Country Folks
GROWER
The one publication for all aspects of commercial horticulture
June 2023 Volume 32 Number 6 EAST

Helping people grow

In this issue—

The next generation shares best practices

(L - R) Panelists Dale and Paige Wickham, Audrey Allen, Sarah Henning, Allie Huber and Marcella Hawk talked about what's working for them as they work to establish their presence on their operations.

Photo by Courtney Llewellyn

by Courtney Llewellyn

The American Farm Bureau Federation says that "young" farmers and ranchers are those age 35 and under. Just because they have less years on this planet doesn't mean they don't have wisdom to share.

At this year's NAFDMA Convention in Austin, Texas, an under-35 panel from three different agritourism enterprises shared where they've struggled, where they've succeeded and what others in agriculture can learn from they're experiencing right now.

Representing Wickham Farms in Penfield, NY, were siblings Dale and Paige. Dale is in his first year as a farm owner, and Paige is in charge of the farm's donut operation. Sisters Audrey Allen and Sarah Henning were from Long Acre Farms in Macedon, NY; Audrey focuses on winemaking, managing the corn maze and events while Sarah became a partner five years ago. She handles the bookkeeping and special events. From Huber Family Farm and Orchard & Winery in Starlight, IN, were sisters Allie Huber (director of private events) and Marcella Hawk (who's been full-time for 11 years).

The six young farmers first shared what they believe they do well and what they struggle with. Generally, they think they handle special events well and grow and market exceptional produce (and in the case of vineyards, exceptional wines and spirits).

The Huber team said they think they handle communication well on their operation, but it can be a struggle at Wickham and Long Acre. Like many (if not most) farmers, all of them said finding a work/life balance is difficult as well. The Long Acre team also noticed a different work ethic between the different generations – the older folks believe in the grind no matter what; the younger folks understand the importance of strategic time off.

No matter the age of the owners, finding solid employees is a struggle, as is the ever-changing market, both for produce and for tourist attractions. Without an outline, succession planning can be tough too.

"Strategic planning is one of the most fun things we do on our farm," Dale said. "We're very candid about our revenues and expenses." Wickham Farms focuses on both creative and financial planning during the winter months – and they make sure to get staff feedback while doing so.

The Long Acre sisters said strategic planning is a "team process" for them as well. Wresting this part of the business from their parents is a challenge for Allie and Marcella, however. They're still making the big decisions at Huber Farms.

"The biggest strategic investment you can make is to travel, see other farms and attend events like NAFDMA" for inspiration, Dale said.

And as for the planning issues at Huber Farms, Allie said, "Hound that older generation relentlessly to make those tech advances or other upgrades. They can be little things to streamline things. Just let the old system fail once and see what happens."

Bridging the gap in regard to work ethic, Allie said she had to explain that she's a better version of herself when she has one day off a week – but it's situational. If she needs to work, she'll be there.

Division of duties can help here. "Look at your job, figure out what makes you happy and try only working that new schedule for three months," Sarah suggested. "Nothing is permanent. Have that older generation give it a shot too."

"We all overstate our own importance," Dale added. "We have to learn to let go."

Audrey noted that while delegating jobs can be tricky, it can be a very positive thing. She said the key is to have some faith in your employees. Allie added that it can be hard to collect your thoughts in a structured order to give whole areas to someone else, but it does help connect different generations and commit to some standards as you do. "Remember than done is better than perfect," she said.

Sarah said it's an ongoing conversation to figure out how to keep those good employees year-round. Paige at Wickham Farms said she and others are salaried year-round, and the pay balances out between the busiest part of the season and downtime during winter.

There seems to be a bigger focus on "company culture" with younger generations. "I love going to work," Dale said. "It's a fun business we're in – and we need to make it fun for our people." All three operations show their employees appreciation with food and recognition.

Marcella added that there's always room for improvement, though. They work with their HR for better employee engagement. For example, they use a wellness app which offers both competition and prizes for those who use it.

Dale boiled down one of the biggest differences between the generations. "With older generations, you tend to understand why each person is there. For younger seasonal workers, you need a boss they can connect with. It isn't about rank – but you need to be competent and confident."

"Older workers ask why we're doing something; younger workers tend to ask how," Paige added. "And if someone isn't doing their job properly, that's a reflection on me not preparing them correctly."

The panel circled back to drive home the fact that clear and open communication is critical. "You grow from those tough conversations," Marcella said.

Eastern Broccoli Project partnership leads to promising variety

by Erin Rodger, Cornell AgriTech

The Cornell-led Eastern Broccoli Project, which built a broccoli industry on the East Coast worth an estimated $120 million over the last 13 years, has produced a promising new broccoli variety in partnership with Bejo Seeds, a Geneva, NY-based seed company.

The new broccoli variety, now undergoing commercial trials, is believed to produce good, high-quality yields – even under the stress of hot East Coast summers.

"There are many forces at work that underscore the need for East Coast-specific broccoli varieties," said Thomas Björkman, professor of horticulture at Cornell AgriTech and director of the Eastern Broccoli Project. "As a result of climate change, West Coast growers are faced with water shortages and rising temperatures, which can cause the head of broccoli to become distorted and unmarketable. Diversifying the production area is important for maintaining food security."

Improving broccoli's adaptation to warm night temperatures in East Coast summers was among Björkman's priorities in the project. Unadapted varieties made distorted heads that were unmarketable. To succeed on the East Coast – where the rising consumption and value of broccoli along with overall consumer interest for locally grown food continues to spark growers' interest – broccoli needed to be developed for East Coast conditions. Despite global efforts to breed warm-season broccoli, until now little progress had been made.

Björkman found a route for a breakthrough by leveraging his past research on broccoli development, evaluating opportunities and seeking out a transdisciplinary team.

He enlisted the help of Phillip Griffiths, associate professor of horticulture at Cornell AgriTech, to develop a breeding strategy. Because of the complexity of genes that would be needed to produce a successful East Coast variety, Griffiths and Björkman teamed up with Bejo Seeds. To further expand access to advanced broccoli genetic material, Griffiths also worked with Mark Farnham, research leader at the USDA Vegetable Laboratory in Charleston, SC.

"Public-private partnerships add value to vegetable breeding because they provide access to endless trait possibilities," said Griffiths, also a fellow in the Cornell Atkinson Center for Sustainability.

The exchange of genetic material, under Material Transfer Agreements, and the development of test

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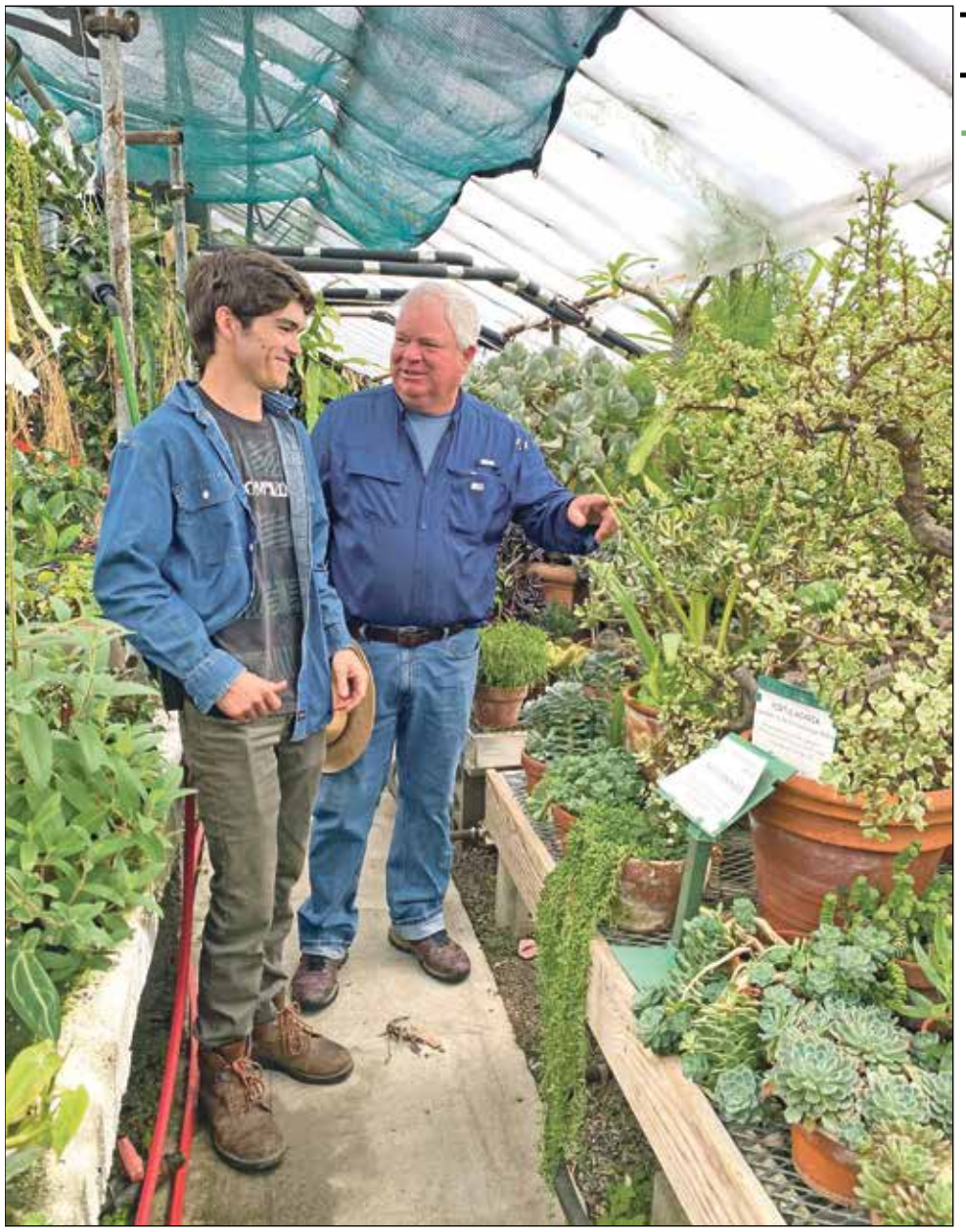

Rick and his son Max in the stock house.

Photo courtesy of Peckham's Greenhouse

Helping people grow

by Sally Colby

Many New England farms have seen major changes from one generation to the next, including Peckham's Greenhouse in Little Compton, RI. Although the Peckham family began farming in 1866 with fruits, vegetables, flowers and dairy, over the years the family transitioned to growing plants.

Fifth generation owners Rick and Laura Peckham expanded the greenhouse and garden center business, and today, their daughter Carley is the sixth generation working the family business.

"I've always loved plants and have been working here since I was a little girl," said Carley. "When I moved out west and worked at a greenhouse there, I realized that's where I wanted to be, but with my family."

