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COVER STORY

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Flexible & Crop-Focused

David Kuack

While both ornamental and vegetable crops are grown in controlled environments, one important facet that's required when producing ornamentals is the need for flexibility—a skill that can come in handy in a food production greenhouse, as well.

"As an ornamental grower you have to have more flexibility than a vegetable grower," said Renato Zardo, director of growing at Great Lakes Growers in Burton, Ohio. "I'm growing lettuce now so I set the greenhouse climate for lettuce. When I grew ornamentals there had to be some compromise to find a climate that was suited for all the varieties and species in the greenhouse."

Pictured: Renato Zardo, director of growing at Great Lakes Growers in Burton, Ohio, benefited from starting out in ornamental flower production at Green Circle Growers before moving into controlled environment agriculture production.

Renato started his career as an intern and then a grower at Green Circle Growers in Oberlin, Ohio, where for five years he produced a wide variety of ornamental plants, including annuals, poinsettias, mums and tropical plants. It was while he was there that he won the *GrowerTalks* Young Grower Award in 2015 as a promising up and comer in the industry. After leaving Green Circle, Renato then grew hydroponic tomatoes at Nature Fresh Farms in Delta, Ohio.

"My work experience at Green Circle really helped me at Nature Fresh where I was growing different tomato varieties," he said. "Having the experience of working with different ornamental species helped me to grow different tomato varieties."

The flexibility to grow ornamentals extends beyond maintaining the proper environment. Renato noted the fertilizer rate for different ornamental species in the same greenhouse may not be the best for all the plants.

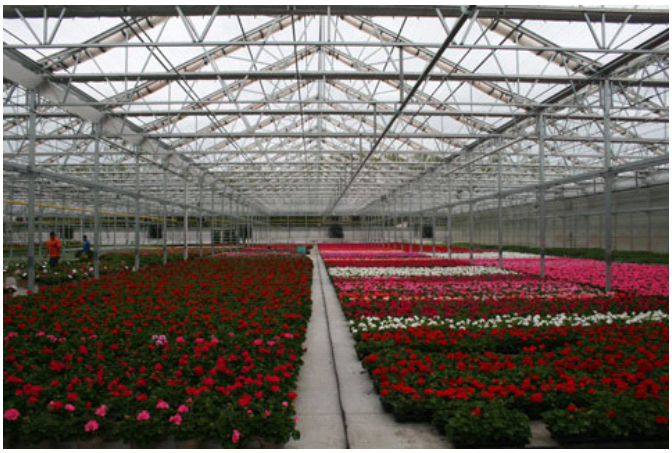
"Some of the plants are not going to be happy when grown under less-than-optimum conditions. Some may experience iron deficiency or magnesium deficiency," he said, adding he learned to read the plants and react to them as an ornamental grower. "For most varieties of a specific ornamental species, their climate and nutritional requirements are similar. There are also some sensitivities from one crop to another.

“This is something growers have to adapt to. This is something vegetable growers can learn from ornamental growers.”

On top of climate control

Because ornamental growers may be growing some species in less-than-optimum environmental conditions, they’re dependent on plant growth regulators (PGRs) to overcome some of the production issues that can occur, a tool that doesn’t need to be in the food production toolbox.

“Some ornamental varieties and species may not grow as quickly or size up because they need to be grown in a warmer greenhouse, but this isn’t necessarily possible,” Renato said. “This may result in growers having to apply PGRs to cause the plants to grow larger. Or the plants may grow too much so a growth retardant has to be applied to slow down the growth. Fortunately, ornamental growers have more tools to work with in controlling plant growth.”



On the flip side, working with vegetables and leafy greens, growers can directly see the consequences of manipulating the climate and fertilizer rates on the yields and performance of their crops. Renato said vegetable growers need to be on top of greenhouse climate control 24/7.

“With ornamentals, such as mums or spring crops, they aren’t easier crops to grow, but they are more forgiving,” he said. “If I make a wrong call with the climate on lettuce, tipburn can occur on all the heads and ruin the harvest of the crop for the next four weeks. If I make the wrong call on the climate of ornamental crops, they’re just going to grow slower. If I burn the tips of the ornamentals’ leaves, they can grow more flowers in a week and it’s not a big deal.”

Pictured: Ornamental crop growers are used to staying flexible, as they grow multiple crops—something that helps them stay in tune with the crops’ needs.

Also, with vegetables, growers tend to use more cultural practices to speed up or slow down a crop than ornamental growers, he said. Vegetable growers constantly make changes and tweak the climate because the plants seem to respond faster than ornamental crops. It’s why more indoor fruit and vegetable growers are looking at technologies that can help tweak the climate automatically and provide constant readings to monitor those conditions.

How much automation is too much?

While technology has a place in the production of controlled environment agriculture crops, the focus still needs to be on the actual crops themselves.

“Anybody who wants to try to take advantage of the advances in CEA technology and apply it to an ornamental plant business has to figure out exactly where it fits in and how to capitalize on it,” said Glenn Behrman, founder and president at CEA Advisors. Glenn had a long career in tropicals in Florida before moving to the CEA side developing growing containers. “It’s not as general as growing lettuce, leafy greens or tomatoes. With ornamental crops, growers have to figure out exactly if and where the technology fits in.

