

GPN

GREENHOUSE PRODUCT NEWS

Easy COMBOS

p. 18

INSIDE:
Blossoming trends
Controlling inventory

INCLUDING:
BIG GROWER

SEPTEMBER 2024 | GPNMAG.COM
GREAT AMERICAN MEDIA SERVICES

Dahlias are grown for cut flowers.
Photo courtesy of
Sunny Meadows
Flower Farm.

Blossoming INNOVATIONS

A look at how CRISPR and tech are transforming cut flower production

BY KEITH LORIA

Cut flowers have experienced an increased interest over the last few years and breeders are looking at creating new and improving varieties to work better in cut flower production.

Chuck Pavlich, director of new product development at Terra Nova Nurseries in Canby, Oregon, noted one of the most recent advancements is the use of CRISPR, the gene editing technology currently being used in biomedical and agriculture.

“The ability to insert or delete a gene brings many possibilities to the table, such as speeding up breeding projects immensely,” he said. “It does have its limitations though. It is not 100% accurate nor 100% efficient. Sometimes plants that have undergone CRISPR treatment do not exhibit the desired result.”

Melinda Knuth, Ph.D., assistant professor in horticulture science at North Carolina State University — whose



Chuck Pavlich, director of new product development at Terra Nova Nurseries, poses with a large hanging pot of coleus.

Photo courtesy of Terra Nova Nurseries.

research experience has focused on cut flower consumers, the supply chain and the overall industry — has also seen a rise in gene editing, with the blue chrysanthemum being one that is attracting a lot of attention. In fact,

she's seen a ton of interest and production in the area of chrysanthemums as of late.

"From my research with consumers, I have seen if they can't get a rose that they like, they really like lisianthus because it has the same shape and texture," she said. "That's something that has been very popular recently."

Cindy Finneseth, executive director of the Kentucky Horticulture Council, has seen a movement by consumers to know their local greenhouse farmers, which has been a boon to cut flower growers.

TECH INNOVATIONS

Some greenhouse technologies are evolving to enhance the growth and quality of cut flowers and innovation continues to bring big changes to the industry.

"I think the use of cameras or drones to implement integrated pest management (IPM) and point out drought stress as well as other problems is significant," Pavlich said. "Additionally, artificial intelligence (AI) is going to aid just about every sector of the horticultural industry and is, in my opinion, still in its infancy."

Environmental control systems, such as LED lighting and climate control, are also playing an important role in increased yield and quality of cut flowers in the greenhouse.

"These technologies have made it possible to grow better, larger and more consistent crops than ever before," Pavlich said. "We can now cultivate crops that were once dependent on natural daylight cycles, such as mums, to bloom on any day of our choosing."

Knuth feels implementing LEDs has been a big game changer, and monitoring the length is important for domestic greenhouse growing especially.

"Using lighting strategies to lengthen the stem and also using LEDs are two of the strategies used a lot," she said.

Finneseth noted that several Kentucky growers use extension technology, low tunnels and high tunnels, to extend the seasonality of crops. Additionally, many growers have shown an interest in integrating new technologies to assist with production and harvest.

"For instance, some growers are using drones to help with better monitoring of their production areas," she said.

SUSTAINABLE PRACTICES

When it comes to sustainable greenhouse practices, less is more. This starts with good breeding.

"Selections that are less susceptible to pests and diseases are gold," Pavlich said. "Think of the labor and chemical savings that can be had with thoughtful

PROTECT YOUR BATTLEFIELD

HERBICIDES

INSECTICIDES

FUNGICIDES

IGRS

PGRS

Atticus

VIEW OUR GREENHOUSE & NURSERY LINEUP

Bootstrapped and ready to serve, Atticus delivers battle-tested chemistries and an experience like no other. Proud to be 100% American-owned and operated, our mission is to help you grow every step of the way.

BATTLE-TESTED CHEMISTRIES

ATTICUSLLC.COM ©2024 Atticus. Important: Always read and follow label instructions.



Steve and Gretel Adams, owners of Sunny Meadows Flower Farm in Ohio, enjoy the blooming lisianthus house. Photo courtesy of Sunny Meadows Flower Farm.

“We have been working with seed breeders to try to get them to keep the more unpredictable varieties.”

— Gretel Adams

Photo courtesy of Sunny Meadows Flower Farm.

breeding. On a recent visit to a large Dutch grower in the Netherlands, the question was posed: What is the best thing we could breed? His answer was disease-resistant plants, because soon, chemicals are going away.”