As manager of the indoor section at Peckham's Greenhouse, Carley oversees tropicals and other houseplants along with a wide variety of garden supplies.

"There are a lot of colleges in the area, and many college students are interested in houseplants," said Carley. "It's fueling the whole indoor gardening movement. Not everyone has an outdoor space to garden, so it's a fun experience for people to have a green thumb."

Peckham's maintains a selection of houseplants with plenty of variety to suit every customer. Not long ago, hoya was everybody's favorite houseplant, and now, indoor plants such as rare philodendrons and anthurium are popular. "We have a hard time keeping up with stocking the more rare plants," Carley said. "They can be hard to grow, but we try to keep them in stock."

Peckham's maintains 17 greenhouses, about half of which are used for growing; the rest are dedicated to retail. "We also have a large tree and shrub area," said Carley.

The season begins with a variety of flower and vegetable starts. "People love vegetable gardening right now," said Carley. "A large section of a greenhouse has herbs and vegetables. We seed and grow almost all of those ourselves, and seed most of our annuals. We grow 4.5-inch pots of annuals and grow perennials from plugs."

Herbs and vegetables are sold in four-packs, 3.5-inch square pots and sometimes large pots. Peckham's also maintains a selection of herbs for cooks, collectors and homeowners who want to get started with them.

Social media has helped people become aware of what's available for gardening. "Maybe people knew of a garden center and went there or saw something in a magazine or a book," said Carley. "Now we can look at whatever we want on the internet – it's hard not to get excited about that."

Carley has found that customers appreciate purchasing plants from a greenhouse where the owners are overseeing plants from start to finish. "We spend a lot of time making sure plants are healthy," she said. "Our retail workers spend most of their day cleaning plants and separating them if something looks unwell. We play close attention to all of our plants."

The garden center includes a selection of outdoor planted pots that provide ideas. "Our crew is very creative," said Carley. "We always have containers of annual mixes for sale, but people can look at them and think about how to use different plants."

Peckham's also offers custom potting for customers who prefer to pick up pots that are already planted. Selections include everything from plants that prefer full sun to shade mixes, as well as mixed houseplant containers. One of the greenhouses is dedicated to maintaining mother plants for cuttings.

The majority of Peckham's customers are from Rhode Island and Massachusetts, and many are discovering a large uptick in deer that eat plants they haven't bothered in the past. The garden center stocks a variety of all-natural animal repellants in both spray and granular form to keep wildlife from ruining gardens. Staff can also recommend plants that don't attract wildlife.

Carley said for those who grow plants Indoors, the main issues are with spider mites and mealybugs. In summer, when people are growing outside, aphids and powdery mildew are the challenges. Carley and her staff advise early treatment to stop problems before they grow out of control.

To keep plant health at its best, greenhouses are equipped with automated windows that operate with temperature sensors. The business has also transitioned to a POS system. "We can track all of our inventory with it," said Carley. "It's so important for us to know what did well and what to grow next year. Keeping track of current inventory has been a game-changer for us, and it's a great tool that helps us be better growers."

Over the years, Carley's family continues to see more young people who are interested

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crosses between Cornell and Bejo genetics allowed breeders of both programs to evaluate the combining abilities of each breeding line and select those lines that made valuable contributions to vigor and stress tolerance.

The partnership has led to a broccoli variety that is a combination of environmental resistance traits and quality.

"We found this exchange of broccoli genetics among the two different programs useful, and we all benefited from the exchanges and discussions about breeding directions and philosophies," said Mark Overduin, CEO of Bejo.

Bejo, Griffiths and Björkman are relying on growers to help maximize commercial trial results this year. Growers are currently able to trial the variety in their own fields by calling Bejo for seeds.

"We are ready to test the best hybrid to come out of this collaboration on a larger scale," said Jan van der Heide, Bejo's Northeast market manager. "This experimental status allows us to distribute larger quantities of seed to many growers to give us more information on the adaptability and fit in commercial markets through feedback from many growers in many different microclimates."

The variety will receive a commercial status and a fitting name once adaptability and commercial fit are confirmed.

"We already know that this variety can take the stresses of a New York State summer and produce high-quality broccoli with good yields," van der Heide said. "Maturity will be a few days later than Eastern Crown, another commercial variety, and will be suitable for crown cuts and bunching."

Bejo USA President Mark Overduin and professor Thomas Björkman.

Photo provided

What has shifted in ag consumer engagement

by Courtney Llewellyn

About 10 years ago, farmers started to feel this pressure, this need to pay attention and be involved in consumer engagement. "It's a weird thing that we agreed consumer engagement is a thing we needed to focus on," said Janice Person of Grounded and Rising, a community and training platform focused on bridging the rural/urban divide.

She presented "Consumer Engagement – A Decade In, What's Shifting?" at the recent Farm Bureau Fusion event.

Person broke down how this shift came about. It started with the social media boom of 2005 - 2007. Agriculture was a bit behind the curve then and only began to organize around 2009 - 2010, but once farmers did, they began connecting with all kinds of people. Farmers were also reaching out to new venues (such as the South By Southwest festival, partnering with museums and with promotions at baseball games) – and reaching out to other farmers.

This big leap into the digital space was led by technological leaps happening with cell phone cameras and biotech. The need to engage more online was also catalyzed by the deterioration of trust and lack of shared experience – urbanization and misinformation about ag were happening rapidly. The beauty of social media is that it provides the ability to reach people directly without huge marketing budgets.

"We saw a very different reality than before," Person said of this evolving shift. "Where was a premium for 'better.' There was less farm knowledge and more connection to similar people, and authority was discounted if it was seen as a part of 'they,' the others."

But things continue to change. Person said we can take a lot of cues from the young adults of Gen Z (those born between 1997 and 2012. "They are the most diverse generation ever and globally thinking and making money and hustling, and they are happy to share how they're spending their money," she said.

In general, Gen Z places a high value on education, are politically active, see their food as a part of themselves and have a food philosophy. (Want to learn more about food philosophy? Check out foodintegrity.org.)

Consumer engagement is easier now with these young adults thanks to changes in technology. Think of the ubiquitous QR codes, now often seen as shortcuts to payment options at farmers markets. People are continuing to purchase groceries online post-pandemic, because some consumers don't mind paying for convenience.

For farmers, Person offered this tip: "With the social media explosion, focus on what works best for you instead of trying to do everything." Rather than try to be on every app, use the three that result in the best return on your time investment.

"With the social media explosion, focus on what works best for you instead of trying to do everything."

Rather than try to be on every app, use the three that result in the best return on your time investment.

What do all these changes mean for outreach though? "People are actively making changes in how they live, work and eat," Person said. "There are lots of new opportunities out there; there is no single way to approach things."

Being flexible can definitely be an advantage. For example, if a farmer offers a CSA but expects the entire share amount paid up front, try offering the cost in a few more manageable payments. Person noted that younger consumers tend to like smaller, regular payments versus using a credit card or carrying debt.

The culture will continue to shift, but what's working right now for engagement is offering experiences/participation (either on-farm or off – Person said openness is a prerequisite for trust). Younger Millennials and older Gen Z'ers like to learn while enjoying the process.

Focus on being easily found in the social space too. Younger consumers tend to search for things to do and places to visit through social media apps and not search engines.

Person also recommended partnering with someone who is already more engaged on social media – perhaps an "influencer," perhaps someone who just knows how to utilize it better than you do.

"You don't have to do everything yourself. It may be worth it to get that one big experience [and have it go viral] rather than develop your own entire channel," Person said.

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On the cover

The Peckham family – Carley Harrington and Max, Laura and Rick Peckham – represent the fifth and sixth generations to run the family business in Rhode Island.

Photo courtesy of Peckham's Greenhouse

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in gardening. "A lot of young families with young kids are coming in," she said. "It's great to see multigenerational interest in gardening."

While customer tastes change from year to year, Carley strives to keep items that are timeless and will always look good. "From fall through winter, we go through all the catalogs," she said. "Rick handles ordering for plant material and I go through the seeding list. I collect notes to find out what did well and what sat on the bench for too long. We try to add a few new fun things each year."

Autumn vegetable crops are a big sellers, so Peckham's keeps a supply of lettuce, kale, chard, cauliflower and broccoli to finish the growing season. They grow mums in a variety of colors and start poinsettias in July so they're ready for Christmas.

Both Carley and her father handle hiring for the business. "We hire in spring, and usually put it out on our website and social media, along with a little bit about the positions available," she said. "Then we chat with people. I like to think we're hiring personalities and people who have passions and hobbies. We try to get to know people, and because we're a family business, our crew is an extension of our family."

With the goal of maintaining a family-oriented business, Carley seeks friendly people who are willing to work hard. "I tell people that having knowledge of plants is a plus, but it's a seasonal job and a lot of our crew come back year after year," she said. "Sometimes we have high school or college students who only work in spring and summer. It's more important to me they're willing to learn and are excited about plants. Friendliness and a passion for plants is the most important thing – there's nothing they can't learn."

Customer service is important to everyone at Peckham's, and their goal of providing one-on-one service ensures a good experience for all customers. "We try to help them find the plants that are right for them." said Carley. "Which way do windows face? Is there a woodstove in the house that might dry out plants? Or is the yard soggy? We want people to have the best garden or houseplant they can have."

Visit Peckham's Greenhouse online at peckhamsgreenhouse.com.

Country Folks GROWER

The one publication for all aspects of commercial horticulture
USPS 8885; ISSN 10651756

Published monthly by:
Lee Newspapers, Inc.
PO Box 121 / 6113 St. Hwy. 5
Palatine Bridge, NY 13428
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www.CFGrower.com

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Subscriptions:
subscriptions@leepub.com or 888.596.5329

U.S. subscription price: $24 per year
Digital subscription $18 for 2 years
Canada: $55 per year

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Periodicals Postage Paid at Palatine Bridge, NY and at additional offices.

POSTMASTER: Send address changes to Country Folks Grower, PO Box 121, Palatine Bridge, NY 13428-9999

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TRADE PAPERS • TRADE SHOWS

Mindful communication during a farm transition

by Sonja Heyck-Merlin

"During the farm transition process, we can feel frustrated, feel like we're grasping at straws to find solutions. We also become suspicious of other people. Sometimes we make negative assumptions about other people's motives. We start to experience a downward spiral. We feel stuck. This is how everyone reacts when there is a conflict," Claudia Kenny said during a recent NOFA-NY conference.

Kenny is the co-director of the New York State Agricultural Mediation Program. At the conference, she discussed techniques to improve communication during a farm transition.

Clarifying Decision Making

"A lot of conflicts come in the door because decision making is unclear and creates a lot of tension," Kenny said.

