Horticultural News

Volume 105, Number 2
Spring 2025

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.

Horticultural News is published four times per year by the New Jersey State Horticultural Society. It is provided as a benefit to membership in the society. Membership costs $50 per year. Each one-year subscription begins January 1 and ends December 31. Payments via check must be in United States currency and should be payable to the New Jersey State Horticultural Society. Horticultural News Electronic subscriptions are available as benefit of membership in the NJ State Horticultural Society. A hidden link will be mailed immediately after publication to members. Issues will be made freely available on this website six months after publication.

For advertising opportunities, contact: Win Cowgill: Telephone (908) 489-1476, wincowgill@mac.com.

Correspondence should be sent to: New Jersey State Horticultural Society, Business Manager, Win Cowgill, P. O. Box 111, Baptistown, NJ 08803-0111.

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Cover: Montmorency Cherry blooms, UMASS Cold Spring Orchard. Photo Credit: Jon Clements

New Jersey/Massachusetts Apple Variety Trial Update

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

Jon Clements
Extension Tree Fruit Specialist
University of Massachusetts Amherst

We maintain apple variety blocks in both New Jersey and Massachusetts currently focusing on Midwest Apple Improvement Association (MAIA, https://maiaapples.com) new cultivars.

This report will focus most on the New Jersey trial, however, with observations from both MA and NJ.

In northern New Jersey we have a 350-tree test orchard with over 42 named and numbered selections planted to a tall spindle at 2.5 by 12 feet. Cultivar selections typically have 2-5 trees each. Trees are grown and maintained with NJ standard pest management protocols.

We have evaluated apple cultivars for the past 34 years, established a web site for cultivar evaluation at http://appletesters.net/ currently with 1,315 individual apple variety evaluations. The significance of the project is that new cultivars that are marketable are essential to the viability of the modern orchard enterprise. Growers selecting their 'next' new variety they have success with is critical; every grower asks, "what is the best new variety?"

Most exciting is we continue to have new commercial releases from our evaluation blocks. Three new releases from the MAIA program are now available from select nurseries. They include:

MAIA-Mitchell (Figure 1) is a red limb sport of MAIA1 (EverCrisp®). Recently released, MAIA-Mitchell is an earlier coloring, vibrant red color alternative to EverCrisp® which already has over 800,000 trees in the ground in the USA and has the potential to become a major variety in the USA. MAIA-Mitchell press release:

Figure 1. MAIA-Mitchell vs. MAIA1 (EverCrisp®), at Mid-Atlantic Fruit & Vegetable Conference, Hershey, PA, January 2025. Photo by Win Cowgill.

https://maiaapples.com/wp-content/uploads/2023/06/MAIA_Spring_Newsletter_Digital-1-1.pdf

MAI-AM (USPP 36071, Figure 2) was tested as MDD-379, it is not trademark named yet but it is pending TM.

Figure 2. MAIA-AM at the UMass Orchard, Belchertown, MA, September 16, 2024. Photo by Jon Clements.

This is a crowd-pleasing crunchy yellow apple. It has been outstanding in NJ for the last four years, and has favored well in MA, NY and OH. The fruit harvests approximately one week after Gala and has a long harvest window of 3-4 weeks. It is crispy and juicy with a waxy-smooth, russet-free light-yellow skin. This selection jumped out at us the first time we observed and tasted it!

MAIA-Red Zeppelin (Figure 3) is a newly named MAIA apple, with attractive red skin (obviously!), tart-sweet flavor, modest size, and a good crunch. Although we have only seen it cropping for a year, it clearly deserves attention.

Figure 3. MAIA-Red Zeppelin at the UMass Orchard, Belchertown, MA, September 16, 2024. Photo by Jon Clements.

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http://www.horticulturalnews.org/102-1/a2.pdf

Experimental Control of Bindweed in Established Blueberry Plantings

Matthew Bley and Maria Gannett
University of Massachusetts Extension

Control of hedge bindweed (*Calystegia sepium*) is notoriously difficult (Kolmanič et al. 2020). This plant is an aggressive rhizomatous perennial in the Morningglory family (Convolvulaceae). Few herbicides provide good control of this weed (Besancon et al., 2022; Kolmanič et al., 2020; Sideman, 2024), partly due to its aggressive rhizomes; 50% of which are able to sprout from 20 cm deep within the soil profile (Willeke et al., 2015). This results in organic mulches being completely ineffective at control. Synthetic mulches prevent emergence where they cover the soil, but the mulch directs lateral shoot growth to the base of the crop. Repeated tillage can manage *C. sepium* growth over time, but 50% of fragments with just one bud are able to sprout, so inadequate tillage can increase an infestation by spreading these fragments (Willeke et al., 2015). In addition to direct competition with the crop for water, nutrients, and light; aboveground growth becomes intertwined within the crop and can impede crop management and harvest (Davison, 1976). Growers need new tactics to control this difficult perennial weed.

Quinclorac, a highly selective synthetic auxin that mimics an auxin overdose and causes an accumulation of abscisic acid in susceptible plants, may be an additional chemical weed control tool that growers could use to manage *C. sepium* (Enole et al., 1999; Grossmann, 1998). It had been labelled for use in lowbush blueberries and agronomic crops with a post-emergent application to control broadleaf perennials, primarily bindweeds (Moretti & Peachey, 2022). Research in highbush blueberries demonstrated that split pre-emergent and post-emergent applications of quinclorac could provide adequate control of field bindweed (*Convolvulus arvensis*) without damaging the crop on silt-loam soils in Oregon (Moretti & Peachey, 2022). This work led to a change in the label in 2018, allowing for both pre- and post-emergent applications of quinclorac in highbush blueberries. Since this change, little research has been done to test the efficacy of pre-emergent quinclorac use in highbush blueberries in the Northeast where soils are typically sandier, or on the efficacy of quinclorac on *C. sepium*, which is closely related to *C. arvensis*.

