Cornell Cooperative Extension
Eastern NY Commercial Horticulture Program

Tree Fruit News

April 2022
Volume 10, Issue 1

Lost in a Valley of Confusion: The State of Today's Wholesale Apple Industry in the Hudson Valley—A Summary of Recent Producer Feedback

A Commentary by Daniel J. Donahue, CCE ENYCHP

During our winter fruit conference program in February 2020, just prior to covid shutting down our in -person meetings, Mike Basedow and I devoted the entire second day to the question of "What apple variety should I plant?". After a full day of listening to growers, marketers, nursery producers, and academics tackle the question from different angles, the path towards future success remained fuzzy at best. The question has remained foremost in the minds of our Eastern New York producers and the answer continues to elude us. Today, for the first time in many years, nurseries have trees available for purchase without prior contracts and many producers have slowed or even delayed their replanting plans. With establishment costs heading north of 25K $$$ per acre and faced with the task of top-working young blocks of the last, but now past, new variety star to more reliable options begs the question: "What variety do I plant" or perhaps more telling, "should I be planting anything at all?"

The Hudson Valley supports an industry that from a marketing standpoint is amazingly diverse. Our proximity to the New York City metropolitan fuels a vibrant agritourism market. Orchards that focus on direct retail marketing including the supply of outside farm markets has also benefited from our favorable geographic position. No surprise here as our location has been the strength of our apple industry since pre-revolutionary times. Back then the Hudson River was our highway, later replaced by trains rolling alongside the great river. Today it's trucks, and internationally, ships, that have helped grow our wholesale markets into the national and international behemoths of immense complication that they are today. Varieties from around the world now compete for shelf space and the consumer sees "apples" as a commodity, not necessarily a product of our local orchards. "Envy", "Opal", where do they come from? Who knows says the consumer, to me, they're just tasty apples.

Every business owner wrestles with the question of what comes next. Changing consumer expectations, competition in the marketplace, competition amongst suppliers to offer the highest quality at the lowest cost, unstable labor markets, a challenging regulatory environment for small

(Continued on page 2)

Table of Contents

(Continued from page 1)

business, and more recently supply chain and cost inflation issues are drivers common to all businesses. What makes the apple industry a special case in this economy is how biology sets distinct limits on just how fast a small business can pivot to meet demands that change at an ever-increasing rate. In my view, rapid innovation in the technology sector has been a major factor contributing to the shortening of product development and marketing cycles. As a result, consumers have become conditioned to expect that the "next big thing" is only just around the corner. I call it the "iPhone Syndrome", that is we expect a new and improved product every two years or so. The evolution of cell phones is one example, and the explosion of tech in modern automobiles is another. Perhaps this shortening of the consumer's attention span helps explain the explosion of product branding we see in today's retail stores.

So where does this leave a traditional industry where the speed of change is biologically limited? How do we effectively address these two conflicting realities? Producers for the wholesale market in the Hudson Valley are particularly concerned about their prospects for the future. Since last November, the overarching theme of my discussions with producers invariably focused like a laser on issues of marketing, rising production/packing costs, and increasing government regulation at all levels. The traditional topics of horticulture and pest management have become de-prioritized in today's difficult business environment. I'll break the topics down into these five categories:

The rising cost of production and packaging inputs: The number one issue on the minds of our Hudson Valley wholesale apple producers. To a degree, our current inflationary environment has contributed greatly to this, and there's nothing more visceral that the unit cost of Captan fungicide doubling or cardboard costs increasing 30% in just a few months' time. The issues run deeper though. Labor costs have been increasing for years while supply has dwindled. New technology can be exciting, but can also be expensive to implement, and do we really have a clear picture of what technological improvements boost the bottom line versus which simply look good? Orchard establishment costs are up. Sure, increasing tree density is the major factor, and we have good reason to believe that high density orchards offer a better investment return, albeit at a higher risk. Other, maybe less obvious factors are in play as well, such as the increasing cost of trellis structures and the payment of royalties for many new varieties and rootstocks.

Fresh apple marketing: The second major issue. Concerns expressed are low FOB pricing, poor pack-outs due to ever higher quality standards, and intense competition for retail shelf space. Last but not least, in fact it is foremost in the minds of producers, is the question "what varieties do I plant?". I understand that some consider this a horticultural issue, but it is really all about the marketing. A profitable apple variety has three characteristics: strong consumer demand resulting in high FOB's; excellent and reliable pack-outs; big yields on an annual basis. Of these three, the first, consumer demand, is the most important, the least understood, and seemingly most difficult to predict. My impression is that as an industry we need to improve the communication between marketers and producers, and gain a better understanding of how retail chains make purchasing and shelf space decisions.

Industry regulation: True, farm labor overtime and the unpredictable pesticide regulatory environment in New York State are hot-button issues today. Such issues have a direct and once again, visceral impact on the bottom line and all business owners see and feel the immediate effects. More often than not these are policy questions driven by the political climate of the day. The role of Cornell Cooperative Extension is to educate, document, and study, but not advocate. Bottom line, if the members of an industry don't support certain policy directions, then they need to put themselves and their organization representatives squarely in the negotiating mix. Effective efforts take dedication , time, and money, there's no two ways around it. I'll point out a more nuanced form of industry regulation as well, the "quality" and "safety" requirements imposed by large retailers that are often unique to individual wholesale buyers. The topics here include multiple GAP protocols and restrictive pesticide policies, among others. Unique purchasing standards increase both marketing and productions costs for producers, but do they ultimately increase producer returns? What about the hidden "tax" such standards impose on our university and private research efforts? Is it a reasonable decision to divert scarce research resources to solve problems that are retailer driven? Note that I said retailer, not consumer.