It may be possible to prevent conflicts if the stakeholders discuss ahead of time which type of decision making will be used in various situations. There are four types of decision making (consultative, democratic, consensus and delegatory) and it's common for all types to be used during a farm transition.

In consultative decision making, a decision is made by one person after the group has discussed ideas and potential solutions. In a democratic process, the whole group discusses, and then there's a vote and majority rules.

Consensus decision making requires that the entire group agrees, whereas in delegatory decision making one person makes the decision for the whole group.

In a farm transition, the senior generation may go through a process where they consult the junior generations, taking into account everyone's preferences and opinions about the farm's future. They have decided to use a consultative process, but the junior generation may be unaware of this and assume it will be a consensus decision.

This leads to a lack of clarity in who gets to decide and may result in a conflict. "Getting clarity about how decisions will be made and how people will be involved can help avoid misunderstandings and conflict from the get-go," Kenny said.

Listening to Understand

Kenny said one of the most effective ways to prepare for a farm transition conversation is to become a skillful listener. To Kenny, this means bringing the full self – eyes, ears, hearts and undivided attention – to the person speaking.

It also means setting aside personal concerns and prerogatives while someone is talking. The listener should strive to listen for new information with curiosity and to withhold judgment.

When it's the listener's turn to respond, Kenny suggested they strive to rephrase and reflect back to the speaker their words and their perspective. An attempt should be made to use the speaker's exact words to make sure the listener is understanding the speaker's point of view. This is an important communication tool because more often than not, the listener's perceptions are incorrect.

Kenny also discussed the "Iceberg Theory" of negotiation. In a farm transition conversation, a person's stance can be thought of as the part of the iceberg sticking out of the water. Underneath this figurative iceberg, however, are the unseen hopes, fears, desires, expectations and concerns that are often left unarticulated. A listener should be aware of and seek to understand this "below the line" subtext.

"The goal about listening is not to be perfect in every conversation. We all respond in unhelpful ways at times. We jump in and tell our own story. We refute what someone's saying. We offer advice instead of listening," Kenny said. "The goal is not to do those things but to know the difference between skillful listening, so you can refocus when you start responding in unhelpful ways."

Asking Curious Questions

Asking open-ended questions is a technique that can be used to understand some of the "below the line" subtext. Open-ended questions invite people to reflect and share their ideas in more depth. Using them also demonstrates a sincere interest in understanding others' needs and creates a sense of validation for the speaker's opinions.

Kenny suggested using short, concise questions – no more than seven words – such as "What's really important to you about this?" and "What matters most to you about this?"

"The questions are direct. They're not too complex. The idea is that they are invitations, not probes," Kenny said.

By using this type of questioning, farm families can seek to better understand each other's perspectives. According to Kenny, the human mind is hardwired to egocentric thinking, creating a barrier to understanding another person's perspective.

"Recognizing someone else's point of view is not simple. It's not intuitive. It takes a little bit of intention. It takes hard work and practice," she said. "If you put in the effort, it's a skill that anyone can learn."

This conscious attempt to understand another's

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New York FarmNet cultivates stability for farming families

by Susan Kelley, Cornell Chronicle

In 2004, Fred Lee saw no other option but to sell off half his farm equipment – trucks, pipes, tractors, cultivators – an event that usually signals a farm is about to collapse. "Most farms, when they experience an auction, it means the end of the business," said Lee.

He and his then-wife couldn't afford the lease payments for most of the 142 acres of land they farmed in Peconic, Long Island, where they grew Chinese cabbage, bok choi and other Asian vegetables wholesale for New York City restaurants. At the same time, fierce competition had tanked their markets.

"I was really sort of at wit's end," said Lee, who grew up working on the family farm with his father and uncles, leveraging Long Island's famous loamy soil and temperate climate. "I had to figure out, with what we had left, was it enough to keep going?"

He called New York FarmNet. The free, confidential Cornell program provides farmers with two consultants, one specializing in ag finances, the other in the social and emotional dynamics of running a family farm. Cornell is the only land-grant university in the U.S. to offer the service.

The FarmNet consultants visited the farm, listened to the Lees, brainstormed solutions and suggested a plan of action.

"It was very instrumental," Lee said. "They said, 'You need X amount to really cover your expenses and move forward.' And so I focused on that number."

The Lees pivoted. They began selling directly to local customers by starting up a CSA, an unusual model at the time. "While we didn't earn exactly the number that they had suggested," Lee said, "it was the beginning of opening the door to see the light at the end of the hallway."

Almost 20 years later, Sang Lee Farms is thriving. Lee and his family now grow more than 100 varieties of fruits, vegetables and herbs on about 100 acres, specializing in heirloom tomatoes and orange and yellow seedless watermelon. They sell their harvest at their retail store, two farmers markets and to 650 CSA members from Southampton to Queens.

They also make value-added products, like orange rosemary scones, and run workshops for children and home gardeners. The farm employs nearly 50 people each summer, 20 in the winter.

In 2019, 15 years after they nearly auctioned off their equipment, the Lees were named Farmers of the Year by the Northeast Organic Farming Association.

"FarmNet to me has almost been like a fairy godmother sitting over my shoulder," said Lee, who has turned to FarmNet several times in his career. "I wish I didn't have to call on them for the time periods that I did. It was at very tough junctures in my life. … I was grateful that FarmNet was there to rely on and to look to for help."

Lee is one of the thousands of farmers across NYS who have relied on FarmNet for help with everything from financial analysis to anxiety and depression.

It's important to support farmers because they play a crucial role in the state culture and economy, said Greg Mruk, FarmNet's executive director and a former FarmNet financial consultant. "New York is an incredibly rural state, which surprises a lot of people. And a lot of that rural culture centers around the farm, and the family farm," he said.

Those farms make important economic contributions. In 2021, New York agriculture produced roughly $3.3 billion in gross domestic product and paid close to $1 billion in wages, according to the U.S. Bureau of Labor Statistics.

But the job comes with stress, from financial pressures outside their control like the high land values the Lees experienced to the emotional complications of a multigenerational business.

For some, the stress can become untenable. Male farmers and other agricultural managers in the U.S. have a significantly higher rate of suicide deaths – 43.2 per 100,000 – compared to the average across all other occupations of 27.4 per 100,000, according to the CDC.

FarmNet has helped the Lees navigate both emotional and financial obstacles, said Fred's son Will Lee, 37, who helps run the farm as a part owner. "Having FarmNet as an adviser has given my father the capability to feel secure and sound in the decisions that he's making," Will said. "FarmNet was there for him when he needed it the most."

Rising interest rates are the main financial concern facing New York farmers, said Wayne Knoblauch, faculty director of FarmNet and professor in the Charles H. Dyson School of Applied Economics and Management, part of the Cornell SC Johnson College of

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Fred Lee talked frequently with Becky Wiseman, a NY FarmNet family consultant, when he was going through a difficult time in his personal life.
Photo courtesy of Ryan Young/Cornell University

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point of view is worth the effort in Kenny's opinion. It can create real learning and reshape interactions and relationships.

Finding Support

If a farm family is struggling to communicate during a farm transition, Kenny recommended getting support from a mediator. Mediation and arbitration should not be confused. A mediator is a neutral party who helps to create dialogue and promote understanding between the participants; they are not decision makers. An arbitrator acts more like a judge, handing down a decision after listening to the positions.

Mediation is voluntary, with all participants agreeing to participate. A mediator works for all of the parties involved, helping each person to be heard. They offer a neutral process so everyone gets the time they need to bring up the points important to them.

People can call upon the mediation process at any point of a farm transition. "People reach out for mediation when they want support in promoting understanding, preserving relationships and coming up with creative solutions. So, usually it seems like there is no solution and there is no way forward. People are often at an impasse when they come to mediation. Sometimes they're looking to make clear agreements and to prevent future disputes," Kenny said.

There are 44 mediation programs in the U.S. funded by the Farm Bill. In 2018, ag mediation programs were authorized to offer services to farms in transition. These programs are free or low-cost and may be conducted in person or virtually.

Producers can reach out to one of the programs and discuss if the situation is appropriate for the mediation process. If so, all participants go through an initial interview. In some situations, conflict coaching is used before the initial interview to help participants gain clarity about what they hope to achieve before sitting down as a group.

"People usually reach out for mediation after a specific situation has escalated," Kenny said. "It's fine to reach out before a situation escalates as well. Really, any time a supportive dialogue would help create a safe space is a good time to get some help."

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Business and the College of Agriculture and Life Sciences (CALS). "That's one of the current issues, helping individuals who are either applying for new loans or having adjustable-rate mortgages, getting lines of credit to buy feed, seed, fertilizer," said Knoblauch, who is a farmer.

High interest rates were one of the factors that prompted Cornell to found FarmNet in 1986. During the 1980s farm crisis, milk prices dropped precipitously due to low grain prices, leaving New York dairy farmers struggling to pay their mortgages and creditors. "Interest rates were rising, energy costs were rising, commodity prices were falling. And the underlying asset values were also falling," Knoblauch said. "That combination of factors put a tremendous financial strain on the rural economy."

CALS and Cornell Cooperative Extension charged a faculty committee with determining Cornell's response. "Our thought was that we needed a program beyond what the normal Cornell and Cooperative Extension programs could offer," he said.

CALS authorized funds to start the program, which is now housed and operated at Dyson and is funded primarily by Cornell and the NYS Department of Ag & Markets and Office of Mental Health.

NY FarmNet can be reached at 1.800.547.3276.

The cone wars: How do we stop them?

CHRISTMAS

by Bill Lindberg, MSU Extension, and Bert Cregg and Riley Rouse, MSU

Fraser fir is among the most widely grown Christmas tree species in Michigan and the Midwest due to its excellent form, needle color, scent and superior needle retention. For growers, however, one downside to producing Fraser fir trees is excessive cone production. In fact, the largest labor expense many Christmas tree growers encounter in tree production is cone removal.

In agricultural settings, Fraser fir trees start producing cones at a much earlier age than they do in natural stands in North Carolina, where the species is native. In plantations, cone production can begin three to five years after transplanting, and cone quantity increases as trees age.

Cones are problematic for several reasons. The first is that cones are photosynthetic sinks, diverting energy away from vegetative growth. This can greatly reduce tree quality by limiting top shoot growth, reducing bud density and creating vegetative holes in the upper tree canopy where high amounts of cones were formed.

Cones also result in an aesthetic problem at harvest. Cones of fir trees, unlike pines or spruces, are not persistent and disintegrate in autumn. The remaining stalks left behind are undesirable to customers and can greatly reduce tree value.

Some fir species, such as Fraser fir and Korean fir, tend to produce large quantities of cones early in their lifecycle. Most other fir species do not produce cones until trees are past the typical harvest age for Christmas trees. Individual Fraser fir trees can produce hundreds of cones per year and growers have reported over a thousand cones on a single tree.

