LORI-ANN KAMINSKI

Presider

MAINTAINING MOMENTUM

Wheat research continues to yield measurable results for western Canadian farmers

his year marks the end of one Canadian National Wheat Cluster and the beginning of another.

As all farmers know, research takes time to yield tangible outcomes and results. But that doesn't mean that we in the research administration world are now resting on our laurels. Far from it.

In fact, while the transition from one wheat cluster to the next runs its course and new projects are approved, we have been focused on communicating research results from the last cluster and ensuring we are well positioned for future success.

Since the 2018-23 cluster concluded, we have been communicating the relevant outcomes to farmers through a variety of channels, including the Canadian Wheat Research Coalition (CWRC) website and social media accounts, as well as the newsletters, print publications and websites of our founding organizations. Many of these results are highlighted in a series of wheat cluster project performance stories that are available to read at **wheatresearch.ca**.

One of the most noteworthy takeaways was the return on investment that Canadian wheat breeding work has provided to farmers over the last 25 years. A 2021 report commissioned from University of Saskatchewan agricultural economist Dr. Richard Gray showed that for every \$1 farmers have invested in wheat breeding efforts over the last 25 years, they received \$33 in returns from varietal development alone. That is an amazing return on investment, but even more so when you consider that the rate of return has increased from \$4.40 on the dollar in 2005, when the first such study was done. This reflects the growing momentum and capacity of our breeding programs, as well as the incredible efficiencies that our industry has achieved through increased collaboration during that time. In fact, a key development from this period was the formation of the CWRC in 2017.

We recently seized the opportunity to update our most valuable communication tool: the CWRC website. A major goal of the website redesign was to make it easier for farmers to learn about the research they have funded and continue to support through the wheat clusters, as well as how that research will translate to tangible benefits in the field. You can view the new-look website now at wheatresearch.ca.

Since the CWRC's inception in 2017, we have been focused on making sure our organization is running as efficiently as possible, while promoting collaboration and unity within the Canadian wheat industry. This requires a dedicated group of industry representatives who can provide strong leadership on behalf of western Canadian farmers. A key development in this area was the announcement of Lori-Ann Kaminski, Manitoba Crop Alliance's (MCA) research program manager for cereal crops, as our new CWRC president earlier this year. This change was strategic and planned - CWRC launched in 2017 with an understanding that hosting duties would rotate every three years between our founding organizations, and it is now MCA's turn - but it's also excellent news for the industry. Kaminski is a well-respected veteran within the worlds of wheat and cluster research who has lived and worked in every western Canadian province throughout her career. Prior to MCA's amalgamation, she served as research manager for both the Manitoba Wheat and Barley Growers Association and Manitoba Corn Growers Association.

All these changes mean we are well positioned to head into a new wheat cluster, with the goal of continuing to advance wheat variety development and agronomy. We will also strive to ensure this valuable research is managed as efficiently as possible and the important takeaways are communicated back to farmers. Once again, we thank you for your important contributions to wheat research and we can't wait to see what the future holds.

For EVERY DOLLAR they invested in wheat breeding, Western Canadian farmers HAVE RECEIVED NEARLY

CONSTRUCTION Coalition

IN RETURN through varietal improvements

WHEAT CLUSTER PERFORMANCE STORIES

Breeding Improved Canada Prairie Spring Red (CPSR) Cultivars

By Ellen Cottee

Lead Researcher: Dr. Richard Cuthbert (AAFC-Swift Current)

he wheat industry is always looking for the best: the highest yield, the strongest resistance, top quality, and the goal of strong marketability. It can be difficult to find a variety to check these boxes, but Dr. Cuthbert with Agriculture and Agri-Food Canada – Swift Current is ready to take on the challenge with his latest work in Canadian Prairie Spring Red (CPSR, or CPS Red) breeding research.

Funded in part through the Canadian Wheat Research Coalition's 2018-2023 cluster, Cuthbert's research is all about breeding the best CPSR wheat to give farmers a great crop and versatility to enter multiple markets.

"This is a continuation of a lot of work that has been done over the decades," Cuthbert says about his work. "We've worked for many years to breed and improve high-yielding bread wheat varieties for the CPS red market class for farmers."

