Horticultural News

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HorticulturalNews

Editors: Winfred P. Cowgill, Jr. & Jaime C. Piñero

The New Jersey State Horticultural Society was organized on August 17, 1875 at Geological Hall, Rutgers College, New Brunswick, NJ. It remains the oldest Horticultural organization in New Jersey.

Horticultural News began as the *The New Jersey State Horticultural Society News*, in October of 1920. The Society began "collecting paid membership in order to obtain funds to promote new features of the society and extend the usefulness of the society. The Horticultural Society News was started to be the official society publication." Published M. A. Blake, Professor at Rutgers College was the first president and chair of the publication committee.

Editors served as follows:

MA Blake	1920 - 1947
Norman F Childers	1948 - 1980
Win Cowgill	1981 - 1988
Emily Brown Rosen	1988 - 1990
Linda Butenis Vorsa	1991 - 1995
Jerry Frecon	1995 - 2010
Win Cowgill & Wes Autio	2010 - 2021
Win Cowgill & Jaime Piñero	2021-

June 2010: Horticultural News has moved to an online web-based format. The New Jersey State Horticultural Society has partnered with the University of Massachusetts Fruit Notes.

October 2021: Jaime Piñero became the editor from UMass upon the reitrement of Wes Autio. Cowgill and Piñero are the new editors of Horticultural News and Fruit Notes.

Horticultural News is distributed to growers, extension personnel and researchers and libraries across North America. Horticultural News focuses primarily on tree-fruit culture, but addresses small-fruit cultural issues as well. Most reports are from current research at Rutgers University, University of Massachusetts, and other universities.

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Table of Contents

COVER: New MAIA apple cultivar released, MAIA-AM 'Amarilla Soul', tree grown in Baptistown, NJ on B.9 rootstock, 5th leaf. Yellow, blemish and russet free, long harvest window for PYO, begins in Mid-September and can usually hang for 3 weeks or longer. It is crisp, crunchy and juicy with excelent flavors! Photo Credit Win Cowgill

Massachusetts Fruit IPM Report for 2025

Jaime Piñero[1], Jon Clements[2], Duane Greene[3], Elizabeth Garofalo[2], Maria Gannett[2], Ajay Giri[1], Soonhong Min[1], Jianyu Li[1], John Galvan[2], and Chris Gates[1]

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[3]Emeritus Professor, Stockbridge School of Agriculture

Over the past several years, the UMass Extension Fruit Program operated with a leaner team due to staffing transitions. In 2024 and 2025, we strengthened capacity again with the addition of John Galvan (Extension Educator), Dr. Maria Gannett (UMass Extension – Weed Science), and Dr. Jianyu Li (Extension Assistant Professor, Sustainable Fruit and Vegetable Production). Their expertise in weed management, berry pest management, and horticulture has already expanded our reach and on-farm support for growers across the state.

Weather (Jon Clements)

(All observations from the UMass Orchard in Belchertown, MA)

Winter brought a minimum temperature of –4 °F on January 21. Overall, it was a relatively mild winter with little snow cover, and we did not expect nor observe any major bud injury. Peaches were borderline, and some colder pockets in Massachusetts may have seen slightly more stress, but at the UMass Orchard there were no visible bud losses heading into spring.

Spring: Green tip arrived on April 7, and full bloom occurred by May 3. May was exceptionally wet, with nearly 11 inches of rainfall, making fungicide timing extremely difficult during primary scab season. Spray windows were narrow, coverage was challenged, and leaf expansion during repeated rainfall episodes created high vulnerability for infection.

Summer began with heat and humidity, culminating in 97 °F on June 21, and strawberries struggled under those conditions. Apples experienced some early August sunburn (Fig. 1), while peaches benefited from the heat, resulting in a strong peach harvest with excellent fruit quality statewide.

Figure 1. Sunburn observed on Honeycrisp apples on 12-August 2025 at the UMass Orchard in Belchertown

Fall brought below-average temperatures, clear days, and ideal conditions for color development, especially for red varieties. Apples were large with good internal quality, although orchards with significant scab earlier in the season still showed symptoms at harvest. The size of the apple crop overall was average to slightly above average. One notable exception: some Honeycrisp blocks seemed "off" this year, likely due to heavy cropping in 2024.

Weekends were generally favorable, except for a rainy Columbus Day system, but overall, the pick-your-own season was successful.

NEWA update: As of 2025 we now have 43 operational NEWA stations in Massachusetts. Apple Scab, Fire Blight, and the Apple Carbohydrate Thinning Model continue to be the most used tools (Fig. 2), with over 2,500 page views for scab alone. Interestingly, more NEWA users now access the platform through mobile than desktop. If you would like to join NEWA, or need assistance adding a station, contact Jon Clements; we'd be glad to help.

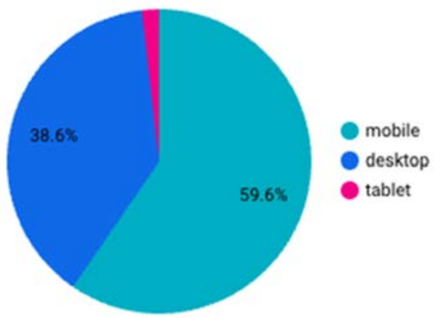

Figure 2. Mobile users exceeded desktop users in Massachusetts when using the top three NEWA "Resources" apple scab, fire blight, and apple carbohydrate thinning model.

Tree Fruit Diseases (Elizabeth Garofalo)

Apple scab was again front and center in 2025. The first spores were observed on April 8, and primary inoculum persisted into early June. The real challenge wasn't the early low-risk periods, it was the extended, high-pressure infection episodes driven by back-to-back rainfall and rapid leaf expansion

.

RIMpro recorded minor early events on 4/19 and 4/22 (RIM values of 18 and 1 - negligible). But starting April 26–28, we entered a sustained high-risk period totaling RIM 3,815, coupled with over an inch of rain. This was followed by the most difficult stretch, May 2–6: RIM 12,230 across five rain-soaked days, and then another severe spike immediately afterward.

In plain terms, there were multiple long windows where applying fungicides was nearly impossible and maintaining coverage through repeated rain events was even harder. Leaf tissue was growing rapidly, fungicide residues were washing off, and many blocks were effectively unprotected.

If you experienced scab breakthrough in 2024 and again in 2025, assume you now have a heavy local inoculum load going into winter. This is the year to commit to sanitation.

- Apply food-grade urea (46% N) to leaf litter this fall
- Follow with leaf chopping in spring

These two actions will significantly reduce overwintering inoculum pressure. I cannot emphasize this enough.

Bitter rot in Massachusetts seems to have largely taken a back seat to scab this year. While the season started off wet, with a handful of infection events in June, conditions later dried out, reducing wash-off and improving the effectiveness of fungicide coverage. In one location, early season, we saw some bitter rot develop in a block with historically high pressure and some dry eye rot that appeared to be creating wounds for the inoculum to gain purchase early in the summer.

When accomplishing dormant pruning, pay attention to removal of dead, diseased and damaged shoots as well as mummies to reduce inoculum leading into next season. Fireblight strikes are said to harbor *Colletotrichum* spores as well, making this one more reason to get rid of old strikes.

Dry eye rot *(Botrytis cinerea)* was the "odd duck" of the season. It shows up as a soft rot originating from the calyx, eventually drying to a circular depression (Fig. 3). We observed it in multiple locations but never at block-wide damaging levels. Its presence mirrors bloom-period conditions: cool, wet, and difficult for maintaining fungicide coverage which is exactly what May delivered.

Figure 3. Dry eye rot appears in cool, wet bloom conditions and begins as a soft rot at the calyx end that later dries out.

Fire blight, in contrast to 2023, was largely a non-issue this year. Cool bloom temperatures kept the EIP (Epiphytic Infection Potential) manageable. May 3 reached 82 °F briefly, but otherwise bloom temperatures hovered in the low-70s or cooler, significantly reducing infection risk. Most orchards that had managed overwintering cankers from 2024 saw very little activity.

Peach leaf curl continues showing up more frequently than we used to see. If you've wrestled with this, do not wait until spring. Begin treatments now, in late fall or early winter.

Recommended control materials for fall:

- Chlorothalonil (watch ESA label language!)
- Copper High Rate (spring follow-up before bud swell)
- Repeat Chlorothalonil in spring as well

Where copper alone hasn't worked, an initial chlorothalonil fall application seems to yield better early suppression.

Insects (Jaime Piñero, Ajay Giri, Soonhong Min, Chris Gates)

Fruit Injury Levels at Harvest Across 11 Massachusetts Orchards. Injury patterns this year followed the same general distribution we've seen since 2022: most pest feeding happened along the edges (Fig. 4). Across all orchard sites:

- Plum curculio (PC) averaged 2.3% damage on perimeter trees and 0.9% in the interior,
- Tarnished plant bug (TPB) averaged 1.5% along edges and 0.5% internally,
- Apple maggot fly (AMF), San José scale, stink bugs, European apple sawfly, and oriental fruit moth caused minimal to nearly zero detectable injury.

The message remains consistent: perimeter-focused IPM continues to work well in Massachusetts orchards, especially when combined with targeted monitoring and timely intervention.

Plum Curculio (PC). PC activity began in late April, with first captures around **217 DD base 43**. The early May cold spell briefly slowed movement, but once temperatures recovered, fresh oviposition marks became more apparent.

This was our first year as part of a large, multi-institutional grant studying improved methods for PC monitoring and management — including lure technologies and degree-day forecasting.

We deployed odor-baited trap trees across commercial orchards using:

- benzaldehyde + grandisoic acid (BEN + GA), and
- methyl salicylate + GA.

Trees were visually examined twice weekly. These baits reliably increased localized PC pressure on those trees, strengthening the value of trap-tree perimeter strategies.

We also revisited the Reissig et al. (1998) PC oviposition model. According to this model, after 308 degree-days (base 43) from petal fall, oviposition risk significantly declines. This provides a useful timing window especially for timing the final PC spray.

