswego & Wayne

Fruit Notes

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

Cornell Cooperative Extension
Lake Ontario Fruit Program

Volume 22 Issue 6 April 5, 2022

Updated Predicted Green Tip Dates for WNY in 2022 – Your Sprayers Should be Ready Earlier than We Last Predicted!!

Craig Kahlke

For an explanation of the chill units and heat units accumulation for this model, **please see the Robinson, Gonzalez, and Kahlke article in our last newsletter.** Following the completion of rest in Feb. 2022, fruit trees in WNY have been responding to warm temperatures (accumulating heat units) with mainly non-visible (but some early silver tip!) bud development leading toward bud break. Our calculations of growing degree hours (GDH) in WNY since the completion of rest in February show that by April 3, trees have accumulated ~1560 GDH in Medina, 1135 GDH at Appleton North, and 1275 GDH at Williamson. For our region, this is about 55-80% of the 2000 growing degree hours needed to reach GT.

Forecasting Bud Break in the Spring of 2022

The 1-2 week forecast has significantly warmer temperatures that were predicted even 5 days earlier. If these temperatures prove to be close to actual, green tip would be on **April 8** for early bloom varieties (Idared) in warmer (inland) sites in Niagara & Orleans Counties, and on **April 11** for mid bloom varieties (Delicious). Green tip is predicted to on **April 13** for early bloom varieties (Idared) in warmer (inland) sites in Wayne County, and on **April 14** for mid bloom varieties (Delicious). For lake sites in Niagara and Orleans Counties, the models also predicts **April 13** for early bloom varieties (Idared), and **April 14** for mid bloom varieties (Delicious). For lake sites in Wayne County, good forecast data was difficult to find, but I would estimate 1-2 days later than the inland Wayne County sites. We caution that the estimated date of GT is dependent on the accuracy of the weather forecast (which changes on a daily basis!) that we used and the accuracy of the models (which in most cases is quite good). **Our predictions are for several days earlier in WNY** than we estimated about 2 weeks ago. We suggest growers prep their sprayers soon, especially in inland sites in Niagara & Orleans Counties, which could be at GT in early varieties by Friday of this week.

PS – If anyone has good temperature forecast for sites close to the Lake in Wayne County, please contact Craig Kahlke at 585-735-5448, or cjk37@cornell.edu. Thank you!

	Niagara/Orleans		Wayne	
Lakeside sites	Early bloom varieties (IdaRed):	Mid bloom vars. (Delicious):	Early bloom varieties (IdaRed):	Mid bloom vars. (Delicious):
	April 13	**April 14**	**~mid April**	**~mid April**
Inland sites	Early bloom varieties (IdaRed):	Mid bloom vars. (Delicious):	Early bloom varieties (IdaRed):	Mid bloom vars. (Delicious):
	April 8	**April 11**	**April 13**	**April 14**

Soil Qualities to Optimize New Orchard Growth

Mike Basedow

As a follow up to our soil health session at the 2022 Cornell Tree Fruit Conference, I thought I would briefly discuss what I consider to be some of the key characteristics of a high-quality orchard soil. I think a good way to think about this is by thinking through what some of the key functions of an orchard soil are.

A high-quality soil should be relatively free of organisms that cause soil borne diseases.
There are numerous soil organisms that can be detrimental to orchard longevity. Several species of *Phytopthora* cause root and crown rots. Phytophthora rots can girdle the scion (collar rot), damage the rootstock just below the soil surface (crown rot), and cause necrosis and death of fine roots (root rot). These can be particularly problematic in our region, where we have rainy springs and falls, and some orchards on heaver soils (Dupont et al., 2019). Nematodes should be another consideration. Dagger nematodes (*Xiphinema spp.)* can transmit tomato ringspot virus, the causal agent of apple union necrosis and decline, and peach stem pitting. Root lesion nematodes (*P. penetrans*) are one of many contributors of apple replant disease (Peter, 2017).

Prior to planting a new orchard, we recommend conducting nematode tests on your site. Diagnostic testing is only conducted by a few universities, the Cornell Plant Diagnostic Lab does have a testing service, and I have also sent samples to Clemson in the past. For root rot diseases, a simple test would be a bean bioassay. In this test, bean seeds are planted into the soil sample, and are subsequently rated for their disease incidence as the seedlings grow. If tests indicate high levels of nematodes or root disease pressure, corrective actions can be taken prior to planting the orchard.

