Vertical Farming: A Look Beyond the Hype

Big money and sexy technology may be hallmarks of this industry, but it still has some lessons to learn before it can feed the world.

Is Controlled Environment Vegetable Production in Your Future? page 24
How to Respond to Consumer Demand for Fresh Veggies page 40
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You only have to visit your local grocery store’s produce section and see the shelves stocked with organic and locally grown vegetables and the wide selection of pre-packaged grab-n-go vegetables to realize that the produce market is in the midst of radical change. Much of this is stimulated by consumers’ desire for safe, ultra-fresh vegetables. This locally grown, freshness-bias is going to favor greenhouse vegetable growers who are in close proximity to retailers. We’ve already seen this with suppliers like Gotham Greens and Leaf Farms.

As I delved into the viability of vertical farming for this month’s cover story (page 12), I realized that they have one advantage over greenhouses. They can easily be located near, or even in, urban grocery stores because space requirements change when you grow vertically. As Robert Colangelo, President of Green Sense Farms, a Chicago-based vertical farming operation puts it — vertical farms are nothing more than vertical greenhouses that use controlled lighting instead of ambient lighting.

While the vertical farming industry is still developing, I feel it will have positive repercussions for the greenhouse industry in the future as it matures. Not because it will replace our industry, but because the lessons it is learning about technology, automation, and sustainable growing can only benefit other horticultural and agricultural enterprises. After all, the entire premise behind vertical farming is to grow more with less. Isn’t our industry chasing the same goal?

The vertical farming industry is certainly one to watch. I hope you enjoy the overview the cover story gives on where the industry is now and where it has the potential to go. Happy spring growing!
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Biocontrols Conference Offers New Pest Management Solutions

The Biocontrols USA West Conference and Expo, held in early March in San Diego, CA, offered real-world success stories of how to integrate biocontrols, along with conventional and organic options, in integrated pest management programs. Go to GreenhouseGrower.com or BiocontrolsConference.com for highlights.

Keeping Tabs on Vertical Farming

This month’s cover story focuses on the emerging vertical farming trend, and what it means for greenhouse operations. We gathered so much information for this story that we were unable to include it all in print. Head to GreenhouseGrower.com for insights and analysis from some of the industry’s key players.

On the Road: California Spring Trials

By the time you read this, the Greenhouse Grower team likely has their suitcases packed for California Spring Trials (CAST) 2018. Watch for daily updates on GreenhouseGrower.com on all the tour stops, including slideshows of new varieties, breaking news, and analysis from Greenhouse Grower Editors Laura Drotleff and Janeen Wright, Contributing Editor and industry icon Allan Armitage, and Andrew Scheldorf, winner of the 2018 Dr. Allan Armitage Scholarship for the California Spring Trials. You can also get a taste of what was on display in the CAST preview slideshows, available online.

Featured Slideshow: Greenhouse Vegetables

From tomatoes to peppers, go to GreenhouseGrower.com to see some of the latest greenhouse vegetable varieties that will be available in the coming year.
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During the Seed Your Future Leadership Meeting Fundraiser dinner at Longwood Gardens in Kennett Square, PA, on Feb. 12, Pennsylvania’s Secretary of Agriculture Russell C. Redding thanked the Seed Your Future initiative for its work over the past three years to create awareness of horticulture and careers in horticulture. Redding was among more than 100 distinguished guests invited to the dinner from the local horticultural community in Pennsylvania and surrounding states, who joined dozens of Seed Your Future Cabinet Members and Advisory Council members, in attendance for the two-day meeting.

Redding spoke during the dinner, saying he applauds the Seed Your Future initiative because it has “done what most sectors in agriculture struggle with, and it has been a pleasure to see it come together.”

Redding said there is nowhere in the state of Pennsylvania where securing enough jobs in the agricultural workforce is not an issue.

“We have found that we really have to be very straightforward about what agriculture is, what the jobs are that need to be filled, and what the salaries are for those jobs,” he said.

Thus far, very few agricultural jobs have been defined, he said, but Seed Your Future is beginning to fill in the blanks to explain horticultural careers, and determine how the horticulture industry wants to be perceived in public. Redding ended his remarks with a quote from his favorite management guru, Steven Covey: “Before you reap the harvest, you have to plant the seed.”

Redding was among several who spoke during the evening fundraiser, including Seed Your Future Co-founders, Anna Ball, President and CEO of Ball Horticultural Co., and Longwood Gardens’ President and CEO Paul Redman, who each shared the idea and inspiration behind the initiative. Seed Your Future Executive Director Susan Yoder presented the many milestones and accomplishments of the movement since its inception in 2015, and highlighted some of the exciting new things to come this spring.

Stay tuned to Greenhouse Grower for full coverage of the Seed Your Future initiative and its offerings, and visit SeedYourFuture.org to find out how you can contribute to the initiative in time, treasure, and talent.

GG

**NICH Releases New Marketing Infographics**

Indoor plants — including those where we live, learn, heal, and work — have far-reaching positive effects on people’s well-being and indoor environment, according to a new report from the National Initiative for Consumer Horticulture (NICH).

A new series of four #PlantsDoThat Inside infographics focuses on the multitude of ways indoor plants affect where we live, where we work, where we heal, and where we learn.

“Greening the great indoors is a way to help create sustainable indoor ecology and healthy minds and bodies,” says Dr. Charles Hall, Ellison Chair at Texas A&M University.

The infographic series was developed from a scientific literature review evidence base developed by Dr. Hall and his students. The series of four brightly colored infographics, designed by Jennifer Gray of AmericanHort and the Horticultural Research Institute, is free. The infographics can be downloaded from NICH’s website, ConsumerHort.org.

The new series of infographics adds to the original infographics NICH released in March 2017, detailing the power of plants to enrich lives, create jobs, build wealth, and save money.

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Vertical Farming: A Look Beyond the Hype

Big money and sexy technology may be hallmarks of this rapidly growing industry, but it still has some lessons to learn before it can feed the world.

By Janeen Wright
Managing Editor | jwright@meistermedia.com

Vertical farming is receiving nearly as much attention in the news lately as the conundrum on how to feed a mushrooming world population in the 21st century. And rightly so, as this practice of growing produce in vertically stacked layers, usually through hydroponic or aeroponic growing methods, may be one solution to the problem — or not. As vertical farming continues to develop, it’s worth looking beyond the hype to see what growth in this sector of the horticulture market means for you.

Deep-Pocketed Investors Spur Momentum

The global vertical farming market was valued at $1.5 billion in 2016, and forecasts predict it will reach $6.4 billion by 2023, according to 2017 Market Allied Research. Some of the reported benefits of vertical farming include the ability to:

• Source production closer to the point of consumption
• Maximize growing capacity by cubic volume
• Improve water-use efficiency
• Control growing conditions with precision
• Produce food crops year-round.

The industry appeals to altruistic investors lured by promises ranging from big profit margins to more sustainable farming practices. It also attracts innovators drawn to its advanced technology.