Cone removal requires extensive hand labor and has become a major expense for Christmas tree producers.

Paul Bloese, MSU forestry tree improvement specialist, collects Fraser fir seed from the MSU Delayed Coning Seed Orchard.

Photos courtesy of Bert Cregg, MSU

Cone Management Strategies

Physical removal – Removing cones by hand is a common practice. The ease of removal changes as cones mature. Initially, cone removal is difficult and can often result in part of the cone breaking apart while a portion remains on the tree. As cones age, they become easier to remove and can be easily pushed off the tree. However, shortly thereafter the

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cones hold fast to the tree and require more force (twisting and pulling) to remove.

The cost involved with manually removing cones can be very high. Costs can vary widely due to many factors, such as number of cones per tree, tree height and tree density, but expenses of $1,000-plus per acre can occur.

Finally, as trees mature and grow taller, cone removal requires workers going up and down ladders to remove cones. This becomes a potential worker safety issue with employees working from ladders on uneven ground.

Chemical control – Research at Michigan State University (MSU) and at North Carolina State University has demonstrated that development of cones can be stopped using sprays of various formulations of pelargonic acid or citrus oil. The products are sold as burndown herbicides, including some marketed for organic production.

When applied to fir cones in the time window between cone emergence and vegetative budbreak, products such as Scythe, Axxe or Avenger herbicides can provide 80% - 100% cone control when applied with backpack sprayers.

Be aware of the potential for phytotoxicity (tree injury), and sprays cannot be applied once vegetative budbreak has occurred. It is important to remember that products do not need to be applied to the entire tree or trees without cones, but can be targeted to cones specifically. Coverage is critical, as cones that do not receive spray contact will not be damaged and will continue to develop. Research performed over multiple years and at many grower-cooperator farms found the following results:

- A single application of a caustic product reduced cones by over 80%
- Phytotoxicity was low across multiple farms when sprays were applied prior to vegetative budbreak
- Several products showed good results (Scythe, Axxe and Avenger), with Scythe showing the best cone kill

It is essential that applicators wear appropriate personal protective equipment and avoid spray drift.

Preventing Cone Formation

Another way to reduce cones is to stop them from being produced by the tree. Cone formation is a complex process, but in part is controlled by environmental factors. Trees that experience stressful summer conditions (heat, drought) tend to produce more cones the following year than when they experience more moderate conditions.

Growers have reported supplemental irrigation applied consistently over the course of the growing season reduced the number of cones the following year. Previous research by MSU contradicts those reports, with no change in cone production under various irrigation or mist cooling regiments. Future research is needed to determine potential causes of this discrepancy and what cultural practices growers can implement to limit cone formation.

Cone formation can also be affected by the application of plant growth regulators. Gibberellic acid (GA) is a naturally occurring hormone in conifers involved with cone formation. Compounds that block GA pathways can reduce cone formation.

MSU trials showed that soil applications of the GA-inhibitor paclobutrazol (trade name Cambistat) in summer reduced cone formation the following years by up to 40%. Other observations following paclobutrazol application were an increase in bud density and a reduction in leader growth (30% - 40%). Paclobutrazol is persistent in the soil; a single application can reduce coning for three to four years. A limitation of managing cone formation with PGRs is that all trees need to be treated, whether they will produce cones or not.

Improved Genetic Stock

Within a tree species, some trees naturally produce fewer or no cones compared to other trees. Approximately 10 years ago, MSU researchers collected about 70 Fraser fir trees that were found to produce very few or no cones in tree plantations, relative to their peers. The trees were transplanted to a plot at the MSU Horticulture Teaching and Research Center (HTRC) to form an experimental delayed-coning seed orchard.

As the trees eventually began to produce cones, we made a series of seed collections from the orchard. Seedlings were grown by a cooperating nursery, Peterson's Riverview Nursery LLC, in Allegan, MI. Trees from the first collection from the seed orchard are now being grown in a trial at the MSU Horticulture Teaching and Research Center.

The goals of this project are to observe these seedlings to determine whether they produce cones at an early age, and if they do not, to provide them as a potential genetic stock for continued tree improvement efforts and future tree plantations.

For further information, visit MSU Extension's Christmas Trees website at canr.msu.edu/christmas_trees/index or contact Bill Lindberg at lindbe35@msu.edu.

New markets with nutraceuticals

by Courtney Llewellyn

Let's begin by defining "nutraceutical." It is a product isolated or purified from foods that is generally sold in medicinal forms not usually associated with a food. A nutraceutical is demonstrated to have a physiological benefit or provide protection against chronic disease.

That's how Evan Elford, Ontario Ministry of Agriculture, Food & Rural Affairs new crop development specialist, explained the concept at the most recent Great Lakes Expo. He presented "Adding Value to Nutraceuticals and Other Alternative Market Crops" – or, he said, how to take advantage of "specialty cropportunities."

In some further definitions, Elford explained that nutraceuticals are different from functional foods, which are similar in appearance to (or may be) conventional food, are consumed as part of someone's usual diet and are demonstrated to have physiological benefits and/or reduce the risk of chronic disease beyond their basic nutritional functions.

Also different are a natural health products (NHPs), which include probiotics, herbal remedies, vitamins and minerals, homeopathic medicines, traditional medicines (such as traditional Chinese medicines) and other products like amino acids and essential fatty acids. These are more like value-added products.

"A good example of a nutraceutical is Aronia/chokeberry," Elford said. "It's high in antioxidants."

Aronia is often lumped into that amorphous "alternative crop" category, which Elford defined as a niche crop not covered by mainstream horticulture/agriculture. It is typically a low acreage/high value crop. An alternative crop may be new to your region or an underutilized species there. It could also be a re-emerging crop – such as hops.

Other examples include elderberries, which can be sold fresh, processed (in jam, juice or syrup) or for dye, and its flowers can be used for elderflower cordial.

Haskap (or honeyberry) is often touted as a functional food. Growers can sell fresh and frozen berries, juice, wine and preserves. Sea buckthorn is very high in vitamin C and omega fatty acids; it is used as a functional food and in cosmeceuticals (cosmetic products that have medicinal or drug-like benefits).

Hops have culinary value for brewing (beer and hard cider), for non-alcoholic beverages (hop water), as hop asparagus and for flavorings. Elford noted that sparkling hop water has grown a lot in popularity recently. The crop has medicinal value (as a sleep aid) as well as a place in some cosmeceuticals.

Hops also have ornamental value (as potted plants and trellises). "One brewery captured more value using hops as decoration for events than harvesting them for beer," Elford said.

Nutraceuticals, functional foods and NHPs can all be sourced from alternative crops. However tempting the market may be, though, alternative crops are not for everyone or for every farm.

Challenges for Alternative Crop Producers

Elford outlined the following as challenges a grower may face with alternative crops:

• Markets: There's often no established market; a lack of consumer knowledge may limit market development; niche markets are easily saturated; your idea may not be novel; and there's a cyclical nature to the popularity of alternative crops

• There's often unknown or limited production information; they can be capital intensive; and it may be difficult to finance a start-up

• Unique growing conditions/requirements – Growers may need season extension tools (plastic mulch, low tunnels, high tunnels, etc.); and the new crop may be labor intensive

• Difficulty obtaining desired cultivars/genetic material – This can be true for seeds, vegetative propagules and plants or improved cultivars

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• There may not be the money – or desire – for research on a specific crop

Benefits of Alternative Crops

On the other hand, those willing to make the leap have a few things going for them:

• The crops are typically high value and grown on small acreage – and can be great for new farm and small farm businesses

• They provide a new challenge for those eager to learn

• The crops draw customers to increase revenues – this can create a better financial situation/risk management plan for some growers, who can gain more control of the market chain; they can improve cash flow and off-season income (through storage or value-added products); and they can even finance expanded on-farm employment (for farm family members and/or the next generation)

Figuring out the "next big thing" is tougher than ever these days, as it can take several years to grow a crop and consumers deal with shorter and shorter attention spans. In trying to identify alternative crop trends, Elford suggested looking at your personal situation and what health food/nutrition stores are selling as well as organic stores/specialty grocers. What are media outlets saying in regard to the crop in food, restaurants, medical blogs and TV programs? What about the demographics and statistics of your market?

"Personal health issues are often a catalyst" for growers attempting a new crop, Elford said. Demographic shifts are an indicator but it can take a long time for trends to emerge.

Steps to Follow

For those willing to risk the time, effort and funding to trial an alternative crop, Elford presented the steps below to help begin the process.

First, find and understand the markets. What is the market need – and is there one? Do your research and look into nearby competition. Also consider the specific varieties or growth stages of the crop that the market would need. Customer and end user expectations should be a part of market considerations.

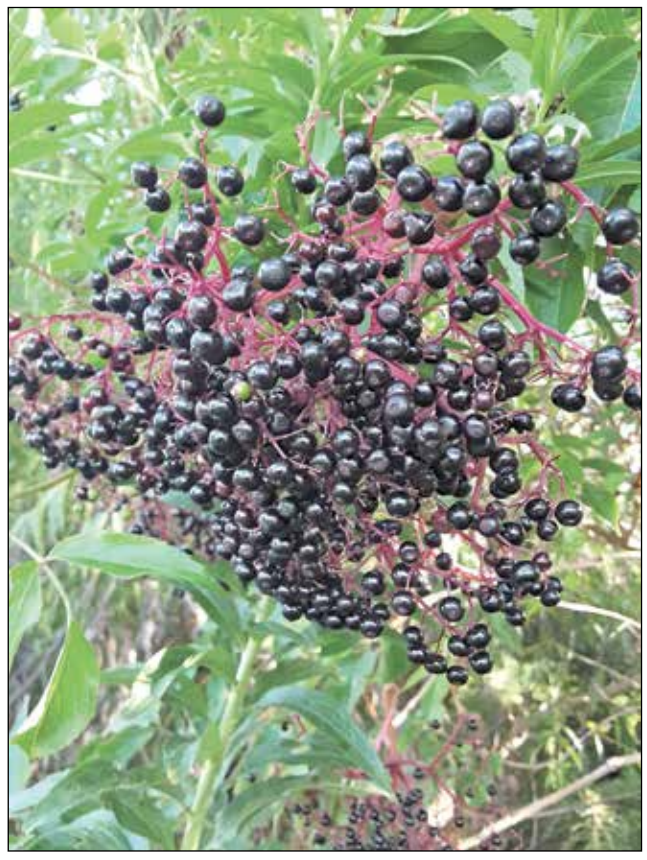
Next, consider your objectives and the fit for your farm. Can you grow the crop for the market need? Can you actually grow it in your climate or on your farm? And it will it just survive there, or will it thrive?

As for the crop type, look at its agronomic requirements for soil type, irrigation, season extension, rotation, nutrition, harvesting system and storage.