Another potential cultural weed control tool that may be useful in highbush blueberries would take advantage of their preference for the ammonium form of nitrogen (Claussen & Lenz, 1999; Osorio et al., 2020). Previous work has found that blueberry plant growth and yield can be higher in plants that are fertilized with only ammonium, compared to plants only fertilized with nitrate. However, in a field environment, soil microbial communities often quickly convert ammonium to nitrate (Coskun et al., 2017). Nitrification inhibitors chemically suppress the activity of soil nitrifiers, prolonging ammonium availability in field soil (Coskun et al., 2017; Lei et al., 2022). Many plants, including many weeds, prefer the nitrate form of nitrogen (Britto & Kronzucker, 2002). It is possible that keeping nitrogen in the ammonium form through the use of nitrification inhibitors will improve blueberry plant growth more than weed community growth. This could shift the competitive advantage away from the weed community and towards the blueberry plant.

This research tests both the efficacy of quinclorac on sandy soils to manage a heavy infestation of *C. sepium,* and then overlays a nitrification inhibitor treatment to potentially shift the competitive advantage away from the weed community and towards highbush blueberry growth.

Materials and Methods

Plots were laid out in an established highbush blueberry planting, located at Belchertown, MA. The blueberries

were mixed varieties, organized with earlier ripening varieties located in the Northeast corner and later ripening varieties in the Southwest corner. Treatments were organized as a randomized complete block, with each row as one block. There were 7 treatments, each replicated 5 times, for a total of 35 plots. All plots were mulched with one inch (2.5 cm) of woodchips on March 25th. Treatments, shown in Table 1, included two rates of quinclorac (Quinstar 4L, Albaugh): high (12.6 oz/A) and low (6.3 oz/A), each applied pre-emergent and post-emergent with crop oil concentrate included at 2 pints per acre. Two controls were included, an untreated, mulch only control, and a grower standard control consisting of pre-emergent flumioxazin (Chateau EZ, Valent) at 12 oz/A followed by two applications of post-emergent glufosinate (Rely 280, BASF) at 56 oz/A. There was also a nitrification inhibitor treatment, with nitrification inhibitors (Instinct Nxtgen, Corteva) applied at 24 oz/A in the spring immediately after fertilizing (Ammonium sulfate) at 12 oz/bush. There were two additional treatments combining nitrification inhibitors and quinclorac applications at both high and low rates. All treatments were fertilized a second time at the same rate, on July 2nd, without an additional nitrification inhibitor treatment.

Weed emergence was monitored by counting bindweed emergence from the soil and measuring the height of 5 randomly selected shoots 7 and 9 Weeks After pre-emergence Treatment (WAT). After bindweed shoots began to wrap around aboveground vegetation weed growth was measured 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. Before harvest, a biomass clip of the weed community was done for each plot by clipping, identifying, counting, and then drying at 65°C all weeds within a randomly placed square.

Blueberry growth was monitored by harvesting fruit twice each week from June 27th until Sept. 16th. All fruit that was just beginning to ripen was harvested and weighed. Fruit was picked earlier than ideal because fruit left to ripen on the bush was eaten by birds. Leaves of blueberry bushes were harvested on Aug. 2nd and sent to Maine soil lab for tissue analysis. Plant nutrient levels were measured using acid digestion with a AIM600 Block Digestion System (SEAL Analytical, Kitchener, Ontario, Canada).

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 the response variables. Treatments were the fixed effects, and block was the random effect. When necessary, response variables were square root transformed to fit assumptions of normality. 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

Emergence of bindweed shoots was slower in treatments including quinclorac, applied at both high and low rates early in the season, however, this effect was no longer significant 9 WAT (Fig. 1).

Weed canopy cover was significantly different over time (p-value = 0.001) and by treatment (p-value <

Table 1. Description of the seven treatments applied in a highbush blueberry planting in Belchertown, MA, designed to evaluate the effects of quinclorac and a nitrification inhibitor on hedge bindweed control. All plots were mulched (on March 25th) and fertilized uniformly with ammonium sulfate (on July 2nd).

Treatment Name	Herbicide and Fertilizer Applications
NI + Quinclorac (high rate)	March 25: Flumioxazin + Quinclorac (high rate); May 10: Nitrification inhibitor; May 24: Quinclorac; June 7: Glufosinate
NI + Quinclorac (low rate)	March 25: Flumioxazin + Quinclorac (low rate); May 10: Nitrification inhibitor; May 24: Quinclorac; June 7: Glufosinate
Quinclorac (high rate)	March 25: Flumioxazin + Quinclorac (high rate); May 10: Quinclorac; May 24: Glufosinate
Quinclorac (low rate)	March 25: Flumioxazin + Quinclorac (low rate); May 10: Quinclorac; May 24: Glufosinate
Nitrification Inhibitor (NI)	March 25: Flumioxazin; May 10: Nitrification inhibitor; May 24: Glufosinate
Current Practice	March 25: Flumioxazin; May 24: Glufosinate
Mulch Only (Control)	No herbicide applied

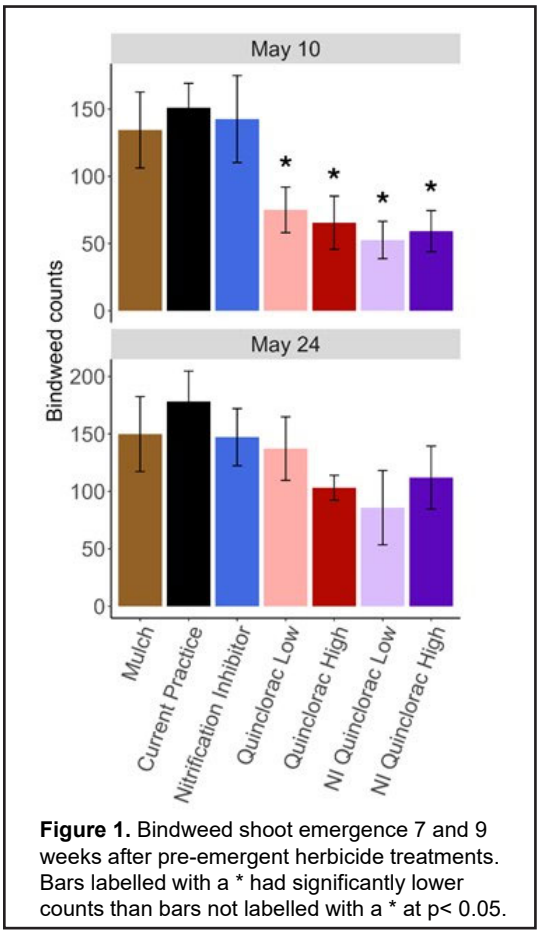

Figure 1. Bindweed shoot emergence 7 and 9 weeks after pre-emergent herbicide treatments. Bars labelled with a * had significantly lower counts than bars not labelled with a * at p< 0.05.

