

BY PETER KONJOIAN AND KAYLEE SOUTH

A Ph.D. Program Seeded in High School and Shaped to Serve Horticulture



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Joining me today is Kaylee South. In August of 2020 Kaylee completed her graduate studies at Ohio State University under the guidance of Michelle Jones. She is continuing her research with Jones as a postdoc and pursuing her career's next step. Kaylee grew up in Carnesville, Georgia, and found her interest in the greenhouse industry through her middle and high schools' agriculture education program and National FFA Organization. She majored in Horticulture at the University of Georgia and earned her bachelor of science in Agriculture in 2015. During her time at UGA, she completed an American Floral Endowment Vic and Margaret Ball Internship at Sun Valley Floral Farms in Arcata, California.

Peter: Kaylee, thank you for taking time today. Let's start with a great big congratulations ... Dr. South! Welcome to the ranks. What career path is of interest to you as graduate school comes to an end? Which way are you leaning regarding an academic or industry position?

Kaylee: Thank you! And thank you for having me today. It is an honor to get to talk with you. For my career path, I am leaning toward an academic position. During my time at UGA, the horticulture faculty made my college education and experience exceptional, full of passing on knowledge, hands-on experience and adventures. It had a huge impact on me, and I want to one

day pursue a career path that allows me to work with undergraduate and/or graduate students as they grow in their passions and future careers.

One of my undergraduate advisors, Paul Thomas, shared with me the opportunities of seeking a graduate education and becoming a university professor. As I completed my graduate program at OSU with him, I learned the important role research plays in the greenhouse industry. I want to continue on the path of conducting research in the university system that will serve growers in the horticulture industry. I also had the opportunity to teach during my Ph.D. program, which confirmed my interest in a position that includes a teaching or outreach appointment.

Peter: The impact undergraduate advisors have on young minds is wonderful, isn't it? Many of us share similar stories of how advisors steered us in career shaping directions. Those experiences fuel us to flip the coin and guide our own student advisees along their career paths. Pay it forward, right?

Kaylee: This is very true, Peter, and I was fortunate to not only have great advisors during my time at UGA and now at OSU but to also have been guided during my high school career by my agriculture education advisors. I look back and see the many people that had a hand in providing me opportunities from high school through graduate school and that fuels me to pass on these opportunities. Did you have advisors or mentors that helped you in your career trajectory?

Peter: I certainly did, Kaylee, thanks for asking. I, too, go back to high school for my first one, my sophomore AP math teacher. One day in class he sat on the front of his desk and asked us, what is the definition of education? A couple of my classmates offered up versions of knowing answers to questions. He put his hand up to stop this line of reasoning and said, simply, education

isn't knowing all the answers, it's learning where to find them. He changed my life at that moment as I became confident as an introvert hearing that I didn't have to raise my hand all the time knowing answers but did need to learn where to find them.

Fast forward to my graduate work at Ohio State, it was my doctoral advisor George Staby who added another floor to my education structure by asking us the same question. His answer was even more enlightening for me, his definition of education is not knowing all the answers but learning how to ask the right questions. The two teachers that impacted me the most taught me things that had little to do with the subjects they taught: math in high school, horticulture in grad school. I'm certain every reader of this article has similar life lesson moments to share.

The combination of research and teaching is going to be exciting for you. Tell us about your Ph.D. program and research, I understand you focused on stress tolerance of greenhouse crops.

Kaylee: The focus of my Ph.D. research was on improving stress tolerance in greenhouse floriculture crops with a majority of my time focusing on the use of beneficial bacteria to improve crop performance. My first research topic in this area was investigating a collection of beneficial bacteria for their ability to reduce gray mold caused by *Botrytis cinerea*. *Botrytis* has become resistant to several fungicides, and additional tools are needed for its management. I did both in-lab studies and greenhouse studies with petunia (shown in photo) to select bacteria that reduced disease severity. From these studies, bacteria were identified as potential biological control agents of *Botrytis* in floriculture crops.