Horticulture: Postharvest issues are at the forefront here, with internal browning the lead challenge. Technology now allows us to practically specify our own custom harvest date for certain varieties, but as an industry we appear to have a problem getting the fruit off the tree at the correct stage of maturity for long-term storage. The warm temperatures of the Hudson Valley can inhibit fruit red color development, reflective materials may help, and producers are interested in learning more. New varieties and rootstocks are entering the marketplace more quickly and in greater diversity these days, with early-adopting commercial producers taking on increased financial risk as they speculate on what is the best combination over the 15–20-year economic life of a modern orchard. What about hi-tech labor-saving technologies? Referring back to points 1, 2, & 3, will we still be growing apples commercially here by the time these technologies mature and become economically viable?

Pest Management: Conversations I've had with producers on this topic leave me a conflicted. On the surface, pest management questions are usually the first topic of conversation as many producers seek out multiple opinions. However, in the face of the serious economic questions revolving around costs, marketing, and regulation, producers are noting that by and large they know how to control insects, weeds, and diseases. The real action items here are the invasives, and how do we implement mating disruption technologies. Incremental improvements in sprayer technology and computer modeling that might save a couple hundred dollars/acre in spray material costs in certain years are not nearly enough of a financial boost to offset the profitability challenges posed in points 1, 2, & 3.

My discussion above does not cover every topic, or opinion. In conclusion, I believe we've all received a wakeup call. The leadership of the NYS Horticultural Society, NY Apple Association, and NYS Apple Research and Development Program are tuned in. Cornell Cooperative Extension has taken that call as well. Recent grower "listening sessions" provided valuable grassroots input. Do we need a focused industry lead strategic planning effort to address the challenges discussed above? Our last effort was 22 years ago and it produced tangible results. Premier Apple Cooperative and the shift toward more agritourism come to mind. I would say now is the time to give it another go.

The commentary presented in this article is solely that of the author and do not necessarily represent Cornell Cooperative Extension.

Trends and Challenges in Fruit and Tree Nut Sectors: Recent Series of Research Articles in Ag Econ Journal *Choices* Highlights Some of the Challenges Facing the Apple Industry

Elizabeth Higgins, CCE ENYCHP

Choices, the American Agricultural Economic Association's policy-oriented journal, featured the fruit and tree-nut sectors in their 2nd quarter issue in 2021. Two articles, Challenges for the US Fruit Industry: Trends in Production, Consolidation and Competition by William Ridley and Stephen Devadoss and Economic Issues Related to Long-Term Investment in Tree Fruits by Reetwika Baasu and R. Karina Gallardo are particularly relevant to the NYS tree fruit industry.

In Challenges for the US Fruit Industry, Ridley highlighted trends that are apparent in New York: (1) consolidation of fruit production, particularly apples, into fewer growers on larger acres. Between 2002 and 2017 the number of apple operations in the US between 5 and 250 acres shrank from 8,151 to 4,710 (USDA Fruit and Tree Nut Outlook, 2019); (2) the need for increasing efficiency and mechanization to reduce labor costs in order for the US fruit industry to remain competitive and (3) the importance of the H2A program to the viability of the US fruit sector.

Another challenge he highlighted is declining domestic consumption. Ridley cited USDA Economic Research Service statistics on the annual per capita retail availability of apples, cherries, peaches, pears, and plums (a proxy for consumer demand) and showed they declined from an average of 28.4 lbs per U.S. resident in the 1990s to 24.4 lbs over 2010–2017 (USDA ERS Food Availability (Per Capita) Data System, 2019). This is in part due to the availability of other competing fruits, but he was not sure whether the consumer shift to other fruits was due to price or income effects or consumer taste and preference.

Export markets have helped to alleviate some of the loss in sales from declining domestic markets, but Ridley noted that export growth for US fruit is stagnating due to import barriers and competition from other countries. For example, between 2002 and 2017, China's annual exports of apples increased from $208 million to $1.37 billion in 2017 dollars and Poland's increased from $72 million to $475 million as it entered the European Union (United Nations Comtrade Statistical Database, 2020).

In addition to recommending continued investments in labor saving technology Ridley focused on growth in export markets as the primary strategy for keeping the US tree fruit industry competitive. He stated:

> *While American fruit growers face ever-rising competition from foreign producers, the opportunities promised by international markets suggest that the long-term viability of the sector will continue to hinge on export opportunities. Policy makers should make every effort to expand foreign-market access, both by strengthening ties with existing partners and by gaining concessions in markets that U.S. fruit does not reach in large quantities. Along these lines, future presidential administrations would be wise to reconsider the country's abandonment of the Trans-Pacific Partnership (the TPP, rechristened and enacted without the United States as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, to which many of the original signatory countries are party) and exert more effort toward concluding the currently stalled negotiations on the Transatlantic Trade and Investment Partnership (T-TIP) with Europe.*

Recently the New York State Department of Agriculture and Markets (the "Department"), on behalf of the New York State Apple Marketing Order Advisory Board, issued a notice that it is soliciting proposals to enhance the competitive position of New York's Apple industry. One of the areas of focus for this request was for a consultant to identify underserved export markets.

In Economic Issues Related to Long-Term Investment in Tree Fruits, Reetwika Baasu and R. Karina Gallardo discuss the specific challenge of the phenomenon of "asset fixity" in tree fruit production and recommend that policy interventions are likely to be needed to help growers overcome this problem. Asset fixity is found when a production system has high fixed costs so reorganization is unprofitable in the short run. Asset fixity leads to a phenomenon "hysteresis"—the perpetuation of an economic phenomenon long after its initial cause has disappeared—to explain why producers continue to grow crops that have become uneconomical in perennial crop production. These concepts should be very familiar to anyone who has tried to decide whether it makes sense to replace a productive apple orchard with an older variety with a modern planting of a new variety, or felt unsure about what investment choice in apple variety to make because the high upfront cost and

(Continued on page 4)

(Continued from page 3)

the long time period for recouping the investment makes profits uncertain.