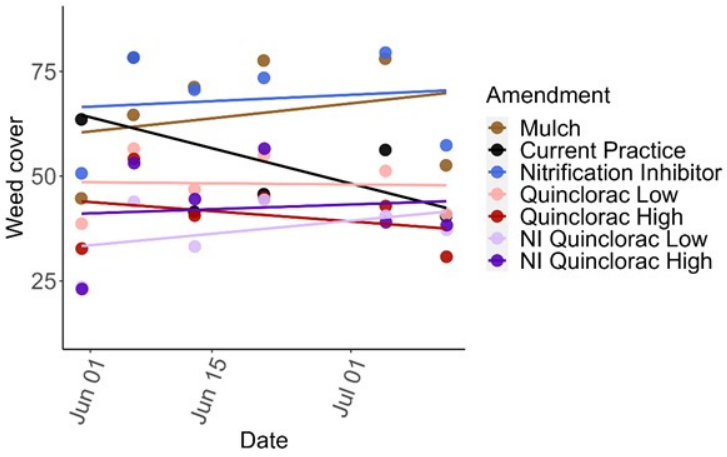

Figure 2. Weed canopy cover over time across 7 different herbicide and nutrient management treatments.

0.001), but not the interaction (p-value = 0.98) (Fig. 2).

The mulch only and nitrification inhibitor only treatments had higher weed canopy cover than all the treatments including quinclorac. However, average shoot height, bindweed biomass, and total weed biomass were not affected by treatments (Table 2),

Blueberry plant growth was similarly not affected by treatments, both yield and leaf tissue analysis were the same across all treatments (Table 3).

Discussion

Although pre-emergent treatments of quinclorac at first seemed promising for *C. sepium* weed control, effects of these treatments did not last long. Post-emergent applications of quinclorac did not lead to differences in bindweed control and all treatments resulted in unacceptable levels of control.

Despite disappointing levels of bindweed control, we hope to continue this experiment for another year. Systemic herbicides need to translocate through the plant to the site of action and are often slower to control weeds. According to the label, Quinstar 4L symptoms may not become evident for several weeks, up to 3-6 months. The pre-emergent application of quinclorac appeared more effective against bindweed growth than the post-emergent application because effects of treatment were only noticed during emergence and early in the growing season. Perhaps, since the infestation of bindweed was so extensive, multiple pre-emergent applications will be necessary before having a measurable effect on *C. sepium*.

Additionally, after looking at roots harvested from the no-quinclorac plots and the high-quinclorac plots, there are noticeable differences in root physiology (Fig. 3 and 4). Roots from the no-quinclorac plots had normal root hair development, but roots harvested from the high-quinclorac plots were lacking in root hair growth. This indicates that quinclorac is having an effect on *C. sepium* growth, even if it is not measurable aboveground within the first year of treatment. It would be interesting to see whether there is a delayed or cumulative effect over multiple years of treatment.

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Table 2. Mean *Calystegia sepium* growth metrics and total 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 any weed response variable.

Response variable	Average shoot height May 10th (cm)	Average shoot height May 24th (cm)	Bindweed biomass (g)	Total weed biomass (g)
P-value (F-statistic)	0.24 (1.42)	0.74 (0.58)	0.65 (0.69)	0.65 (0.71)
Mulch	16.4	90.3	12.0	22.1
Current Practice	17.0	89.6	7.9	14.3
Nitrification Inhibitor	15.2	72.0	17.2	27.1
Quinclorac low	13.2	82.6	9.8	14.6
Quinclorac high	11.3	72.7	6.2	19.7
NI and quinclorac low	14.2	74.2	8.2	23.6
NI and quinclorac high	11.2	73.4	17.0	27.5

Table 3. Mean blueberry fruit yield and leaf tissue nutrient level 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.

Response variable	P-value (F-statistic)	Mulch	Current Practice	Nitrification Inhibitor	Quinclorac low	Quinclorac high	NI and quinclorac low	NI and quinclorac high
Blueberry yield (g)	0.60 (0.78)	702	743	967	908	1,698	323	1,479
N (%)	0.41 (1.05)	1.9	1.9	2.0	2.0	2.1	1.9	2.1
Ca (%)	0.48 (0.95)	0.56	0.67	0.63	0.53	0.54	0.54	0.56
K (%)	0.76 (0.55)	0.45	0.47	0.49	0.50	0.53	0.48	0.51
Mg (%)	0.66 (0.69)	0.16	0.17	0.16	0.15	0.14	0.15	0.15
P (%)	0.11 (1.96)	0.12	0.12	0.13	0.13	0.15	0.13	0.15
Al (ppm)	0.26 (1.37)	64.3	70.8	78.3	67.0	52.9	47.0	49.9
B (ppm)	0.41 (1.05)	38.8	54.5	49.1	34.7	39.6	36.6	40.9
Cu (ppm)	0.34 (1.20)	3.6	3.8	3.3	3.0	2.9	2.8	3.2
Fe (ppm)	0.46 (0.98)	51.7	120.0	51	46.8	49.1	42.2	49.0
Mn (ppm)	0.93 (0.30)	166	175	168	185	155	121	135
Zn (ppm)	0.24 (1.42)	11.9	10.8	10.5	10.5	12.5	10.4	13.5

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Figure 3. *Calystegia sepium* root fragments excavated from plots without any quinclorac application.

Figure 4. *Calystegia sepium* root fragments excavated from plots sprayed with the high rate of quinclorac (12.6 oz/A Quinstar 4L).

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Valent conducted grower demonstration trials in NJ in 2021 & 2022 with numerous peach growers and replicated research trials at grower orchards in 2023 and 2024.