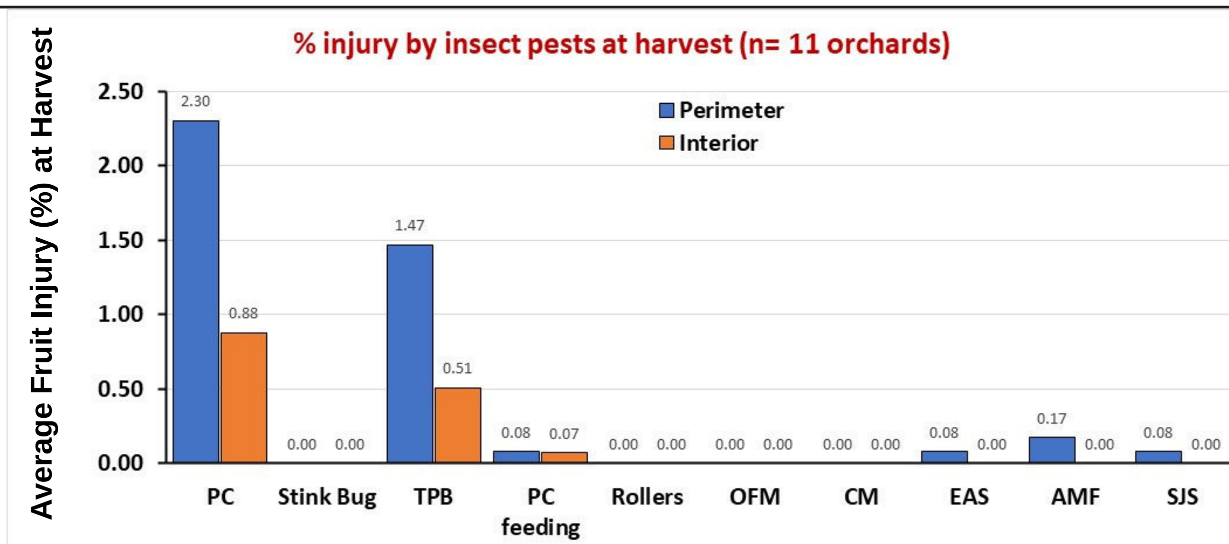

Figure 4. In 2025, fruit injury levels recorded at harvest across 11 MA orchards was low and concentrated at edges: PC averaged 2.3% perimeter vs. 0.9% interior; TPB 1.5% vs. 0.5%.

Apple Maggot Fly (AMF). AMF monitoring was conducted in 11 blocks, including those in our multi-cultivar grafting study. We used unbaited red sticky spheres in both grafted and non-grafted perimeter trees.

In 2025, AMF activity was low almost everywhere. Captures rarely exceeded 0.5 flies per trap. Even during the typical July uptick, numbers stayed subdued.

However, the exception was Wickson apple. Just as in previous years, Wickson remains highly attractive for both AMF landing and oviposition. While damage was not widespread, high levels of egg-laying (30–55%) were recorded on Wickson apples in the grafting project trials. This reinforces Wickson's role as an effective sentinel / "magnet cultivar" for AMF monitoring purposes.

Lepidoptera: OFM, CM, OBLR. This year marked expanded use of automated camera traps to track:

- Oriental fruit moth (OFM)
- Codling moth (CM)
- Obliquebanded leafroller (OBLR)

Traps were managed from April through September across orchards in MA and NH. Daily image-based counts allowed precise biofix determination and better flight timing estimates.

OFM. First detection April 23 at CSO. Cool weather and mating disruption in peach reduced captures there, though other sites experienced modest peak flights in early May. We documented three clear OFM flight peaks across the season (Table 1), with a partial fourth generation in warm sites.

Table 1. Oriental fruit moth generations and degree-day timing (base 45°F), with life-cycle notes on capture patterns and larval injury risk.

Generation	Flight Period	DD Range	Notes
1st	Apr 23 – May 25	0–350	Controlled by petal-fall spray; minimal residual activity after 350 DD
2nd	Jun 1 – Jul 5	920–1100	Moderate captures; low due to mating disruption
3rd	Jul 15 – Aug 25	1800–2300	Highest larval injury potential; continued through ~2600 DD
4th (partial)	Late Aug – Sep	>2700	Minor, incomplete development; overwintering larvae

CM. Biofix occurred around May 13–16. Then came a cool period where flight essentially paused, creating a split first-generation emergence. Degree-day tracking proved essential for timing sprays (Table 2). Using CM thresholds, most orchards achieved excellent suppression, and CM fruit damage was essentially negligible.

Table 2. Codling moth generation timing and DD ranges (base 50 °F), including key life-cycle observations.

Generation	Flight Period	DD Range	Observations
1st	May 13 – Jun 15	0–600	Two distinct peaks due to asynchronous emergence; sprays advised at 220–250 DD and 500–600 DD.
2nd	Jul 10 – Aug 20	1060–1400	Moderate flight; optimal spray window 1250–1400 DD.
3rd (partial)	Late Aug – Sep	>2100	Present mainly at warm sites; minimal injury risk.

OBLR. June 6–12 biofix. Captures were moderate initially, then tapered. Second-generation catches in August were low, and damage remained below economic thresholds. In organic blocks lacking broad-spectrum moth controls, OBLR catches were slightly higher but still manageable.

Entomopathogenic Nematodes (EPNs). This year, in lab tests comparing controls for the soil-dwelling PC stage, *Steinernema carpocapsae* showed dramatically higher efficacy than *Beauveria bassiana* achieving:

- 50% mortality in 3 days,
- 80% by day 7,
- and 100% by day 10.

In field emergence trials, BioSC suppressed adult emergence completely at both full and half-label rates.
We went further: in July, we purchased and distributed 11 billion nematodes to 22 growers across CT, MA, and NH (at no cost to them) thanks to grant funding. These were applied to perimeter rows and hotspots.

We also finalized (95% complete) the EPN grower application guide, including:

- Mixing / agitation instructions
- Nozzle recommendations
- Tree-count coverage per bag
- Soil-moisture guidelines
- Cost modeling

These steps will support broader, confident grower adoption in 2026 and beyond.

Spotted-Wing Drosophila (SWD). Monitoring across seven farms using our tried-and-true fermented Concord grape juice + 2% salt bait showed a familiar pattern:

Low activity in June → gradual buildup in July → sharp peak in early August (Fig. 5).

Peak fly captures averaged ~245 SWD, with a maximum of 910 in a single trap in a late blueberry block. After this peak, activity dropped sharply as harvests concluded and fruit availability declined. The advantage of the diluted Concord grape juice laced with 2% table salt remains consistent: It produces high SWD selectivity and low bycatch, making interpretation cleaner for growers.

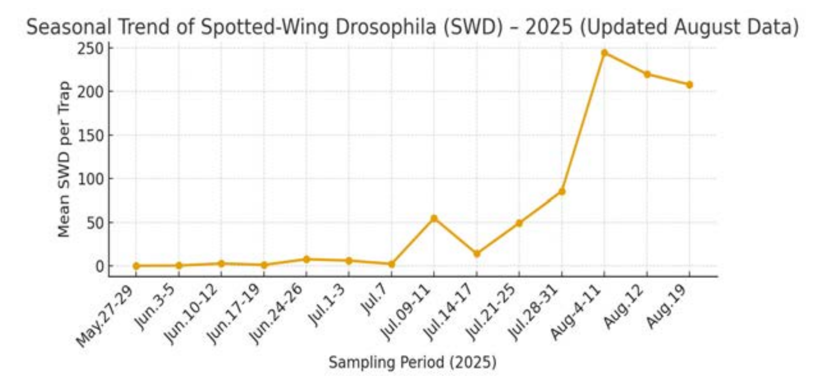

Figure 5. Seasonal captures of spotted-wing drosophila in traps baited with diluted Concord grape juice + 2% salt across 7 commercial fruit orchards.

Brown Marmorated Stink Bug (BMSB). Long-term monitoring shows BMSB populations continue to fluctuate dramatically from year to year. 2025 was another low-pressure year. Most orchards saw trap captures near zero for weeks at a time. One orchard briefly triggered an insecticide treatment after exceeding 4 adults/trap, but overall, 2025 BMSB activity was very light and geographically limited, suggesting that in BMSB populations remained at subeconomic levels in Massachusetts orchards.

Horticulture (Jon Clements and Duane Greene)

Pretty much unexceptional here with one caveat. There was a significant carbohydrate deficit around the petal fall thinning window (circa May 13), however, that reversed itself during the traditional 12 mm thinning window when there was significant carbohydrate surplus (Figure 6). After the fact, it was clear thinning sprays (NAA) applied just post-bloom into petal fall were quite effective. But then very little thinning was observed when sprays were applied later during the traditional thinning window (circa May 25). Apple crop load management remains challenging but has huge implications when it must be followed by hand thinning (costly and no one wants to do it), and too many apples (quality and return bloom issues). Take home: make every effort to apply NAA during bloom and petal fall, start the thinning process and promote return bloom (particularly in Honeycrisp). Not to say ignore that 12 mm spray, but cool springs seem to be making that spray more difficult in terms of efficacy.

One more thing: we expect to have BrevisTM (ADAMA, metamitron active ingredient, a Group 5 herbicide) for thinning apples and pears in 2026. It has federal registration, but we are still awaiting Massachusetts state registration, which should be forthcoming. Brevis “Temporarily inhibits photosynthesis w/o interacting with plant hormone regulation.” We have some research experience here with Brevis, but as usual, it’s been a bit up and down in terms of thinning results. A mild thinner at best? Still, we think it will be a very useful tool to help with your thinning beginning in 2026. Stay tuned on that...

Smal Fruit (Jianyu Li and John Galvan)

Blueberries. 2025 emphasized again how rapidly Septoria leaf spot (Fig. 7) can establish during the first-year establishment period in young blueberry fields. We followed disease incidence (Fig. 8) and severity (Fig. 9) from June through August in five cultivars: Bluegold, Chandler, Last Call, Northland, and Reka.

Patterns were consistent:

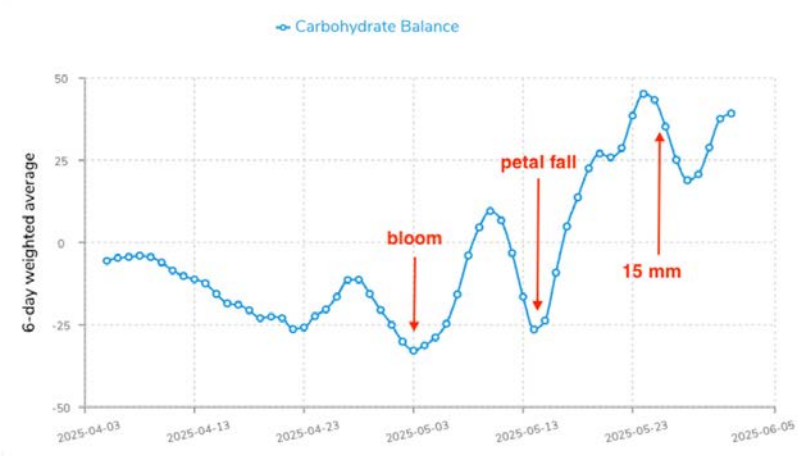

Figure 6. Apple carbohydrate thinning model for UMass Orchard, Belchertown, MA. Note the carbohydrate deficit during bloom and petal fall, followed by a carbohydrate surplus during the traditional thinning window circa 10-15 mm.