When identifying targeted crops for policies oriented to mitigate asset fixity, tree fruits stand out from annual row crops. The investment in orchard infrastructure is extensive and irreversible, and there is a lack of secondary market for such capital goods. The recuperation period on the investment is longer for tree fruits, proving that asset fixity problems are exacerbated for tree fruits compared to annual row crops.

Because of asset fixity in tree fruit, the authors believe that there is a need for policy measures/interventions to help producers shift to more profitable varieties and production systems in tree fruit.

These types of measures proposed could include contracts and revenue insurance to help provide income security as producers make the change as well as price supports, production control in established sectors to prevent over production. They note that policies should be based on the specific characteristics of the production and marketing sector.

***Citations**:*

Reetwika, B. and R.K. Gallardo. 2021. "Economic Issues Related to Long-Term Investments in Tree Fruits" Choices. Quarter 2. Available online: https://www.choicesmagazine.org/choices-magazine/theme-articles/trends-and-challenges-in-fruit-and-tree-nut-sectors/economic-issues-related-to-long-term-investment-in-tree-fruits

Ridley, W. and S. Devadoss. 2021. "Challenges for the U.S. Fruit Industry: Trends in Production, Consolidation, and Competition" Choices. Quarter 2. Available online: https://www.choicesmagazine.org/choices-magazine/theme-articles/trends-and-challenges-in-fruit-and-tree-nut-sectors/challenges-for-the-us-fruit-industry-trends-in-production-consolidation-and-competition

Early Season Disease Management in 2022

Liga Astra Kalniņa & Kerik Cox, Cornell University

Winter finally came again in mid-January, and we had reasonable snow fall through February and into mid-March, during which came in the form of sporadic snowstorms. Snow cover is consistently over, and while it's still cool in the evenings, we've had considerable bouts of warm temperatures often exceeding 60°F. In the Hudson Valley and Long Island, green tip is presently happening or imminent. The rest of the production areas in NY may still have a week or more before bud break. While we've had some bursts of warm weather and in the coming week, there are cooler days forecasted for the week, which could slow tree development. Overall, the season will be upon us shortly, and we need to consider early season management for apple scab. In 2021, there was a decent amount of rainfall in early to mid-April, but little in May to June, which was characterized by sporadic, but hot (>75°F) heavy thunderstorms and July more so. Still with the drought from 2020 and the lack of rain from tight cluster to petal fall, my unsprayed trees of several different cultivars had only moderate levels of apple scab. Not surprisingly, there were no reports of apple scab control failures in commercial orchards anywhere in NY.

Inoculum reduction recommendations in 2022.

Despite the low levels of apple scab in 2021, the conditions were such that there should be plenty of inoculum for apple scab in 2022. Hence, it will be important to reduce overwintering or "primary ascospore inoculum", which starts the epidemic that we manage all season. Reducing this initial inoculum will delay the epidemic, and in theory, if there is little rain early in the season, it could possibly delay the epidemic to a point in the season where it would be too dry and hot for the apple scab fungus to cause infection. Since we don't know when the next drought season will occur, we should keep suppressing apple scab so that it can't get a foothold in orchards. Moreover, reducing orchard floor leaf litter and fruit drops may greatly reduce the inoculum for other foliar diseases like Marssonina blotch and numerous fruit rot diseases including bitter, black, and white rot. As soon as it is possible to safely get a tractor in the orchard, remove any remaining fruit drops and pruned shoots left on the floor from winter pruning as they may contain bitter rot or black rot inoculum. If orchard floor management was practiced in the fall with flail mowing or urea sprays, it won't be necessary to repeat the practices this spring. Research out of the University of New Hampshire has demonstrated that there are diminishing returns for practicing inoculum reduction in the fall and spring. Even if the planting is in green tip, inoculum reduction may still provide considerable benefit by reducing inoculum pressure by tight cluster or pink, when tissues are at their greatest susceptibility to apple scab.

The two best options for inoculum reduction are to apply the urea to leaf litter or use a flail mower to shred leaves. These practices hasten decomposition of the leaf litter. In the case of flail mowing, leaves should be first swept or raked from underneath the canopy into row middles as most of the apple scab inoculum is present on litter under the trees. Subsequently, go over the row middles with the flail mower set to scalp the sod. If urea is used, apply 40 lbs. of feed grade urea per acre in 100 gallons of water to the herbicide strip (5% solution). Dolomitic lime applied at a rate of 2.5 tons per acre can be used of in place of urea. Of the various options, applying urea is the simplest approach, but take care to flush the sprayer pumps with water afterwards since the urea is caustic and can corrode a pump over time. As suggested above, the use of orchard floor urea may also reduce inoculum of other diseases (e.g. Marssonina blotch,

(Continued from page 4)
Bitter rot, and Black rot) as it hastens decomposition of leaf litter, fruit drops and pruned shoots that harbor the pathogens causing foliar diseases, cankers, and summer fruit rots.

Delayed-Dormant copper for fire blight inoculum reduction.