Biofumigation is one technique that can help reduce the amount of soil-borne pathogens. In this technique, cover crops containing high levels of gluocosinolates or cyanogenic glucosides are grown on the field prior to establishing the new orchard. When I was at Penn State, we did an orchard establishment cover crop field demonstration. These included a rotation of sorghum sudangrass in the summer, followed by subsequent fall and spring plantings of rapeseed. The key to getting good biofumigation is to finely chop the cover crops with a flail mower, and then immediately incorporate the residues into the soil by plowing it in. Chopping the residues releases the fumigant chemistries from within the plants, and incorporation prevents the loss of these chemicals to volatizing into the air. These compounds volatilize very quickly (15-30 minutes), so it is best to incorporate immediately after mowing. In addition, your rootstock choice should be carefully considered. Many of the Geneva rootstocks are tolerant of replant disease, which is a complex at least partially caused by the presence of these soil-borne pathogens.

Sunken cankers at the base of an apple tree is an indication of a Phytophthora infestation. Photo courtesy OMAFRA.

A high-quality soil should hold water well to resist drought conditions.
An adequate supply of water is critical to the success of any new orchard planting. Soils with low water storing capacity, such as stony, well-drained soils, are at a greater risk of plant stress during droughty conditions. In general, dwarfing rootstocks such as M.9 have smaller root systems that are more prone to drought stress, while M.26 has average drought tolerance (Barden and Neilsen, 2003).

A soil's available water capacity (AWC) can be measured using the AWC test add-on through the Cornell Soil Health test. AWC is an indicator of the amount of plant-available water a soil can store, and

through this measurement we can better predict how well the orchard will fair under periods of water stress.

Soil texture plays an important role in water availability, as coarse textured soils do not hold soil moisture as well as fine textured soils. Water availability is also improved when soil organic matter (OM) levels are higher. Greater soil aggregate stability prevents soil surface crusting, and improves water infiltration into the soil during heavy rainfall events. OM and soil aggregation can also be measured through the Cornell Soil Health test. AWC can be improved by adding more stable forms of organic matter during the pre-plant period. Consider incorporating mulches, composts, biochar, or high biomass cover crops, such as sorghum sudangrass or winter rye. Of course, trickle irrigation can also be provided to the orchard to limit the ill-effects of soils with low AWC.

A high-quality soil should also drain water well in times of heavy rain.

In our region, we should also be concerned about our soils having too much moisture when we have particularly wet seasons. Poor internal drainage in the soil profile can limit oxygen from reaching the roots. In addition, the soil-borne diseases mentioned above thrive under wet soil conditions. Poorly drained soils can increase tree stress, making trees more susceptible to winter injury. Some rootstocks, such as M.9 and MM.106, are particularly sensitive to poorly drained soils. (Barden and Neilsen, 2003)
Poor soil drainage is closely tied to soil texture. Fine textured soils are most likely to have drainage issues. Drainage issues are also more likely to occur on lower sections of a field where water tables are permanently or seasonally high, so site selection is key. It can also result from water seepage from other nearby locations.

To check the drainage of your soil, you can use a test similar to a percolation test for septic systems. Simple instructions can be found here: https://www.bartlett.com/resources/soil-drainage.pdf
Alternatively, you can use a backhoe to dig a five to seven foot hole to view the soil profile. Poorly drained soils will generally have horizontal layers of lightly colored materials have oxidized due to excess soil moisture (Bradshaw).

Poor soil drainage can also result from an impermeable layer within the subsoil. Impermeable layers are often a natural characteristic of some soils and can be several meters thick. These impermeable layers are not correctable with deep plowing but can be managed with good tile drainage with the tile lines placed just above the impermeable layer. Soil compaction from improper tillage can also impede water movement through the soil profile. Compaction occurs very rapidly when the soil is worked or trafficked while it is too wet, and compaction can be transferred deep into the soil from surface pressure. Subsoil compaction in the form of a plow pan is usually found just below the plow layer, and can be caused by smearing and pressure exerted on the undisturbed soil just beneath the deepest tillage depth, especially if tillage was done when the soil was wet. When subsurface compaction occurs, water can build up over a hard pan causing poor aeration both at depth and at the surface after heavy rain events. Surface compaction often leads to poor infiltration, causing ponding, runoff, and erosion.