The benefit of CPSR wheat is its middle-of-the-road quality, saleable to milling and export markets or feed markets, as opposed to its cousin, Canadian Western Spring wheat, and its place as a premium market product.

"Some people have said you can ride two horses with CPSR," Cuthbert explains. "That's really the focus of this, to push grain yield while maintaining milling characteristics."

Also setting CPSR and CWS apart are the differences in quality parameters varieties fit into, such as limitations on trait selection and use quality. These reduced restrictions in CPSR allow wheat breeding programs to create higher performing lines with diverse genetics and traits, opening more opportunities for research and farmers alike.

"You can have stronger gluten strength, a little more room around milling yield and flower ash," Cuthbert explained. "Some of those traits that make CWS elite, we have a little bit more room to operate on."

Cuthbert and his team focus on breeding for high yield and strong diversity, found by using common genomic breeding practices including marker assisted selection and doubled haploidy production.

"Where this work will really shine is in providing that stepping block and building parents to move diversity into the highest quality wheat in Canada. It allows that crossover of genetics to happen much more easily,"

The research has been successful, with new variety HY2136 gaining registration support at the 2023 Prairie Grain Development Committee annual meeting. Yielding 19 per cent over AC Brandon and 9 per cent over the highest yielding CPS red variety currently available, HY2136 also checks boxes for leaf rust, stem rust, and loose smut resistance, and bears the Sm1 gene for wheat midge resistant.

HY2136 is generated through the crossing of CPS Penhold, CWS variety CDC Titanium, and an advanced line previously Cuthbert's team created, incorporating high-yield germplasm from both Canada and Australia.

"It brought a lot of things together," Cuthbert explained. "It's from a cross that a lot of people would not have made if it weren't for this type of funding that allowed for these intermediary steps and bringing diversity together."

Other varieties from Cuthbert's work are in the pipeline, also scoring high yield and milling quality – along with the ability to cut across different markets.

"It gives the farmer a lot of options, especially in regions where livestock is involved," Cuthbert said. "You can bolster your feed and forage, and also fulfill milling markets if so desired."

While the farmer benefits are important, Cuthbert also emphasizes the significance of this work for the future of wheat breeding.

"Where this work will really shine is in providing that stepping block and building parents to move diversity into the highest quality wheat in Canada. It allows that crossover of genetics to happen much more easily," he explained. "It is going to take decades, but we have already started it."



Investigating Crop Management Options to Lessen the Impact of Fusarium Head Blight in Wheat

By Ellen Cottee

Lead Researcher: Dr. Kelly Turkington (AAFC - Lacombe)

■ Service Ser

Previous research on FHB focused on better understanding the pathogen and breeding new wheat varieties for resistance. While important in the ongoing fight against the disease, this approach neglects on-farm management options producers are able to implement themselves.

"It really has been a complex issue," Dr. Kelly Turkington, researcher with Agriculture and Agri-Food Canada - Lacombe said. "It's a challenging disease for farmers to manage and in terms of research."

Long interested in the prevention of FHB in wheat crops, Turkington launched two new projects under the 2018 - 2023 Canadian National Wheat Cluster to examine the impacts of crop management choices on the presence of FHB.

The first of Turkington's projects focuses on how seeding rates could improve fungicide efficacy with fewer applications. Lower seeding rates lead to a wide window of head emergence, complicating the current fungicide recommendation of application at 75 per cent head emergence. "That means you still have 25 per cent of the heads still in the boot, not directly protected by fungicide," Turkington explained. "Once those heads emerge, they have no protection from the pathogen."

"With the work we're doing under the current cluster program ... we have strategies - and perhaps some refinements - that will greatly help producers achieve better management of FHB on an annual basis."

Increased seeding rates can provide more uniform crop development and therefore more uniform targets in fungicide application. Trials combined different seeding rates with various fungicide practices, allowing Turkington and his team to see the larger picture. In the future, Turkington said research will likely integrate external factors, such as weather and pathogen forecasts, to build out recommendations for seeding rate and fungicide best practices. Turkington's second project examines the direct impact of crop management practices on FHB presence. One trial in the project focused on residue management – removing and treating all crop residue, including the chaff of the wheat, in order to reduce the amount of inoculum returned to the field following harvest.