“There is increasing interest in vertical farming from Silicon Valley and venture capitalists who see an opportunity to accelerate the use of big-data analytics, artificial intelligence, machine learning, automation, and other precision ag technologies like machine imaging to the CEA sector,” says Viraj Puri, Co-Founder and CEO of Gotham Greens, a pioneering urban agriculture company with rooftop hydroponic greenhouses in New York City and Chicago.

There are some big players in the U.S. vertical farming industry already, along with small- to mid-sized operations. Fast Company named New Jersey’s AeroFarms as one of the world’s most innovative companies in 2017. There’s also the $200 million start-up Plenty that lists Amazon’s CEO Jeff Bezos among its backers, and Indiana-based Green Sense Farms with its expanding network of vertical farms throughout the U.S., Canada, Scandinavia, and Asia-Pacific (APAC) countries.

Growing Pains Help Work Out the Bugs

Despite the swift growth, the vertical farming industry is still in its infancy and not without its challenges as it begins to mature. One of the biggest deterrents to this type of growing is its high operating cost, which can put a damper on near-term profits. The average age of profitable farms is seven years, according to Agrilyst’s 2017 Indoor Farming Report, and farms that were not yet profitable are on average five years old.

According to Dr. Roberto Lopez, Professor and Controlled Environment

>>> Cutting Room Floor
To learn more about vertical farming, please visit GreenhouseGrower.com.
Extension Specialist at Michigan State University (MSU), installing sole-source lighting, growing, and HVAC (heating, ventilation, and air conditioning) systems needed to run vertical farms not only requires plenty of capital, there’s also the daunting electrical costs involved in keeping the systems running. Similar to the ornamental industry, advances in light-emitting diode (LED) technology and the availability of cost-effective, state-of-the-art lighting equipment have changed the game for the vertical farming industry. As lighting continues to become more efficient and less expensive, it will go a long way toward bringing the operating costs down for vertical farms to make them more profitable ventures.

For now, growers are using other strategies to offset vertical farming costs such as growing only crops that generate high revenues and working toward achieving exponentially higher crop yields. The main crops grown are leafy greens, microgreens, herbs, and strawberries, with leafy greens and herbs being the majority. Growers have tested many crops for vertical farming, including highly specialized edible flowers and pharmaceuticals, but suitability and profitability are the main challenges operations face.

“Ideal crops for vertical farming are those that are physically short (so you can get many layers), have short growth cycles (so you can turn your facility over many times), and are highly perishable (more valuable when grown locally),” says Rens Muusers, Account Manager at Grodan, a supplier specializing in high-performance growing media for precision growing.

Green Sense Farms, one of the vertical farming pioneers in the U.S. that grows 365 days a year using automated computer controls, has taken a different approach to offsetting energy costs. Founding Farmer Robert Colangelo says the company first tries to make sure its farms are as low energy use as possible. Secondly, it is actively working to get its farms off the grid with the help of renewable energy sources such as groundwater heat pumps, windmills, and solar panels.

“It will be a while, but I believe advancements with energy storage devices will eventually help Green Sense Farms achieve this goal,” Colangelo says.

Growing Expertise Rounds Out Technology

Because of the operating systems involved in vertical farming, as well as the social ramifications of hypothetically feeding a burgeoning world population, the industry is a melting pot of activists and professionals, especially workers with specific skill sets outside of horticulture. While the industry has plenty of people who understand systems and growing, there is a need for more people who understand how to grow crops using indoor vertical systems.

“One gap I see is the need for more people with produce industry experience, particularly those with...
Association of Vertical Farming Can Be a Great Resource

The Association for Vertical Farming (AVF) is an internationally active nonprofit organization focusing on leading and advancing the sustainable growth and development of the vertical farming movement. The group offers a number of services to the industry, including:

- News from the vertical farming industry
- Resources and tools
- Events and workshops
- An online educational platform through its Vertical Farming Academy
- Open exchange of research, data, and technology
- Regional policy and advocacy support

In September 2017, the AVF hosted a summit in Washington, DC, that offered a mix of education, advocacy, and policy discussion about vertical farming and how to broaden its adoption. Greenhouse Grower’s Executive Editor Richard Jones attended the summit. Here are a few highlights Jones reported from the Summit:

- The overriding interest of most seemed to be in the potential of vertical farming not just as a business opportunity, but also as technology that can help solve some of the most pressing problems of getting nutritious food to people in areas where there’s limited availability. Techniques such as hydroponics or aeroponics can produce crops with a fraction of the water and nutrient resources required in traditional outdoor production.
- That said, the resources required to produce crops in completely enclosed environments where the grower supplies all the inputs — even the light — can be expensive. That’s certainly a limiting factor in adopting vertical systems to this point. A number of people at the conference suggested that as the technology advances and becomes more affordable, vertical farming will become a much more reasonable investment and business.
- The concluding session of the AVF Summit, and possibly the most relevant for the longer-term adoption of urban agriculture and vertical farming, was a discussion of the upcoming Farm Bill negotiations. Bob Van Heuvelen, CEO of VH Strategies, a legislative policy and strategic consulting firm, told the group there’s opportunity for vertical farming in a number of areas under the Farm Bill, but it could be difficult to obtain the funding. But, he said, the only way to have a chance to move things forward is to ask for it.

For more information on the Association for Vertical Farming, go to Vertical-farming.net.

post-harvest growing experience who can get high-quality crops growing on a regular schedule with food safety controls for customers,” Colangelo says.

The hard lean toward technology may set some vertical farms up for failure, according to hydroponics expert Joe Swartz, who works for American Hydroponics, which manufactures and installs food-grade growing systems.

“There is significant growth among both established growers and new start-ups that are focusing on correct crop production,” he says. “As a result, the industry will continue to grow steadily as demand for local food production increases, shipping and logistic issues continue to push for more localized production, and as food safety/sustainability issues become more demanding.”

Time and experience will most likely prove the best teachers as the vertical farming industry continues to grow. Making mistakes will be a crucial step in this process of growth and improvement.

“There is a lot of learning going on right now, and with learning comes failure,” says Travis Williams, Vice President of Marketing at Fluence Bioengineering, a company that designs LED lighting systems for commercial cultivation and research applications. “This period of exploration and learning will lead to successful vertical farming companies/applications coming online as more people and companies fine-tune the details that will make vertical farming a major component of the horticulture industry.”

Where You Fit In

Until vertical farming technology advances more and begins to prove itself sustainable, Swartz says he recommends greenhouse growers stick with production methods that have a better history of success and similar to their core of experience.

One positive trend that interests ornamental growers is moving young plant propagation out of the greenhouse and into vertical tiers of indoor CEA chambers. MSU’s Roberto Lopez and Erik Runkle have been researching how sole-source lighting, carbon dioxide, and temperature control can produce consistent and uniform young plants.

Another example is Virginia-based Battlefield Farms’ working with Fluence to set up this type of system (see cover photo), which resulted in reduced shrink and improved plug development, according to Williams.

As the vertical farming industry progresses, Colangelo says he thinks more partnerships will begin to form between vertical farms and greenhouses to co-locate and maximize efficiencies for both growing technologies.