Peter: For our readers' benefit, Kaylee, as we identify naturally occurring organisms that have commercial benefits to greenhouse crops can we assume that their "natural" characteristic also qualifies them for use on food crops? Am I correct in assuming

that, unlike traditional pesticides that are often labelled either for ornamental or edible crops but not both, this product category should bring crossover efficiencies to growers producing both crop groups?

Kaylee: I do see that many of the commercial biocontrol products that I come across are labeled for both ornamental and edible crops. As new microbes are identified as biocontrol agents and we learn more about their modes of action and their performance in the greenhouse production environment, we will have a clearer picture of the breadth in which they can be used. Although there are many factors that need to be considered, I think there is potential for crossover between crops with both biocontrols and biostimulants.

Peter: Thank you for that insight, I think growers will be encouraged to learn that biological products bring the opportunity to consolidate and simplify pest control arsenals. Please continue, what other areas of research have you pursued?

Kaylee: The second topic that I investigated was the use of beneficial bacteria as biostimulants to improve plant performance when grown under low nutrient conditions. I evaluated many parameters of plants treated with bacteria that included plant quality and size to select bacteria with the ability to improve plant performance parameters that are of interest specifically for ornamentals. In addition to working with beneficial microbes, I was also involved in a project that evaluated Phalaenopsis orchid health when irrigated with the consumer-targeted ice cube irrigation method. It was found that the orchid's health was not negatively affected.

Peter: At this point in your career, how do you view the commercial grower sector? Have you been able to meet growers? Which production sector are you most interested in serving?

Kaylee: The greenhouse industry is an amazing industry full of inventive and passionate people. I had the opportunity to work at a large commercial greenhouse during my undergraduate studies. During my graduate studies, I was able to join Dr. Jones and other OSU faculty on Extension trips, tours, presentations, and industry events to visit greenhouses and meet with growers.

These trips and meetings were always a highlight of my program. I enjoyed meeting with the growers, learning about their facilities and what issues they were facing. The production sector I have been the most interested in serving is ornamental production, but I am also interested in edibles.

Peter: I'm proud to hear your excitement about serving growers, Kaylee. Don't ever lose

that sense of commitment. As one who chose to straddle the university-commercial grower line I live by the statement that everything we do as horticulturists is focused on helping growers. Those who don't have this passion to serve commercial growers may find the discipline of Botany more comfortable. It's all about the growers on our side of this fence.

Kaylee: That's right, Peter. I look forward to continuing to be involved in working alongside growers to understand problems that they face, developing a research program that can answer those questions and then having educational programs to share the information learned. Based on what you have learned, what is your advice to horticulturists looking to conduct research in academia to maintain that connection between research in the university and commercial growers?

Peter: Before I answer this, let's stop for a moment. I'd say you eloquently put on display what we're talking about by asking me wonderful questions while being my guest in this column. Well done, Doc.

My advice to junior colleagues starting their research, teaching and Extension careers is define your research interests and when communicating these interests to growers make whatever effort is needed to speak 'to' and 'with' them rather than 'at' them. After decades of speaking, I've had so many growers come to me following conference presentations thanking me for speaking to them rather than above their level of understanding. Never forget, it's all about our growers.

Let's wrap up — is there another aspect of your graduate work or upcoming career that you'd like to discuss?

Kaylee: During my graduate program and in my current research, I am learning the large role that microbial communities play in our production systems. The growing understanding of the beneficial microbial communities associated with plants and animals is changing the way we tackle problems, establish systems, and think about health. Although there are many unanswered questions when it comes to using beneficial microbes in the greenhouse production system, it has the potential to improve plant performance and play a role in the continual move toward more sustainable production systems.

I learned a great deal as a graduate student through conducting research, attending meetings, and getting to know other researchers and people within the commercial greenhouse industry. I am eager to take what I have learned to continue to grow and move into the next phase of my career. The relationship between research, training students, and interacting with commercial growers is important to the growth of the industry, and I am looking forward to a career that allows me to be involved in this relationship.

Peter: Kaylee, once again, congratulations on your accomplishment. I look forward to watching your career blossom and thank you for committing yourself to the education of our students and growers. [gpn](#)

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