- Chandler and Northland showed early and aggressive Septoria buildup, reaching as high as ~80% of leaves affected by mid-summer.
- Last Call showed intermediate levels (40–70%).
- Bluegold and Reka maintained much lower levels, typically below 30%.

Severity (Fig. 9) followed the same order, with Chandler especially showing larger lesion coverage by late August.

Take-home for new growers: Start scouting **by mid-June**, even in year-one plantings. Maintain airflow through:

- Pruning
- Spacing
- Vegetation management

Figure 7. (Left) Fungal disease *(Septoria albopunctata)*, (Right) Young blueberry plants infected.

Fungicide rotation and coverage still matter, but cultivar choice may be one of the most important long-term decisions for reducing input needs.

Grapes and Spotted Lanternfly (SLF). SLF (Fig. 10) was first confirmed in MA in 2021 and is now distributed across multiple counties (Fig. 11). In 2025, we documented adult feeding on both hybrid and vinifera grape varieties. Adult activity was highest from August through October, primarily along:

- Vineyard borders
- Trellis lines
- Areas adjacent to *Ailanthus* (tree of heaven)

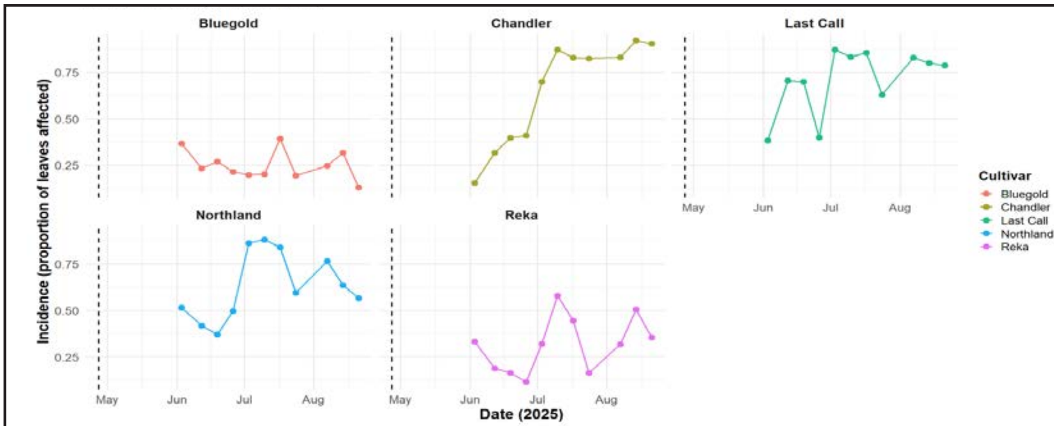

Figure 8. Septoria disease incidence over time (mean ± SE, four blocks). Dashed line = transplant date (April 27, 2025)

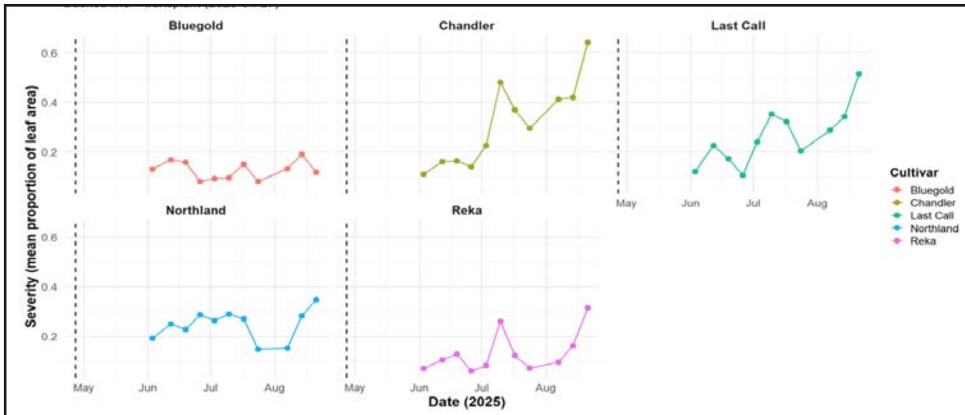

Figure 9. Septoria disease severity over time (mean ± SE across four blocks). Dashed line = transplant date (April 27, 2025).

Late-season SLF feeding can drain carbohydrate reserves before winter dormancy, and several growers noticed weakened bud vigor by spring in affected vines.

We encourage vineyard managers to:

- Monitor border activity
- Remove local Ailanthus stands where feasible
- Document sightings
- Follow evolving SLF management guidance

Figure 10. Spotted lanternfly (*Lycorma delicatula*) on grapevine 10/16/2025.

For more information, see Fact Sheet.

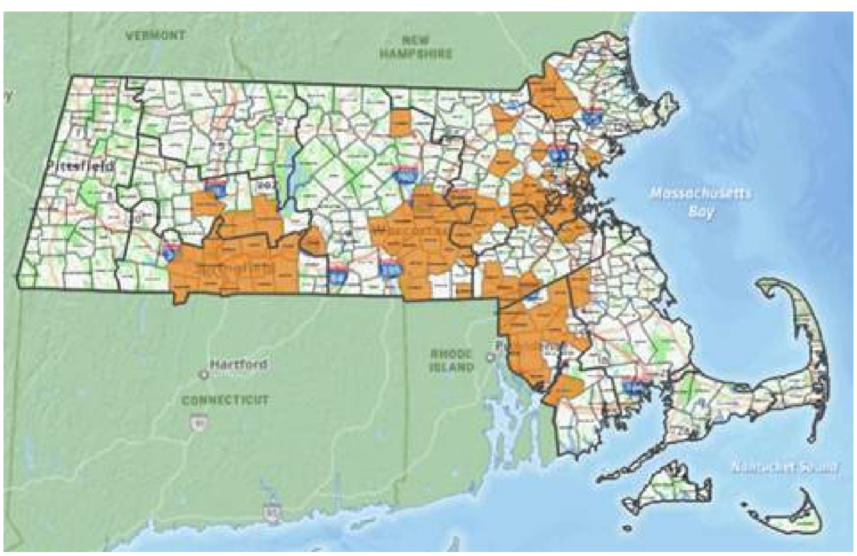

Figure 11. Current distribution of spotted lanternfly in Massachusetts. Photo Credit: Cornell University CALS, & MDAR.

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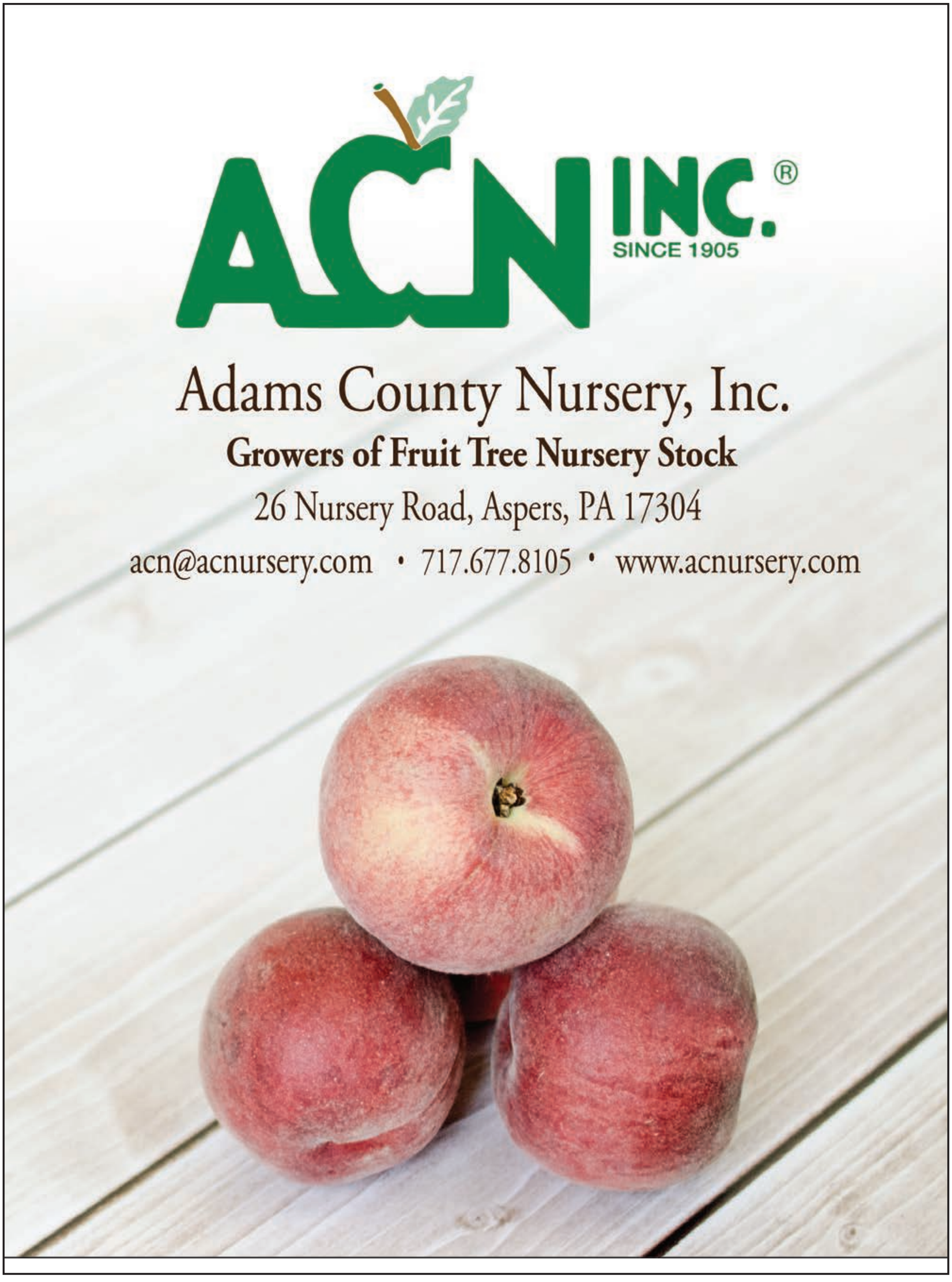
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2025 Rutgers-New Jersey Statewide Tree Fruit IPM Report

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Observation Overview

The IPM observations for 2025 come from the North and South Jersey Tree Fruit IPM Programs. There are 29 farms that participate in the North Jersey program and 12 farms in the South Jersey Program. The program includes approximately 500 acres of apples, 120 acres of pears, and 1,160 acres of peaches. Each farm is scouted once a week and baited traps are checked to monitor pests. The data for the charts below comes from the NEWA model, using weather stations located at the Rutgers Snyder Research and Extension Farm in Pittstown, NJ and the Rutgers and Upper Deerfield.