See our article on Accede Peach Grower Trials in 2021 and 2023 in New Jersey
http://www.horticulturalnews.org/103-2/HN4.pdf

and Accede 40 SG Peach Thinning Evaluation in New Jersey-2023
http://www.horticulturalnews.org/103-4/HN5.pdf

2024 Accede Peach Thinning Evaluation in North Jersey

In 2024 we repeated for the second year an Accede thinning trial on peach at Melick's Town Farm, Califon, NJ (Hunterdon County). The goal was to evaluate Accede on a number of peach varieties for efficacy, two years in a row on the same 4 cultivars. We know there are varietal differences in how Accede performs as a peach blossom thinner and wanted to test the consistency of responses with multiyear applications.

The experiment was set up with single tree replications in a completely randomized design. All treatments were applied with a Rears Nursery Cart Sprayer (Photo 1) with a handgun (Photo 2), at 100 PSI at 100 GPA. Treatments were applied full bloom, (Photo 3). Accede SG was used at 300 ppm (10 oz/100 gal) and tank mixed with Regulaid at 16 fl oz/100 gal.

Photo 1. Reers Nursery Cart Sprayer with Handgun.

The effects of the treatment can start to be seen one week after application (photo 4), but it really takes until pit hardening to determine the percent of fruit that was removed by the thinning treatment. Fruit size data was

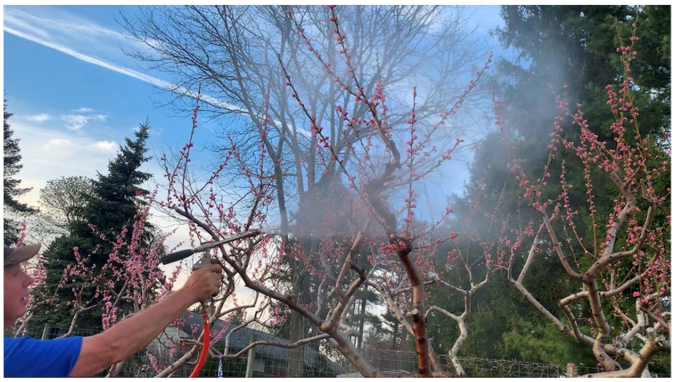

Photo 2. Handgun Application of Accede @ 100 psi.

Photo 3. Treatments applied at full bloom.

Photo 4. Hunterdon County, NJ - Peach fruit 11 days after treatment with Accede-brown sepals, % flowers/fruit aborting.

collected at first harvest from ½ bushel of peaches per tree per replication. Fifteen of these were selected for uniformity and weight and diameter data were collected (Photos 5,6,7).

Discussion

Accede SG Plant Growth Regulator worked well across the board on all 4 cultivars tested 2 years in a row with 53% average overall thinning in 2023 and 63% average overall thinning in 2024 (Fig. 1)`. The sensitivity of the four varieties to Accede was nearly the same for the two years, with Gloria exhibiting the most thinning while Victoria thinned the least. Hand thinning still needed to be done for touch up. In my mind Gloria over thinned with Accede in this experiment. Out target is 40- 60% thinning.

There was an average 4 % increase in diameter and 16 % increase in weight/mass for the 3 varieties, Gloria, Big George, and Victoria in 2024. In 2023, there was an average 6% increase in diameter and 17% increase in fruit mass for all 4 varieties. Results from both years illustrate the potential increase in fruit size that can be achieved by early thinning.

We used the low rate of Accede 4**0 SG** @ 300PPM and a higher rate of surfactant 0.125% v/v or 16 ounces/100 gal. The surfactant was Regulaid which is a NIS penetrating surfactant and therefore a bit more active. It has been my standard for use with PGR's for over 20 years.

Applications of any PGR and Accede should be done in early morning or evening to allow for slow drying. We have found that late afternoon or early evening is best with Accede. Even though our temperatures were warm on day of application, in 2023 no phototoxicity was observed.

Conclusion

Accede is a unique product filling a niche for a chemical PGR thinner for peaches. It assists with effective Crop Load Management. Of significance it allows for reduced hand thinning labor (up to 50%), the biggest cost of production in peaches. We also see increased fruit size and mass and therefore yield and greater $ return per acre (see Table 1).

Thank you to John Melick and Melick's Town Farm for hosting this research and providing valuable assistance in the trials as well as keen observations.

Photo 5. Data collected at Harvest, 15 peaches per tree, measured for diameter.

Photo 6. Data Collection at harvest, 15 peaches sampled per tree, weighed on scale.

Photo 7. Fruit harvested for data, ½ bushel per each single tree replication.

Table 1. 2024 Fruit Size %Diameter Increase and % Mass (weight increase).

2024Variety	% thinning	% Incr dia	% Incr mass
Gloria	81.1	7.3	23.2
Big George	54.3	2.4	11.3
Messina	66.5		
Victoria	50.0	4.8	14.2

Variety screen: New Jersey

- Cooperator: Win Cowgill / Consultant
- Location: Melicks Town Farm, Califon, NJ
- Handgun, 100 GPA
- 4 Varieties
- Treatments:
  - UTC
  - ACCEDE 300 ppm + Regulaid 1 pt/100
- General results: Overall % thinning
  - 2023: 53%
  - 2024: 63%

Melick	% Thinning	
Variety	2023	2024
Gloria	73.2	81.1
Big George	62.9	54.3
Messina	42.2	66.5
Victoria	32.3	50.0
AVG	52.6	63.0

Melick	% Thinning Rank	
Variety	2023	2024
Gloria	1.0	1.0
Big George	2.0	3.0
Messina	3.0	2.0
Victoria	4.0	4.0

Date	Tmin	Tave	Tmax	RHavg	Precip
2023-04-07	39	49	54	34	0
2023-04-08	33	41	50	42	0
2023-04-09	34	44	56	50	0
2023-04-10	35	49	62	51	0
2023-04-11	43	58	70	36	0
2023-04-12	60	69	80	35	0
2023-04-13	59	72	84	40	0
2023-04-14	61	74	87	35	0
2023-04-15	58	63	70	88	0.98
2023-04-16	54	61	69	89	0
2023-04-17	50	56	62	69	0.18
2023-04-18	41	46	51	51	0
2023-04-19	37	49	62	49	0
2023-04-20	43	55	70	53	0
2023-04-21	47	57	71	70	0

Date	Tmin	Tavg	Tmax	Rhave	Precip
2024-04-10	50	57	64	76	0
2024-04-11	49	56	67	93	0.76
2024-04-12	50	57	60	82	1.56
2024-04-13	42	46	51	65	0
2024-04-14	41	55	70	58	0.2
2024-04-15	54	63	72	62	0
2024-04-16	47	57	68	45	0
2024-04-17	47	52	61	68	0.006
2024-04-18	42	46	49	89	0.01
2024-04-19	40	48	56	78	0
2024-04-20	41	53	62	64	0.04
2024-04-21	35	42	48	51	0
2024-04-22	35	46	58	48	0
2024-04-23	36	51	63	53	0
2024-04-24	45	54	66	56	0

Figure 1. NJ Variety Screen Data for 2023-2024 Mellick's Town Farm, Califon. NJ.