“More ornamental growers are incorporating mechanization into their operations, including soil mixers, plug and pot fillers, transplanters, and conveyor systems. It is more mechanical automation than precision robotics. While different parts of the production process can be mechanized, there are still a lot of the production processes that have to be done manually. It’s a similar situation with climate control. Most ornamental growers don’t need the same level of precision environmental control that is required for most food crops.”

In the case of controlled environment vegetable growers, Glenn said some companies have put producing technology ahead of producing the crops in order to catch the investor’s eye.

“A lot of technology chosen for controlled environment vegetable production is inappropriate,” he said. “It doesn’t really give the growers the bang for the buck that they think they’re getting. A grower doesn’t need to use grow lights that deliver 400 micromoles of light if the crop being grown only needs 300 micromoles.”

Tuning the technology to the needs of the crop can make the grower more efficient without big expenses.

Labor constraints

Even though ornamentals are grown in a variety of structures, Renato said it can be more physically difficult to scale up ornamental production than it is with vegetables. This is an aspect where the technology gives indoor food production an advantage over ornamentals.

“When I was working with ornamentals there were a lot of workers on the growing staff, including assistant growers, growers, section growers, head growers, manager grower and director of growing,” he said. “Because ornamental crops involve many more hands-on activities, including fertilizing, applying pesticides and PGRs, and staging crops from one greenhouse to another, there is a need for more growers and workers. With vegetables, there is an assistant grower, grower and director of growing/operations. In a technically advanced vegetable greenhouse, one head grower/grower can operate 45 acres of tomato production. For tomatoes, there is a specific group of workers producing the crop year-round.”

Also, because most vegetable crops are grown hydroponically, they’re irrigated automatically. Unlike ornamental crops, he added, there’s no need to manually water vegetable crops based on the weather. With vegetable crops, computer-controlled irrigation is done based on the settings determined by the grower. A vegetable grower can manipulate the settings of a 45-acre greenhouse in 10 minutes.

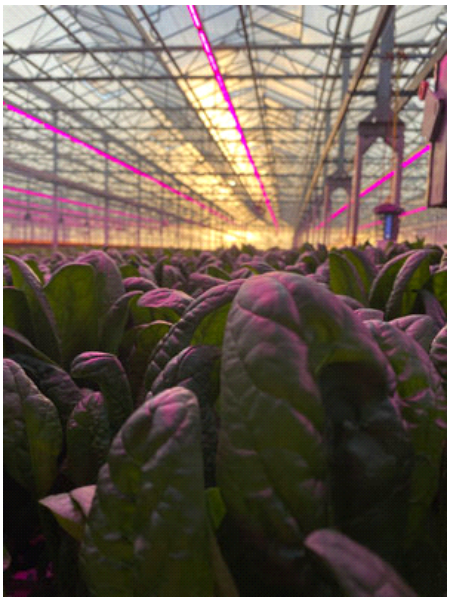
“If 2 acres of ornamental plants have to be hand-watered, it might take the whole day depending on the crop. With ornamental plant propagation, growers may need to irrigate the edges of the benches, depending on whether it’s a crop of plugs or poinsettias,” he said. “In most cases, a grower needs to ensure watering is being done in a proper and timely manner.”

Sharing information

One of the things that Renato misses the most from the ornamental industry is the amount of communication between growers.

“Green Circle was part of the Van Wingerden family, which operates multiple greenhouses throughout the country,” he said. “There was much more sharing of information. There were more consultants coming in. We had a poinsettias consultant, a mum consultant and a potted plant consultant, so we were able to learn more from other experts in the industry. The Van Wingerdens operate one greenhouse in Ohio, one in North Carolina, one in Virginia and they are not directly competing with each other.

“They share the same consultants, and as a consequence, they also share more information.”



Pictured: CEA vegetable growers can see the consequences of manipulating the climate and fertilizer rates on the yields and performance of their crops.

On the vegetable side, controlled environment growers are less willing to share information because they are direct competitors. The number of vegetable greenhouses is much smaller and they're competing for the same markets, making it harder to provide detailed information that can help other growers. There are organizations, however, that are stepping in to fill the void when it comes to that information, providing benchmarks for growers based on data shared by some operations. One such example is the Resource Innovation Institute, which has brought together industry members, governments and even utilities to create reports based on shared data. You can find more at resourceinnovation.org.

Focus on plant production, not systems

Glenn considers the tightening of investment money in the controlled environment agriculture industry a good thing for more efficient food production overall.

"It's no longer about chasing some crazy valuation," he said. "It's no longer about social media savvy entrepreneurs who want to get into the business grabbing the headlines. If someone wants to get into any type of controlled environment agriculture, it's because they want to be successful in this business. And they're going to have to work hard in order to be successful.

"Obtaining funding is no longer a business model."

He noted the example of the vertical farming industry in particular, where some companies go by rules that were generated by Silicon Valley without focusing on the crop. He mentioned buzz words like "fail fast" and "pivot," along with others. But, he added, these words don't always apply to controlled environment agriculture.

"If a cucumber grower has a bad year, he's not going to start growing tomatoes. He's going to wait until next year to grow another crop. All too often in the CEA industry, if companies are not good at growing, they try to pivot to selling their technology or their production systems," Glenn said. "If they couldn't make money selling the crops they're producing, they became suppliers of vertical farming systems, sometimes ignoring the fact that a poor system was one of the reasons they couldn't make any money."

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