Horticulture/Thinning

There was significant bloom this year on apples and peaches. Return apple bloom was strong on most cultivars with good pollinating conditions. Growers that used the nibble approach to chemical thinning and made both the bloom and petatal fall applications had the majority of their thinning completed early this season. The bloom application of NAA is critical for return bloom in 2026.

2025 Weather. There were no large-scale frost events early in the season during bloom. This season in northern New Jersey June, July and August we had 17 days over 89F setting apples up for sunburn. **Temperatures 89F or higher occurred on** June 22, 23, 24, 25, 29, 30, July 8, 16, 17, 25, 28, 29, 30 August 12, 13, 14, 17

Table 1. Peach Phenology 2025.

Location	Bud Swell	Pink	Full Bloom	Petal Fall	Shuck Split	Pit Hardening
Bridgeton, NJ	30-Mar	1-Apr	10-Apr	19-Apr	26-Apr	15-Jun
Pittstown, NJ	4-Apr	13-Apr	24-Apr	21-Apr	7-May	-

Table 2. Apple Phenology 2025.

Location	Silver Tip	Green Tip	½” Green	Tight Cluster	Pink	First Bloom	Full Bloom	95% Petal Fall
NJ	-	30-Mar	-	5-Apr	16-Apr	-	25-Apr	2-May
Pittstown, NJ	25-Mar	28-Mar	2-Apr	14-Apr	20-Apr	21-Apr	25-Apr	-

These high temperatures in summer (Figs. 1 and 2) resulted in the need for sun protectants to be sprayed on specific apple cultivars (Honeycrisp, Empire) to prevent injury and bitter rot infection. In Northern New Jersey warm temperatures in June, July through mid-August advanced ripening of peach and apple cultivars 4- 7 days. September continued early ripening of several peach and apple, though apple maturity evened out by October 10 give or take. These advances in ripening dates made applications of Retain stop drop harder to plan.

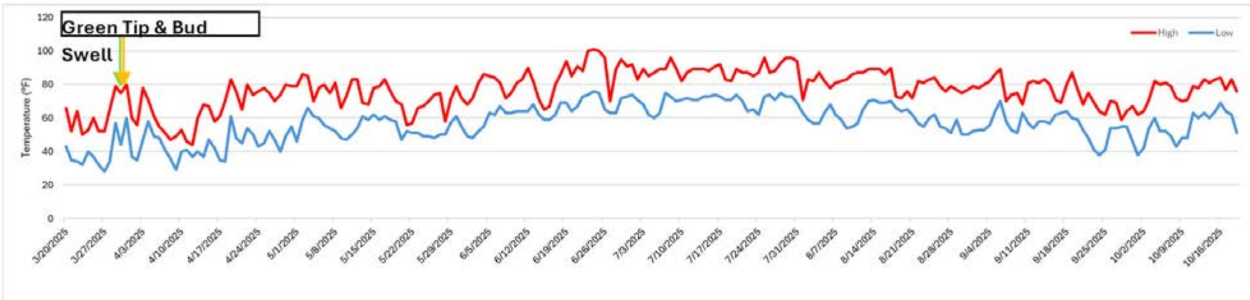

Figure 1. Maximum and minimum temperatures for the growing season in Pittstown, NJ.

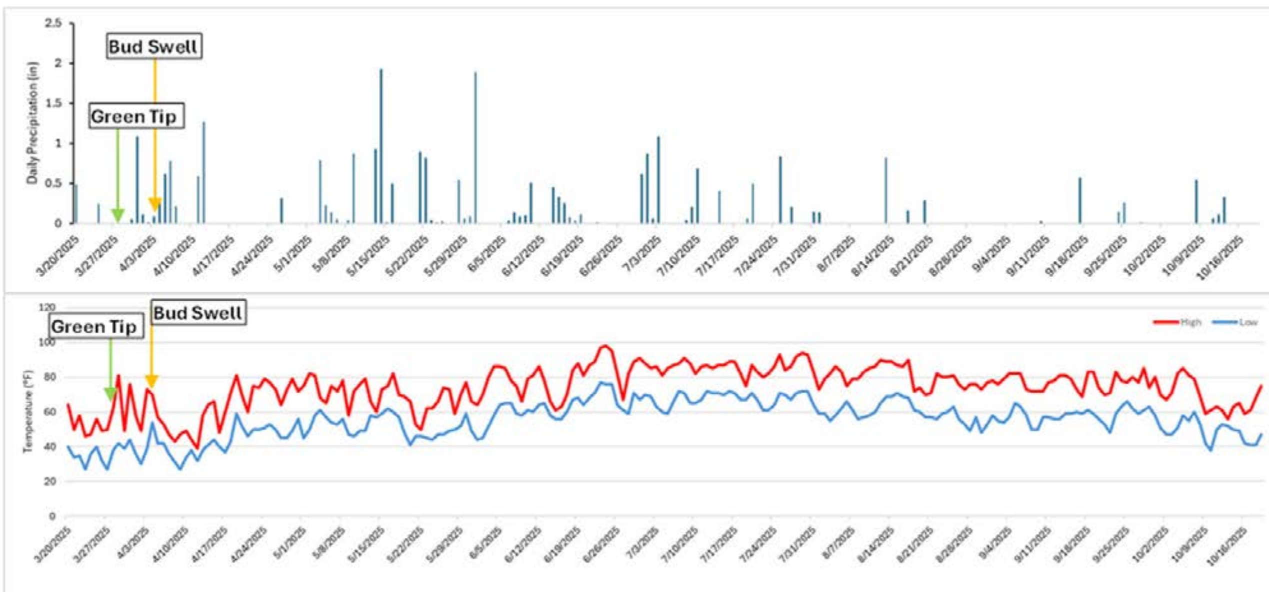

Figure 2. Maximum and minimum temperatures for the growing season in Upper Deerfield (near Bridgeton), NJ.

Overall total precipitation in 2025 was about normal with above average rainfall occurring in May followed by below average rainfall in June and August, September and October in Northern NJ. In fact, August, September and October were one of the dryest harvest seasons on record: Aug -1.5", Sept 0.8", Oct 0.9".

Fireblight. Although we had a shorter bloom than previous years, fireblight presented an issue during the blossom blight phase for growers in both North and South Jersey. As you can see from the chart below, which pulls data from the NEWA fireblight model https://newa.cornell.edu/, there were at least two infection periods during bloom where the EIP value was over 100 (Fig. 3). One of these periods persisted over the course of 6 days which required two applications of an antibiotic, 3 days apart from each other for optimal control.

Apple Scab. Green tip occurred at the Rutgers Snyder Research farm on 3/20 for Empire, one of our earliest

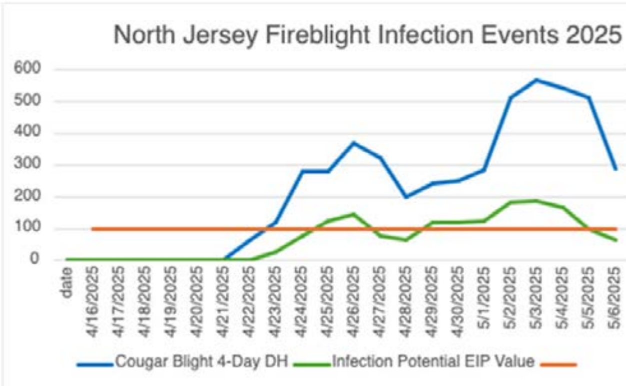

Figure 3. Fireblight Infection Events.

blooming varieties. Compared to last year, we experienced fewer scab infection periods during the primary scab phase. Most of these infection periods spanned over a couple days with the longest combined infection period lasting 10 days (Fig. 4). This extended infection period included 2 days of 11% daily ascospore discharge. There were two major scab infection periods at the tail end of primary scab, the first coincided with a 20% daily ascospore discharge and the second with a 31% daily ascospore discharge. Most growers were able to avoid primary scab by applying effective fungicides prior to NEWA predicted infection periods. There were a few orchards with heavy scab pressure that experienced major scab outbreaks.

Rots. Bitter Rot remains the most challenging to control throughout all New Jersey orchards. Incidence of this disease occurred in almost all farms in our Tree Fruit IPM Program and appeared most devastating in the Honeycrisp, Empire, and Ambrosia varieties. White Rot was present but not prevalent this season in South and North Jersey counties.

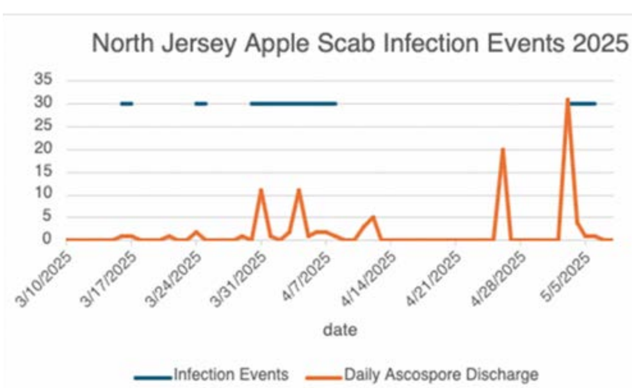

Figure 4. North Jersey Apple Scab Infection.

Cedar Apple Rust and Quince Rus.t In Southern New Jersey these diseases are prevalent, especially in Asian Pear.

Bacterial Spot. In North and South Jersey control of this disease was very good and not a significant issue for growers as it has been in past years.

Peach Scab. Control of this disease remains very good in commercial orchards across both North and South Jersey.

Brown Rot. This disease did not present a major issue in North or South Jersey this season. In North Jersey, most growers had less than 2% crop loss caused by brown rot.

Codling Moth. A biofix was set for this pest on 4/28 in South Jersey and 4/30 in North Jersey. Across the state, trap captures of the first generation were high. Trap counts for later generations were generally low, and damage to fruit was decreased compared to last year indicating that early season management minimized losses. Mating disruption remained effective in most blocks, but small amounts of damage were found at a few farm locations.

Brown Marmorated Stink Bug. In both North and South Jersey, trap counts for this pest were higher than the past few seasons. There was also a higher incidence of damage found in post-harvest assessments of Pome fruit. In North Jersey, some Stone fruit growers had up to 3% damage caused by this pest.

Ambrosia Beetle. We continued to monitor this pest in North Jersey utilizing clear sticky traps baited with Trece's ethanol lures. We began monitoring at a farm in South Jersey and we plan to expand the monitoring program for this pest next year. We had significant trap captures in North Jersey counties. This pest attacked apples at 7 of the 29 scouted farms, which is an increase from previous seasons and only 4 of which were previously known infestation sites. This increase in infestation sites may have been triggered by tree stress caused by the drought in fall of 2024. In South Jersey, new infestation sites and tree losses were documented. In NJ chloryrifos is the only insecticide effective for control.