Soil compaction can be assessed with a field penetrometer and is evaluated and scored on the Cornell Soil Health test as the surface (0-6”) and subsurface (6-18”) hardness. It is measured as field penetration resistance in pounds per square inch (PSI). Root growth is reduced above 300 PSI. Subsurface hardness can be improved by mechanically loosening the soil during the pre-plant period to break up any hardpan that may exist. To avoid compaction, avoid using plows and disks that will create new pans when soils are wet. You should also try to avoid traffic on the soil, particularly when the soils are wet. Consider using deep rooted cover crops, such as sorghum sudangrass or daikon radish, to help break up subsurface compaction prior to planting the orchard. Surface hardness can be improved by using shallow-rooted cover crops prior to orchard establishment.

A high-quality soil should be sufficiently deep to allow for optimal root growth throughout the rooting zone.

Atkinson (1980) found apple roots tend to grow to a depth of 0.8 meters on average, however a depth of 1-2 meters was common. While dwarfing rootstocks may not grow quite as deep, they would likely explore more of the soil profile if unimpeded. Roots that grow deeper can access more nutrients and water, which will make them more resilient to weather extremes. Even when soils are improved with irrigation and proper fertilization, trees grown in a smaller soil volume are still prone to negative impacts on tree and fruit growth.
Shallow soils can result from high water tables, compacted layers, or abrupt textural changes or

bedrock near the soil surface, as noted above. Shallow soils caused by high water tables can be improved through proper drainage techniques. Where compaction or impermeable layers are the culprit, soil depth may be improved through deep tillage prior to planting, depending on the depth of the impermeable layer. Soil ripping should be performed when soils are dry, as this will have the greatest impact. However, results of deep ripping have been variable, and may only be temporary. Cover cropping with very deeply rooted cover crops, may also provide some benefit.

A high-quality orchard soil should have adequate fertility.

For apples to grow well, soils should have appropriate levels of the major macro and micronutrients, and should be within an adequate pH range of 6.5-7.2. (We recommend a pH of 7.0-7.2 for Honeycrisp). Thankfully, these are all characteristics that we can readily adjust prior to planting and during the life of the orchard. Soil testing from 0-16 inches will allow you to determine which nutrients are lacking and allow you to incorporate nutrients deep into the soil and the future rooting zone as necessary. This is particularly helpful for immobile soil nutrients, such as P and Ca. Nutrient availability is optimized in orchards when soil pH is between 6.5-7.2. Soils with pH below 6.5 are prone to manganese and aluminum toxicities, while soils above 7.5 are more prone to growth limiting deficiencies such as P, Zn, Fe, and Mn. In New York, low pH is the more common problem, and this can be improved by incorporating lime prior to planting. In addition, surface applications can be applied during the life of the orchard as well. See the article on 'Honeycrisp' nutrition and pruning for additional details on fertility management for your 'Honeycrisp' blocks.

A high-quality soil should resist erosion and runoff.

Soils should have the right physical properties to prevent erosion and runoff. Soil erosion from the herbicide strips can lead to the rootstock shank and roots being exposed too far above the soil line. This could lead to reduced tree vigor and may also lead to more winter damage to the exposed shank and root systems. Runoff may move water and nutrients away from the herbicide strip, and may deposit fertilizers in unintended, offsite locations in the environment. Aggregate stability is a measure of how well soil aggregates or particles hold together under rainfall or other rapid wetting stresses and is assessed in the Cornell Soil Health test. Good aggregate stability helps prevent crusting, runoff, and erosion, and facilitates aeration, infiltration, and water storage, along with improved root and microbial health.

Aggregate stability is influenced by microbial activity, as aggregates are largely held together by microbial colonies and exudates and is impacted by management practices. It can be improved by incorporating organic materials such as mulch, or by rotating between plantings with shallow-rooted cover crops. It can also be increased by surface mulching with wood chips.

Surface crusting due to poor aggregate stability can lead to reduced water infiltration and storage, and increased soil erosion and runoff. Image courtesy Comprehensive Assessment of Soil Health: The Cornell Framework.

A high-quality soil should have adequate organic matter.