Gretel Adams, co-owner and operations orchestrator of Sunny Meadows Flower Farm in Columbus, Ohio, noted having an IPM program has allowed many greenhouses to discover new insects to use for creating a program to combat issues; the trick is to catch it early before it is an infestation.

“For energy efficiency, we found that passive ventilation worked better for us (ridge vent and open sides) as opposed to ventilation fans at the end of the houses with louvers on the other end,” Adams said. “We also apply shade cloth to the greenhouses in the summer months to help decrease the temperature inside.”

Knuth has seen more growers interested in getting involved in sustainable measures and believes that will become more important in the future for domestic growers.

NEW VARIETIES

Breeders are handling a demand for new flower varieties with longer vase life, improved disease resistance and enhanced aesthetic qualities.

“Breeders are addressing these issues on two fronts: biotechnology and good, old-fashioned thoughtful selection,” Pavlich said. “I learned recently of a company using CRISPR technology to take care of the powdery mildew issue on roses, but there are so many other genera that this would benefit also. Through thoughtful selection, some roses have been bred with resistance to powdery mildew. Although this sounds ideal, we still have to face new disease strains and pesticide-resistant insects that could overcome the good work breeders are doing.”

A majority of growers in the U.S. are desiring more of the blush colors or unique in-between colors on the color palette to create a bridge between the more vibrant colors or create softer color schemes. Still, the flower industry is a global market, and the Dutch flower market likes brilliant colors.

“We have been working with seed breeders to try to get them to keep the more unpredictable varieties or the flowers that are not bold purple, red and yellow, but it is a work in progress,” Adams said. “Now with more domestic seed companies here in the states, there has been some isolation of those colors as far as seed/plant availability. We’re hoping the other parts of the world will continue to develop colors that our designers are interested in so we can also help to expand the possibilities in the floral design world.”

Biotechnology is increasingly making its way into every aspect of floriculture. In fact, colors that one could only dream of have been achieved in this genus, and there’s a lot of traditional breeding going on, focusing on singular colors and unique color patterns.



Above and top right: Echinacea varieties from Terra Nova Nurseries best-of-breeding include 'Delightful Gold' and 'Princess Bride'. Both serve as great cut flower options. *Photos courtesy of Terra Nova Nurseries.*

Bottom right: 'Queeny Lime Orange' zinnia blooms with lime and rosy colors making it a popular cut flower choice. *Photo courtesy of Sunny Meadows Flower Farm.*



For instance, petunias have forever been altered by the yellow gene from maize.

"Gene insertion or deletion does affect the color of the flowers immensely," Pavlich said. "For the new blue chrysanthemums, both campanula and butterfly pea genes were inserted into a red chrysanthemum to achieve the rather nice violet-lavender colors."

PROPER NUTRIENT MANAGEMENT

One only has to do a quick Google search to see more than 130,000 results on research about optimal growing conditions and nutrient management for different types of cut flowers in the greenhouse environment, showing there is a wealth of information available.

Therefore, cut flower growers could immerse themselves in extensive research if they choose.

In Pavlich's opinion, recent research on computer- and AI-aided plant growth models predicting a crop readiness date is amongst the most useful things to growers.

"With cut flowers, timing is everything," he said. "Missing a target date could potentially spell disaster for a grower."

At Sunny Meadows Flower Farm, every zone has its capabilities based on climate and day length in its region.

"Each year our nutrients used are based off soil tests that we do to ensure that we are creating a balanced environment conducive to growing flowers," Adams said. "We suggest getting yearly soil tests to check in with what nutrients are needed. And if you experience any issues with plant growth, to send plants away to your local university lab for testing to determine what the issue is before assuming that you know what is happening, especially as you are learning."

"You can get plant tissue tested, because we have had instances where the soil tests show that the nutrients are in there, but the plants are not uptaking those nutrients, meaning there was some kind of imbalance in the soil blocking availability of those nutrients," Adams said. "There is a lot involved in the soil chemistry of growing plants, especially in a greenhouse where it is a more controlled environment."

Sometimes, she added, growers will be surprised with the results of no disease, but something mechanical, such as water, nutrients or some weather activity affecting it. [gpn](#)

A graduate of the University of Miami, Keith Loria is an award-winning journalist who has been writing for almost 20 years. View his recent writing at keithloria.contently.com.