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Apple Chemical Precision Thinning Research Update - New Jersey 2023-2024

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

Precision apple crop load management is the most important task fruit growers do each season, being critical for enhancing fruit size the current season and ensuring return bloom the following year.

In 2023 and 2024 we chemical thinned two orchard blocks using Plant Growth Regulators (PGR's) to obtain cropping consistency from year to year using the fruitlet growth rate model and other horticultural practices as follows:

- First, we determined the ideal crop load per tree to achieve target yield per acre.
- We use precision dormant pruning to adjust the fruit bud density to a predetermined number.

Photo 1. 2024 Gala fruit cluster at petal fall flagged for measuring at Sun High Orchards Gala Thinning Experiment. Photo Credit: Win Cowgill

- We use the nibble approach to best utilize plant growth regulators (PGRs) to adjust crop load at bloom, petal fall and 10-15 MM, and again at 15-20 MM if needed.
- We use on site or local NEWA weather stations that utilizes the data via the Cornell Carbohydrate model to predict fruit set.

Photo 2. 2024 Gala whole tree view with 14 clusters selected for measuring at Sun High Orchards Gala Thinning Experiment. Photo Credit: Win Cowgill,

- We measure fruitlets in 14 clusters on each of 5 trees per variety periodically to determine efficacy of the PGR applications and the need for additional applications and rates (photos 1 and 2).

We have been honing this process for 15 years now. Our work using precision thinning with multiple cultivars over this time frame indicates the methodology of measuring fruit size/growth rate to determent chemical thinning treatments is highly reliable! The most important reason to measure fruit yourself is that you then

Photo 3. Overview of trees in 2024 Sun High Orchards Gala Thinning Experiment Overview. Photo Credit: Win Cowgill

know in real time what trees are doing and can make informed decisions.

For everything you need to know about Precision Apple Cropload Management see https://pacman.extension.org

2024 Precision Thinning Trial at Sun High Orchards, Randolph, NJ

Methods

Gala cv. Buckeye - 7th leaf tall spindle apples spaced 3' x 12' (photo 3).

Target apples per tree determined to be 80 fruit per tree. Nibble approach to chemical fruit thinning included:

- May 3 - Bloom – AMS 1 Lb./100 gal + NAA 4 ounces/A in 100 Gallons +Regulaid 16 oz/100 gal @ 100 GPA TRV dilute
- May 7 - Petal Fall (4.3MM)–Benzyladenine (BA) as Exilis @ 75PPM /Acre in 100 + Sevin XLR @2 pint (32oz)/100 gal + Regulaid 16 oz/100 gal @ 100 GPA TRV dilute-
- May 22 - 10MM spray – Benzyladenine (BA) as Exilis @ 75PPM /Acre in 100 +Sevin XLR @2 pint (32oz)/100 gal @ 100 GPA TRV dilute

Used the NEWA Cornell Apple Carbohydrate Thinning model to determine 10MM rates.

Measured Fruit on May 7, May 12, May 22, May 27, and June 9. Fruitlet measurements entered in the Ferri Fruit Growth app predicting fruit set (Table 1).

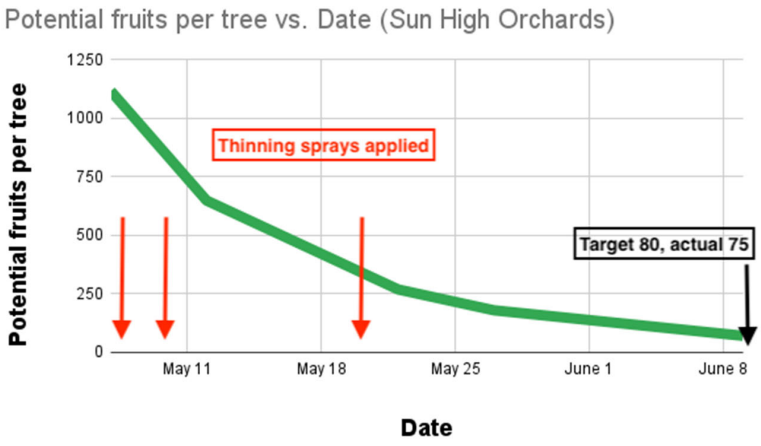

Figure 1. 2024 Sun High Predicted Fruit Set.

Table 1. 2024 Sun High Predicted Fruit Set.

Date	Potential number apples set	Percent set*
May 7	1,117	
May 12	649	58
May 22	269	23
May 27	181	14
June 9	71	10

*Target is typically 10%

2024 Conclusion Sun High Orchards Trial

Sun High Orchards Thinning Trial - 2024 worked as predicted with nibble approach and Cornell Carb Model. 71 fruit predicted to set on June 9, 75 actual fruit count per tree on June 12, 2024 so very close to target of 80 per tree (Figure 1).

2023 Precision Thinning Trial Wightman Farms - Morristown, NJ

Methods

Goldrush – 7th leaf tall spindle apples spaced 3' x 12'(Photo 4).

Photo 4. 2023- Goldrush whole tree view with 14 clusters selected for measuring at Wightman Farms Thinning Experiment.
Photo Credit: Win Cowgill

Photo 5. 2023- Goldrush fruit cluster at petal fall flagged for measuring at Wightman Farms Thinning Experiment.
Photo Credit: Win Cowgill

Target apples per tree determined to be 80.

Nibble approach used NEWA Cornell Apple Carbohydrate Thinning model.