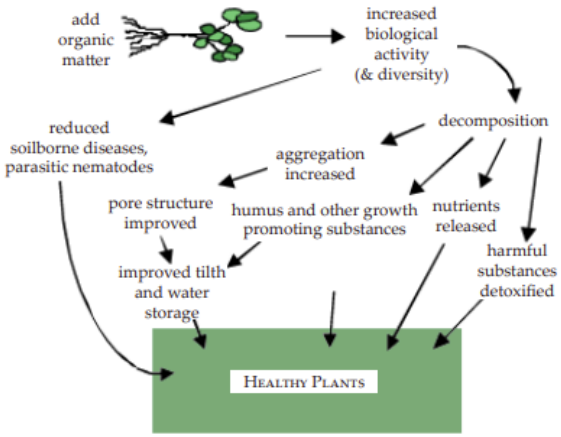
Organic matter is a measure of the carbonaceous material in the soil that is biomass or biomassderived. OM is a central indicator of the physical, biological, and chemical health of the soil. OM influences numerous soil properties such as soil aggregation, water retention, nutrient cycling, and ion exchange capacity. Soils with low organic matter tend to require higher inputs (nutrients and pesticides), and be less resilient to drought and extreme rainfall. Increasing OM content is most beneficial in coarse textured soils.

In general, we recommend orchard soils in New York be within the range of 2.5-3.5% OM. The retention and accumulation of OM can be influenced by management practices such as tillage and cover cropping, as well as by microbial community growth. Intensive tillage and lack of organic biomass additions from various sources (amendments, residues, active crop or cover crop growth) will decrease OM content over time.

To increase your soil's OM content, consider incorporating stable organic materials prior to planting. Some materials to consider include mulch, compost, biochar, and high biomass cover crops. Incorporating materials prior to planting will allow the materials to be incorporated uniformly throughout the depth of the rooting zone. OM levels can also be improved through the addition of organic

materials at the surface once the orchard is established. Coarse hardwood bark mulch has been used in some organic production systems to increase soil OM, and additional research is being conducted on other surface amendments. Note that OM amendments can impact nutrient availability, so look closely at the C:N ratios of your amendments to consider if they will release or tie up nitrogen prior to incorporation.

A high-quality soil should be biologically active.
In addition to the physical and chemical components of the soil, it is also important to consider the biological component of your orchard soil. An acre of soil can contain 5,000 pounds of bacteria and fungi (Dupont 2019). Organisms in our soils include bacteria, fungi, nematodes, microarthropods, earthworms, and many others. While some of these can be detrimental to orchard growth (such as those talked about at the beginning of this article), many of these organisms provide benefits to the orchard. Some organisms are involved with nutrient cycling, maintaining soil structure, scavenging nutrients for the plant roots, and some also help fight against plant diseases, to name a few.



Adding organic matter results in many soil benefits. Image courtesy Buildings Soils for Better Crops, 2nd edition, Sustainable Agriculture Network – USDA).

One indicator of your orchard soil's biology is soil respiration. This measurement is available on the Cornell Soil Health Test and measures the amount of CO_2 released from the soil over a given time period. The greater the CO_2 released, the more active the soil microbial community.

Microbial activity is influenced by management practices such as tillage, cover cropping, organic matter incorporation, and biocide (pesticide, fungicide, herbicide) use. To increase soil biology, consider maintaining plant cover and adding fresh organic materials such as manures and green manures during the pre-plant period. Also consider cover cropping with symbiotic host plants prior to establishing your orchard, and minimize soil disturbances, such as tilling or cultivation throughout the life of your orchard.

More on the Cornell Soil Health Test
You can view a sample Cornell Soil Health Test result from a New York orchard site at the following link. https://enych.cce.cornell.edu/submission.php?id=837&crumb=crops|crops|apples|crop*38

You can also find a copy of the Cornell Soil Health Test manual here. http://www.css.cornell.edu/extension/soil-health/manual.pdf

Citations

Atkinson, D. (1980) The distribution and effectiveness of the roots of tree crops. Horticultural Reviews 2, 424–490.

Barden, J.A. and G.H. Neilsen. 2003. Selecting the orchard site, site preparation and orchard planning and establishment, p. 237-267. In: D.C. Ferree and I.J. Warrington (eds.). Apples: Botany, Production, and Uses. CABI Publishing, Wallingford, UK.