European Apple Sawfly. Damage from this pest was noted at higher levels than previous years. In severe cases, growers experienced up to 15% damage. Traditionally growers that make a pink insecticide application have had less sawfly damage.

Scales. In South Jersey, incidence of San Jose Scale infestation notably decreased in heavily infested sites from previous seasons. Attention was given to early season controls which seemed to suppress crawler populations. Damage was notable in some orchards in August with scale infested fruit. In North Jersey, this pest did not cause notable damage except in known problem areas.

Oriental Fruit Moth. A biofix for this pest was set on 4/2 in South Jersey and 4/17 in North Jersey. This pest did not present a major issue to growers across the state this season. Few growers had a small incidence of damage to their peaches found in post-harvest assessments.

Plum Curculio. Similar to last year, plum curculio damage was above average in stone fruit. This pest also caused significant damage to pome fruit due to the long bloom period which made control difficult. Traditionally north Jersey growers that make a pink insecticide application have get a jump on pc control.

Lesser Peach Tree Borer (LPTB) and Greater Peach Tree Borer (GPTB). Trap counts of LPTB and GPTB were higher this season compared to previous years. Historically orchards in New Jersey had used chlorpyrifos on an annual basis to control these pests. Mating disruption displaced this annual treatment of chlorpyrifos about 10 years ago because it was highly effective and less toxic to the applicators. Increased pest activity may be a result of environmental stress from drought and change in climate/temperature, reduced use of chlorpyrifos, and or skipping a year of mating disruption. Damage and tree loss from peach tree borers was observed in South Jersey orchards. Generic chlorpyrifos as of this writing is labeled in NJ and available from multiple distributors.

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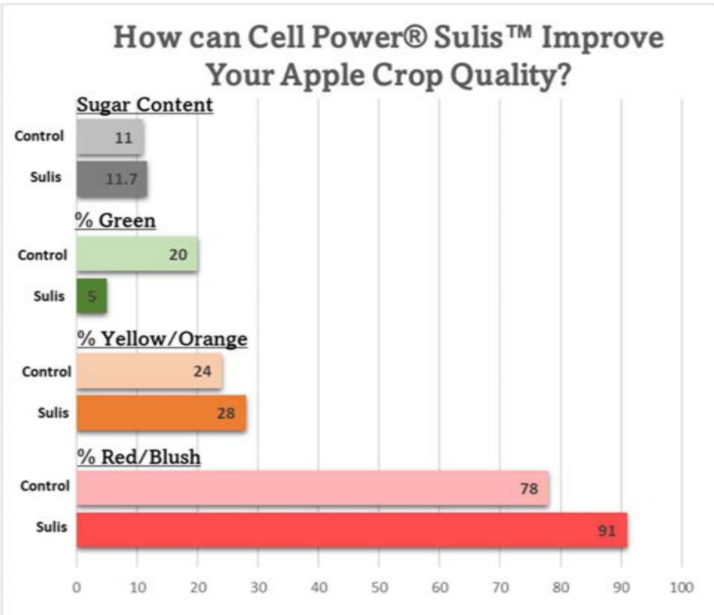

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Experimental control of bindweed in established blueberry plantings: Year 2 (2025)

Maria Gannett
University of Massachusetts Extension

Growers in Massachusetts struggle to control the rhizomatous perennial weed hedge bindweed *(Calystegia sepium*), especially in perennial cropping systems (Kolmanič et al., 2020). Once established, it is difficult to control through herbicides, mulches, or tillage (Besancon et al., 2022; Kolmanič et al., 2020; Sideman, 2024; Willeke et al., 2015). Last summer, research was conducted at the UMass Research Orchard in Belchertown, MA, exploring the efficacy of new weed control tactics on hedge bindweed: quinclorac applied pre- and post-emergence and nitrification inhibitors used to slow nitrification (Bley and Gannett, 2025). In these trials, the pre- and post-emergence quinclorac application in the spring resulted in significantly slower emergence of hedge bindweed and lower weed canopy cover compared to the mulch-only or nitrification inhibitor + mulch treatments. There were no further differences in weed growth, however we observed altered root morphology in quinclorac-treated bindweed. This motivated a second year of research, since quinclorac is a systemic herbicide and can be slow to provide full control of an established perennial weed.

The 2025 (year 2) research tested the efficacy of a second year of quinclorac applications and the potential of abrasive weeding to manage an established population of *C. sepium* in highbush blueberries. Here, quinclorac treatments remained the same, but nitrification inhibitor treatments were removed from the study since there were no effects from their use in year 1. Nitrification inhibitor treatments were replaced with abrasive weed management treatments (Forcella et al., 2011, 2023; Wortman, 2015). Abrasive weed management is an emerging technology primarily pioneered at the University of Minnesota. An abrasive material, often crushed walnut shells, corn gluten meal, sand, or fertilizers (Perez-Ruiz et al.), is applied using a sandblaster connected to an air compressor set on the back of an all-terrain vehicle or wagon, with or without a grit hopper (Forcella et al., 2018). The material is applied to the weed canopy with about 500 kPa of pressure. The abrasive action and destruction of meristematic tissue caused by the pressurized application causes seedling plant death (Forcella et al., 2011). This tool is still in development, but may have utility in high value perennial cropping systems where the lignified stem of the crop provides selectivity relative to the vegetative stems of herbaceous weeds (Forcella et al., 2020, 2023).

Methods

Plot layout remained the same as in 2024 (Bley and Gannett, 2025) except nitrification inhibitor treatments were replaced with abrasive weeding treatments. There were 7 different treatments, each replicated 5 times, for a total of 35 plots, organized as a randomized complete block design. Plots were mulched in 2024 and did not receive additional mulch in 2025. Treatments (Table 1) included high (12.6 oz/A) and low (6.3 oz/A) rates of quinclorac (Quinstar 4L, Albaugh), each applied pre-emergent and post-emergent with crop oil concentrate included at 2 pints per acre. These treatments also included one pre-emergent application of flumioxazin (Chateau EZ, Valent) at 12 oz/A and two post-emergent applications of glufosinate (Rely 280, BASF) at 56 oz/A. There were two additional quinclorac high and low treatments where the second glufosinate treatment was replaced with two additional abrasion treatments. Three controls were included: a mulch-only control, a mulch + abrasion treatment, and a grower standard control consisting of only the pre-emergent flumioxazin application and the two post-emergent glufosinate applications. All plots received two applications of fluazifop (Fusilade, Syngenta) at 12 oz/A for the first

Table 1. Treatment descriptions of 7 treatments included in a highbush blueberry planting in Belchertown, MA exploring quinclorac and abrasion treatments to control hedge bindweed.

Treatment:	Mulch only	Current practice	Abrasion	Quinclorac (low rate)	Quinclorac (high rate)	Abrasion & quinclorac (low rate)	Abrasion & quinclorac (high rate)
March 28th	flumioxazin	flumioxazin	flumioxazin	flumioxazin & quinclorac	flumioxazin & quinclorac	flumioxazin & quinclorac	flumioxazin & quinclorac
May 1st			← all plots treated with fluazifop →				
May 15th				quinclorac	quinclorac	quinclorac	quinclorac
May 19th			← all plots treated with fluazifop →				
May 29th			← all plots treated with glufosinate →				
June 26th		glufosinate	abrasion	glufosinate	glufosinate	abrasion	abrasion
June 30th			← all plots fertilized with ammonium sulfate →				
July 2nd			abrasion			abrasion	abrasion

application and 8 oz/A for the second application to help control grasses that were becoming pervasive. All plots also received the first application of glufosinate to help knock down aboveground broadleaf weed growth, and one fertilizer application of ammonium sulfate at 12 oz/bush.

Weed emergence was monitored weekly using photos of weed cover within a square foot, randomly placed within the plot once each week. Cover was estimated by uploading photos to Canapeo (Patrignani & Ochsner, 2015), which measures green and non-green pixels. A biomass clip was done on August 11th. All weeds within a square placed randomly in each plot were clipped at the base, identified, counted, and then placed in an oven at 65°C until dry.

Data were analyzed in R 4.3.2 (R core team, 2024). General linear mixed models were used to test the effect of the treatments on weed response variables. Treatments were the fixed effects, and block was the random effect. If necessary, models were square root transformed to satisfy assumptions of normality, but untransformed means are reported. An ANOVA was used to test for significance of fixed effects, and any significant effects were further explored with Tukey's HSD test post-hoc analyses to determine means separation.

Results

Weed canopy cover was significantly different based on the interaction of time and treatment (p-value < 0.001) (Fig. 1). The mulch only and mulch + abrasion treatments had higher weed canopy cover than all the treatments that included quinclorac at either the high or low rate. The treatments with quinclorac and glufosinate had lower weed canopy cover than any treatment without quinclorac. However, bindweed biomass and total weed biomass were not affected by treatments (Table 2).

Discussion

High and low rates of split pre- and post-emergent quinclorac applications combined with glufosinate provided some weed control, resulting in reduced canopy cover early in the season. Despite lower weed canopy cover

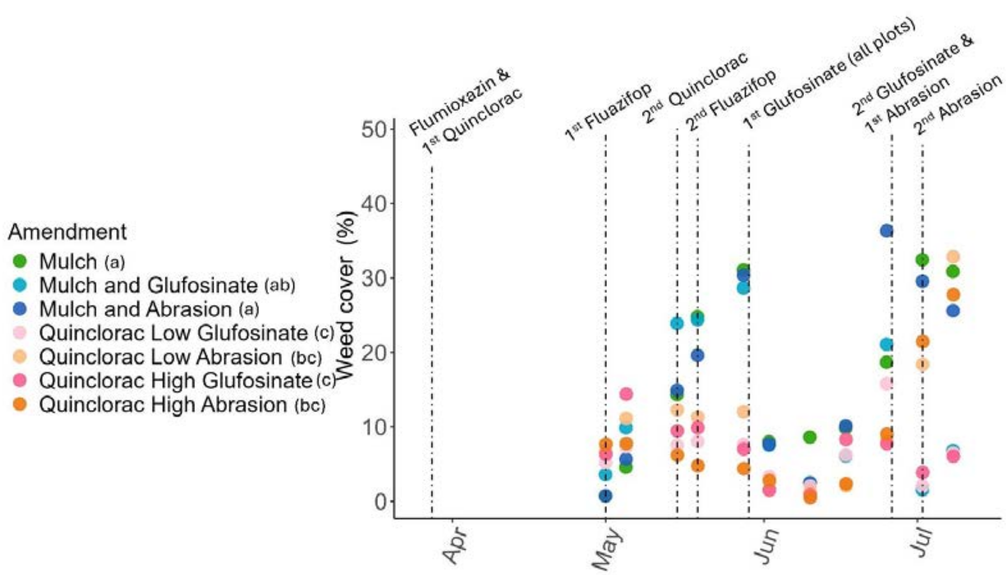

Figure 1. Weed canopy cover over time across 7 different herbicide and abrasion treatments.