“The exciting thing about the farming industry right now is that it is stratifying,” he says. “When you overlay a sustainability goal, you see that precision field farming is great for large-volume commodity crops. Greenhouses are fantastic for tomatoes, peppers, and cucumbers, and vertical farming works great for lettuces and herbs. If we reshuffle our farmland along technologies, we will start to have a more efficient, sustainable way to grow produce.”

Musser agrees, saying it is unlikely vertical farming will ever replace traditional greenhouses. Instead, it can be seen as part of an overall sustainable precision growing strategy that growers can use to do more with less.

Vertical farms’ small footprints, in terms of the space they take up, is a distinct advantage for locating farms in close proximity to distribution centers. Photo by Pixabay.
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Dickman Farms partnered with the GrowIt! app to trial its event listing service and promotion capabilities. The GrowIt! team created a series of event push notifications, targeting GrowIt! users within a 50-mile radius of Dickman Farms. GrowIt! users who saw the notification were given a promotional code to save on the purchase of event tickets. GrowIt! also created and shared a number of targeted Facebook ads with the same promotional code, target audience, and geographical reach. As a result, 25% of attendees were tagged as GrowIt! users through use of the promotional code.

Through post-event discussions with the garden center team and the

How Dickman Farms Used a New Event to Expand Its Customer Base

By Brian D. Sparks
Senior Editor | bdsparks@meistermedia.com

Last fall, Dickman Farms Garden Center in Auburn, NY, hosted “Carve & Brew,” a new event that was part of Dickman’s series of fall workshops and events. Geared toward adults aged 21 to 45, attendees were able to carve a pumpkin, taste craft beers from two local microbreweries, chow down on grub from a local food truck, and relax with friends and neighbors. Tickets cost $25 and included a commemorative tasting glass, brew tastings, and a pumpkin for carving.

Greenhouse Grower (GG): How did you promote it?
Stephanie Whitehouse: We promoted through our Club Dickman loyalty program weekly e-newsletter, as a Facebook Event on the Dickman Farms Garden Center Facebook page, and through the e-newsletters and Facebook pages of the two breweries and food truck. We used Constant Contact to sell tickets online, as well as in-store at the garden center.

As an early adopter to the Garden Shop program with the app GrowIt!, Dickman Farms Garden Center partnered with the app to trial its event listing service and promotion capabilities. The GrowIt! team created a series of event push notifications, targeting GrowIt! users within a 50-mile radius of Dickman Farms. GrowIt! users who saw the notification were given a promotional code to save on the purchase of event tickets. GrowIt! also created and shared a number of targeted Facebook ads with the same promotional code, target audience, and geographical reach. As a result, 25% of attendees were tagged as GrowIt! users through use of the promotional code.

Through post-event discussions with the garden center team and the

Attendees of Carve & Brew liked the chance to be at the garden center during off hours for a laid-back gathering with friends.
### Tips on Engaging and Expanding Your Customer Base

Greenhouse Grower’s 2018 State of the Industry survey included the question “In the last 12 months, what have you and your business done to better understand and cultivate new customers?” Here is just a sampling of the responses, some of which you might be able to take advantage of at your operation.

- “New marketing expenditures on Facebook and TV advertising. Seminars for beginning gardeners.”
- “Face-to-face discussions with our top customers. Also, grower focus groups to collect information from our grower customers.”
- “Classes, continuing education. Individual education if necessary.”
- “New color catalogs for both young plants and finished products, and open houses and trial gardens open to both brokers and customers.”
- “Increased the amount of custom planters available.”
- “Attend trade shows where we have the opportunity to meet and interact with our customers.”
- “Employ a younger sales team with a pulse on the new trends.”
- “We have started listing on plant databases for customers to better find us and reach markets we would ordinarily not have been in.”
- “Listened to other similar groups (not for profit) and looked for connections or opportunities to work together.”
- “Continue to add classes in our retail sector to create connection and give positive experiences.”
- “We have hired a Business Development Director, and one of his duties is to study direct-to-consumer sales.”
- “Good communication with local growers to see how our products support their efforts to reach their customers.”
- “We talk to our customers. We want to know how they found us and why.”
- “Employ a dedicated social media and marketing manager.”
- “Our practice of marketing with biocontrols has helped us dive into a whole new segment of customers that has helped us increase our market share.”
- “The AmericanHort SHIFT study has been useful, as well as any info we can gather on the Millennial generation.”
- “We spend quite a bit of time on the road visiting growers and talking to them. It helps us understand what they do, who their customer is, and which of our products might fit into their mix.”
- “Identified mass-merchant suppliers with similar products to ours that we do not already sell to and made sales calls and presentations.”
- “We have engaged in field days with topics that are relevant to homeowner horticulture.”
- “I work directly with universities to beautify their campuses.”
- “Online surveys with our customers.”
- “Started tracking new customers more closely and following up with them. Seeking out larger landscape projects and investigating contractors associated with them.”

breweries, for 2018 we will allow tickets to be sold at the breweries and online through Eventbrite to broaden the avenues for event promotion and ticket purchasing.

**GG: What was the feedback from those who attended?**

**Whitehouse:** Attendees of Carve & Brew liked having the chance to be at the garden center during off hours for a laid-back gathering with friends and family. Folks in our target demographic (both attendees and those who were interested in the event but had schedule conflicts) all expressed an interest in seeing an additional brewery or two, an additional food truck, and more activities included for the 2018 event.

**GG: How have you engaged with attendees since the event?**

**Whitehouse:** Members of the target demographic for Carve & Brew were all contacted for our Holiday Open House in November, which included tastings, pairings, and mini seminars given by local wineries, eateries, a chocolatier, and a vintage rentals and event planner. We didn’t track how attendees had heard about the event, but sales, attendance, and profit margins were all up for our Holiday Open House as compared to 2016.

**GG: Have you been able to turn attendees into new customers, or boost sales from those who were already customers?**

**Whitehouse:** All attendees signed up for or were already members of Club Dickman, our garden center’s loyalty program, which includes a weekly e-newsletter listing upcoming events, our Smart Gardening Tip videos, and additional content. About 25% of attendees of Carve & Brew were new customers.

We have developed all events for 2018 with a more definitive target audience in mind, and with multiple targeted marketing methods in the works to not only reach our existing loyal customers, but also to attract customers who are new to the Dickman Farms brand, the company, and the retail center. We hope to increase our consumer reach and purchase traffic by 10% for 2018.
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Why Your Efforts to Sell Plants Fall Short and What You Can Do About It

“It’s time to look at outside industries for ideas and inspiration on what we can do to operate more efficiently in today’s economy, and how to adapt to a rapidly changing consumer landscape.”

Mason Day
GrowIt!

By Mason Day

It has been a decade since the peak of the recession we saw in the late 2000s. Most industries have recovered nicely. They’ve reached their pre-recession levels, and in several cases, they’ve actually gone well beyond that. U.S. consumer spending is up. People are willing to spend $1,000 on a phone that will be outdated in a year and a half. It’s fair to say that people aren’t exactly pinching every penny that they have.