Bradhsaw, Terence. Tree fruit: horticulture. Site selection and preparation in Vermont apple orchards. University of Vermont. 25 March 2022. https://www.uvm.edu/~orchard/fruit/treefruit/tf_horticulture/AppleHortBasics/SiteSelection.html

Dupont, T. S. Hewavitharana, and M. Mazzola. 2019. Phytophthora crown, collar, and root rot of apple and cherry. Washington State University Extension. 21 March 2022. http://treefruit.wsu.edu/crop-protection/disease-management/phytophthora/

Dupont, T. 2019. Soil biota in orchards. Washington State University Extension. 24 March 2022. http://treefruit.wsu.edu/orchard-management/soils-nutrition/soil-biota/

Moebius-Clune, B.N., D.J. Moebius-Clune, B.K. Gugino, O.J. Idowu, R.R. Schindelbeck, A.J. Ristow, H.M. van Es, J.E. Thies, H.A. Shayler, M.B. McBride, K.S.M Kurtz, D.W. Wolfe, and G.S. Abawi, 2016. Comprehensive Assessment of Soil Health – The Cornell Framework, Edition 3.2, Cornell University, Geneva, NY.

Peter, K. 2017. Nematodes – preventing problems in deciduous fruit trees. Penn State Extension. 21 March 2022. https://extension.psu.edu/nematodes-preventing-problems-in-deciduous-fruit-trees

When to start applying fungicides for apple scab management

Līga Astra Kalniņa & Kerik Cox
Cornell University, Plant Pathology and Plant-Microbe Biology Section

For any fungicide application, it is advisable to use an apple scab forecasting system such as the one in the NEWA system (http://newa.cornell.edu/). This will identify predicted ascospore releases and potential infection events to improve application timing and cost-effectiveness of fungicide investments. The first step when using any apple scab disease forecasting system is to determine the biofix, which is the date at which to start the model based on a biological feature of the host or pathogen. Determining the biofix can be frustrating as the forecasting system will provide them (without accuracy) by default, and there are different green tip dates for the many cultivars on the farm. Historically, shooting towers and squash mounts were first used to determine maturity and ejection of ascospores and have highest level of accuracy. However, these techniques are labor intensive and require a high level of skill to do well, and this information is truly most applicable to the orchard from which the leaves were collected.

A considerable amount of published research proposed that ascospore maturity could be reliably estimated based on temperature accumulation (degree-days) after 50% flower bud break on 'McIntosh'. This research led to a 'Maturity Model' that would allow any grower to estimate ascospore maturity without labor intensive and highly technical squash mounts and shooting towers. 'McIntosh' was chosen as most of the region was planted to 'McIntosh' and local populations of the pathogen were well adapted (evolved) to mature and release when 'McIntosh' had green tissue. There is also an evolutionary advantage for ascospores to mature and release at green tip, not prior to green tissue. Individuals ascospores in populations that mature and release when there is no green tissue, would just dry up and die and not contribute to the epidemic or survival of the population. Presently, estimations based on the biofix of 50% flower bud break are considered to best capture the peak and tail end of ascospore maturity and release. Despite the intense scientific validation of this model for estimation, researchers routinely found mature ascospores in squash mounts and shooting towers long before bud break. Indeed, in 2019 and 2020, Dr. Acimovic (Virginia Tech) often captured mature ascospores in eastern NY 1-3 weeks before the 50% McIntosh budbreak biofix. To complicate matters, local populations have likely evolved to mature and release in accordance with the development of newer local varieties as 'McIntosh' is not as widely planted. Perhaps, 'Gala' budbreak should now be used as the biofix? Since we know that ascospores are present before green tip, one solution might be to choose a biofix 1-2 weeks prior to budbreak. Unfortunately, starting ascospore maturity and release simulations early may cause the end simulation early and any potential threat of ascospore release at the end of the epidemic may be missed. **Fortunately, ascospores released prior to green tissues won't be able to infect, and if they could, the recommended copper application as silver tip (see article in FN issue 5) will afford excellent protection should even the slightest green tissue be available**.