Look at your farm resources and sales/distribution requirements (time, labor – including detailed recordkeeping – and equipment). Will you need special equipment? Will you need licensed or specialized facilities? Typically, the more processed the product, the higher the investment costs.

There may be some legal requirements for the crop itself, such as for those growing hemp. Rules and laws can cover sales, labeling, pricing, farm market regulations, liability, equipment and transportation. Do your research to know what you can put on a label.

"While there can be some steep hills to climb, opportunities exist," Elford said. "Understand there is no silver bullet, however."



Elderberries are one example of an alternative crop that has seen a recent surge in popularity.
Photo by Courtney Llewellyn

Corporate efficiency for greenhouse operations?

GREENHOUSE

by Courtney Llewellyn

Many are familiar with the phrase "stop and smell the roses," which encourages us to take a break from our usual hustle and bustle. A presentation at Cultivate'22, however, flipped that notion on its head. Cathryn Fageros, the business process improvement manager at Ball Seed Company, spoke about using the fast-paced and structured roles of the corporate world and integrating them into horticulture.

(Fageros admitted that while 2022 was her first year in the horticulture industry, she has a valuable career history in operations.)

Lean is often used as a synonym for efficient, and so Fageros began by asking which practices can make your businesses leaner. She said at Ball, they have distilled them down to four:

• Understanding the customer and what they value

• Building deep understanding of the process

• Reducing waste, process unevenness and overburden

• Continuously improving the process and outcomes

"Because this industry is seasonal, evenness for staffing is key," Fageros said about the third point.

But how does an organization approach these practices, which can appear a little vague at first glance?

A tip Fageros provided is to attack your organization's biggest problem first, whether that's the customers, the processing, the waste or not improving.

To understand the customer, talk with them to understand their needs and then clarify the priority of those needs and where your process isn't meeting expectations. Then, make a plan and take action to deliver measurable improvement. "The secret sauce is to quantify things," Fageros said. "Get numbers."

For a deep understanding of your process, she suggested taking a Gemba walk. As described by author James P. Womack, a Gemba walk is "an opportunity for staff to stand back from their day-to-day tasks to walk the floor of their workplace to identify wasteful activities." Fageros said the walk is an opportunity to "get out of the chair or greenhouse to understand before you try to change something."

Document your processes and double check with staff to see if what you observed matches with what they do. Once you have that information, create a value stream map, noting how much value you add at each step of your process, with measurements, to look at your big picture.

According to the model Fageros works under, there are eight forms of waste, often abbreviated to TIMWOODS: Transport, Inventory, Motion, Waiting, Overproduction, Overprocessing, Defects and Skills. Waiting and Overprocessing are great first places to look for waste.

"The number one waste form is waiting," Fageros said. "Number two is wasting skills – everyone in this industry is an expert in something, so share that knowledge. Number three is wasting inventory, including your time."

Once your wasteful areas are identified, prioritize and implement process changes to eliminate that waste.

Fageros suggested using the Kaizen cycle for improvement. Kaizen is defined as an approach to creating continuous improvement based on the idea that small, ongoing positive changes can reap significant improvements. Kaizen is usually based on cooperation and commitment – in contrast to approaches that use radical or top-down changes for transformation.

"Measure what makes sense so we can track our improvement progress over time," she said. "And communicate your successes broadly so that others can learn too."

Joining Fageros for the presentation was Tom Wheeler, director of growing operations for Bell Nursery USA.

"With nine sites, logistics create challenges and positives," Wheeler said. "Transport has a huge opportunity for savings, and does overproduction, especially coming off the COVID spike and gardening fever and things going back toward normal."

He mentioned wanting to become more lean with overprocessing too. "We're all focused on quality but also on making money – and we're our own biggest critics of our products," he said. "Consumers might not be as discerning as we are."

Wheeler also said his operation is always looking at efficiencies, even with the number of plants per pot. "We like to minimize plants per pot when we can – and adjust our production schedule based on the time of year," he said.

To help him and other operations with their goals, Fageros said key performance indicators (KPI) are needed. "Have workers be responsible for key measures," she said. "Put targets down so you can try to fix the gap between where you are and where you want to be."

Another tip Fageros gave: Figure out your needs on your own if you can, because consultants are expensive, both with your money and your time.

Cultivating Thoughts

by Bill Lamont

Thoughts on Weather

I just finished an excellent book, "Mountain Man: John Colter, the Lewis and Clark Expedition and the Call of The American West" by David Weston Marshall; now I am reading "Guardians of the Valley: John Muir and the Friendship that Saved Yosemite" by Dean King. The breadth and intensity of the weather events highlighted in both these books is truly breathtaking.

Both books take place in the western U.S. in the rugged mountainous regions – and highlight Muir's appreciation of the natural beauty and spiritualism of the outdoors and his awe and appreciation of weather of all kinds.

Webster's defines weather as "the state of the atmosphere with respect to heat or cold, wetness or dryness, calm or storm, clearness or cloudiness." The mountain men, like their Native American counterparts, had an innate sense of the changing weather and could read the signs that indicated a change in it. Today we have meteorology, concerned with the processes and phenomena of the atmosphere, especially as a means of forecasting the weather.

I have been in grower's offices that sport sophisticated monitors tracking the weather both nationally and locally. They may even have weather stations set up in their fields that help them in scheduling farming operations from planting to timing application of sprays for disease control based on weather data.

If we consider all the calamities that can befall a grower, weather is still the one that is not in their control. One can try to escape the effects of weather by farming indoors (in a greenhouse or high tunnels), but even so I have seen weather prove overwhelming with severe storms that bring high winds, baseball-sized hail, heavy wet snow or maybe a tornado.

If we look at the different facets that make up our weather, we first think of heat and cold – the temperatures of the soil and air. For centuries, growers have attempted to get a jump on the growing season by using windbreaks, glass cloches, hot caps, plastic mulches, drip irrigation, low tunnels, high tunnels, transplants and row covers to hopefully get in the markets earlier.

In many cases, this works fine, but sometimes a killing cold snap can come roaring down from Canada and kill or stunt their crops. Then the normal orderly progression of harvests up the coast is disrupted, and harvests overlap one another (and the price of produce can tank). I think of the cabbage market as a classic example.

Another example of trying to outwit Mother Nature is the hoops sweet corn growers go through to have sweet corn on the Fourth of July using clear plastics over direct-seeded corn to hasten its emergence or transplanted corn.

Growers try to avoid extremely high temperatures, especially for crops that are susceptible to a decline in quality (such as some leafy greens, broccoli or tomatoes) by planting date modification or by breeding new varieties resistant to such quality issues brought on by high temps.

Wetness or dryness

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can be real problems, especially for vegetable growers where all they're really doing is selling water packaged in a vegetable-shaped container. Rainfall can be spotty and growers who watch the sky hoping for rain are going to lose out in the long run. We've seen the development of many types of irrigation systems to mitigate the lack of moisture at critical times in the development of crops. We've had solid set aluminum sprinkler systems, moveable aluminum pipe, traveling guns of various sizes and capacity, large circle pivot irrigation systems, furrow irrigation and drip irrigation.

Red sky in morning, sailors take warning/red sky at night, sailor's delight. Photo by Bill Lamont

I have observed more adoption of drip irrigation throughout the country which provides more precise control over the application of water and fertilizer and a reduction in the amount of water being applied. There is a real push to refine the precision of drip irrigation through enhanced instrumentation in the field.

I believe most growers would rather have a dry year where they can control the application of moisture than a wet year. Let the rain that falls fill the ponds, wells, creeks, etc., that are the water sources for irrigations systems.

Wetness can also cause problems with diseases and interfere with harvests. One advantage of high tunnels is that they keep moisture off a crop and lessen the impact of diseases and permit activity inside to continue even though it is raining.

Next, we have calm or storm. Give me calm (although storms do bring moisture). Big storms – sometimes called "super cells" – can spawn tornadoes that can damage homes, farm buildings, woods and fields.

There is another weather event that can be very localized and devastating in a matter of minutes to a crop – a

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NYSFI annual meeting

New York State Flower Industries will hold its annual meeting on July 24, 9 a.m. at Dickman Farms in Auburn, NY.

We'll be touring Dickman Farms wholesale & retail facilities, plus there will be a display of new flower varieties from Ball Horticulture & Selecta.

Dickman Farms is a 5th generation family-owned business located in the Finger Lakes Region of central New York. Twelve acres of modern greenhouses are set up specifically for production of liners sold to fellow growers. Dickman Farms has been a rooting station for Ball Horticultural Company since 1977.

Luncheon to follow at Prison City Pub & Brewery, 28 State Street, Auburn, NY. Cost per person: $25 and includes salad, non-alcoholic beverages, choice of entre, brownie & ice cream sundae. Beer & Wine sponsor, Mark & Sue Adams.

R.S.V.P. newyorkstateflowerindustries@gmail.com or newyorkstateflowerindustries.square.site by July 12, 2023.

Dickman Farms is a 5th generation family-owned business located in the Finger Lakes Region of central New York.

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hailstorm, with hail that can range from pea- to softball-sized. I have seen the sky turn greenish with puffball clouds (signs of severe turbulence) and then had hail rain down. I have visited fields of staked tomatoes previously full of beautiful, large green fruit with hail embedded throughout. The plants were stripped bare. I have seen devastation to fields of other vegetables in various locations over the years. The only thing you can do if you think you can salvage the crop is spray a fungicide to lessen the impact of diseases on the exposed plant tissue.

In a matter of minutes, one's entire crop can be lost. Hail can also damage glass greenhouses and damage, shred or ruin the plastic on greenhouses or high tunnels – not to mention roofs, cars and machinery.

When we think of clearness or cloudiness, it tends to be a local/regional phenomenon. The Northeast is often cloudy. If we go southwest, we'll find that that region has a preponderance of sunshine. A lot of large greenhouse operations are located there for that reason.

The reason that this component of the weather is important is that plants grow well in sunshine and the sun tends to warm things up. After a rain the sun comes out and begins to dry things off. Another factor is that if it is always cloudy and rainy, we humans tend to become depressed. I vote for sunshine for both crops and those who grow them.

Weather is a big factor in the lives of farmers and humans in general. Having served in the Navy, I have a healthy respect for weather and storms and for the power of wind and water. We can try to mitigate the effects of weather on our crops, our farming practices and on its unpredictability at times, but as the adage goes, "Keep your eye to the sky" like the mountain men, Native Americans and others have throughout history.

You can contact me with feedback on my columns or ideas for future columns at wlamont@psu.edu.

Finding the right herbal farm property

by Courtney Llewellyn

You can do so much on so little, especially with herbs. That was the message Michael Kilpatrick, founder of Growing Farmers and the Farm on Central in Franklin, Ohio, an eight-acre urban farm, provided during the recent Herbal Entrepreneur Conference.