But what about us in the horticulture industry? Depending on who you ask, things have been good, or things have been just OK. Some never really recovered from the recession at all and were forced to part ways with their businesses. In many ways, our industry didn’t make that leap forward. We’re close to where we were before, but we aren’t gaining the ground where others have.

How Do We Change That?

It’s time to look outside of the industry. No, not for a career change. It’s time to look at outside industries for ideas and inspiration on what we can do to operate more efficiently in today’s economy, and how to adapt to a rapidly changing consumer landscape.

The Subscription Economy

These days you can get a subscription to just about anything — razors, clothes, makeup, meat. Harry’s Razors, Stitch Fix, and Birchbox are all built off this model. There are a few different companies toying with the idea for plant subscriptions, but it’s something that every greenhouse and garden center should be looking at. How can you turn your mixed container program into a seasonal décor program? Charging $39.99 per month for four containers to be swapped out throughout the season is a great start. It could be applied all over. Seasonal vegetables, herbs, you name it. Consumers are used to purchasing this way, and the reason they don’t switch their containers more often is because they don’t know they should. Recurring revenue and loyal customers is what it’s all about.

E-Commerce, SEO, Social Media, and the App Economy

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IOT and Automation

Labor is one of, if not the biggest, challenge facing our industry. Other industries have solved this problem by outsourcing production. When it comes to one-gallon echinacea, outsourcing is not exactly an option. Luckily, technology is advancing rapidly. We have a history of being notoriously hesitant about emerging technologies. We have to reverse that trend.

In the last few years, we’ve seen an explosion in the development of IOT (Internet of Things) products. Think Amazon’s Echo, Google Home, and Nest. Business technology is seeing the same improvements. Our machines are gaining the ability to communicate directly with each other. Creepiness aside, this communication is only increasing our ability to automate. Automation is the labor answer that we’ve been looking for, and as these technologies become cheaper, we need to jump on the bandwagon before it passes us by. The machines are going to take over with or without us, so we might as well use them to our advantage while we can.

Mason Day (mday@growitmobile.com) is challenging the horticultural status quo as Co-Founder of the mobile initiative GrowIt!, which helps consumers purchase the right plants for their location.
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In November 2017, USDA’s National Organic Standards Board took a vote that continued to allow hydroponic, aquaponic, and soil-based container production of organic crops. While discussion will continue on whether hydroponic and aquaponic production methods meet organic production principles, growers interested in producing vegetables using these methods can move ahead with their plans.

Demand for Locally Grown Produce on the Rise

The 2015 Local Food Marketing Practices Survey conducted by the USDA-National Agricultural Statistics Service was designed to collect data related to the marketing of food directly from farm producers to consumers or retailers who then sell directly to consumers. Results from this first-ever survey showed that 167,009 U.S. farms sold $8.7 billion in edible food products directly to consumers, retailers, institutions, and intermediaries. Consumers accounted for 35% of direct-food sales, retailers 27%, and institutions and local intermediary businesses 39%. More than 80% of all direct-market food sales occurred within 100 miles of the production site. With around 14 farms selling fresh and processed food direct, California accounted for 33% of the U.S. total sales with $2.9 billion in direct-farm sales. California also led the country in direct-to-consumer sales with $467 million.

Greenhouse Grower State of the Industry Survey Results

Growers who participated in Greenhouse Grower’s 2016 and 2017 State of the Industry Surveys are already taking advantage of the rising demand for local and organic produce. Others are considering adding vegetable and organic crops. Of the growers who responded to the 2016 survey, about 20% indicated they are producing greenhouse vegetables for the fresh market. Of these growers, 77% are producing in greenhouses, 42% are using high tunnels, and 15% grow in low tunnels.

As the demand for organic and local food increases, more controlled-environment growers can be expected to add vegetables to their crop mix.

Vegetables Grown Year-Over-Year

Among growers who produce food in greenhouses, here are their top crops grown in 2016 and 2017.

Source: Greenhouse Grower 2016 and 2017 State of the Industry Surveys
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said they planned to increase production in 2017. Another 11% said they would not make any changes to the number of vegetables they were producing. Only 2% of the growers said they planned to decrease vegetable production.

In the 2016 survey, growers were asked about their interest in filling the gaps in their crop schedules by growing and selling greenhouse produce for the fresh market. About 23% of growers had planned to grow produce in 2017. Another 15% stated they weren’t interested in growing produce in 2017, but would consider adding vegetables in the next few years. The majority of growers (64%) said they had no interest and didn’t plan to grow produce.

In the 2016 and 2017 Greenhouse Grower State of the Industry surveys, tomatoes were the number one greenhouse vegetable with more than 70% of growers indicating they produce the crop.

Even though most growers who participated in the 2016 survey weren’t interested in growing vegetables for fresh-market sales, more than half (65%) of the growers did produce herbs and vegetables for garden plant sales. In the 2017 survey, 17% of growers said they planned on growing greenhouse produce for fresh-market sales in 2018. Just as many growers (17%) said they didn’t plan to grow vegetables in 2018, but would consider adding them in the next few years. Most growers (66%) didn’t plan on growing produce.

Just as in the 2016 survey, herbs and vegetables for garden plant sales were an important crop for growers who participated in the 2017 survey. Thirty-two percent of growers planned to increase production in 2017, while 43% would keep production levels the same. Only 5% of growers said they would decrease the production of herbs and vegetables.

David Kuack (dkuack@gmail.com) is a freelance technical writer in Fort Worth, TX.


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Bug Your Customer About Biocontrols

Getting customers educated about your biocontrol use and using it to build your brand is all about telling your story in a way that attracts attention.

By Nadine Stielow

At Thiel’s Greenhouses, a retail/wholesale facility in Bruderheim, AB, Canada, our production focus is on a strong integrated pest management (IPM) program using biocontrol as our first and main line of defense. We have also added a media campaign that focuses on social interaction and direct contact with the end consumer. My biocontrol journey has been a learning process that is still ongoing. Here are 10 lessons I have learned along the way:

1. As I began to teach my audience, my skills and confidence grew in terms of implementing my program. I started to relay more information, and every time I talked about bios, the engagement from customers would soar. Plants are cool and interesting, but bugs? They are different, helpful, and cool. Customers love the message.

2. Contact a reliable and reputable biocontrol supplier. Develop a rapport with your product specialist and then trust them. Have someone who can answer your questions so you can relay the right information to your customers.

3. If you are hesitating to start a biocontrol program, just start somewhere. Pick one pest to control and go for it. You can worry about scaling later.

4. Make sure you have dedicated staff to implement your program. Scouting and proper distribution are critical to success.

5. Host events and classes. Highlight your biocontrol focus at every opportunity you can, even if it’s a short blurb during a do-it-yourself class. Talk about it, and share it on social media.

6. Be stubborn. Don’t give up on the program after a challenge or two. If you know it’s a sound practice and has value, then it’s worth it.