- April 21, bloom - 4 ounces NAA/acre in 80 gallons H2O @ 100 GPA TRV dilute
- May 1, petal fall - NAA @ 3 ounces/acre + 1.5 pints Sevin XLR in 80 GPA @100 GPA TRV dilute - (high carbohydrate surplus)
- May 17- 10 mm Maxcel @ 64 ounces + 1.5 pints Sevin XLR in 67 GPA @ 100 GPA TRV (high carbohydrate surplus, 150)
- May 27 – 18 mm - Accede SG @13.4 ounces (400PPM) +2 pints Sevin XLR @75 GPA + 8 ounces Regulaid @ 100 GPA TRV

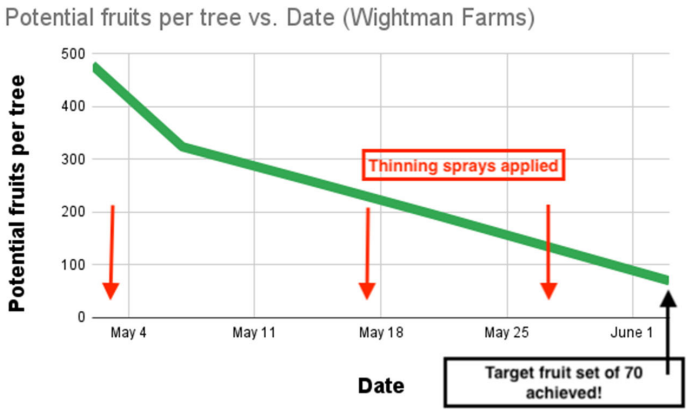

Figure 2. 2023 Wightman Farm Predicted Fruit Set.

Table 2. 2023 Wightman Farms Predicted Fruit Set.

Date	Potential number apples set	Percent set*
May 2	479	
May 7	324	82
May 14	260	66
May 21	195	41
June 3	70	12

*Target is typically 10%

Measured fruits on May 2, 7, 14, 21, and June 3. Fruitlet measurements entered in the Ferri Fruit Growth app predicting fruit set (Table 2, Photo 5).

2023 Discussion Wightman Farms

Every year in the chemical thinning world is different. It turned out to be a difficult thinning year for apples. Normally the nibble approach with three applications, Bloom, BF, 10MM gets the fruit off. This year in North Jersey and Wightman Farms the three Bloom, PF and 10 MM treatments did not take adequate fruit off our

Goldrush trial. In fact the rest of the orchard was way overset as well. We were still estimated to have 260 fruit per tree on the May 21st measurement with a target of 80 fruits per tree. Our newest PGR, Accede SG from Valent saved the day.

2023 Conclusion Wightman Farm Trial

Accede SG was applied at the high rate of 13.4 ounces (400PPM) +2 pints Sevin XLR @75 GPA + 8 ounces Regulaid @ 100 GPA TRV. It performed excellent; fruit load was estimated to be reduced to 70 fruits per tree in 2023. **Note:** In addition, return bloom was evaluated the following spring on May 7, 2024 and averaged 181 clusters per tree on the 5 treated trees from 2023, just about perfect, Figure 2.

Thank you to Adam Costello, Wightman Farms and Phil Green, Sun High Orchards for their support in conducting this important research on their farms.

Propagating Grapes and Other Small Fruits for Fun and Profit: Currants, Gooseberries and Jostaberries

J. Stephen Casscles
Cedar Cliff Vineyards and Nursery

In the Northeast, there is increasing interest by commercial and hobby growers to cultivate rare heritage and other cool climate hybrid grapes and other small fruits, such as currants, gooseberries, or jostaberries. This is because such fruits are: of historical interest; cold-hardy, productive, & fungus disease resistant; can be grown in a more 'sustainable' manner; and produce unique fruits that make wine or juices that possess wild and fun flavor profiles and colors. There is a growing demand for these varieties, especially by craft beer and cider makers who use such fruits in their co-fermented products.

Many of these heritage small fruits and grapes can 'roll with the punches' and accept the punishment that comes with our changing climate. With climate change, we are experiencing more frequent and catastrophic hurricanes, floods, mid-winter heat waves, and ice storms, that bring with them more violent weather patterns, rain, hotter and wider swings in temperatures, and more variable spring and fall frost dates.

There are many scores of suitable heritage grape and other small fruit varieties that can be propagated to provide our local fruit growers with the tools needed to combat these more violent weather patterns. Unfortunately, many of these heritage varieties are not readily made available by commercial nurseries, so the grower needs to secure their own source of cuttings and propagate them on their own.

This article outlines how to propagate grape cuttings. While this article concentrates on heritage and other cool climate grape varieties, the same principles in propagation apply to other small fruits such as currants, gooseberries, or jostaberries. This article outlines propagating techniques that are not labor or capital intensive for those growers who want to propagate their own plant material.

There are more labor- and capital-intensive ways to propagate woody fruit plants during the long winter months in heated greenhouses. This subject may be covered by a later article that details how to propagate woody plants in less time in a heated greenhouse, so that such cuttings can be set out in just a few months.

While information on propagation techniques can be found on the internet, I find that referring to books written by authoritative horticulturalists provides easy access to accurate and practical information. Two great books include, *A Wine-Grower's Guide* by Philip M. Wagner (Alfred A. Knopf, 1985) and *Manual of American Grape Growing,* by Ulysses P. Hedrick, (The Macmillan Company, 1919). While out of print, both are available on-line. These are terrific reference books that should be part of any horticultural library because they are written in a manner that is easy for a grower to understand. Also, I refer to *Success with Small Fruits,* by E.P. Roe, (Dodd, Mead, & Company, 1881), which while it does not cover grapes *per se,* has very good sections on how to propagate currants, gooseberries, and raspberries which is similar to how to propagate grapes. It has a section on propagating cuttings in the "South", so I wanted to share this with my friends south of the Mason-Dixon Line.

How do you gather cuttings for propagation? When selecting cane wood, use only first year wood, and if possible, the joint that is at the juncture of second year wood to increase rooting capacity. Ideally, start

to gather your wood just after Christmas, when the canes are dormant. Gathering cuttings in late January to March is fine, but the collector runs the risk of collecting winter damaged cuttings. This is because with our changing climate, our winters are on average warmer, but accented by polar vortex artic blasts and other fridged weather events. These occurrences of alternatively seasonally very warm and then severely cold winter temperatures accompanied by high winds can damage propagating wood. Hence, I now collect most of my propagating wood as early in the winter as possible. Cuttings can be gathered as late as March or April before the sap starts to run. Limited amounts of propagating wood of rare heritage varieties are available from the USDA Germplasm Repository at Geneva, NY and U.C. Davis, CA.

