Leveraging technologies to deliver better products more quickly

A conversation with Tara Tarnowski, Corteva Agriscience Technology Lead - Regional Crops

Tara Tarnowski is one of those lucky people who has a job that's different every day. "I have to wear a lot of different hats depending on which crop I'm working on," she said. Tarnowski works in research and development for Corteva Agriscience, specifically helping to deploy new breeding technologies. "Anything new that comes up, I get to have my hands on it and say, 'This is a really great idea, but how do we actually deploy this for the breeders?'" she explained. "That is really fun."

Technologies with benefits for multiple crops

In Tarnowski's role, the term "technology" has a broad meaning. "It can be anything, depending on what the crop needs," she said. Examples vary from statistical analysis to drones in the field to genetic improvements. She said, "We're focused on driving and adopting new technology really quickly across crops, so if you find something working well in, say, corn, we can leverage that across our crops to improve breeding in all of them."

One example is using drones in plant phenotyping. "We started out using that a lot in corn and soybeans, figuring out how to take stature measurements with a drone instead of sending crews out to do that with a stick," she explained. "Once we figured that out, we could deploy it in all crops, just adjusting it for how a particular crop grows."

Another example, still in early stages of deployment, is crop modeling, which is used to predict how germplasm might perform in a given environment. Tarnowski explained, "It lets you look at things like how much rain do you get in a key developmental stage, was there a lot of plant stress and then predict how various lines might do in different environment types." She continued, "We have so much data coming in about things like weather, soil, germplasm performance. How do you bring all that together and understand more about what environments you need to be representing, how often they might show up in a farmer's field, how it's changing over time?"

Speeding up genetic gain

Tarnowski explained that conventional crop breeding can take as long as 15 years, but advanced technologies like those she works on make it possible to cut multiple cycles from the breeding process. "You're saving years off the timeline," she said. "It's really huge for a breeding program, because we can just go faster. The genetic gain compounds."

One crop where Tarnowski has been working to speed genetic gain is hybrid winter wheat. New products would allow Corteva Agriscience to expand its reach into new geographies in North America, while customers would see more choices in the marketplace and higher yield potential. She has also been working on projects focused on genetic gain for alfalfa. "We've done a good job in alfalfa with native traits like disease resistance and digestibility," she said, "but yield gain has been pretty static over the years." Tarnowski explained that in alfalfa, R&D is just starting to leverage some of the breeding technologies that have proven successful with other crops. "We're increasing genotyping efforts on alfalfa and we're on the cusp of some really big steps," she said. In addition to boosting yield, the Corteva alfalfa

Tarnowski and other R&D scientists are looking to improve alfalfa yield and disease resistance by deploying new breeding technologies developed with other crops. Tarnowski said new work to genotype alfalfa means, "We're on the cusp of some really big steps."

R&D team is also hoping to identify new native traits for disease resistance and wants to expand alfalfa testing to more environments with a focus on product stability.

Tarnowski also mentioned the development of the Inzen™ herbicide trait, a novel native herbicide-tolerance trait for sorghum, which recently launched. In sorghum, the team continues to focus on stability, especially in tougher environments where a crop like corn can't go. They're also always looking for ways to apply lessons learned from one crop to others. "My counterparts in North America and all over the world stay very well connected," Tarnowski said. "We've got the crop leads and scientists who do the work to validate a new technology and we're doing the legwork to deploy those new ideas."

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Fueling the whole pipeline

Although her work touches specific crops, Tarnowski said the real aim is to develop technologies that are "crop agnostic" and provide good breeding value for all the crops R&D works on. This research is also closely connected to commercial needs, something Tarnowski sees as unique to Corteva, stemming from a long legacy of putting the right product on the right acre. "We have a strategic focus on what would work best in the market," Tarnowski said. "A lot of what is done is about how we change the way we breed so we can deliver even better products as quickly and efficiently as possible. We want to make sure the pipeline is fed with the right products to meet market needs." Tarnowski continued, "When it comes down to it, we are very focused on driving product performance and meeting the needs of our farmers. What products do our customers need and how can we get there the fastest?"

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