7. Your brand is how the consumer recognizes you. What kind of emotions and thoughts are evoked when they think of your company, services, or products? Your brand includes your logo and colors, but it is so much more. It is the overall feeling and experience that differentiates you in a sea of similar businesses. Make it count. Add your biocontrol message to everything you send out to the public.

8. Develop the lingo and context you want to use in your business culture and be consistent. Hashtags such as #biocontrol, #growclean, and #goodbugs could be part of your brand and help create consumer awareness.

9. Biocontrol is hot right now, and so are healthful living and wellness. They all tie together in your customers’ eyes, so start talking it up.

10. Educate and excite your customers by increasing awareness of your IPM strategy to set apart your business. Sharing your unique grow-it message is on trend, and you can ensure top-of-mind awareness by adding biocontrol methods to your greenhouse story on social media and beyond.

Why You Should Bug Your Customers

Consumers are making buying decisions based on what excites them, what speaks to them, and what moves them. If I can be the one educating them about my production methods, which will eventually be the industry standard, then I can be considered as one of the businesses leading progress, not one who is reluctantly dragged into it. It differentiates my business from others. Remember: You may know the benefits of using bios as a grower/owner, but is it obvious to your audience? Spell it out. Tell your story.

Nadine Stielow (info@thielsgreenhouse.ca) is owner of Thiel’s Greenhouses in Bruderheim, AB, Canada. Follow her on Twitter (twitter.com/ThielsGH), Facebook (Thiels Greenhouses), and Instagram (Thiels Greenhouses) and be sure to check out her Nadine’s Scenes Grow IT Eat IT Live IT channel on YouTube.
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Greenhouse Toolkit Series: Using Data Loggers in the Greenhouse

The fifth article of this five-part series about the tools you need to measure environmental and cultural parameters in your greenhouse, you will learn why you should be using data loggers and how to best put them to use.

By Brian A. Krug, Roberto Lopez, Brian E. Whipker, W. Garrett Owen, and Chris C. Currey

O n greenhouse production, we try to control as many inputs to our crops as possible. A wise man once said, “You can’t control what you can’t measure.” Some of the most common parameters we measure in the greenhouse are light, temperature, humidity, etc. Growers have been measuring these parameters for as long as greenhouses have been in use, but what about recording these measurements?

In the past, and maybe in the present, growers have kept crude records of the high and low temperatures of a greenhouse by using a thermometer that marks the points where the mercury reaches its highest and lowest points during a 24-hour period. It was up to the grower to check it, write those values down, and use a magnet to reset those points each day. This is great data, but it really only provides two points during the day. What about the average? When did it get to the low or high points, and for how long? This is where the use of data loggers becomes beneficial.

Types of Data Loggers

Data loggers allow the user to get much more detail about the environment. These instruments can range in complexity and price to match the needs of any grower. To upgrade from the thermometer, a grower can get a sensor that is connected to a small onboard computer that automatically stores the high, low, and average temperatures and keeps them for a couple of months. The grower must go to the data logger and use a small screen to read the values and scroll through the days, as well as record the data for use in the future. Different variations of these same data loggers can also measure relative humidity, light intensity, and the daily light integral (DLI).

To get more detailed information, programmable data loggers are also available. These units can be connected to a personal computer, and with software specific to the particular brand of data logger, the user can program how often the sensor records data. The frequency of data logging can typically range from milliseconds to hours. Data loggers in this category can come in many shapes and configurations. Some will come with only one or two sensors that are factory installed and not interchangeable with others that can be coupled with any number of external sensors. Be aware though, not all sensors are compatible with all data loggers. Be sure to consult the manufacturer to confirm that the data logger you purchase is compatible with the sensors you purchase.

Programmable data loggers are typically some of the most useful ones. Not only can you configure the data logger to record data and different intervals, you can also download the resulting data back to your computer to view and analyze. A programmable data logger with external sensors is often the most flexible unit because you can match the sensor at any

This is a simple data logger that will measure temperature and relative humidity. Data can be loaded by connecting the data logger to a computer and exporting it using the software that comes with the unit. Photos by Brian A. Krug.

To read more Greenhouse Toolkit articles visit the Production section at GreenhouseGrower.com.

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and although some losses were experienced, the crop was partially salvaged. Additionally, he put more safeguards in place to avoid this problem in the future.

If you are a grower that ships plants via truck or parcels, using a simple compact data logger that records temperatures can be a useful tool. Plants in shipping can be sensitive to temperature extremes. Periodically tracking the temperatures in your trucks or shipments can serve as a quality control to ensure that plants are not exposed to such extreme temperatures.

Using data loggers as quality control devices in your greenhouse on a regular basis is always a good idea. We rely on our thermostats and environmental control systems for our livelihood. If they are not working correctly, we risk
our bottom line. When was the last time that you checked over a 24-hour period, or longer, that the greenhouse conditions were consistent with your set points? This might sound like overkill, but a Midwest grower was surprised by the discrepancies he found and was able to track down some systemic errors that were negatively affecting crop quality. The grower now has a suite of data loggers and sensors that are deployed on a regular basis that serve as an environmental quality control check.

Another grower has used data loggers to monitor natural light levels to determine when supplemental lighting is needed. Once the natural light levels in the fall dropped below a critical level, the grower began using supplemental lighting. Supplemental light was used until natural light levels rose above the critical threshold in the spring. This practice ensured that the crop received enough photosynthetic light to produce a quality crop and avoided excessive use of lights early in the fall and late into spring.

As mentioned above, there are numerous applications for data loggers and a plethora of data loggers to match your needs and budget. Talk to your growing staff and identify ways to put data loggers to work in your facility to make you a better grower. Once you start using them, you will surely find ways to incorporate them throughout your greenhouse in multiple applications.

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President & CEO

See how Shenandoah Growers transformed their cultivation with Fluence LED horticulture lighting solutions at www.fluence.science/shenandoah-growers/
Two Simple Hydroponic Production Solutions That Generate Results

Factoring in these two production considerations can help you prevent a host of problems and turn out higher quality hydroponic crops.

By Tami Van Gaal

Hydroponic crop production brings a unique set of needs compared to conventional production. Addressing two often-overlooked factors can improve production and crop quality.

The first factor relates to providing proper buffering to maintain a more constant pH in the irrigation water. The second relates to providing proper air movement over the crop to encourage transpiration and nutrient uptake. Simple fixes for these two factors can make a big difference in the crop.

A Solution for Low-Alkalinity Water

Imagine this scenario: The pH of your fertilizer solution needs to be adjusted down with acid to reach your target pH. All is going well for a period of time until the pH suddenly drops rapidly and won’t hold in the manner you expect. What happened?

One possibility is that the continuous injection of acid eroded the alkalinity of the water. Alkalinity is a natural buffer. Waters lacking adequate buffering capacity can experience rapid pH changes in response to the addition of acid or basic materials, including fertilizers.

Envision a second scenario: You’re a grower in a warehouse production space that uses reverse osmosis (RO) water. The RO process strips all of the alkalinity, or buffering capacity, from the water. Any addition of a non-neutral fertilizer or supplements will result in a change that must be compensated. Even when fertilizer programs are well balanced, the pH of these solutions must be closely monitored. While this can be addressed, production would be more efficient if the extra management step could be avoided.

