

BY PETER KONJOIAN AND SARAH DAVIDSON EVANEGA

Biotechnology's Place in Feeding the World



Peter Konjoian is president of Konjoian's Horticulture Education Services Inc. His career spans four decades as a commercial grower, researcher and consultant. Sarah Davidson Evanega is the lead of stakeholder communication at Pairwise. Konjoian can be reached at peterkfes@comcast.net.

Today's guest is Sarah Davidson Evanega. Sarah is the lead of stakeholder communication at Pairwise, a food-tech startup on a mission to build a healthier world through better fruits and vegetables. Previously, she was on the faculty at the Boyce Thompson Institute for Plant Research in the section of plant breeding and genetics at Cornell University. During that time, she served as the founding director of the Alliance for Science, a global communications initiative focused on improving public understanding of agricultural biotechnology.

Peter: Hi Sarah; thanks for joining us. Let's begin with a recap of your work for the Alliance for Science at Cornell, as it paved the way for your current work at Pairwise. Help

us understand the challenge agriculture faces in educating the public, and the reverse perspective — how agriculture is learning from consumers.

Sarah: Thanks for the invitation to join you in Duets, Peter. Our work at the Alliance for Science was very much focused on helping people navigate the topic of agricultural biotechnology. Some forms of ag biotech like genetically modified organisms (GMOs) had suffered from a lot of misinformation over the past decades in spite of the fact that many applications of biotechnology will be critical in our quest to ensure nutritional security in a rapidly changing climate.

We built a coalition of champions from around the world who were driven to help dispel myths and misinformation, to elevate the voices of underrepresented people — such as farmers in lower and middle income countries — and help people understand the science and the critical utility of agricultural biotechnology.

Peter: I attended a seminar you presented a couple years ago on the topic of GMOs and feeding the world; your message changed me. Since then, a colleague of yours at the Alliance for Science,

Patricia Nanteza, joined me in this column to discuss her work in Africa. Her call to the world community is "please let Africa decide for herself regarding GMO technology and its value to smallholder farmers." Describe the global challenge we face in feeding ourselves.

Sarah: Patricia's message is an important one. Most of us reading this article are well fed and comfortable. But as Patricia reminds us, the actions of those of us in the West can have implications for other parts of the world. The decisions we make in the supermarket in the U.S. have an impact globally. We need to be cognizant of that. We in the U.S. can also learn from other cultures and embrace their consumption of nutritious foods that are underused in the U.S. — where we over-consume a lot of unhealthy, empty calories.

Peter: So, one myth is that a Western diet is by default a healthier diet than those in other countries. The unhealthy, empty calories you cite ... that's a pivotal message, loud and clear. One career focus of mine is helping small greenhouse and farm operations compete in an environment where achieving "scale" is, in my opinion, overemphasized. Adding an exclamation point to this is Patricia stopping me dead in

my tracks by stating that what we consider a small farm here is a huge farm in sub-Saharan Africa. Oh boy, we all need to appreciate different perspectives, right?

Sarah: Indeed, Peter. Diverse perspectives are so important. I have learned a lot from Patricia, for example, about the many and varied ways of preparing groundnut (peanut) or the ways of cooking bananas as an alternative savory starch. I've learned to appreciate different legumes from around the world, like the cowpeas my friends in Nigeria love or the many pulses consumed by my friends in India. There's so much to appreciate and learn about the nutritious foods being consumed in different corners of the world.

But we all have to work together to ensure that everyone has access to nutritious foods and can afford that choice. I serve on the advisory board of the Healthier Rice Project — a project using biotechnology to increase the nutrition of rice. Rice is such an important source of calories for billions of people around the world. It, however, lacks many micronutrients that are essential for proper growth and development — nutrients like iron, zinc, and beta carotene. It's important to help ensure that the tools of biotechnology are applied to improve the lives of all people around the world. There is still so much work to do!

Peter: The challenge we face in feeding the world's population can feel daunting with so much work to do, but we are making progress. While you are no longer directly involved with the Alliance for Science program, what would a progress report look like at this time?

Sarah: Since we launched the Alliance in 2014, we have seen a real shift in public perceptions around

biotechnology. In the years leading up to the pandemic, the conversation became increasingly favorable. In 2020, it reached an all-time high. People understood that biotechnology played an important role in the rapid development of our effective, life-saving vaccines and began to appreciate the role that biotech could also play in helping us address other challenges outside of human medicine, such as improving our food system and mitigating and adapting to climate change.