The warm weather at and just after petal fall in 2021 allowed for considerable fire blight epidemics in NY. In 2022, there will likely be an excessive number of cankers in affected orchards. However, a "delayed-dormant" application of copper at silver tip will help reduce inoculum of fire blight in cankers and even overwintering apple scab conidia in buds. Presently, overwintering fire blight cankers are still dormant even in my high inoculum fire blight research orchard in Geneva. As the weather begins to warm (> 60°F) in the coming day/weeks, fire blight cankers could begin to ooze. Now is the time to scout for oozing cankers, especially in the eastern part of the state. It's important to note that cold weather will not kill fire blight bacteria overwintering in cankers; the bacteria will remain inactive, but viable at low (< 32F) temperatures. To mitigate the threat of oozing cankers and reduce both fire blight inoculum and early season apple scab inoculum, make a "delayed dormant" silver-tip application of a high (>15%) metallic copper equivalent (MCE) copper fungicide (e.g. Badge, Kocide, Cuprofix). It may be hard to get into the orchards at silver tip due to wet fields, so the application can be delayed to green tip. Even at green tip, it is generally still safe to apply high MCE copper products. In the Geneva research orchards, a second application of a high MCE copper fungicide is often made at ¼" green with no consequence.

When to start applying fungicides for apple scab management.

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 by default, regional extension specialists will release information regarding shooting towers and squash mounts, and finally 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 the highest level of accuracy. However, these technics 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 the 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. Individual 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 also end the 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 above) 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 (see the next section). 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.

Early season apple scab management.

Once green tip is past, it's advisable to start applying protectant fungicides for apple scab, timed according to infection events predicted by weather conditions. One of the most popular protectant fungicide programs consists of a tank mix of Captan with Mancozeb at half maximal rates for each product (e.g. Captan 80 at 2.5lbs/A & Mancozeb 3lbs/A). The combination is referred as "Captozeb" in the vernacular sense and has excellent residual (Mancozeb) and redistribution (Captan) properties, but has little to no post-infection activity, and must be applied before rains. Re-application is warranted when unprotected tissues emerge 7 days later or when considerable rainfall (> 1") occurs. Regardless of the simulation or biofix used, one should target fungicides applications just prior to predicted large releases of ascospores (> 15% discharge) during weather conditions conducive to infection (Figure 1, page 6).

As the season approaches bloom or if there is rain for several days after green tip, consider some of the products containing single-site fungicides (e.g. Cevya, Luna Tranquility, Luna Sensation, Flint,

(Continued on page 6)

(Continued from page 5)

Date	Ascospore Maturity	Daily Ascospore Discharge	Cumulative Ascospore Discharge
Apr 14	10%	0%	7%
Apr 15	12%	4%	11%
Apr 16	14%	0%	11%
Apr 17	16%	<1%	12%
Apr 18	19%	<1%	12%
Apr 19	24%	0%	12%
Apr 20	30%	16%	28%
Apr 21	35%	0%	28%

The Ascospore Maturity model predicts that 95% of the ascospores have matured. At this point, essentially all ascospores will be released after a daytime rain of greater than 1/10 inch with average temperature above 50°F

Infection Events Summary

Download CSV

Events: Dry Wet

Date (2019)	Infection Events	Average Temp (°F) for wet hours	Leaf Wetness (hours)	Hours > 90% RH	Rain Amount
April 14	no	64	1	5	0.02
April 15	yes	57	14	9	0.65
April 16	no	48	1	0	0
April 17	no	44	8	0	0.02
April 18	no	48	5	7	0.01
April 19	no	54	6	9	0.01
April 20	yes	65	7	15	0.56
April 21	no	-	0	6	0

Figure 1. Output from the NEWA apple scab disease forecasting tool in early May in the Hudson Valley. An ideal time for protecting the crop with a fungicide would be before the predicted ascospore discharge on 4/20. The date of 4/16 would also be an ideal time for selecting a product containing a single-site fungicide, which has post-infection activity. Such an application would also protect against the minor infection on 4/15 (4% ascospore discharge) and the subsequent infection a few days later on 4/20.

Fontelis, Merivon, Syllit, Rally, Rhyme, Inspire Super, Miravis, Aprovia). Many of the products containing single-site fungicides will provide a broader range of activity against other fungal pathogens like powdery mildew and fruit rots, which may cause latent infections at bloom, whereas the "Captozeb" combination does not. Given fungicide resistance concerns, it's no longer recommended to apply products containing single-site fungicides for post-infection activity. Instead, think of making applications between infection periods. Use disease forecasting to identify periods where substantial ascospore release (> 15% discharge) has occurred and another infection period is predicted soon after. (Figure 1).

For example, apply your selected product containing a single-site fungicide(s) (with 3 lb/A mancozeb) for "next week's" infection within 24-48 hours after the last infection period. It should protect against the next predicted infection and perhaps afford some curative activity if any germinating spores slipped through the fungicide coverage from the previous week. Of the products with single-site fungicides, dodine, sold as Syllit, will likely be your strongest performer for applications between infection periods. However, Syllit may only be applied twice before pink. Another option would be to use Aprovia, Miravis, Sercadis, Luna Tranquility, Cevya, or Inspire Super. As the season progresses into bloom, Luna Sensation or Merivon, which contain quinone outside inhibitor (QoI) fungicides. QoI fungicides are highly effective against mildew and would be good choices for orchards of mildew susceptible cultivars and plantings along the lakes where apple powdery mildew pressure can be high.