Boost Fertility With Potassium Bicarbonate

Fortunately, there’s an easy, crop-friendly way to add buffering capacity back into the water and minimize the likelihood of encountering either scenario — potassium bicarbonate. The Griffin CEA team recommends adding potassium bicarbonate to fertility programs whenever clear irrigation water has less than 50 ppm CaCO₃. Potassium bicarbonate will also provide a touch of potassium to the crop. This is generally a favorable addition and easily managed in the greater fertility program.

With improved buffering capacity, you can work to build a strong fertility program for your crop that’s also forgiving. Remember to ask your supplier for help in this process.

If you’re using concentrated stock tanks, remember that potassium bicarbonate is a product that needs to be injected solo. Avoid mixing potassium carbonate with other fertilizers and supplements in concentrated form.

Which Crop Likes Airflow Directed Onto The Plants?

A uniform production environment produces a uniform crop. It’s normal

Lettuce is one hydroponic crop for which a more direct, vertical airflow onto the crop is beneficial.
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for microclimates to develop within a production space when the only sources of airflow are greenhouse vents, fan/pad systems, or warehouse HVAC systems. These microclimates result in temperature and humidity differences across the crop. In the worst-case scenarios, dead-air zones develop where humidity can rise to levels that are conducive to disease development and/or significant temperature gradients can occur within the production space. Microclimates can be minimized by adding horizontal airflow (HAF) fans to the space, which move the air throughout the production space. Properly placed HAF fans will move the air around a crop without actually blowing air onto a crop.

With few exceptions, directing fans onto crops should be avoided. While a little airflow is a good thing, turbulent airflow over a crop resulting in visible movement of the crop can have a detrimental impact on crop growth. When airflow over a leaf surface is high, the stomates close to reduce transpiration and prevent excessive moisture loss. Stomatal closure limits carbon dioxide availability to the crop, reducing photosynthesis and growth. This is generally very evident in production — plants in the direct path of airflow are generally shorter and have less vegetative growth.

**Take Care With Lettuce**

There is one crop for which a more direct, vertical airflow onto the crop is beneficial. Under low light and higher humidity, lettuce crops can develop tip burn of the interior leaves. This tip burn is also known to occur under excessively high daily light integrals (DLI) in lettuce — greater than 12 mol/m²/day without good airflow and 17 mol/m²/day with good airflow.

Tip burn of the young leaves is often caused by a calcium deficiency due to low transpiration resulting from pockets of stagnant air at the growing tip. Gentle airflow in a downward direction over the crop has been shown to improve transpiration of the young leaves and reduce the incidence of tip burn. Gentle is key here: It doesn’t take a lot of airflow to improve transpiration. No gale-force winds are needed. Instead, achieve gentle airflow with vertical fans. These large paddle fans, mounted above the crop, have been shown to produce enough downward air movement to improve transpiration at the growing tips and reduce the incidence of tip burn.

Making efforts to address these two commonly overlooked factors, buffering and airflow, can go a long way to simplifying production and producing a great crop. Our simple solutions are easy to deploy and bring measurable results.
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Innovative IPM: Chili the Pest-Detecting Canine

NatureFresh Farm’s newest employee may have four paws, but that doesn’t stop her from sniffing out a major pest problem.

By Cam Lyons

Chili, a pest-detecting canine, is the newest addition to the Integrated Pest Management (IPM) team at NatureFresh Farms in Leamington, ON. While she is an unconventional member of the team, her work has been invaluable to our operation and could have a future impact on the industry as a whole.

Chili is a two-year-old Belgian Shepherd that is registered with the American Working Dog Association as a service dog. She is the only dog in the world specifically trained to detect the scent of pepper weevil. We introduced Chili to our team in the spring of 2017 after the greenhouse industry experienced major issues with pepper weevil during the previous year. The pepper weevil is an invasive species that is resistant to typical pest control measures used in our North American greenhouses, so we brought in Chili to help our team gather information on how to combat this pest.

No Idea is a Bad Idea

The idea for Chili came when we found ourselves in a desperate situation, and we had exhausted all other possible options for pest control. We needed to think differently about this issue, so we were encouraged to think outside of the box and even take silly ideas seriously. I started doing some research and stumbled upon the idea of service dogs. I delved further into this idea, and the rest is history.

How Chili Finds a Needle in a Haystack

One of Chili’s most important jobs has been to conduct perimeter checks. Pepper weevil is a highly elusive pest. We needed to gather more information about the weevil’s point of entry.

After conducting perimeter checks with Chili last year, we determined that the pepper weevil is not found on the ground or in the grass directly surrounding our greenhouses. This means that we do not need to put resources toward more pest entrapment on the perimeter. Chili’s specific skill set allowed us to make a more informed decision about what preventative measures to put in place.

Another important job that Chili performs is vehicle checks. In this industry, many vehicles drive between greenhouses and can serve as literal vehicles for pest transfer between different farm operations. Chili can search vehicles and detect whether or not pepper weevil insects have latched on to them. If Chili finds pepper weevil during vehicle checks this coming season, we may need to look at modifying how we conduct farm visits in the future.

Chili is also an essential part of clean-out season. Once we clear plants out of the greenhouse, bugs like the pepper weevil feel threatened and hide. In addition, their food source is taken away, and the temperature inside the building drops. All of these factors cause the insect to hibernate, providing us with the perfect opportunity to bring Chili into the greenhouse and search for weevils to find their tricky hiding spots. If even one mated female survives the crop change, it could lead to crop loss by early summer. This means that clean-out season is the one opportunity our team has to find the needle in the haystack.

Chili’s Most Important Role at NatureFresh

Chili’s most important role is to provide us with new information about a highly destructive pest. With this new information, we are able to make more informed decisions regarding effective pest management. We know that what Chili does for the IPM department will allow our company to grow and produce food more efficiently and safely in the future. This is what makes Chili an incredibly valuable asset for our team.

Cam Lyons (cam@naturefresh.ca) is a Research & Development/IPM Technician for NatureFresh Farms with 25 years of pest management experience.
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How You Can Respond to Complex Consumer Demands for Fresh Veggies

If you want to sell greenhouse-grown fresh vegetables for a profit, set yourself apart from the competition.

By Janeen Wright  
Managing Editor | jwright@meistermedia.com

Demand for greenhouse-grown produce is steadily rising, with sales in the U.S. expected to reach more than $4 billion by 2020, according to a report by Rabobank’s Food & Agribusiness Research & Advisory group. Consumers’ push for new choices will put pressure on breeders and growers in this expanding market. Considering that most consumers often can’t tell one variety from another, the growers who will have a competitive edge will be those who differentiate.

Proximity to retail will give greenhouse growers an advantage as the locally grown movement plays more into this market. “We have had many requests from new and old growers wanting to put up indoor facilities in their region to capture local vegetable sales,” says Joe Messer, North American Manager for Hem Genetics, which recently jumped into the vegetable arena with its ‘Sweet Valentines’ tomato.