Table 2. Mean bindweed aboveground biomass and total aboveground weed biomass per treatment. For each response variable, the p-values and f-statistics of an ANOVA run on a general linear mixed model are also given. Treatment was the fixed effect and block was the random effect. Treatments had no significant effect on either weed response variable.

Response variable	Bindweed biomass (g)	Total weed biomass (g)
P-value (F-statistic)	0.87 (0.40)	0.57 (0.75)
Mulch	2.9	10.8
Mulch and glufosinate	2.4	9.8
Mulch and Abrasion	2.8	14.0
Quinclorac low and glufosinate	2.2	13.2
Quinclorac high and glufosinate	2.2	6.6
Quinclorac low and abrasion	1.1	19.8
Quinclorac high and abrasion	5.9	6.5

through the beginning of July, these treatments did not continue to provide adequate weed control through harvest. There were no significant differences in bindweed aboveground biomass or total weed biomass in mid-August. The effect of quinclorac on weed growth lasted later in the season than in 2024, when there were no significant differences between quinclorac-treated plots and plots only treated with glufosinate after May 10th. It is encouraging that there may be a cumulative effect of multiple years of quinclorac treatments, however it is discouraging that these effects are still only measurable until early July. In highbush blueberries, only two applications of quinclorac and glufosinate are allowed per year, and so additional weed control tactics will be necessary to provide season-long weed control when bindweed has become well-established.

Acknowledgements

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Tree Fruit Twilight Meeting at Brookdale Fruit Farm Hollis, New Hampshire - Highlights

Jon Clements
University of Massachusetts Extension

Win Cowgill
Professor Emeritus, Rutgers
Win Enterprises International, LLC

On August 20, 2025, Brookdale Fruit Farm in Hollis, NH hosted a Tree Fruit Twilight Meeting co-sponsored by the New Hampshire Fruit Growers' Association and the University of New Hampshire. Also dubbed an "end-of-season celebration," the Meeting included a field tour with an update on IPM results in NH in the 2025 season from Jeremy Delise and the NH team. Equipment and technology demos highlighting equipment for mechanical weed control and sucker removal by Trevor Hardy, Brookdale Farm Supply. Irrigation automation with soil moisture sensing was reviewed by Anthony Tasselli of Toro Irrigation. Jon Clements UMass reviewed orchard mapping and fruit count estimates using an UAV (drone). Hi-density apple orchard pruning and training and tree branching with Plant Growth Regulators (PGR'S) were topics covered on our orchard tour by Win Cowgill, Win Enterprises International (see Photos 4-5). Also of interest was the observation and discussion of current and upcoming MAIA apple releases by Bill Pitts, Bill Pitts Consulting. Growers walked a tall spindle block of numerous established (4-5 years) new apple varieties from the Midwest Apple Improvement Association (MAIA) including MAIA- SM (Sweet Maia), MAIA12 (Summerset), MAIA11 (Rosalee), MAIA-L (Ludacrisp), MAIA 1 and 12 (Evercrisp and Evercrisp Mitchell), and MAIA-AM Photo 7.

Photo 1. Trevor Hardy demonstrates The Rinieri Biodynamic SRL mechanical weeder which makes short-work of weeds and apple rootsuckers at Brookdale Fruit Farm. Sold by Brookdale Farm Supply. Photo Credit: Win Cowgill.

The Meeting was attended by well over 100 fruit growers, industry reps, private consultants, and Brookdale Fruit Farm staff of course. Brookdale-grown corn, salad and a food truck dishing out BBQ and sausage grinders were enjoyed by all (along with beer for those who chose to partake). Chuck Souther of Apple Hill Farm, Concord, NH was presented with a special recognition for long-time service to the industry by the NH Fruit Growers Association. Brookdale's H2A workers provided a raucous backdrop of Reggae music while

Photo 2. The view of the crowd from “above” taken by Jon Clements, UMass Extension, while flying the UAV (drone) at Brookdale Fruit Farm. Jon visited Brookdale Orchard several times, flew the drone, and in collaboration with outfield.xyz mapped apple variability and estimated block apple yield.

we ate and enjoyed. Thanks to Trevor Hardy, the rest of the Brookdale Orchard staff, Jeremy Delise, UNH and the NH Fruit Growers Association for entertaining and educating us. Surely the meeting was a great break after the growing was done and before apple harvest got underway!

Photo 4. Win Cowgill, Trevor Hardy, Jon Clements, Bill Pitts- all invited speakers to the NH Fruit Growers Association meeting.

Photo 5. Win Cowgill (left), Win Enterprises International , and Bill Pitts (right), Bill Pitts Consulting, talk hi-density apple pruning and tree training/ branching at Brookdale Fruit Farm. Both experts in their respective fields. Bill was also representing MAIA Apples and updated growers on new MAIA cultivars at Brookdale Fruit Farm. Win updated growers on how to branch apple trees with PGRS from years 1-5 in the orchard. Phil Green owner of Sun High Orchards, Randolph, NJ in the background, traveled the longest distance to attend the event!

Photo 3. Well-branched 4th leaf Brookfield Gala/M9 on tall spindle at Brookdale Fruit Farms. Photo Credit: Win Cowgill.

Photo 6. MAIA-Am (Amarilla Soul)- newest outstanding apple from MAIA discussed by Bill Pitts- Brookdale had a 4 year old test row planted. Available for MAIA members at maiaapples.com- commercial nurseries are propagating.

Photo 7. Impromptu Reggae music blasted by Brookdale's H2A worker. Photo credit: Jon Clements.

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Photo 8. Chuck Souther, left, receiving presented with the first NH Service to Agriculture award by the NH Fruit Growers' Association while Trevor Hardy looks on. Photo credit: Win Cowgill.

Dr. George Greene-

Jon Clements and Win Cowgill visited our old friend Dr. George Green in Damariscotta, Maine last August following the summer meeting of the NH Fruit Growers Association held at Brookdale Fruit Farm. George has been retired from Penn State for 15 years plus and resides in an assisted living facility. Many of you will remember George as one of the experts on bitter pit in apple and correction with foliar calcium sprays. We had a great visit bringing many apple and peach cultivars to sample and discuss. For more pictures and video, see https://flic.kr/s/aHBqjCtLU3 If anyone would like to be in touch with Dr. Greene, drop us a note and we will put you in touch.

Assessing Oxidate and Percarb Effectiveness in Reducing Conventional Pesticide Use on American Grape Hybrids

Elsa Petit and Annie Jones
Stockbridge School of Agriculture, University of Massachusetts

Biopesticides are a promising alternative to conventional pesticides for sustainable disease management in grape production. Moyer et al. (2016) demonstrated that combining biopesticides with fruit-zone leaf removal and the addition of a synthetic fungicide during the window of ontogenic susceptibility in clusters significantly reduces powdery mildew. Avan et al. (2023) reported effective control of powdery mildew using *Brevibacillus brevis* strain CP-1. Other studies (Malviya et al., 2022; Vicente-Díez et al., 2023) highlight microbial and volatile-based approaches that limit fungal diseases without synthetic pesticides. However, managing downy mildew (*Plasmopara viticola*), an oomycete, remains difficult in organic systems because the most effective organic pesticides they can rely on are copper fungicides, which pose environmental and phytotoxicity concerns (Dagostin et al., 2011; La Torre et al., 2018; Lamichhane et al., 2018). Growing pesticide resistance and environmental regulatory limits have accelerated the adoption of biopesticides and disease-resistant American hybrids such as Frontenac and Chardonel to reduce chemical inputs. For detailed information on disease susceptibility and chemical sensitivity of different grape varieties, refer to the UMass Extension Fruit Program guide.

This study aims to evaluate the effectiveness of a disease management program that substitutes several conventional fungicides with biopesticides compared to a fully conventional program. The biopesticides used include PerCarb, a peroxycarbonate-based contact fungicide that releases hydrogen peroxide to disrupt fungal cell membranes, and OxiDate, a hydrogen peroxide-based oxidizing agent that rapidly kills fungal spores on contact. The evaluation quantifies the program's impact on disease management, yield, and juice quality on two American hybrid grapes, Chardonel and Frontenac.

Materials and Methods

Location and plant material. This trial was conducted during the summer of 2025 at the University of Massachusetts Cold Spring Orchard in Belchertown, Massachusetts (42.28° N, 72.35° W). The experimental vineyard spans approximately 0.7 acres and is planted with two cold-hardy hybrid grape varieties [Frontenac and Chardonel] selected for their contrasting disease resistances. Vines were trained to a high-wire cordon system with 8 ft between rows and 6 ft between vines. The soil is a well-drained loam typical of the region. Standard vineyard management practices were applied, including annual pruning, chemical weed control, and canopy management.

Treatments. Prior to the trial, all vines received the same pesticide applications (see Table 1). Beginning on June 6, 2025, the vineyard was divided into two treatment groups, a conventional program with a mix of conventional and biopesticide treatments and (2) a biopesticide program, exclusively using biopesticides (Oxidate and PerCarb).

Spray schedules for both programs are detailed in Table 2. All treatments included NuFilm (16 oz/A) except those involving PerCarb.

Table 1. Pre-trial spray schedule and cost per acre

Date	Products applied (All)	Cost per acre (USD)
04/24/2025	NuCop 3 lb/A; Damoil (1%) 1 gal/A	$31.93
05/09/2025	Captan 2.5 lb/A; Manzate 3 lb/A	$16.95
05/15/2025	Rampart 3 pt/A; Movento 7 oz/A	$62.22
05/21/2025	Revus Top 7 oz/A; Ph-D 6.2 oz/A	$65.88
		Total: $176.98

Table 2. Spray schedule starting 6/6/2025 and cost per treatment. All used NuFilm (16 oz/A) except PerCarb.

Date	Conventional treatment	Cost (USD/A)	Biopesticide treatment	Updated Cost (USD/A)
06/06/2025	ProPhyt 3 pt/A; Aprovia 9.5 oz/A	$51.14	OxiDate (1%) 1 gal/A	$27.50
06/13/2025	Pristine 10 oz/A; Captan 2.5 lb/A	$34.83	PerCarb 2 lb/A	$15.00
06/20/2025	OxiDate (1%) 1 gal/100 gal	$23.66	OxiDate (1%) 1 gal/A	$27.50
06/26/2025	Inspire Super 18 oz/A; Revus Top 7 oz/A	$49.06	PerCarb 2 lb/A	$15.00
07/07/2025	Ph-D 6.2 oz/A; ProPhyt 3 pt/A	$50.25	OxiDate (1%) 1 gal/A	$27.50
07/16/2025	PerCarb 1.5 lb/A	$9.36	PerCarb 1.5 lb/A	$11.25
07/28/2025	OxiDate (1%) 1 gal/100 gal	$23.66	OxiDate (1%) 1 gal/A	$27.50
08/06/2025	Pristine 10 oz/A; Revus Top 7 oz/A	$48.93	PerCarb 1.5 lb/A	$11.25
		Total: $290.89		**Total: $162.50**

Experimental design. Each grape variety was planted in six rows. Each row was divided into two blocks of 10 vines. Treatments were randomly assigned to blocks within each row.