Today, as I am sure you can appreciate Peter, we are living in a very different environment where people — especially young people — are excited about food-tech, from applications in fermentation, alternative proteins, controlled environment agriculture, to the role of CRISPR. People realize that we need new tools to address the enormous challenges that are before us. The tools of agricultural biotechnology are so critical to improving the lives of people and the planet.

Peter: I explain the evolution of biotechnology to fellow growers using a power tool analogy. Most of us grew up working with hand-powered hammers, screwdrivers and saws. These tools then evolved into corded power versions, and today their cordless counterparts are powered by high-tech batteries. But I still keep my hand tools — hammer, screwdrivers and saws — in my tool cabinet.

New biotechnology tools allow plant breeders to work faster and more precisely to release new crop cultivars compared to traditional plant breeding. And just like with my tools, traditional breeding will remain in use and be complemented by the new biotechnology to leverage speed and efficiency.

Congratulations on your contribution as the founding director of the Alliance. It must have been

difficult to leave your work in the public sector on one level and exciting to move to the private sector on another. Tell us more about Pairwise: its mission, vision and how you're contributing to the effort.

Sarah: Now, let me tell you about what motivated my move to Pairwise. For over 20 years, we've been talking about how we need to apply the tools of agricultural biotechnology to develop products that have direct benefits to consumers. The first generation of ag biotech products mostly benefited the people who produce our food, which is extremely important. Those benefits included benefits to the environment (like reduced insecticide use) and also helped ensure that we had a safe and affordable food supply.

However, as less than 2% of the population is involved in the growing of our food, most of us didn't feel the direct benefits of ag biotechnology. The burdensome and restrictive regulatory environment that surrounded ag biotech meant too few players could use the tools to innovate for impact and too few crops benefited. But today, new ag-tech tools have come online that are opening up new opportunities.

Peter: I see a similarity in your desire to apply agricultural knowledge to the world's farmers and consumers. Both of us spent part of our careers in the university setting and then chose to move to the private sector to get closer to where agriculture is practiced. My move was to the family farm; yours is to Pairwise. Both of us lean in to educating growers and you add the dimension of educating consumers.

Sarah: When I learned about Pairwise, their mission drive to improve diets and their goal to use CRISPR to innovate in fruits and vegetables, I was super excited. Here was a fun, dynamic startup

that was going to use the innovative tools of biotechnology to directly serve consumers — to deliver health benefits to everyday consumers. I wanted to be part of that team.

The Pairwise mission is to build a healthier world through better fruits and vegetables. Our vision is to reduce the barriers that prevent people from consuming more fruits and vegetables. It may surprise you to learn that fewer than one in 10 American adults consumes the recommended daily amount of fruits and vegetables and, as a result, dietary diseases are on the rise. At the same time, very little innovation is happening in produce that makes fruits and vegetables more accessible and convenient. Only 3% of the innovation in the supermarket is in produce.

At Pairwise, we are responding to the complaints of consumers about

produce and are using the tools of CRISPR to improve nutritious foods so that they are more desirable to consumers. For example, when you ask people why they don't eat blackberries, a highly nutritious superfood, they say they don't like the seeds. So we are using CRISPR to try to address this. We are trying to remove the seeds from blackberries — just like we have seedless grapes — so that consumers are more likely to choose this highly nutritious, delicious snack. We are also improving raspberries and black raspberries and are also taking on the longer-term challenge of making pitless cherries.

But the real excitement right now is around our flagship product, Conscious Greens, which will be launching this year in food service as well as in retail. We believe that

this will be the first branded CRISPR product to enter U.S. supermarkets; a delicious nutrient-dense salad green, with all the nutrition of kale but with the crunch, light texture and mouth-feel we expect in a salad green. It's super exciting to be directly serving consumer benefits. We know salad consumers today are bored with salad green offerings. We're thrilled to be able to apply the tools of CRISPR to bring a new salad green into the category — one with superior nutrition.

Peter: Thank you for sharing your expertise with us Sarah, I learned a lot and wish you and Pairwise continued success. Learning that fellow farmers in far away places who live more challenging lives on their farms than I do deserve better opportunities to make their living is a wake up call. [gpn](#)

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