Geography is not the only driver of hyper-localism. It’s also about the farm-to-table freshness consumers value, because they equate it with higher quality. lèf Farms in Loudon, NH, has experienced this with local chefs who want something different to set them apart from the kitchen next door. “We have had great success with our restaurant pack,” says Sales and Marketing Manager Donald Grandmaison. “The chefs like having unique blends of greens delivered just 24 hours after harvest because they can serve a higher-quality product and reduce food waste.”

Flavor Sells

Pinpointing what consumers value in their fresh produce will be the key to getting noticed in the fresh produce market. Currently, flavor ranks at the top of consumer preferences and has become one of the distinguishing factors that make a superb vegetable variety stand out from bland look-alikes. It also comes down to growers becoming familiar with regional market differences in their area, including specific trends and tastes, says Arjen de Haan, Technical Manager-Europe for Oasis Grower Solutions, a supplier that develops new products and solutions aimed at hydroponic growers. “Growers have often catered to a generic market in the past, but those growers scoring better will be the ones that aim toward regional taste and culture,” he says. Gotham Greens is one of the pioneers in urban agriculture, with greenhouse facilities in New York City and Chicago. It has experienced regional success by supplying highly perishable leafy greens and herbs to urban consumers. The company can differentiate its products from other brands and growers because it can offer a fresher, better-tasting product with greater transparency. “Locally grown produce offers the additional benefits of greater shelf life, increased sell through, overall greater customer satisfaction, and decreased food safety risks,” says Viraj Puri, Co-Founder and CEO of Gotham Greens.

To learn more about greenhouse vegetables grown for fresh produce sales please visit GreenhouseGrower.com.

Continued on page 42
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“Recent outbreaks of food-borne illnesses like Salmonella and E. coli have only propelled consumers’ demand for greater transparency around how and where their food is produced.”

Yet, it’s still not enough to claim that produce is locally grown. Growers also need to communicate why their growing practices matter in the production of safe food.

“Consumers want transparent labeling and information on the company growing their food and its ethics,” says Sakata’s Product Development and Marketing Manager for Home Garden and Farm Market Vegetables Tracy Lee. “Consumers also want information on the health benefits of fresh produce. This can be a challenge for companies because making health claims is a tricky business.”

**Trending Now: Grab-n-Go, Novelty, and Ethnic Veggies**

Increased consumer awareness of how their food is grown has also fueled their interest in organically grown vegetables. According to data from the Organic Produce Network, sales of organic fresh produce items reached nearly $5 billion in 2017. Despite organic vegetables’ rise in popularity, organic doesn’t always equate to healthiest, and there is still some confusion about what organic really means.

Equal in value to consumers is uniqueness and convenience. Mini cucumbers, snack peppers, cherry tomatoes, etc., offer easy, grab-and-go options.

“Heirloom vegetables also work well for fresh-produce sales, and ethnic and novelty vegetables are gaining popularity,” says Josh Kirschenbaum, PanAmerican Seed Vegetable Sales Account Manager. “Incorporating different colors, shapes, and flavors into traditional vegetables is becoming more mainstream.”

PanAmerican’s HandPicked Vegetable and Herb Collection is geared especially for those who supply fresh market farms. One convenience product it is currently developing is a seedless sweet pepper. If grown in a greenhouse, isolated from standard peppers, the fruit will be free of seed. This allows consumers to cook the peppers whole without having to worry about removing the seeds.

**Greens Are Where It’s At**

Consumer demand for leafy greens, such as arugula and romaine lettuce, and micro and baby greens has exploded. Sakata Vegetables is one breeder focusing on the leafy greens and baby greens markets, to find varieties that exhibit superb flavor when grown indoors.

“In addition to flavor, growers want items that will add a percentage of color to their greens, such as red or gold varieties like yellow-stemmed chard. They are also looking to expand into other areas,” Lee says.

Some of these areas include a focus on herbs such as oregano, basil, and rosemary, and hydroponic leafy greens and herbs that are sold with the roots intact.

“By selling greens and herbs this way, growers avoid many of the food safety concerns that occur with cut leaves, and the consumer gets a fresh product that lasts longer than cut products,” Kirschenbaum says.

As growers venture into these new areas and try to make a name for themselves selling greenhouse-grown vegetables for the fresh market, they will need to adopt the more flavorful, distinctive vegetables consumers crave. Sharing their stories and focusing more on benefit-driven communication will improve their chance for success.
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SHIPPING YOUR BEDDING PLANTS?

Some useful tips from the Phyton® Corporation growing expert.

“A successful post-production season comes down to shipping toned plants that are strong, compact, fertilized, and disease/insect-free with high reserves of carbohydrates. These will hold up best during unpredictable spring weather conditions and will have more colorful, longer-lasting flowers that perform better all season long.”

Bedding plants toning guidelines for winning results:

**Moisture:**
Reduce watering frequency. Allow plants to dry, but not wilt, between watering. Keep humidity low in the greenhouse by providing good air-flow, ventilation, and adequate spacing between plants.

**Fertilizer:**
Reduce fertilizer levels by about half. No more than 40% of the total nitrogen should come from ammonium as this promotes soft growth. Consider using a controlled-release fertilizer to protect against leaching from rain and overwatering at retail.

**Temperature:**
Reduce nighttime temperatures to enhance flower color, decrease respiration and increase stamina. Do not reduce daytime temperatures or you’ll compromise photosynthesis.

**Light:**
Stimulate photosynthesis by increasing your plants’ exposure to light.

**Post Production tips**
Scout your finished plants for signs of disease or insect infestation and discard any offenders. Remove damaged, old, or dead tissue.

Protect against diseases like Botrytis and fungal leaf spots, use a broad-spectrum fungicide/bactericide. Phyton® 27 and Phyton® 35 can be safely applied to open blooms and leave no visible residue.

**Shipping:**
Make sure foliage and flowers are dry before packing. Ventilate packing material and ship in a truck that is ventilated and refrigerated. Keep transit time to a minimum and ship plants at temperatures between 42 and 60 degrees F, depending on your crop’s tolerance to cool night temperatures. Some cold-sensitive plants are begonia, celosia, coleus, impatiens, pepper, tomato, vinca, and zinnia; ship these at temperatures between 55 and 60 degrees F.

**Arriving at Retail:**
Enclose care instructions for the retail staff. Plants should be unpacked immediately, placed in a lightly shaded, cool area, and watered if needed. They should never be allowed to wilt; and damaged plants should be discarded.
GOT A QUESTION ABOUT PLANTS?

Ask an expert...call the new PHYTON GROWER HELPLINE and chat with ALAN MILLER. Alan is a graduate of The Ohio State University in Horticulture, and he has 40 years of experience as a grower and as an expert helping other growers solve their growing problems. Whether it is a general question or a specific one about Phyton products (Phyton 27, Phyton 35 or X3), Alan will assist you with a solution. Call him at 800-356-8733, Ext.1 today!