Summary

A strong early disease management program should begin with inoculum reduction with urea or flail mowing as soon as orchards can be entered. Prior to applying urea or flailing mowing to reduce leaf inoculum, make sure to sweep the orchard to remove prunings and any remaining apple drops, which may harbor inoculum from many other late season diseases. After orchard floor management, apply copper from bud break "silver tip" to early green tip. This application will help reduce overwintering apple scab and fire blight inoculum and protect against early-season apple scab infections. From green tip to bloom, a program of protectant fungicides (i.e. captan and mancozeb) should be implemented to protect the developing fruit clusters. If there are prolonged wetting periods in the early season, an application of mancozeb (3 lb/A) along with either Aprovia, Cevya, Miravis, Sercadis, Syllit, Luna Tranquility, or Inspire Super may be helpful. As we proceed toward bloom, additional applications of products with single-site fungicides (e.g. Luna Sensation, Merivon) may be needed to manage powdery mildew and other fungal diseases that may begin as latent infections during bloom. Keep track of apple scab ascospore discharge and infection events predicted from local weather on the disease forecasting service of your choice.

Managing Pruning and Fertilization of Honeycrisp to Balance Growth, Cropping, and Fruit Quality

Terence Robinson, Lailiang Cheng, and Mario Miranda Sazo, Cornell University

Bitter pit in Honeycrisp is affected by tree vigor which in turn is affected by both pruning and fertilization levels. Thus, to achieve a balance between vigor and fruit quality we must manage both pruning and fertilization in a coordinated manner. When deciding how severely to prune a Honeycrisp tree, we should consider flower bud number per tree and also leaf nutrient levels and the peel sap nutrient values, which we have been collecting statewide over the last 2 summers.

From leaf analysis data we often see that some blocks are high in nitrogen (N) and others are closer to our recommendation. With potassium (K) some blocks are high and should receive reduced or no K fertilization. With calcium (Ca) most blocks need additional lime or gypsum. The fruit peel sap data we have collected indicates that many blocks have too high of a ratio of K/Ca and N/Ca indicating the need to better manage all three nutrients. We have recently published a Fruit Quarterly article (Cheng and Sazo, 2021 Fruit Quarterly Winter Issue) where we have suggested modified leaf nutrient targets for Honeycrisp compared to other varieties such as Gala.

First let us address suggested fertilization strategies for Honeycrisp. The recommended levels of N, K, and Ca for Honeycrisp are different than the suggested levels on the standard leaf analysis we use for most other varieties. For N we recommend a leaf level of 2.0% (this is similar to what we recommend for McIntosh). For hard varieties like Gala, Delicious, Empire, Rome's etc. we recommend a leaf level of 2.25% but for Macs we have always recommended a lower level of 1.9-2.0. Honeycrisp should be managed like Macs in terms of N. If you have leaf analysis results from last summer (leaf samples take in early to mid-July) then use the following three rules to determine N fertilization rates.

-For blocks with **leaf N lower than 2.0%** we suggest 20 to 50# of N per year to keep the tree vigor from falling too low. If tree vigor falls too low then no new renewal shoots develop from limb renewal pruning cuts.

-For blocks with a **leaf N level between 2.0 and 2.25%** we suggest slightly lowering the rate of N from last year's to allow a gradual lowering of leaf level to the 2.0% target.

-For blocks with a **leaf N level >2.25%** we suggest no ground applied N.

K fertilization of Honeycrisp is often tied to increased bitter pit; therefore K fertilizers must be applied with caution and only when leaf analysis results suggest additional K is needed. Based on our recent work published in the Quarterly winter issue 2021, we developed a new recommended leaf K levels of 1.0%. This is lower than other varieties such as Empire and Gala where we strive to elevate leaf K levels to 1.35-1.8%. This high K level for those varieties helps give large fruit size but with Honeycrisp that high of K gives excessive bitter pit. Based on leaf K levels, we suggest you use the following three rules to determine K fertilization rates.

-For blocks with **leaf K lower than 1.0%** we suggest 60# of K_20 per year to keep fruit size from being too small.

-For blocks with a **leaf K level between 1.0 and 1.2%** we suggest 30# of K_20 per year to maintain good fruit size.

-For blocks with a **leaf K level >1.2%** we suggest no K fertilization until leaf level drops below 1.2%.

Ca fertilization is achieved by additions of lime before planting and at bi-annual intervals after planting. Honeycrisp requires higher levels of Ca than other varieties and we recommend a level of 2.0% which is on the high end of the recommended range for Ca level in the leaf. We have been suggesting for the last 2 years to add lime even if soil pH is in the recommended range (between 6.5 and 7.0). In a survey we did, the best performing blocks had pH of ~7.2 and about 5000# of Ca per acre from a soil test. Based on leaf Ca levels, we suggest you use the following four rules to determine lime fertilization rates.

-For blocks with **leaf Ca lower than 1.3%** we suggest 4 tons of lime every other year to raise soil calcium level even if pH goes to 7.1 or 7.2. If soil pH goes above 7.2 then add gypsum instead of lime.

-For blocks with a **leaf Ca level between 1.3 and 1.8%** we suggest 2 tons of lime every other year to raise soil calcium level even if pH goes to 7.1 or 7.2. If soil pH goes above 7.2 then add gypsum instead of lime.

-For blocks with a **leaf Ca level between 1.8 and 2.0%** we suggest 1 ton of lime every other year to maintain soil Ca.

-For blocks with **a leaf Ca greater than 2.0%** we suggest no lime but add gypsum until soil Ca level is ~5000 lbs. per acre.

Next let us address pruning, vigor and bitter pit. Excessive pruning does stimulate vigor and excessive vigor results in more bitter pit. We judge vigor based on length of shoot growth.

- If shoot growth on the ends of Honeycrisp branches is **more than 15 inches long** then vigor is too high, and this is associated with more bitter pit. In this case light pruning is suggested. If flower bud load is high (due to the on-year) then prune lightly but remove buds by spur pruning to get down to the required flower bud number.