Kilpatrick addressed what to look for when finding an herbal farm property. "The yield you can get off a very small space is tremendous, especially if you pick the right type of soil," he said. "Don't feel like you can't do this if you don't have 100 acres. You don't even need an acre. Just test it and see if it's for you before you expand."

Much like a house-hunting reality show, there are certain must-haves a property requires if you're considering turning it into an herbal farm. Kilpatrick outlined these six key principles:

• Access – for power, water, vehicles and anything else that needs to physically reach the property. At his first farm in downstate New York, the terrain was very hilly and challenging for some trucks to climb (including firetrucks).

Also consider access for sewer or septic systems, as well as mail and delivery service, especially if you're planning on shipping any product. Look at proximity to needs too, such as hardware or farm supply stores.

• Water Source – Growers definitely don't want contaminated water for herbs, which are generally seen as healing plants. Kilpatrick said a well or spring is generally safer than a municipal water source.

Water-testing labs are widely available in the U.S. – and he suggested talking to people in the community to see if there's any issues with the local groundwater. How much water is available is key, as are any conservation efforts. Kilpatrick noted many herbs are very hardy, but water still needs to be a concern.

• Market – Where are you going to sell your product? "Herbs a little more difficult than vegetables," Kilpatrick said. "It depends what your product list is too – elderberry syrup is pretty ubiquitous right now, for example. It does help to move online and do e-commerce."

But, as mentioned above, think about the logistics of shipping. One strategy Kilpatrick has seen succeed is selling a product that's physically very dense – it saves on shipping and moving more product to special events and sales. Leafy and dried things can take up a lot of space.

• Soil – "Soil can be changed," he said, if it's not ideal at the outset. You can bring in amendments and beneficial fungi, and even grow in raised beds. You can do remediation with compost, cover crops and pre- and probiotics.

"Definitely test your soils," he added. "Don't overwork your soil with tillage either. And avoid floodplains and super heavy clay soils."

• Weather – Kilpatrick noted there are definitely areas in the U.S. that have specific weather patterns, even locally. That presents another reason to reach out to the people in the community. "If you can, live in an area for a year before you buy farmland there," he said. "Do your due diligence."

• Community in the Area – "It's more and more important every single day," Kilpatrick said of community. "You want a community that's welcoming and agriculturally focused. And be invested in your community so that you're welcomed."

His final bit of advice when looking for herbal ag land was doing a little more research before falling in love with a property. Be sure that you'll be allowed to do what you want to do before signing any paperwork.

Focus on farmer physical fitness

by Sonja Heyck-Merlin

"Bending, squatting, grabbing, twisting, pulling, pushing, cutting, walking, running, jumping, dragging, digging, pounding, lifting, tossing, catching, reaching. These are all examples of ways you're likely incorporating physical activity into your farming duties regularly," said Kate Graves.

Graves is a registered dietitian working for University of New Hampshire Extension. She discussed the importance of physical health and physical health guidelines as part of the UNH Women in Agriculture Wellness series, sponsored by Annie's Project, Northeast Extension Risk Management Education and USDA.

While it cannot be disputed that farming is a physically demanding occupation, Graves said research shows it is not as physically demanding as it was 100 years ago, due to the assistance of tools and mechanization. This, of course, depends on the equipment being used and the type of agricultural business. Farmers and farmworkers are likely to have gaps in the physical health recommendations as set by the CDC.

According to CDC guidelines, adults ages 18 - 65 should get at least 150 minutes a week of moderate intensity aerobic activity or 75 minutes of vigorous intensity aerobic activity. This is different from anaerobic exercise, which includes short bursts of intense activity such as weightlifting, sprinting, Pilates or yoga.

Only one in four adults in the U.S. is meeting the CDC guidelines for aerobic activity. Aerobic activities, also referred to as "cardio," are those that increase breathing and heart rates, such as brisk walking, swimming, cycling and rowing. The CDC also recommends muscle strengthening activities of moderate or greater intensity that involve all major muscle groups on two or more days per week.

"Oftentimes when we're discussing physical activity, people think of things like reduced weight gain or increasing their muscle mass, but the benefits of physical activity actually extend far beyond that, including benefits on brain health, which studies show happen immediately after a session of physical activity," Graves said.

Another reason farmers and farmworkers should assess their physical well-being is that studies show physical and mental well-being are interconnected. Research shows that major depressive disorder is more likely to occur among people in agricultural occupations. Farmers and farmworkers should be aware that meeting the CDC's physical activity guidelines may reduce short-term feelings of anxiety, reduce the risk of developing dementia including Alzheimer's disease and reduce the risk of depression.

Graves said symptoms of depression may be two to 10 times more common for individuals who have a disability or chronic illness. Meeting the guidelines may also help people who have a disability or chronic illness cope with their increased risk of depression.

Meeting the CDC's physical activity guidelines can also provide myriad other benefits. They can help reduce the risk of heart disease, stroke, type 2 diabetes and many types of cancers. In addition, they can increase bone strength, help with balance and coordination and improve independence during aging.

"This is a moment I would encourage you to self-reflect and look at what you're already doing," Graves said. "See where your job is already physically demanding and where there are those gaps, so that you can get at least those 150 minutes of aerobic activity and those two or

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Northeast SARE announces multiple grant slates

The Northeast Sustainable Agriculture Research and Education (SARE) Administrative Council has approved more than $7.1 million in funding for 69 grant projects taking place across the Northeast.

Teams of farmers, researchers, educators and industry and nonprofit representatives reviewed proposals. Northeast SARE's Administrative Council, a governance body representing a broad constituency of the Northeast ag community, then made final funding allocation decisions.

The funded projects include:

35 Farmer Grants for $785,000 – Farmer Grants support farmers exploring new concepts in sustainable agriculture conducted through experiments, surveys, prototypes, on-farm demonstrations or other techniques.

13 Research & Education Grants for $2.9 million – The Research & Education Grant program funds projects that result in gains in farmer knowledge, awareness, skills and attitudes that are then applied to make measurable on-farm changes leading to greater sustainability.

11 Novel Approaches for Research Grants for $2.1 million – The Research for Novel Approaches in Sustainable Agriculture Grant Program funds "proof of concept" applied research projects intended to confirm the benefits and/or feasibility of new practices and approaches that have high potential for adoption by farmers in the near future.

10 Professional Development Grants for $1.4 million – The Northeast SARE Professional Development Grant Program funds train-the-trainer projects that develop the knowledge, awareness, skills and attitudes among the full range of service providers who work with farmers.

To learn more about SARE projects, search the full project database at tinyurl.com/wubm5rze.

A container full of different gourds signifying the interconnectedness and the variety of the approved grant slates.

Photo courtesy of Northeast SARE

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more days of muscle strengthening activities for all the major muscle groups."

She suggested consulting with a healthcare professional, especially when the farmer or farmworker plans to add a new physical activity. This is especially important for someone who is farming with a disability, chronic illness or while pregnant because it's easy to overlook that certain physical activities may exacerbate those conditions.

She also encouraged people to listen to their bodies and understand their limits as they undertake new physical activities. "No one knows or understands your body better than you do," she said. "If something is not feeling right to you, especially in a moment where you're being active, listen to that."

It's also important to find the proper space. Graves said, "I think finding a location where you're comfortable being physically active is really important. Some people enjoy being outdoors, others like the comfort of their own home or some people want to go to the gym."

Auditing physical activity goes hand in hand with an eating audit. Graves shared the most recent U.S. dietary guidelines referred to as MyPlate (myplate.gov). The goal of MyPlate is to signify the amount of each food group – fruits, vegetables, grains and proteins – that people should be eating each day in the visual form of a plate.

"Focus on what you can be adding to your plate rather than all of the negatives. I think a lot of us, when we come to health and wellness, we get in this place of all the things we think we're doing wrong. Focus on what we can add to our day to make it more balanced," Graves said.

NYFB-led coalition pushes for science to be driving force for state pesticide regulations

More than five dozen organizations sent a letter opposing the "Birds and Bees Act" to state leaders. The bill would remove critical risk management tools on farms and increase less environmentally friendly practices.

New York Farm Bureau and a large coalition of farm groups, agribusiness and supporters wrote to Gov. Kathy Hochul and legislative leaders asking them to let the Department of Environmental Conservation and its science be the guide when reviewing and regulating pesticides in the state. In addition, the letter calls for a rejection of the Birds and Bees Act (S.1856/A.3226) that would set a threatening precedent by legislating a ban of an entire class of pesticides that has led to more environmentally friendly practices in caring for the land and pollinators.

The letter explains how the ban of neonicotinoids would put farmers, landscapers, golf courses and more at a serious disadvantage in fighting off pests. It would also expose the land to greater tillage to battle pest infestation. This would, in turn, reduce climate smart farming practices that sequester carbon, making it harder for the state to meet sustainability goals.

"Without treated seed and applications of crop protectants, farmers would revert to planting fewer cover crops to avoid losses to seed corn maggot and other pests. Removing these tools would impact the state's carbon footprint, requiring additional tractor passthroughs and products to be applied," read the letter, in part.

The letter also highlights that neonicotinoids represent one of the most significant advances in insecticide technology in recent history and are among the safest pesticides for people and the environment, hence their widespread adoption. In addition, it stresses how seed coating technology mitigates pesticide exposure to pollinators due to the application method and subsurface planting of the crop protectant.

"When used according to label instructions, neonicotinoid products can be used safely by applicators, and they offer unique benefits that make them ideal tools for addressing certain pest problems and as part of an Integrated Pest Management program," said the letter.

Currently, the NYS DEC and its experts have the authority to review and regulate all pesticides in the state, one of the few states to have a stricter regulatory protocol than federal EPA oversight. In addition, NYS has implemented a strong pollinator protection plan coinciding with the nation leading IPM program. The coalition believes this oversight should remain rather than allowing politics to play a role in determining what is best for our food supply and environment.

Visit tinyurl.com/5dk986wx to read the full letter.

> *"Without treated seed and applications of crop protectants, farmers would revert to planting fewer cover crops to avoid losses to seed corn maggot and other pests."*

Pest alert: Tomato brown rugose fruit virus in NYS

Tomato brown rugose fruit virus (ToBRFV) has been found this spring on seed of two tomato varieties, Sweet Prince and Brandywise, being sold to growers and gardeners. This emerging virus (first detected in the U.S. in 2018) is considered more serious than others because of the ease of spread when handling infected plants, the virus's long-term survival ability and damage to fruiting plants.

Recommendations:

• If you are notified by a seed company regarding infected ToBRFV seed or see announcements about seed you purchased, the seed and any plants grown from them must be destroyed – not composted, surface-buried or thrown in a cull pile.