Before propagating wood is collected, the propagator should evaluate the overall health of the vine throughout the previous growing season from which the propagating wood is to be collected. First, mark those vines you plan to collect propagating wood from. Be absolutely sure that the intended vine to be used is in fact the correct variety that you hope to propagate. What is critically important, notice how the vine grows throughout the year before propagating wood is collected. Select only vines that are strong and healthy, which have NO evidence of any systemic virus or disease.

If a vine has discolored leaves of red, purple, maroon, yellow, or red/green/yellow veins, that vine most probably has a systemic virus or disease. If the leaves are curled, it has leaf roll disease. If the vine produces noticeably fewer grapes than it should, it may be diseased. If any of these three conditions exist, do not propagate from that diseased vine because that will spread diseased plant material. Further, to maintain the health of the vineyard, remove the diseased vine from that vineyard to stop the spread of such virus or disease. For more information on how to identify systemic grape vine diseases or viruses, check with your local or state Cooperative Extension Service or website. See https://ag.umass.edu/umass-extension-your-community, https://njaes.rutgers.edu/extension/ .

The most suitable cuttings for propagation are pencil size in width, or a little wider, with the space between the nodes (i.e., buds) close to average for the variety in question. Do not collect "bull canes" which are big and thick, with long-running canes. With bull canes, the distance between the nodes is very-long as they grew very rapidly, are less developed, and less hardy; hence, their success rate in the nursery is far less than those canes of average size. After selecting the right sized cane, prune them to have five to six buds on each cutting. The sticks should be about 10 to 14 inches long. To identify which end goes "up" when planting them in your nursery, leave about one inch of the cane above the top bud and cut the "bottom" of the cutting at an angle close to the base bud so that you know that is the part of the cutting that should go down into the ground. If the cutting is planted upside down, it will not live. Since I prepare thousands of cuttings each year, it is a system that works.

If you gather your propagating wood in the early spring, they can be placed directly in your nursery bed. However, if cuttings are gathered during the winter months, you will need to properly store these cut-

A closer look at what the grape cuttings look like after one year in the nursery. Note that roots often come from the bud sites that are placed under ground.

What the cuttings placed in the nursey in the spring of 2023 looked like in the spring of 2024 when dug up.

A new grape nursery established in the spring that will produce viable vines for placement in the vineyard the following spring.

tings until the spring, when they can then be laid out in the nursery. Since it is too early to set out your cuttings in winter, to preserve them, they need to be placed in a consistently cool (34-40 degrees Fahrenheit) environment that is damp/moist, but not wet. This will keep your cuttings dormant and create an environment so that the ends can callus, which increases the success rate of your cuttings.

Some may have refrigerators to keep bundles cool and moist (never a freezer). For those who have access to a refrigerator, wrap the cutting bundles in a plastic bag, and add paper towels that are moist/slightly wet so that your cuttings stay damp while in storage -- never wet. The plastic bag should be wrapped tightly so that the moisture does not escape over time. Monitor your cuttings throughout the winter to make sure that they remain damp, not wet, and do not develop any mold/fungus that can damage your cuttings. Never store your cuttings with fruit, the ethylene generated can damage the buds.

For propagators who have a vegetable garden, dig a hole that is about 2 feet deep and lay the tied bundle or bundles of sticks in the hole horizontally. Then, cover the hole with soil and heap more soil over the cuttings. This way, the cuttings are in a moist environment that is cool, but not freezing, so that they remain dormant. Mark the site where you buried the cuttings so that you can find them in the Spring.

The question arises 'how many cuttings do I need' ? It is important to collect and set-out more cuttings than you need to compensate for some not surviving. As Joel Fry of the Bartram's Garden in Philadelphia used to say to me "plant two of everything, one will die". How many cuttings to collect and plant is the question. Different grape cultivars successfully propagate at different rates. For example, Baco Noir, which is a part *riparia* variety, tends to have a high success rate because of its *riparia* heritage. Even with *riparias,* plan for a 20 percent non-success rate. For varieties such as Delaware, which is a *bourquiniana* hybrid, they do not root as readily; so expect only a 60 percent survival rate. I recommend propagating as many cuttings as possible to satisfy your anticipated needs and sell or give away the remaining vines.

The ideal time to set out your nursery is early spring when the ground can be easily worked. In preparing your nursery ground, prepare it the same way you would a vegetable garden. Ideally, use ground that has been cultivated before so that there are no sod clumps and the ground can be easily worked up to be loose and friable.

In setting out your cuttings, think of it as if you are planting a vegetable garden. Which means clearly label each row. For safety, prepare a map to record where varieties were planted and keep notes on when they were planted and pulled up. Cuttings should be placed in rows that are at least ten to twelve inches apart. The space between each cutting in the row should be about two and one-half to three inches. To do this, dig a trench, lay your cuttings out and fill in the trench and pat down the soil so that it is snug. Since each cutting has five to six buds, put the cutting -- in the right direction -- with four buds below the ground and two buds above. Generally, place four buds completely under

A collection of 19 bundles of cuttings that can produce up to 900 vines for the next growing season.

Sets of sorted and bundled grape cuttings ready for winter storage.

A hole dug in a vegetable garden in the early winter to place grape cuttings for winter storage and placement in the nursery the following spring.

the ground, with the two top buds -- one way above the soil line and the other bud at the soil-line but exposed to the sunlight.

The challenge in establishing viable grape cutting/vines is to get them to root, so having far more buds below ground increases your success rate. As far as using a rooting hormone, some swear by it. I tend to be more holistic about my growing practices, so I do not use it. Rooting hormones can easily be found in gardening catalogs such as A. M. Leonard's or your local garden center or nursery.

The rows in your nursery should be about as long as you would have them for any vegetable garden row of peas, carrots, or lettuce. I place my nursery in a fenced vegetable garden to keep out rabbits, woodchucks, and deer. They all love the nice tender shoots of grape cuttings. A few browsing episodes by these animals, will doom your nursery. A wildlife proof fence is very important.