- If shoot growth is **between 8" and 12"** then vigor is moderate, and with proper management of N, K and Ca, this level of shoot growth is expected to have little effect on bitter pit incidence. In this case normal pruning is suggested. If flower bud load is high (due to the on-year) then prune by removing 1-2 branches and by columnizing the remaining fruiting branches and then remove spurs to get to the required flower bud number.

-If shoot growth is **less than 8"** then vigor is low and we get almost no renewal shoots from limb renewal cut even if we leave long stubs. In this case, increased N fertilization is

(Continued on page 8)

(Continued from page 7)

suggested and a reduction in flower bud number through spur pruning is needed to stimulate a little more shoot growth.

The effect of both pruning and fertilization levels are manifested in bitter pit incidence but also in biennial bearing. Thus, we must manage both pruning based on tree vigor and fertilization based on leaf nutrient analysis to achieve a balance between vigor and fruit quality. The rules for N, K, and Ca fertilization and pruning severity we have suggested should be considered for each block based on both the tree vigor level (shoot length) and the leaf and fruit nutrient data.

This year where flower bud numbers are expected to be high since it is an "on year", precision pruning will be essential to controlling biennial bearing but it must be done without increasing tree vigor by excessive pruning. Nevertheless the precision pruning strategy to a specific target bud number will be essential to overcome biennial bearing. This strategy is warranted as long as vigor was not high last year (greater than 12" of shoot growth). The pruning severity in the "on year" should be coupled with the proper amounts of N, K, and Ca as suggested from leaf analysis.

The precision pruning protocol requires the grower to first calculate the number of flower buds to leave after pruning (target fruit number X 1.8) followed by the removal of 2-3 large limbs, columnizing the remaining branches and the reduce flower bud number to the target by spur pruning.

Soil Qualities to Optimize New Orchard Growth

Michael Basedow, CCE ENYCHP

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

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

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.

(Continued from page 8)
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.

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

(Continued on page 10)

(Continued from page 9)
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.

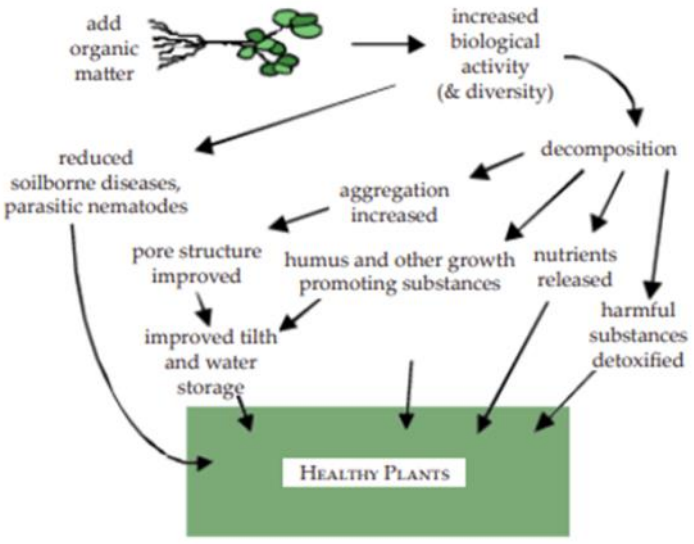
Surface crusting due to poor aggregate stability can lead to reduced water infiltration and storage, and increased soil erosion and runoff. Image: Comprehensive Assessment of Soil Health: The Cornell Framework.

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 biomass-derived. 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.



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

(Continued on page 11)

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.

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

For even more information on the Cornell Soil Health Test, feel free to contact Mike at 518 410 6823 or mrb254@cornell.edu, and please visit the following link: https://soilhealthlab.cals.cornell.edu/resources/

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

Tips in Preparation of Herbicide Shortages in 2022—Tree Fruit and Small Fruit Crops

Thierry E. Besançon, Rutgers University, and Lynn M. Sosnoskie, Cornell University

Many growers in the US have been focused on predicted herbicide shortages in the upcoming field season. While the primary concerns have surrounded glyphosate and glufosinate, **there is increasing apprehension that active ingredients of importance to tree fruit and small fruit growers may also be affected**. Although the supply change is dynamic, chemical stocks may become, and remain, tight at the local or regional level as growers try to fill gaps in their toolboxes. As spring residual herbicides are soon to be applied, please consider the following when planning for the 2022 season.

Important note: Not all herbicides are available in all crops in both New Jersey and New York.

Always review current labels before applying products.

Successful Weed Identification, Regular Scouting, and Detailed Field Records are Crucial for Optimizing Weed Control Success

The first step in developing a novel herbicide program is knowing what species are present and determining which combination of products will be the most effective (and affordable) at suppressing them. Not all active ingredients are equally useful against all species and careful consideration needs to be paid to each chemical's spectrum of control. Please, carefully review herbicide effectiveness tables for various weed species that are available in the 2022 Commercial New Jersey Pest Control Recommendations for blueberry, tree fruits or grape (https://njaes.rutgers.edu/pubs/).

(Continued on page 12)

Similar tables are available in Cornell's weed control guides (PMEP Guidelines (cornell.edu))

Familiarize Yourself with Chemical Substitutes before Applying Them over Many Acres

Some switches may be intuitive (e.g. using Poast (sethoxydim) or Fusilade (fluazifop) in place of clethodim where allowed) while others may be more complicated (e.g. using a tank-mixture in place of a single product). In addition to knowing a product's target species, become acquainted with each herbicide's labeled rate structure and spray volume, use patterns (e.g. application timing), environmental limitations (e.g. soil type or temperature restrictions), adjuvant requirements, and potential interactions with tank-mix partners. Not all chemicals are compatible with each other, and antagonism can reduce weed control efficacy while enhancing crop injury concerns. Contact your Extension Specialists if you have any doubt regarding physical compatibility and efficacy of herbicide mixtures.