• The infected lots reported were plants from Sweet Prince lot numbers NN21-SL-SP and NN22-SLSP2 and Brandywise lot numbers NS 10-ll-br.

• There are no treatments/sprays that will cure plants of ToBRFV or any other plant virus.

• This virus can survive in soil for years, thus there is potential for re-occurrence in future years in addition to potential for spread to other tomato and pepper plants with handling.

• Follow strict sanitation practices if you have infected plants, including disposal or sterilization of all clothing, tools, trays, pots, hoses, benches, etc. Clean surfaces where plants have been with diluted bleach (an example of an appropriate solution is 8.2 fluid ounces of an 8.25% bleach made up to 1 gallon of solution – check whether the concentration listed on the label of the bleach you have is 8.25% and adjust if necessary).

• Handling infected seed is not known to allow seed-to-seed transmission of ToBRFV because the virus resides inside the seed not on the seed surface.

• Handling infected plants followed by handling healthy host plants is a transmission method.

• Minimize touching plants with hands, clothing and tools. Brushing plants to obtain sturdier stems is a dangerous practice because it may move viruses like ToBRFV, as well as bacterial pathogens. Watering seedlings is not considered to have enough force to transfer ToBRFV.

• When plants are handled, such as during transplanting, use hand sanitizer on gloved hands between plants when there is concern ToBRFV might be present.

• Check plants for symptoms at least once a week. Symptoms include mosaic and mottle, yellowing, bubbling in the leaf blade and a "fern leaf" look. If suspicious symptoms are seen, photograph and submit a sample to your local plant clinic. Symptoms will likely start to appear by about four to six weeks after seeding, but some varieties remain free from symptoms even though infected.

For a symptom guide, visit vegetables.cornell.edu/pest-management/disease-factsheets/tomato-brown-rugose-fruit-virus.

For more information, see aphis.usda.gov/aphis/ourfocus/planthealth/import-information/federal-import-orders/tobrfv/faqs/general/general.

In New York, the Plant Disease Diagnostic Clinic is available for testing. Visit plantclinic.cornell.edu.

NRCS Delaware announces signup to assist producers transitioning to organic

USDA announced details around its $75 million investment in conservation assistance for producers transitioning to organic production. As part of the multi-agency Organic Transition Initiative (OTI), USDA-NRCS will dedicate financial and technical assistance to a new organic management standard and partner with new organic technical experts to increase staff capacity and expertise.

The investment, which includes funds from the 2020 CARES Act, will help build new and better markets and income streams, strengthen local and regional food systems and increase affordable food supply for more Americans while promoting climate-smart agriculture and ensuring equity for all producers.

"Producers transitioning to organic can count on NRCS for assistance through the process," said Kasey Taylor, Delaware State Conservationist. "By strengthening our technical proficiency and providing technical and financial assistance through new tools and practices, we can better support producers through the challenges of organic transition."

NRCS will dedicate $70 million to assist producers with a new organic management standard under the Environmental Quality Incentives Program (EQIP).

Higher payment rates and other options are available for underserved producers including socially disadvantaged, beginning, veteran and limited resource farmers.

While NRCS accepts applications for financial assistance programs year-round, eligible farmers, forest landowners and other ag producers beginning or in the process of transitioning to organic certification should apply by June 15 to be eligible for this year's funding. Funding is provided through a competitive process.

Contact your local USDA Service Center for more information. Additional information on NRCS programs and services is available on the Delaware NRCS website at de.nrcs.usda.gov.

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Number / Classification

35 Announcements
50 Applicators
80 Auctions
110 Bedding Plants
120 Bees-Beekeeping
130 Bird Control
155 Building Materials/ Supplies
165 Business Opportunities
210 Christmas Trees
235 Computers
330 Custom Services
415 Employment Wanted
440 Farm Machinery For Sale
445 Farm Machinery Wanted
470 Financial Services
500 For Sale
505 Forklifts
510 Fresh Produce, Nursery
515 Fruit Processing Eq.
530 Garden Supplies
535 Generators
570 Greenhouse Plugs/Cuttings
575 Greenhouse Supplies
580 Groundcover
605 Heating
610 Help Wanted
680 Irrigation
700 Lawn & Garden
805 Miscellaneous
820 Nurseries
840 Nursery Supplies
855 Orchard Supplies
910 Plants
950 Real Estate For Sale
955 Real Estate Wanted
1035 Seeds & Nursery
1040 Services Offered
1130 Tractors
1135 Tractors, Parts & Repair
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Saving energy without sacrificing quality

by Sally Colby

Energy costs are a concern for every greenhouse grower, and it can be difficult to cut corners. Dr. Garrett Owen, assistant professor, sustainable greenhouse nursery systems, Ohio State, discussed energy saving options during a greenhouse management workshop sponsored by Ohio State.

Owen described the work he did in collaboration with USDA-ARS. The case study, which was based on accumulated simulation data, looked at spring flowering bedding plants to determine the water and carbon footprint of floriculture crops.

The study examined three different environments including an unheated, unlit high tunnel; an unlit, heated greenhouse; and a 68° F heated greenhouse with supplemental lighting to manipulate the photoperiod to maintain 16 hours of light.

The temperature in the high tunnel averaged about 12 to 15 degrees lower. "When we compared the environmental data to the greenhouses," said Owen, "we saw a higher daily light integral – the amount of light plants received in 24 hours. Once we take environmental data into account, we can see how it significantly manipulated plant growth and development and marketability of two Coleus cultivars."

Although theoretical simulation data is useful, a subsequent real-time study that measured energy and water use for snapdragons and petunias allowed researchers to put hard data behind carbon and water footprints. Data points began at the time of transplant and were collected until plants were marketable (about 21 days later).

Owen wanted to examine variations in greenhouse lighting. "The greenhouses were still heated to 68°," he said, "but we wanted to simulate a grower that didn't have supplemental day extension lighting."

One house had industry standard high-pressure sodium lamps and two greenhouses had commercially available LEDs – one with a higher proportion of blue light, one with more red light.

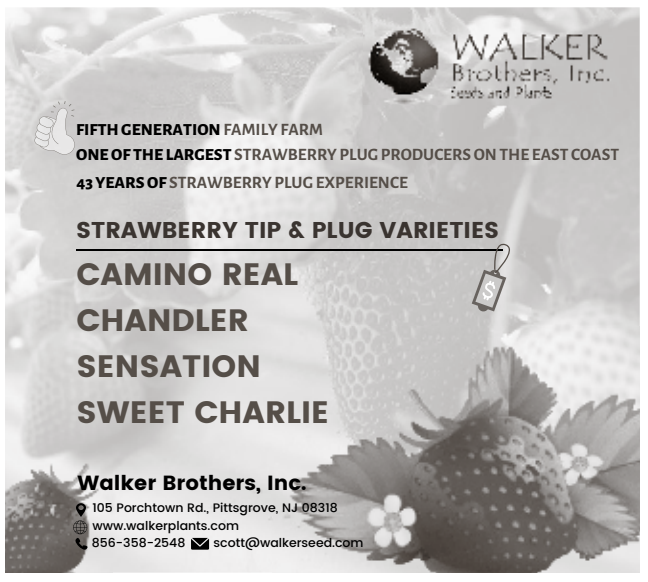
"In general, all crops looked marketable," said Owen. "However, under the high tunnel we had faded flowers, which is an indication of heat stress in an environment without fans to exhaust accumulated heat. Snapdragons grown under high tunnel conditions were not marketable compared to greenhouse-grown crops. Even with greenhouse-grown, we saw a delay in marketability or time to flower with or without supplemental lighting."

He added that there were more superior plants under LEDs compared to those grown under sodium lamps. Petunias were all the same size under various growing conditions, but there were differences among snapdragons.

Horizontal airflow fans required the most energy compared to inflation blowers. "We understand horizontal airflow fans can be set to be on and off," said Owen. "They needed to maintain a constant, and that's where increased demand was seen compared to other components that help manipulate the environment."

The study showed that horticultural lighting units accounted for 69% of total electricity. "This allows us to think about where to be more efficient in implementing strategies to help reduce electrical or heating

Saving 27



Calendar of events

NOTE: Calendar items must be submitted by the second Monday of the month to be included in the Calendar of Events. Listings are free for associations and non-profits. Entries may be emailed to jkarkwren@leepub.com or mailed to Lee Newspapers, PO Box 121, Palatine Bridge, NY 13428 Attn: Editor

June 15

New York State Integrated Pest Management 2023 Annual Conference 9 a.m. - 4 p.m. Speakers will provide insight and instruction on incorporating sustainability and trusted IPM strategies to create landscapes that combine ecological, climate and societal considerations to achieve a more beautiful space with less work. Visit https://tinyurl.com/yzf35db3 for more information.

July 1-6

AIFD 2023 Symposium "GROW" Hear from experts in the industry will impel you to higher levels of inspriation, creativity and design. Hilton Chicago, 720 S. Michigan Ave. Chicago, IL. Visit https://aifd.org for more information.

July 15-18

Cultivate'23 Learn best practices and foster business connections so you and your business can perform better, grow faster than ever, and are prepared for the future. Greater Columbus Convention Center Columbus, Ohio. Visit www.cultivateevent.org for more information.

July 17–18

2023 Agritoursim Learning Retreat Stepping out of the classroom and onto the farm, NADFMA's ALR offers immersive, hands-on education in best operational practices for farms and attractions. Helene's Hilltop Orchard, Merrill, WI. Learn more at nafdma.com or call 855.623.3621, email info@nafdma.com

July 17-21

22nd GiESCO Meeting The theme of this year's conference is "Diverse germplasm and precision technologies for varied and changing climates". Thursday, July 20, the Professional Day, will feature industry relevant, applied viticulture topics presented by international speakers. More information at: https://cals.cornell.edu/giesco

July 24-28

PPA 2023 National Symposium This event features an array of exciting tours, educational sessions, and networking opportunities. Sheraton Fallsview 5875 Falls Ave, Niagara Falls, Ontario. Visit https://perennialplant.org for more information.

July 24-29

49th annual NOFA Summer Conference The conference begins online: Monday, July 24 - Thursday July 27, with evening speakers and workshops. Friday July 28 and Saturday July 29, is both in person and online at Worcester State University, Worcester, MA. Email conference@nofamass.org for more information.

August 3-4

2023 NCTA Board Meeting & National Tree and Wreath Contest Meeting will be held at the Best Western Plus Isanti 409 Main Street East Isanti, MN. The contest will be held at Wolcyn Tree Farms & Nursery, Cambridge, MN. Contact the NCTA at realchristmastrees.org, 800.975.5920 or visit https://realchristmastrees.org to learn more.