Vine maintenance. Shoot thinning was conducted on May 20–21, 2025, maintaining approximately six shoots per foot of linear canopy. Leaf pulling and shoot positioning were performed uniformly across all treatments.

Disease assessment. Disease incidence (percentage of plants infected) and severity (percentage of foliage affected) were recorded each time before spraying but here we report them for the end of the season on August 19, 2025, two weeks after the last spray. The following grape foliage diseases were evaluated: black rot, downy mildew, powdery mildew, Phomopsis. Phytotoxicity (leaf burn from pesticide treatments) was assessed using the same criteria.

Yield and fruit quality. Yield per vine was measured at harvest. Soluble solids (°Brix) and pH were recorded for each treatment. Frontenac was harvested on September 2, 2025. Data for Chardonel were inconclusive due to significant bird damage, possibly linked to exceptional drought conditions.

Cost analysis. Total chemical costs were calculated for each treatment group to quantify economic differences.

Statistical analysis. Data were analyzed using one-way ANOVA in R to evaluate treatment effects on disease, yield, and juice quality. Tukey's HSD post hoc test was used for pairwise comparisons. Statistical significance was determined at $p < 0.05$. Results are presented as treatment means in Table 3.

Results and Discussion

Weather conditions. Average air temperatures from May to September 2025 (Fig. 1) were close to long-term means. In contrast, precipitation was highly uneven: rainfall in May was exceptionally high whereas June and August were markedly dry, reflecting drought periods which could explain the extreme bird feeding.

Disease, juice quality, and yield. Disease pressure during the 2025 growing season was generally low, particularly in August, likely due to drought conditions that suppressed disease development. As a result, no significant differences were observed between the conventional and biopesticide treatments for disease severity in either cultivar. However, phytotoxicity was notably higher under the conventional program for Frontenac (Table 3), indicating potential leaf damage from synthetic fungicides. Phytotoxicity was recorded after the 6/26 conventional treatment which used Inspire Super and Revus top, known to cause phytotoxicity in some grape variety. In contrast, the biopesticide program showed no significant phytotoxic effects.

Brix (sugar content) and yield per plant were statistically similar between treatments for Frontenac, suggesting that biopesticide use did not compromise productivity.

Juice pH was significantly lower in the biopesticide treatment ($p=0.022$), indicating slightly higher acidity (Table 3).

Cost analysis. Pre-trial sprays applied to all vines (see Table 1) totaled $176.98 per acre. Once the trial began on June 6, the seasonal spray cost for each program was

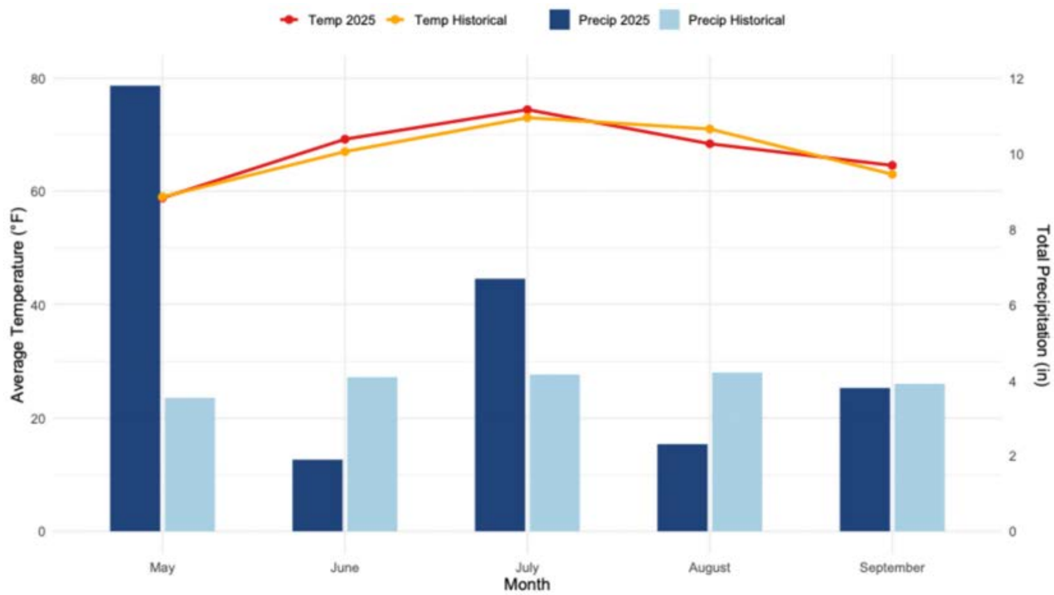

Figure 1. Average air temperature and total precipitation in summer 2025 compared to historical data at the UMass Cold Spring Orchard (Belchertown, Massachusetts).

\$290.89 per acre for the conventional program and \$162.50 per acre for the biopesticide program.This represents a 44% reduction in spray costs under the biopesticide program. The savings were primarily due to replacing higher-cost conventional fungicides (e.g., Aprovia, Revus Top, Pristine) with more affordable alternatives like PerCarb and Oxidate. Despite the lower input costs, disease control remained comparable between programs (see Table 3), supporting the economic viability of biopesticide-based management under the 2025 conditions.

Acknowledgements

This project was supported by the Mass Fruit Growers' Horticultural Research Fund 2025,

Table 3. Averages and P values showing statistical differences in diseases, burnt foliage, Brix (sugar), pH, and yield are presented. P values indicating statistical differences are marked with an asterisk in the results. When no disease was visible, statistical analyses were not conducted, and the P value was recorded as "NA" (not applicable). Yield in Frontenac was lower than expected due to bird damage. Fruit data (Fruit rot, °Brix, pH, Yield per plant) in Chardonel were lost due to bird damage. Disease data were taken on August 19, 2025 and fruit rot and yield data at harvest on September 2d, 2025.

Variable	**Chardonel**			**Frontenac**		
	Conventional	**Biopesticide**	***p*-value**	**Conventional**	**Biopesticide**	***p*-value**
Downy mildew (%)	0.55 ± 0.33	0.98 ± 1.06	0.365	0 ± 0	0 ± 0	NA
Phomopsis (%)	0.72 ± 0.15	0.67 ± 0.10	0.511	0.97 ± 0.15	0.82 ± 0.25	0.234
Black rot (%)	0.014 ± 0.006	0.011 ± 0.006	0.432	0.013 ± 0.009	0.009 ± 0.006	0.378
Anthracnose (%)	0.001 ± 0.002	0.002 ± 0.003	0.718	0 ± 0	0 ± 0	NA
Powdery mildew (%)	0 ± 0	0 ± 0	NA	0 ± 0	0.033 ± 0.082	0.341
Phytotoxicity (%)	0 ± 0	0.003 ± 0.008	0.341	0.733 ± 0.082	0.002 ± 0.004	8.7×10^{-10} *
Fruit rot (%)	NA	NA	NA	0.40 ± 0.17	0.73 ± 0.45	0.31
°Brix	NA	NA	NA	18.87 ± 1.33	19.30 ± 0.79	0.66
pH	NA	NA	NA	2.95 ± 0.03	2.87 ± 0.02	0.022 *
Yield per plant (lbs)	NA	NA	NA	10.01 ± 1.09	9.43 ± 1.12	0.56

CAFE scholar 2025 and Biosafe Systems. Special thanks to the vineyard staff and collaborators who contributed to the fieldwork and data collection.

Where brand names for chemicals are used, it is for the reader's information. No endorsement is implied, nor is discrimination intended against products with similar ingredients. Please consult pesticide product labels for rates, application instructions and safety precautions. The label is the law. Users of these products assume all associated risks.

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STS-1113 FGN 1/4 Pg Ad DEC 2021 4.75"w x 7"h

Working With Disease Prediction Models for Bitter Rot of Apple

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Bitter rot of apple is a disease caused by several species within the fungal genus *Colletotrichum.* The pathogen overwinters in plant material, including fruit mummies, and begins to produce spores in the spring. Once the fruit becomes susceptible to infection (20 days post petal fall), spores begin to infect the fruit during conducive infection conditions. This pathogen prefers a temperature of 70°-90°F and a moist environment. Spores are dispersed by rain events which allow them to reach the fruit surface for infection. Once a fruit becomes infected, the pathogen remains latent until the fruit begins to ripen, then the typical rot symptoms will begin to appear in the field (Figure 1). Spores will form on the surface of these rotting fruits and continue to infect new fruits through harvest; this is why early disease control is so important. Current management relies on a calendar-based, intensive fungicide program while the fruits are susceptible. Fungicides are applied every 14 days or 2 inches of rain, whichever comes first. This type of program is costly and will often result in unnecessary spray applications. Applying fungicides frequently also increases the risk of fungicide resistance development. Rotating FRAC codes each spray application and combining single site fungicides with broad spectrum fungicides are good methods to reduce the risk of fungicide resistance development, however, the fungicide toolbox is very limited for growers. Effective rotational fungicide options include Omega (FRAC 29), Aprovia (FRAC 7), Merivon (FRAC 7+11), Pristine (FRAC 7+11), Luna Sensation (FRAC 7+11), and Flint Extra (FRAC 11). These higher resistance risk fungicides should be tank mixed with a broad-spectrum fungicide such as Captan (FRAC M04), or Ziram (FRAC M03).

Figure 1. Bitter rot symptoms appearing on an apple in the field with orange spores on the lesion.

Bitter rot is becoming one of the most significant apple diseases that growers are struggling with on the East coast. Growers have reported up to 100% crop loss in some varieties due to this disease. Development of effective disease control methods for bitter rot are essential for growers to better manage this disease. Tree fruit growers in New Jersey are currently using fruit tree disease prediction models available through resources such as NEWA and Rimpro to control apple scab and fire blight, while reducing unnecessary fungicide and antibiotic inputs. If a disease prediction model were available for bitter rot, it could provide improved disease control through more precise fungicide timing.

Currently, there is not a model that has been tested and proven to work for predicting bitter rot infections in our climate, however there are four disease prediction models developed to predict infection by *Colletotrichum* species in other crops such strawberry, wine grapes, and Glomerella leaf spot of apple. These four models were tested during the 2025 growing season to determine if they can be used to improve bitter rot management while reducing fungicide applications.

