

Science and Long-Term Vision Guide Wheat Breeding Success



Pasta lovers around the world may not know plant breeder Dr. Curtis Pozniak, but they'll get a taste of his work in the near future when they tuck into a plate of their favourite Italian dish.

That's because 2011 marks the first year of significant commercial production of CDC Verona, a new durum wheat variety used primarily for pasta. Developed by Pozniak at the University of Saskatchewan's Crop Development Centre, CDC Verona is the first new durum variety to be released commercially in 19 years from the Centre. With Canada supplying up to 60 percent of the world's durum needs, it won't take long for Pozniak's work to go global.

Pozniak wears two hats at the University. He's a durum and spring wheat breeder focused on developing high-yielding wheat for Western Canadian farmers; he's also a Professor, working with post doctorate fellows, and graduate and undergraduate students to help train the next generation of plant breeders. At 35, he's already seen tremendous change in plant breeding since he completed his PhD in 2002, and there's much more to come.

"Technology is really advancing quite rapidly in the area of genomics research and understanding key genes that influence desirable traits," explains Pozniak. "Application of this technology to plant breeding is starting to gain steam, and will allow us to follow key genes within our breeding program using DNA testing and to identify only the most desirable individuals to put out in the field for testing."

Pozniak and his colleagues will be helping blaze the genomic sequencing trail in wheat thanks to a recent three-year, \$8.5 million research grant to begin the process of sequencing the genomes of the best Canadian wheat varieties. "That's giving us the opportunity to look at all the genes that are present in wheat and how they

contribute to yield, disease resistance and end-use quality," he says. His research team will also be contributing to developing a high quality reference sequence of wheat as part of a larger effort coordinated by the International Wheat Genome Sequencing Consortium.

Pozniak notes that while scientific innovation is vitally important, plant breeders also need to look well into the future to foresee the long-term needs. The yield-maturity relationship is very important for Prairie farmers, as is having strong disease resistance. But breeders also have to listen to the needs of Canada's international customers.

"Some of the work we've been doing in our lab in identifying genes that influence end-use quality is going to pay dividends for both farmers and end-users," says Pozniak, noting that one of his graduate students has identified a gene that reduces heavy metal uptake in durum wheat. With European customers setting limits on the amount of cadmium present in grain, this will be a valuable tool for plant breeders.

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Pozniak feels that protection of intellectual property will also play a key role in the future of wheat breeding. "Intellectual property is critical to maintain investment. Investment in plant breeding is critical to achieving genetic gains. It certainly is a big part of the reason for the gains we are seeing in corn and canola."

"Intellectual property really drives innovation. And whether you're in the private or public sector, it's always important to generate return on investment," stresses Pozniak. New varieties and intellectual property return dollars to the breeding programs and the industry as well as public knowledge that can be used by all programs, he adds.

Whether it's breeding a better wheat for producing pasta or one that more efficiently uses resources such as nitrogen and water, Pozniak believes he and his students are up to the task.

"I think the role of plant breeders is to solve problems now and in the future," he says. "We need to be thinking about making food production more sustainable and tackling production challenges well before they become a serious problem."

This article is brought to you by the Canadian Seed Trade Association. Photo courtesy of the University of Saskatchewan College of Agriculture and Bioresources.