August 23 - 25

Farwest Show The biggest green industry trade show in the West Oregon Convention Center Portland, OR. There is a Wholesale Growers Tour and a Garden Center Retail Tour available on Aug. 22. 777 NE MLK Jr. Blvd., Portland, OR. More information at farwestshow.com

September 5-8

2023 AAS Summer Summit Vancouver, B.C. Host Hotel is the Westin Wall Centre right at the Vancouver Airport. Register at https://all-americaselections.org/aas-meetings-events/

September 26-29

IPPS ER Annual Conference Get ready for an extraordinary experience at the IPPS Eastern Region's Annual Conference! Brace yourself for four exhilarating days of reconnecting, recharging, and immersing yourself in the wisdom of industry legends. Sheraton Hamilton, Ontario, Canada. Visit https://ena.ipps.org for more information.

October 18-28

IPPS International Tour 2023 Join IPPS Southern Region of North America for exceptional food, drink, and friendship from our nation's Capitol to the mountains of North Carolina! Experience innovative nursery tours, unique cultural experiences, fabulous gardens, and "Southern Region" hospitality. Space is limited, so sign up early! Visit https://ipps.org to register.

October 29 - November 1

2023 IPPS SR Annual Meeting Durham, NC. Visit https://ipps.org for more information.

November 8-9

Northeast Greenhouse Conference and Expo Educational sessions focusing on advanced biocontrol, disease management, business and marketing, greenhouse vegetables, perennial production, and sessions in Spanish language will be offered. Come visit vendors at the trade show with three dedicated hours in each day of the program. DoubleTree by Hilton in Downtown Manchester, NH. Learn more at www.negreenhouse.org

Saving from 26

costs associated with crop production," said Owen.

"We're looking at $2,800 to $3,200 to produce 4.5-inch snapdragons or petunias," said Owen. "If you have a greenhouse that has about 78% ditching (space use) efficiency, then you will have about 38 cents per pot of energy and carbon costs associated with heating the greenhouse for producing snapdragons or petunias. Adding lighting adds about 43 [cents] per pot for 21 days. That excludes substrate, pot, labor and any chemicals."

He described several energy-saving strategies for various production methods, including production delay if it isn't worth starting a crop early. Plugs or rooted liners can be transplanted later, then greenhouses can be heated for seed production, plugs or cuttings.

Consolidating production areas is another strategy. "It's putting together crops that are cold temperate, cold intermediate or cold sensitive so you aren't heating multiple greenhouses or bays," said Owen. "Alternative growing areas can be low tunnels with retractable covers that provide cold protection and manipulate the photoperiod."

In some cases, a high tunnel is a viable alternative. However, such structures may lead to heat stress which can affect plant growth, development and marketability. Heat stress can result in faded flowers, flower bud abortion and reduced aesthetic value.

Other strategies include repairing damaged parts of a greenhouse structure such as glazing material. Owen said this sounds simple, but glazing is often not intact. Growers should also address air infiltration under doors or through gaps where additions have been made, or air leakage around exhaust fans. Temporary plastic on doors can help growers manage greenhouse temperatures.

Cultural practices are influenced by reducing air temperature. Under cooler greenhouse conditions, applying fertilizer with excess ammoniacal nitrogen may induce ammoniacal nitrogen toxicity, resulting in plants that appear chlorotic.

Phosphorus deficiency can be induced at lower air temperatures because the substrate temperature is also cooler. Reduced root activity means roots are unable to take up sufficient phosphorus and deficiencies appear. However, some crops express different pigments or intensify foliage color or flower color under reduced air temperatures. It's important to conduct

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Routine greenhouse repair and maintenance can help cut energy costs.

Photo by Sally Colby

Various ventilation options for tunnel growers

by Sonja Heyck-Merlin

Chris Callahan and Becky Maden of University of Vermont Extension discussed high tunnel ventilation during a Vermont Vegetable & Berry Growers Association webinar. Callahan is an agriculture engineer and Maden is a vegetable nutrient management specialist.

According to Callahan, excessive temperature and humidity are often responsible for plant molds and mildews in high tunnels, including botrytis, gray mold, tomato leaf mold, powdery mildew and downy mildew. Growers should be shooting for less than 85% humidity in their high tunnels to help prevent these issues from occurring.

It's important to differentiate between circulation and ventilation. In high tunnels, circulation is usually generated by horizontal airflow (HAF) fans. HAF fans mix the air in the space, helping to provide consistent conditions in high tunnels.

"If we don't mix that space well, oftentimes what happens is the corners will have dead spots. You might see increased disease there because the air is stagnant and has more of an opportunity to condense and promote molds and mildews," Callahan said.

Ventilation is the actual exchange of air – bringing fresh air into a space and exhausting the humidified air or excessively warm air from inside the tunnel to the outside. Callahan said, "HAF fans circulate the air. They mix, they stir, they distribute, so adding more HAF fans is not going to ventilate the tunnel."

Passive systems – ones not requiring electricity – are the simplest ways to improve high tunnel ventilation. Rolling up the sides and opening the doors are examples of passive ventilation. If these are the only methods a grower uses, Callahan feels that it's critical

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nutrient/substrate testing to verify phosphorus deficiency related to air temperature.

Iron deficiency can occur under reduced air temperatures in relation to irrigation. Waterlogged substrate results in reduced root activity and induced iron deficiency. This can be overcome by increasing air temperature, reducing irrigation frequency and duration or providing fertilizer with iron chelate.

Thermal blankets over crops help create a microclimate to maintain a desirable temperature. Root zone heating provides heat precisely where it's needed and can be done under benches or across the greenhouse floor. Root zone heating can also be done in high tunnels.

Root zone heating can improve plant quality and enhance marketability. In a cold tolerant genus such as Osteospermum, root zone heating had no positive effect. However, with a cold sensitive genus such as Vinca, the negative effect was overcome with 80° root zone temperature.

Air temperature has a significant effect on crop development and flowering. Owen explained that all plants have a base temperature at which crop development progresses, and as temperature increases, plant development increases to the optimal temperature.

"As we continue to increase temperatures, we'll see a negative effect on the plant up until the plant stops developing," he said. "That's considered the maximum temperature."

Plants can be grouped based on their base temperature: cold tolerant, cold temperate (intermediate) and cold sensitive. Grouping plants according to base temperature allows growers to make energy efficient decisions on reducing air temperature in different houses, such as for cold-sensitive tropicals.

"If we know how to group plants according to their base temperature," said Owen, "we can make energy efficient decisions on reducing air temperature in different houses."

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the high tunnel is built in a spot with reasonable crosswinds. Sometimes, he sees situations where passive ventilation is inhibited by hedgerows or woods.

Another form of passive ventilation is to add gable vents on the endwalls of the tunnel or a ridge vent. "This leans on the fact that essentially any vertical structure is a chimney. If you have hot air inside something and you give it an opening up high, if that air is hotter than what is outside, that's going to drive ventilation," Callahan said.

Gable vents can include wax cylinders which open and close louvers without electricity. These sealed cylinders are filled with wax that expands and contracts as the temperature changes.

On Maden's vegetable farm they've taken a unique passive approach to ventilation by moving toward using higher ground posts with a slightly narrower overall width. She feels that the extra height has made a huge difference on ventilation.

She said, "The airflow just feels drier. They grow a nice tall crop. For tomatoes, it feels like a game changer."

Callahan said that with this design, growers get more roll-up side height and also more height to drive the "chimney effect." The moisture that is generated inside the tunnel has more space to occupy.

Unlike passive systems, active systems use electric motors to spin fans and move air. An example of an active system includes two endwall exhaust fans, two inlet louvers on the opposite endwall and a thermostat that opens the louvers and turns the fans on when the temperature is above 85° F.

An alternative to exhaust fans are ridge vents operated by a motor and a rack and pinion. These are sections of the roof designed to open and close, allowing warm, humid air to escape out the top. The drawback to ridge vents is the upfront cost; exhaust fans cost between $2,000 and $3,000 in a 90-foot tunnel, whereas a ridge vent is closer to $5,000. The electricity usage for the ridge vent, however, is much lower than exhaust fans. And ridge vents are quieter.

Another type of active ventilation is using HAF fans inside of the tunnel in conjunction with other ventilation methods. According to Callahan, HAF fans should be placed at least every 50 feet. If the crop in the tunnel has a lot of vegetation, like tomatoes and cucumbers, he recommended placing a HAF fan every 20 to 30 feet. HAFs are usually placed in a "racetrack" pattern. Unfortunately, in this system, the air in the corners tends to stagnate.

Vertical airflow fans are another option. They pull the air up vertically and send it down the side, where it hits a curved shroud and exits out the side. They are commonly found in commercial chicken houses.

"We really like vertical airflow fans," said Maden. "With the HAF fans, it seems like when you have a really thick canopy of tomatoes, it might not be moving air the way we want. Vertical fans seem to be doing the trick." She uses three in a 30-by-90-foot tunnel.

Another ventilation option is positive pressure ventilation – instead of pulling air out of the tunnel, a fan blows air in. Sometimes the air passes through a heater, and it is delivered through a sock with little holes distributed throughout it. They're typically located up high, but some growers have found benefit from them lower, especially for early season or winter production.

Tom Akins of USDA-NRCS added that there is cost sharing available for existing tunnels through EQIP. For example, EQIP may cover retrofitting tunnels with ridge vents, adding HAFs and installing end ventilation units. The first step is to participate in an energy audit, which NRCS can also cost share.

Finally, Callahan believes that growers need more quantitative data to help inform their decision making about what ventilation practices are working and where they can make improvements. He thinks growers should measure humidity in their tunnels in a few different locations.

"I would encourage everybody to consider increased measurement and monitoring in both temperature and humidity. Remote monitoring, particularly for tunnel and greenhouse conditions, has become much more accessible," he said.

For more information about high tunnel ventilation, go to go.uvm.edu/tunnelventilation.

"I would encourage everybody to consider increased measurement and monitoring in both temperature and humidity. Remote monitoring, particularly for tunnel and greenhouse conditions, has become much more accessible."

Fruit Growers Summer Field Day in Connecticut

The Connecticut Pomological Society will host a summer field day with vendors/exhibitors, free dinner and an educational program. Speakers will include Evan Lentz, UConn; Dr. Jaime Pinero, UMass; Colleen Kisselburgh, Arthur Carroll Insurance; and Micheale Williams, Bishops Orchards. Pesticide credits have been applied for.

The event will begin at 4 p.m. on June 13 at Belltown Hill Orchards, 485 Matson Hill Rd., South Glastonbury, CT.

If you would like to be an exhibitor/vendor, contact Mary Concklin at mary_concklin@uconn.edu or mary@raspberryknoll.com. There is no cost to exhibit.

This event is free, although registration is required for dinner. To register, visit tinyurl.com/CTfruitfieldday.

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