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Let’s Revisit the Native Plant Movement

One of the main movements or trends in plant marketing is the use of American native plants in the landscape, garden, design, and retail trades. I reviewed some of my past columns for Greenhouse Grower, where I had composed a number of opinions on native plants over the years. However, one column I wrote in 2004 stood out. Some things have changed, but then again, some things have not.

Here are a few excerpts from my “Invasive Plants Make Us Look Bad” column in the July 2004 (Vol. 22, No. 8, page 142) issue of Greenhouse Grower, and my thoughts 14 years later.

“It seems every time I read a gardening section in the newspaper, someone is dissing our ornamentals, particularly our perennials. I am a little tired of hearing how exotics sold by the horticulture industry are invasive, and as much as I enjoy our native species, I am tired of hearing how they are the end all and be all. I know, and you know, that 99% of the plants we sell from our nurseries and greenhouses are not invasive, so why are our plants under such attack?”

I still ask that question, but it became obvious over time that the attacks were not really about our plants, but about invasive plants in general.

“Is it important what ignorant garden writers say, anyway? I would like to say ‘No, it isn’t. We have been selling plants for a long time, and we will continue to do so,’ but that is self-serving and foolish. It is important because this is what the majority of gardeners read, and if they read often enough that ornamentals are bad for the environment, well, they will stop buying any plant without Native to America on the label. Over time, through word of mouth, this mindset, like a waterfall, will engulf all who get in the way. If you don’t believe me, all I should have to say is ‘Remember the Alar Scare!’”

Boy, have those words become prophetic. Enough voices cried out, enough people believed, and now there is not a single installation, a single garden center, or a single designer that does not look for a Made in America label. For those of you too young to remember Alar, perhaps that is just as well.

“Where did this outcry against these exotics come from, and what does that have to do with me? For a start, nearly 100% of our annuals and probably well over 70% of our perennials are exotic (i.e., not native). On the woody landscape side, the numbers are also far more skewed to exotics.”

This is no longer the case. With breeders adding dozens of nativars and with public opinion so high, many more perennials, trees, and shrubs are natives/nativars than there were 14 years ago.

“I, for one, revel in this diversity, and as long as our customers are happy with what they purchase, I welcome new exotics and new natives to our fold with open arms. However, there is a problem out there, and we are not without responsibility. The key word is not exotic, but invasive.”

Invasive has become a dirty word, even though exotics were brought over by the pilgrims. There is little we can do about this, but we can control thuggery (read on).

“Thuggery is often a matter of where one lives. What is invasive in one area is not always a problem elsewhere. For example, miscanthus grass is starting to dot the natural areas of the Midwest, but struggles in other areas. Lily-of-the-valley (Convallaria majalis) covers entire acres in the North, but in

Allan Armitage (allan@greenhousegrower.com) is a statesman of the industry, as a contributor to Greenhouse Grower since 1984, a groundbreaker in variety trials, a breeder, and a Professor in the Department of Horticulture at the University of Georgia for 30 years. He continues to stir controversy in the industry as an active consultant, author, and lecturer.
The native perennial Asclepias tuberosa attracts bees and other pollinators. We saw the problem of too little time and too little patience at least 14 years ago. With smartphones, it is even truer in 2018. Today, more than ever, we cannot underestimate the need for success.

“For landscapers, I have less patience. It is their job, as it is ours, to know the plants they are using. If they are professionals, they will know not to use them. If they are in the business solely because they own a red pick-up truck and a tiller, there is little hope of educating them.”

I did not mean to pick on landscapers. I have the same impatience with retailers and nursery people. Selling English ivy, Chinese wisteria, or Asian chameleon plant (Houttuynia) should be a capital offense.

“The problem is, we are still selling plants that are invasive. They may not take over entire pastures, woods, or waterways, but they may take over people’s gardens and landscapes, and that is a no-no. Plants like goose neck loose-strife, chameleon plant, and buttercups (Ranunculus) can ruin a landscape in a few years, and as far as the common folk are concerned, they are as bad as kudzu, multiflora rose, and lythrum. That they are lumped in with these pernicious well-known thugs is already showing up in newspaper articles and garden publications. The answer: Know the thugs in your area, and phase them out.”

Can you believe I wrote that 14 years ago, and I am still writing it today? There is no doubt we are far more aware of invasiveness and thuggery today than ever before. However, we are slow learners. We simply can no longer afford stupidity. Unfortunately, we all tend to get tarred with the same brush.

Ah, but enough of this negativity. It is springtime and plant lust is all around. Each year gets better, and each year we get smarter. Enjoy the season! GG
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Learning the Art of the Humble Brag

Our industry has an image problem — and it’s our own fault. We’re too humble, and we just don’t talk enough to the public about how great we are. What’s worse, we won’t stick up for ourselves, either, or correct others when they make derogatory or inaccurate statements about our industry or products. As Sarah Cathcart, Longwood Gardens’ Vice President of Education, said during the Seed Your Future Leadership Meeting in February, “Horticulturists are a rare breed because we are secretive and tend to avoid self-promotion. This may lead to extinction in modern society.”

She couldn’t be more accurate.

That is changing through the efforts of industry initiatives like Seed Your Future, a movement to promote awareness of horticulture and horticultural careers, and the National Initiative for Consumer Horticulture (NICH), a stakeholder partnership with the goal to increase the percentage of U.S. households participating in consumer horticulture to 90% by 2025. This spring, Seed Your Future will launch its new natural science curriculum in middle school classrooms nationwide. Its efforts to promote careers in horticulture to a broader audience are ongoing. Meanwhile, NICH is supplying free #PlantsDoThat infographics to the industry to help promote horticultural products. They are the perfect complement for helping consumers see plants as essential to everyday life.

It’s a good time for these organizations to be developing tools to promote the industry, too, as it seems that teachers, parents, retailers, and consumers in general are receptive to our messaging, and are even seeking out information pertaining to our products.

One area that needs work is in communicating efforts toward sustainable production with retail customers and end consumers. Last month at Meister Media Worldwide’s 2018 Biocontrols USA West Conference & Expo in San Diego, CA, we heard from a panel of experts about how retailers and consumers are driving the market demand for more sustainable products. According to the International Food Information Council Foundation’s 2017 Food and Health Survey, sustainability is important for more than half of consumers. The organic trend, which has doubled every year since the late 90s, has fueled the rapid increase in the use of biopesticides, growing at a rate of 14% to 17% annually, but biocontrols as part of integrated pest management is the real goal, since organic is not likely to feed the increasing population. In Europe, sustainability is more important to consumers than organic-labeled products.

The Sustainability Consortium, an organization that represents dozens of retailers nationwide, is in the process of developing a Sustainability Dashboard to help facilitate more conversation between retailers and suppliers, and improve farm-to-consumer messaging with better packaging, so consumers can see that their sustainability concerns are being addressed.

Perhaps there is potential for our industry to provide talking points for growers to promote sustainable production efforts. Consumers are obviously listening, and they’re waiting for us to provide transparency. So it’s not exactly bragging — it’s simply and humbly speaking the truth.
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