Once your nursery is set out, treat it like you would any other sensitive vegetable crop. I spread out well-rotted compost, mulch, or degraded bark in the rows and in between each cutting to minimize weed growth and retain soil moisture. With that said, still weed your nursery often to keep out weeds. I weed in the evening when it is cool, with a hearty glass of wine to remined me why we toil for new young grape vines. To help your cuttings along, water the nursery at least once every week with a long soak. This is especially important to do during the hot and dry summer months.

As the summer progresses, from the buds that are above ground, small leaves and then shoots will appear and grow. Each bud does not bring forth a single leaf, but a small tender cane with a series of leaves. Some varieties are vigorous, have long canes with many leaves, and root easily such as *riparia* varieties Baco Noir or Bacchus or *labrusca* varieties such as Concord or Jefferson. Other varieties such as Delaware, which are an *aestivalis* or *var. aestivalis/bourquiniana* variety, are harder to root because of their genetic make-up. Each variety will root at its own success rate. As the small canes grow, some varieties will throw out flower clusters. When this occurs, pick off those flowers as their formation will draw energy away from the cutting that is simultaneously trying to push out roots and leaves to become self-sustaining.

In the Fall, as the mother vine will do, these young plants will harden off. For planning purposes, count the number of strong vines in the nursery. Ascertaining the number of young vines will help you to plan the layout of your vineyard in the Spring. The following Spring, young vines should be ready to be dug up and laid out in your vineyard. See the books mentioned earlier for tips on how to trim and prepare your new plants to be set out on the farm or offered for sale. Some of your young vines may still be pretty-tender and weak. For these young vines, you may wish to keep them in the nursery for another year so that they can get stronger before they are set out in the vineyard.

Growing your own vines or other fruit plants from cuttings is a rewarding venture both financially and for a sense of personal accomplishment. With the adverse effects of climate change being documented on our fruit farms in the Northeast and the increased number of adverse weather events plaguing our growers; one answer to securing a consistent and economically sustainable fruit crop may lie in the past -- with heritage grape varieties, older cool climate hybrids, and new hybrids that are now being developed. Growing such hardy fruits that have been adapted to survive many weather-related challenges over time could be crucial to the future viability of our fruit farms, wineries, breweries, and cideries.

J. Stephen Casscles, Esq. operates Cedar Cliff Vineyards and Nursery in Athens, NY, helps to make wine at Dear Native Grapes Winery in Walton, NY, and is author of the books *Grapes of the Hudson Valley and Other Cool Climate Regions of the United States and Canada: 2nd Ed., Revised & Updated to Include New England Grapes* and *The Wine Grapes of Chungcheongbuk-do, Korea.*

New Jersey News

Reinhard Sorge Passed on February 26, 2025

Reinhard Maria Francis (Butch) Sorge, age 78, passed away February 26, 2025, at home in Bloomsbury, NJ. He was born on January 22, 1947 in Manhattan, a son of the late Reinhard and Gertrude Fatzer Sorge.

Butch is survived by Katherine Ballantyne, his loving wife of 30 years; his daughters Jessica and Rebecca Sorge; his sons Reinhard E. Sorge (wife Kelly) and Richard Hanley (wife Bronwyn) and their mother, Peggy Sorge; and many loved and loving grandchildren and nieces and nephews.

He was a graduate of Ridge High School in Basking Ridge, NJ and Rutgers Cook College. He was a lover of agriculture – he grew up on a farm in Basking Ridge and later raised peaches and apples on his own farm in Pittstown, NJ.

After selling that farm, he became farm supervisor at Snyder Research Farm in Pittstown and then opened The Fence Company, installing countless horse fences and deer fences in Hunterdon County and northern NJ.

Never one to sit still for long, in semi-retirement he worked for his dear friends at Peterson Farm in Quakertown, NJ.

With an insatiable need to be of service, Butch was the first to offer to do for others wherever he saw a need. As his health declined, neighbors, friends and family he had helped over the years generously and tirelessly supported him and his family to the end.

Contributions in his memory may be made to www.pollinator.org or Hunterdon Hospice, 2100 Wescott Drive, Flemington, NJ 08822.

Pruning Meeting and PGR Demonstrations Held at Sunhigh Orchards, Randolph, NJ

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

Win Enterprises International, LLC with Rutgers Cooperative Extension sponsored our annual winter pruning meeting at Sun High Orchards on January 27, 2025. Phil Green owner of Sun High Orchards hosted the group of 28 growers (photo 2). Our outstanding guest speaker, Bill Pitts (Photo 1) of Bill Pitts Consulting and Breeder/Horticulturalist for MAIA, did an outstanding teaching pruning tall spindle trees for the 5th year in a row. Bill spent 40 years as the nurseryman at Wafler Nursery in Wolcot, NY and has been instrumental in bringing the new MAIA verities to market and encouraging grower adoption (Photo 3).
Sun High - has been our perfect MAIA cultivar teaching orchard as we have all the new cultivars ranging in age from 1-6 years, perfect for observation of pruning differences.

Photo 1. Bill Pitts teaching pruning at Sun High Orchards. Photo credit: Win Cowgill.

Photo 2. Sun High Orchards- Crowd at 2025 Pruning Meeting. Photo credit: Win Cowgill.

Trevor Hardy Brookdale Farm Supply Hollis, NH demonstrated advanced orchard tillage equipment and new imported steel trellis posts.

Cowgill demonstrated peach pruning and then we moved inside for lunch and a short program.

Rick Kleveze, Growmark FS gave a product update and sponsored lunch at our indoor portion (Photo 4)

Our featured indoor speaker was our Katlin Quinn, north Jersey IPM Program Associate (Photo 4). Her topic was ***Controlling Ambrosia Beetle and Bitter Rot of Apple.***

Photo 3. Ludacrisp apple 5th leaf on G.11 before pruning. Photo Credit: Win Cowgill

Photo 4. Katlin Quin, North Jersey IPM Program Associate, Rutgers Cooperative Extension, discusses controlling Ambrosia Beetle/Black Stem Borer control in apple during lunch provided by Growmark, FS- Rick Klevze- Photo credit: Win Cowgill.

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