Soil-Applied Preemergence Herbicides are Critical Tools

Soil-applied preemergence herbicides are very useful tools for suppressing weeds that emerge with the crop; these plants are the most injurious as early season competitors are very likely to reduce yields. Like postemergence products, soil-applied herbicides must be carefully selected to balance crop safety with weed control needs. Pay attention to rate requirements according to soil type, as this can influence both efficacy and injury. Preemergence herbicides need to be moved (aka activation) into the soil solution (via either rainfall or irrigation) where they are taken-up by emerging weed seedlings; delays in activation can reduce overall performance if some weeds continue to germinate and emerge under low soil moisture conditions. Delays may also facilitate the degradation of some products susceptible to breakdown in sunlight (i.e. photolysis). Be aware that trickle irrigation may cause less effective and less consistent weed control by washing off residual herbicides from top soil where weeds germinate, thus increasing herbicide application costs. **When possible, use overlapping residual products to suppress weed emergence throughout the season**. Some active ingredients may have both preemergence and postemergence activity (e.g. flumioxazin (Chateau) or simazine (Princep)).

Timing Matters

Postemergence (i.e. foliar) weed control should be undertaken when weeds are small and succulent. Herbicide labels will have specific recommendations regarding the optimal size for treatment. For instance, clethodim (Select Max) and sethoxydim (Poast) have a maximum height or lateral growth requirement of 6 inches for effective control of goosegrass or crabgrass. Weeds are more sensitive to control measures when they are small and succulent, so rapid identification and management will improve control success. Because many foliar-applied herbicides can also damage crops, as well, always follow label guidance to reduce risk of injury.

Optimize Herbicide Application Rate for Postemergence Applications

Target using the lowest effective herbicide rate to stretch your herbicide supply. For example, instead of applying 32 or 44 oz/acre of a glyphosate brand product, consider using the standard rate on the label such as 22 oz/acre for Roundup PowerMax. **Again, timing of application with regards to weed size will be critical to optimize your herbicide supply**. The smaller the weeds, the less herbicide you will have to apply to control it! Therefore, frequent scouting as highlighted above will be very important to optimize your herbicide application and stretch your herbicide supply.

Don't Skimp on Adjuvants

If herbicides are going to be in short supply, then there may be fewer shots to control weeds. If there are fewer shots available, make every shot count as much as possible. **Follow label recommendations regarding the inclusion of water conditioners, surfactants, etc…, to maximize product efficacy**. Refer to point number two about potential compatibility concerns when tank-mix partners are involved.

Get Perennial Weeds under Control

Perennial species such as Canada thistle, goldenrods, bindweed or quackgrass are frequent and troublesome weeds of tree fruit and small fruit crops. Because control of these weeds requires the use of systemic herbicides that may be in short supply (i.e. glyphosate), appropriate timing of application will be critical to maximize herbicide efficacy. For example, Canada thistle should be sprayed with a systemic herbicide in late spring after flower buds start to develop, whereas Virginia creeper or poison ivy should be targeted in mid- to late summer after vines flower, but before fall color appears in the foliage. Use effective alternatives such as clopyralid (Stinger) for control of leguminous and composite (e.g. Canada thistle) weeds or soil-applied pronamide (Kerb) for control of perennial grasses where authorized. This may help you to reserve the use of glyphosate for perennial weeds that cannot be efficiently controlled by other products.

Consider Non-Chemical Weed Control Strategies When and Where Appropriate

This includes hand weeding, cultivation, and mowing practices. Like herbicides, these practices are not effective against all species at all times. For example, while cultivation can control many weed seedlings, particularly at the white-thread stage, soil disturbance is less effective against well-developed plants. In the case of some perennials (for instance, field bindweed or Canada thistle), cultivation contributes to break up and disperse root fragments within and across fields, facilitating dispersal. Ultimately, plan for hand-weeding escapes prior to the weeds setting seeds as this will help reducing the weed seedbank for future growing seasons.

Plan Ahead Now

2022 could be a difficult year if many crop production and protection chemicals are limited. Herbicide shortages could impact weed control success in the coming growing season…and beyond. Weeds that are not controlled in 2022 will set seed that will cause problems in the future. **Planning now can help with weed management in both the short and long term**.

Funding Update: Value Added Produce Grants

USDA has issued the RFP for the Value Added Producer Grant. Applications need to be postmarked by May 2, 2022.

If you are not aware of this program the Value-Added Producer Grant helps agricultural producers enter into value-added activities related to the processing and/or marketing of new products. The goals of this program are to generate new products, create and expand marketing opportunities, and increase producer income. Applicants may receive priority if they are a beginning farmer or rancher, a socially-disadvantaged farmer or rancher, a small or medium-sized farm or ranch structured as a family farm, a farmer or rancher cooperative, or are proposing a mid-tier value chain. Grants are awarded through a national competition.

Maximum Grant Amount: Planning Grants $75,000; Working Capital Grants: $250,000.

Matching Funds Requirements: The $2.75 million in COVID–19 relief funds may include a reduced cost share match requirement of 10 percent of the grant amount. The other available funds have a statutory cost share match requirement of 100 percent of the grant amount.

You can see the request for proposals and other information about the program at USDA's website. https://www.rd.usda.gov/programs-services/value-added-producer-grants. One key tip is to look at what projects have been funded in the past, as this will give you some idea about what is a viable VAPG project. Another tip is to seriously consider the planning grant. The planning grant can be used for market research and to test a new idea. The application is easier and the bar for funding is lower. If this is a new idea, a planning grant can be a great way to test the waters first without committing yourself to a project that may not be viable or sustainable.