With all of this information, what should one do about simulations and biofixes? **As green tip approaches**, leave your simulation with 50% bud break biofix, but **if the weather warns of potential infection or considerable rainfall, temporarily set your biofix back to 10 days earlier and see if the amount of ascospores potentially ejecting increases dramatically**. If the simulation increases dramatically, perhaps consider a single-site fungicide or dodine. Once you begin to approach tight cluster, ensure that your simulation is back on the 50% bud break biofix to best capture the peak and ensure that the simulation doesn't end too early.

Mark Your Calendars

Meeting Title	**2022 Respirator Fit Test Clinics**
Date and Time	April 7 9 AM-4 PM (Orleans Co) April 8 8:30 AM-12 PM (Niagara Co)
Location	Orleans County CCE, Conference Room, South Entrance, 12690 State Route 31, Albion, NY 14411 Niagara County CCE, 4H Training Ctr, Large Meeting Room, 4487 Lake Ave, Lockport, NY 14094
Cost	$65 per person
Contact for Info/Registration	Call 607-547-6023 (Monday-Friday, 7:30 am—4:00 pm) and ask for the Fit Test Clinic scheduler **OR** E-mail FitTest@bassett.org.
Brief Description of Meeting	The New York Center for Agricultural Medicine and Health (NYCAMH) and CCCE of Niagara and Orleans Counties are pleased to provide respirator fit testing clinics for agricultural businesses in your region. During the clinic, NYCAMH will provide medical evaluations, respirator fit tests and WPS compliant trainings on how to properly inspect, put on, take off, fit, seal check, use, clean, maintain, and store respirators. Appointments are one hour long. Up to 4 workers can be seen at the same time. Medical evaluations, fit tests, and trainings are available in both English and Spanish.

Meeting Title	**First Bilingual Pruning Workshop (English and Spanish languages)**
Date	Tuesday, April 12
Time	4:00-5:30pm
Location	Hosted by orchard managers Justin Dimercy from Cherry Lawn Fruit Farms and Joaquín Hernández Nava from Johnson Fruit Farm. Address: At the Furber's shop located at 8130 Glover Road, Sodus, NY 14551
Cost	Free
Contact for Info/Registration	Mario Miranda Sazo (cell 315-719-1318; mrm67@cornell.edu)
Brief description of Meeting	Mario will show and discuss how to adjust bud load targets for 'Honeycrisp' with Justin, Joaquín, and pruning crews. English and Spanish languages will be used during instruction.

Meeting Title	**Second Spanish Pruning Workshop (Spanish language)**
Date	Wednesday, April 13
Time	4:00-5:30pm
Location	Hosted by growers Sergio and Silvia Rosario of Rosario Brothers in Medina. Address: At the Marshall Farm, 3168 Marshall Rd. Medina, NY 14103
Cost	Free
Contact for Info/Registration	Mario Miranda Sazo (cell 315-719-1318; mrm67@cornell.edu)
Brief description of Meeting	Mario will show and discuss how to adjust bud load targets for 'Honeycrisp' with Sergio, Silvia, and Spanish pruning crews. Spanish language will be used during instruction.

Meeting Title	**Produce Safety Webinar Series: Tales from the Trenches… Building and Implementing Effective Environmental Monitoring Programs**
Date	April 14
Time	3:30 pm – 5:00 pm
Location	Virtual
Cost	Free
Contact for Info/Registration	HTTPS://TINYURL.COM/PSWSEMPS
Brief Description of Meeting	This is targeted for food safety personnel in packinghouse and storage facilities. Please see the full agenda on the registration page at the link above. Questions? contactproducesafety@ifas.ufl.edu.

Meeting Title	**Pruning Workshop (English language)**
Date	Wednesday, April 20
Time	1:30-3:30pm
Location	Hosted by growers Eric Behling of Behling Orchards in Mexico, Oswego County. Address: At Behling Orchards, 14 Potter Road, Mexico, NY 13114.
Cost	Free
Contact for Info/Registration	Mario Miranda Sazo (cell 315-719-1318; mrm67@cornell.edu)
Brief description of Meeting	Mario will show and discuss how to adjust bud load targets for 'Honeycrisp' with Eric and his Jamaican pruning employees. English language will be used during instruction with all participants.

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

Contents

Updated Predicted Green Tip Dates for WNY in 2022 – Your Sprayers Should be Ready Earlier Than We Last Predicted!

Soil Qualities to Optimize New Orchard Growth

When to Start Applying Fungicides for Apple Scab Managment

Mark Your Calendar

Contact Us

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