Materials and Methods

Trials were conducted at research farms in Virginia, New Jersey and New York during the 2025 growing season. At each location the four models were compared to a grower standard and an untreated control on two different apple varieties. Fruits inoculated with the two most prevalent *Colletotrichum* species for each location were hung above each tree to ensure there would be sufficient disease pressure (Figure 2). An experimental website was developed for this project to determine when each model forecasted infection. At 20 days post petal fall we applied our first fungicide in the grower standard treatment with follow-up applications every 14 days or 2 inches of rain, whichever came first.

Our model treatments received a fungicide application prior to predicted infection periods. If there were back-to-back infection periods, we waited until we had 2 inches of rain or 14 days had passed to complete another fungicide application when the model predicted infection. All treatment fungicide applications were with Captan applied at 3 lb/A. When symptoms first appeared, we began to rate fruit for infection incidence. Fruits were rated a second time closer to harvest.

Results

A statistical analysis comparing the four models to the grower standard showed that all models worked equally as well as the grower standard at preventing bitter rot infection. This held true for all states where this trial was completed. Untreated control trees reached up to 90% disease incidence, which was significantly higher than the grower standard and all four model treatments. In New Jersey and Virginia, the models required 1-2 fewer spray applications than the grower standard treatment. In New York, the models required 2-4 fewer spray applications than the grower standard treatment.

Figure 2. Infected apples hung in onion bags above each tree.

Conclusions

The trend of this year's results suggests that disease prediction models provide equal or better control to the grower standard while reducing unnecessary spray applications. Reducing the number of spray applications reduces grower inputs allowing more profit and reduces the risk of fungicide resistance development. These trials will be continued for at least one more growing season to gain confidence under variable environmental conditions. Further analysis will be completed during the winter to compare climate data with model predictions and determine which models may perform the best for grower use.

Acknowledgements

I would like to thank the New Jersey State Horticultural Society for providing funding for the New Jersey field trial. This funding was essential to this research which will be used to help growers better manage bitter rot in the future. Thank you to the NJ Agricultural Experiment Station and the Rutgers Snyder Research and Extension Farm for hosting the NJ experiment. I would also like to thank all the collaborators on this project and our North Jersey IPM scouts who helped maintain the New Jersey research block.

New Jersey News

Summer NJSHS Grower Meeting at Alstede Farms

Win Cowgill
Professor Emeritus, Rutgers University
Win Enterprises International, LLC

On Wednesday, July 9, 2025 the New Jersey State Horticultural Society (NJSHS) held its 2nd annual Summer Orchard Meeting and Educational Tour at Alstede Farms in Chester, NJ. Fifty farm family's industry personnel, Rutgers Cooperative Extension personnel, NJ Farm Bureau and private consultants attended.

Photo 1. Farm and Orchard Tour Alstede's, PYO Blueberry with Bird Netting- Photo Credit - Natalia Gamarra, Suterra

Thank you to our host Kurt Alstede for hosting us and his outstanding staff for arranging and guiding our farm tour; Colin Manning and Rebekah Alstede-Modery, Hector Ruiz as well as all the other staff the prepared food and did the meeting prep work behind the scenes.

Alstede Farm s is known for its entertainment farming marketing venuses especially its Pick Your Own operations. However, they market their produce at multiple farm stands in Northern New Jersey Phots 2,3-and numerous tailgate farm markets. With over 600 acres of

Photo 2. Alstede Farm Market Chester, NJ. Photo Credit Win Cowgill

Photo 3. Alstede Farm Market Chester, NJ. Photo Credit Win Cowgill

Photo 4. Farm wagon tour. Photo Credit: Midge Hauser, Hauser Hill Farms

crops Alstede's produce 30 acres of apples, 30 acres of stone fruit, including peaches, apricots, and plums, 2.5 acres of pears Asian and European and 2.5 acres of sweet and tart cherries.

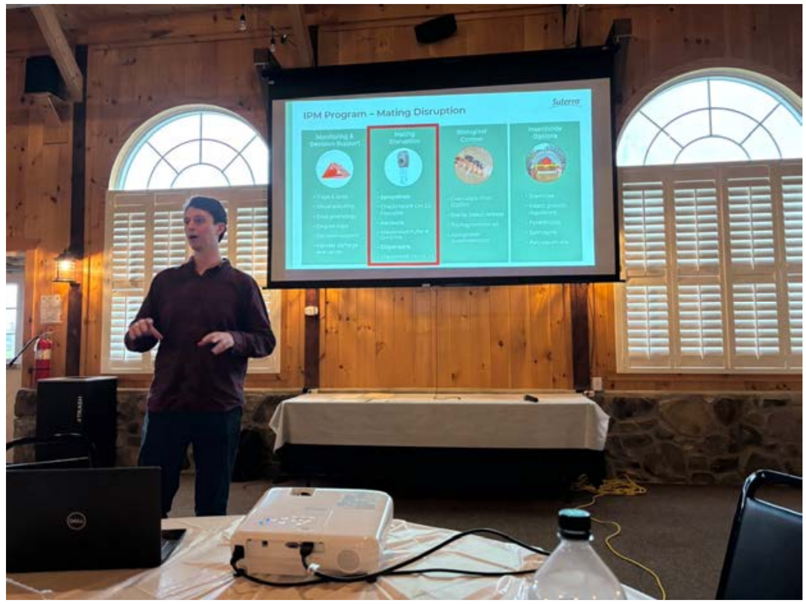


Photo 6. Haydn Lenz, Suttera made a power point presentation as an overview of mating disruption for apple and other fruit crops with Sutera's technology. Photo Credit: Natalia Gamarra

We had an excellent farm wagon tour of the home farm in Chester reviewing blueberry production -Photo 1, high density tall spindle apple production, high density Asian and European pear, and the various stone fruit acreage of peach and cherry.

Following the tour, we had an excellent buffet dinner. It was followed by an educational program for our participants from our Sponsor of the tour/meeting, Suttera. Haydn Lenz- part of the technical and scientific team at Suterra made an informative presentation on mating disruption for apple and other fruit crops. New Jersey growers have used mating disruption for peach tree borer complex for over 10 years but are just begging to adopt mating disruption for Codling Moth in apple and pear. Haydn focused on transferring this knowledge to our growers.

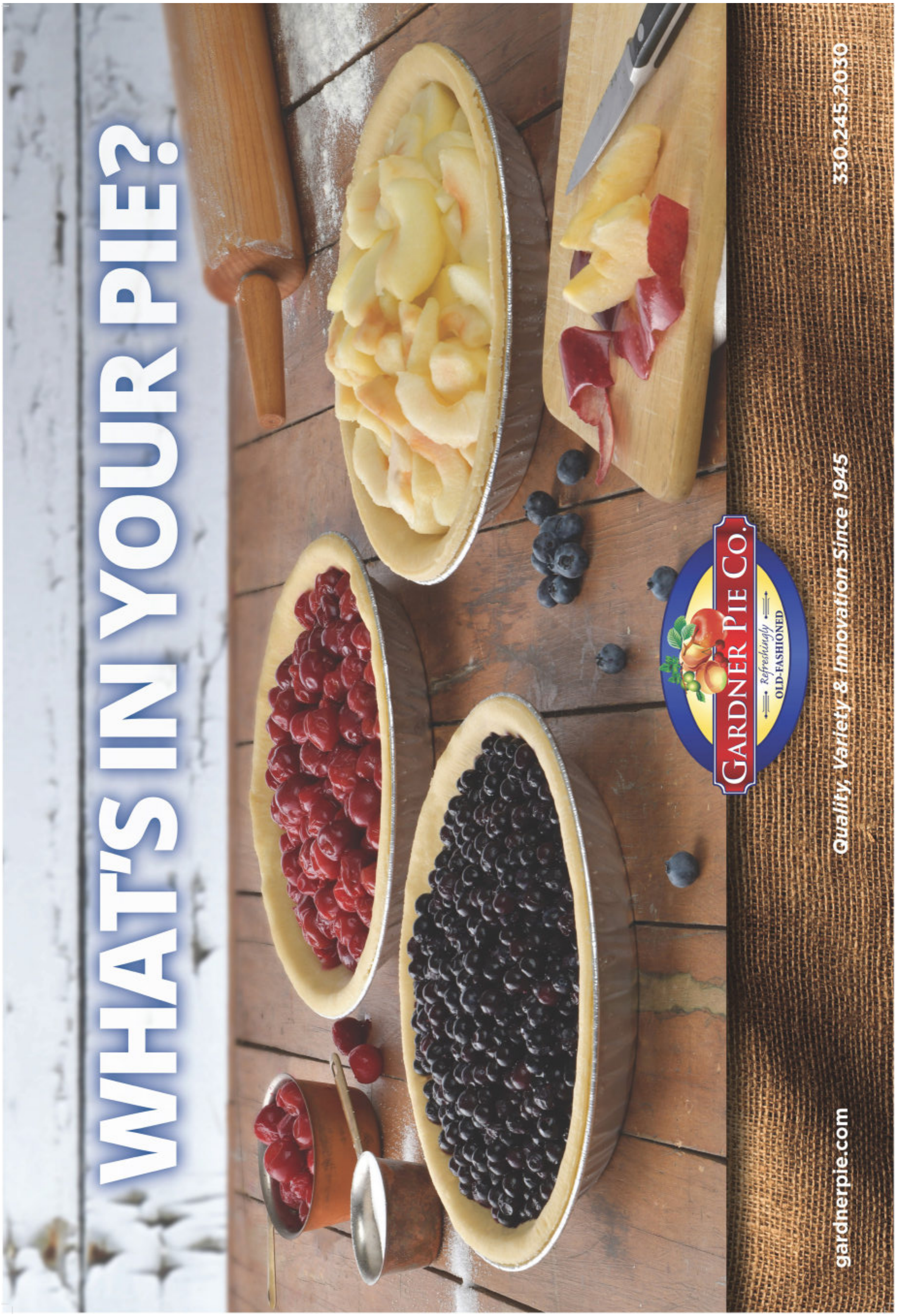
Acknowledgements

Thank you to our meeting and tour Sponsor Natalia Gamarra, Suterra.

Photo 5. Kurt Alstede welcomes the group to the indoor Program and gave an excellent overview of his operation. Photo Credit: Natalia Gamarra, Suterra.

Photo 7. Overview of meeting at Alstede's Harvest Hall Facility- Photo Credit: Natalia Gamarra, Suterra.

Photo 8. Some of the leadership of the NJSHS with our host Kurt Alstede; from left to right, Kurt Alstede, Jim Giamarese President, John Hauser, Chair Grant Committee, Win Cowgill Business Manager and Editor of Horticultural News, Dale Davis NJSHS Board Member. Photo Credit: Midge Hauser, Hauser Hill Farms.



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