Contact Liz Higgins if you are interested in this program and would like more information emh56@cornell.edu. I have worked with growers on their proposals in the past and have reviewed proposals for USDA so I am familiar with what a competitive project would look like.

NYS HERO Act Plans No Longer in Effect

New York State employers are no longer required to implement their workforce safety plans. The NYS Department of Health removed the designation of COVID-19 as a serious risk to public health on March 17.

As a reminder, The purpose of the NY HERO Act is to protect employees against exposure and disease during airborne infectious disease outbreaks. Employers still need to have a HERO Act workforce safety plan ready to go, but it can be put on the shelf when a public health threat is not identified by New York State. For more information see: NYS HERO Act Plans No Longer in Effect | Cornell Agricultural Workforce Development

In Case You Missed It: New Recordings, Online Courses, and Online Materials

Michael Basedow, CCE ENYCHP

If you haven't been on the ENYCHP YouTube page in a while, I recommend giving it a look through. We've added recordings from a number of our winter meetings. We have recordings from our "What's new in crop load management webinar" available at the following link: https://www.youtube.com/watch?v=UDxEaQDkU04&list=PLk2Q-bw9Aiu6PXq-obah0nVqh8h8J3CcV

We've also got the recording of Dr. Kerik Cox's talk on biological materials for fire blight management here: https://www.youtube.com/watch?v=N0PrdYyShok&t=137s

We cohosted a number of webinars in association with the Northeast Fruit Consortium this winter. Those recordings are available on the UMass Extension Fruit Team YouTube channel here: https://www.youtube.com/watch?v=hBjdq_Iuvbc&list=PLr5-TRBPQxrGKlIxCGCr2ZQujumtZPQRE

The Northeast Cider Apple Project webinar can be viewed here: https://www.youtube.com/watch?v=9TnRk-kN1VI

The new Pruning Guide for Precision Crop Load Management video is available on the LOFP YouTube channel in both English and with Spanish subtitles.

If you have employees that are interested in getting their private pesticide applicator certification, but aren't sure where to start the process, they might want to enroll in our online certification training course. This course includes recorded lectures and practice exams, and walks through what you need to do to sign up for the exam, some of the core material, and strategies for the category exam. It is available for $5 for ENYCHP enrolled farms at the following link: https://cce-enychp.teachable.com/p/pesticide-certification-exam-prep-course

Finally, we are also in the process of updating the Cornell Tree Fruit Resources website. The link to that is available here. https://blogs.cornell.edu/treefruit/ If you have any recommendations on how we can improve this page, or any of our other online programming, please reach out to me at mrb254@cornell.edu or at 518 410 6823.

Upcoming Events

2022 Virtual Agricultural Seminar

April 5-7, 2022

Presented in coordination with various federal agencies, the Seminar will focus on federal regulations governing agricultural employment and include presentations on the Fair Labor Standards Act, Migrant and Seasonal Agricultural Worker Protection Act, H-2A temporary agricultural program and Office of Foreign Labor Certification. Learn about requirements for wages, housing, transportation, field sanitation, farm labor contractor certification, and more. Discussions will also include Equity, Retaliation and Labor Trafficking in agriculture. FREE to attend. For more information contact: Ivan Pelaez: (719) 209-3136 or Pelaez.Ivan@dol.gov

Register Here: https://virtual-ag-seminar22.eventbrite.com

Respirator Fit Testing Clinics

April 7 - Orleans County
April 8 - Niagara County
April 25, 26 - Orange County
May 2 - Warren County
May 3 - Albany County
May 12 - Ontario County
May 13 - Yates County

NYCAMH will be offering respirator fit testing clinics across the state this year. For more information, contact NYCAMH at 800-343-7527 or fittest@basset.org.

2-Part Webinar Series on Point-of-Sale Use for Farms

April 21 & 28, 2022

Electronic Point-of-Sale (POS) systems present new opportunities for farmers market vendors to improve sales. POS systems provide a quick and easy means for farms to gather data on customer shopping habits. In turn, this data can be analyzed to reveal growth opportunities for market sales. Researchers Matt LeRoux and Todd Schmit at the Cornell Program for Agribusiness and Rural Development are collecting data using POS with NY farms selling meat, fruits, vegetables, fresh cut flowers and mushrooms in direct-to-consumer channels. The project seeks farms that sell their own products at farmers markets, farm stores, and staffed farm stands to participate.

Registration: Any farm is welcome to attend one, or both, of these webinars using a single registration. Farms that would like to participate in the POS research are encouraged to attend.

Register here: https://cornell.zoom.us/meeting/register/tJEscO-hrzguHNYJX3unCSGH2-M4Vt-vYOI8

Dr. Robinson discusses precision pruning practices in a high density Honeycrisp planting at the ENYCHP Capital Region pruning meeting held on March 11 in Rexford.

Tree Fruit Specialists

Daniel J. Donahue
Phone: 518-691-7117
Email: djd13@cornell.edu

Mike Basedow
Phone: 518-410-6823
Email: mrb524@cornell.edu

Business Specialist

Liz Higgins
Phone: 518-949-3722
Email: emh56@cornell.edu

ENYCHP Office

Chelsea Truehart
Phone: 518-746-2553
Email: ct478@cornell.edu

www.enych.cce.cornell.edu

Find us on Facebook & Instagram

The Eastern New York Commercial Horticulture Program is a Cornell Cooperative Extension partnership between Cornell University and the CCE Associations in these seventeen counties: Albany, Clinton, Columbia, Dutchess, Essex, Fulton, Greene, Orange, Montgomery, Putnam, Rensselaer, Saratoga, Schenectady, Schoharie, Ulster, Warren & Washington.