Extended crop rotation periods, described as more than one year of a non-host crop before planting wheat, also showed success in trials. More time between the planting of susceptible varieties and crops allows for the inactivation of pathogen residue left on the field. While good news, Turkington clarified that the drought conditions of 2021 may have impacted the team's assessments and they will need to collect further data this spring.

With the final public report slated for release after the cluster closes March 2023, Turkington said he hopes his projects, along with future research, will give producers more FHB-fighting power.

"There are tools available, and I think we can tweak those tools," he said.

"With the work we're doing under the current cluster program ... we have strategies - and perhaps some refinements - that will greatly help producers achieve better management of FHB on an annual basis."

MEET OUR PRESIDENT Q&A



LORI-ANN KAMINSKI

Q: Can you tell us a little bit about your background?

A: Over the course of my career, I have had the opportunity to live and work in every western Canadian province. When we were British Columbians, I worked at Simon Fraser University in the biology and chemistry departments on discovery and utilization of insect pheromones - from forest pests to honeybee queens. In Alberta, we were in Brooks, and I worked for the Alfalfa Seed Commission on leafcutter bee health at the Canadian Cocoon Testing Centre. In Saskatchewan, I was the first co-ordinator of what was then called the Tri-Provincial Insect Monitoring Group. From those beginnings, through the great work of many researchers and agronomists, it has grown into the Prairie Pest Monitoring Network. For the last 20-plus years, my husband and I have been pleased to live in Carman, MB, and raise our family here. Since coming to Carman, I worked first for the Canadian Canola Growers Association and then as a program officer with Manitoba Agriculture for research and development funding.

Q: What initially got you interested in agricultural research?

A: I grew up on a farm in east central Saskatchewan and I think my interest came first from my grandfather and father, who always believed that continuous improvement on the farm was important. They routinely hosted Agriculture and Agri-Food Canada (AAFC) research plots and over many years changed business enterprises on the farm from a mixed farm centered around a pure-bred Black Angus herd to a grain farm and becoming certified seed growers. I attended the University of Saskatchewan, graduating with a degree in agriculture. During university, I was a summer student with Saskatchewan Agriculture and at AAFC Saskatoon. Those jobs opened my eyes to the guts of research, and I loved it!

Q: Why is farmer funding so important to wheat research and variety development?

A: Farmers are dynamic business owners who make many decisions every day under varying circumstances. They want relevant information to make those decisions easier. Through farmer funding, researchers are continuously connected to the "Why bother?" of agriculture research. With Canadian Wheat Research Coalition (CWRC) funding we open formal communication. It's a dialogue where our boards and committee members set their research objectives, respond to researchers' questions and research proposals, and researchers also get to hear questions directly from the farming community at multiple extension events held throughout the year.

Q: What are the benefits of a collaborative approach to research?

A: Our collaborative approach brings forward such a wide breadth of experience and wellrounded perspectives to the discussion of issues and opportunities for the advancement of wheat. In addition, the research itself takes a team. New findings can only move wheat forward after serious peer review and industry assessment.

Q: What are some of the biggest challenges and opportunities facing wheat research and wheat growers in Western Canada?

A: One challenge is the production of higheryielding, resource-efficient wheat, while maintaining Canada's international trade hallmark for quality. On the flipside, we have the opportunity to utilize new and emerging technologies in research and production to reexamine what can seem to be a paradox – higher yield and greater resource efficiency – and seek different solutions.

Q: What do you hope to accomplish during your term as CWRC president?

A: My goal is to secure a new model for the funding of wheat variety development.

Q: What are you most excited about in relation to the future of wheat research?

A: I can't even guess, and I can't wait to see where we will end up when we utilize new research tools and technological advances for improvements of farm stewardship, productivity and profitability.

Q: What is one thing people might not know about wheat research or agricultural research in general?

A: The people who work in wheat research want the results of their work to be adopted into new varieties, products or processes that help grow better wheat.

Q: What's a fun fact about yourself that people might not know or that might surprise them?

A: I love bugs. I know that's not a very popular statement, and I don't always like what they do, but insects are fascinating. Besides, insects did it first - think Velcro, bungee jumping, chemical warfare, paper manufacturing, air-conditioned homes and don't forget honey!

