CROP
DEVELOPMENT
CENTRE
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Annual Industry Impact Report

2025/26

Dr. Aaron Beattie
Associate Professor;
Ministry of Agriculture SRP
Chair in Barley and Oat
Breeding and Genetics

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Message from The Director

The Crop Development Centre (CDC) had an exceptionally productive year, and I could not be more proud of the researchers, staff and students who made it happen.

Dr. Curtis Pozniak
Professor; Ministry of Agriculture SRP Chair in Durum and High-Yield Wheat Breeding and Genetics / Director, Crop Development Centre

Collectively, 15 new candidate cultivars were supported for registration in February 2026. The CDC and affiliated faculty secured more than $15.6 million in new research and development funding from government, grower organizations, and private-sector partners while managing more than $3 million in active research programs. Faculty contributed to scientific advancement through 71 peer-reviewed publications, more than 90 conference presentations and over 85 extension and industry outreach activities that connected research directly with producers, industry and end users.

This year marks an exciting milestone with the near completion of our new Harrington Plant Growth Facility. This state-of-the-art plant growth centre will significantly improve our breeding and research capacity for years to come. We are grateful to all the generous contributors to make this project a reality.

For more than five decades, CDC has developed crop varieties that have fundamentally shaped agriculture across the prairies. While this report highlights achievements of the past year, it also represents a moment within a much longer continuum of innovation. This includes decades of prior investment, ongoing scientific discoveries and future opportunities already taking shape within our breeding pipelines. We are turning momentum into impact through continuous advancement of Canadian seed.

On July 1, 2025, I began my second five-year term as Director. Looking ahead, I am excited to work alongside faculty, government, and our many stakeholders as we develop a new strategic plan that will guide our priorities, investments and growth.

To the grower associations, seed companies, industry partners, Saskatchewan Ministry of Agriculture and colleagues at the University of Saskatchewan, thank you on behalf of the entire CDC team.

We invite you to explore this Report and see the impact we are creating together.

Leadership, Quality Support Team and Faculty Researchers

CDC researchers are internationally respected scientists and seed breeders with world-class expertise.

Working in collaboration with producers, industry, government and other research institutions, they are advancing crop genetics to address both today's challenges and the emerging needs of future generations.

Leadership

Dr. Curtis Pozniak
Director, Crop Development Centre

Marissa Janssen
Manager, Crop Development Centre

Jeff Bertholet
Industry Liaison Officer

Arling Kemppainen
Field Superintendent

Ken Lumbab
Manager Finance

Dr. Chris Willenborg
Head, Plant Sciences

Quality Support Team

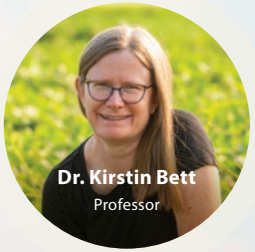
Dr. Genaro Arganosa
Research Officer

Connie Briggs
Research Officer

Giselle Camm
Research Officer

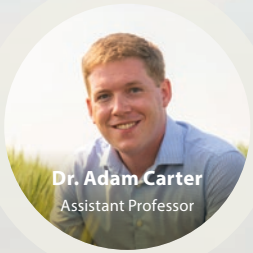
Faculty Researchers


Dr. Sabine Banniza
Professor

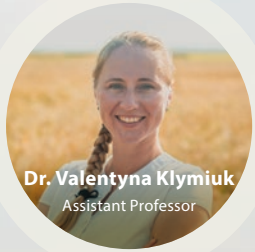

Dr. Kirstin Bett
Professor


Dr. Aaron Beattie
Associate Professor


Dr. Bill Biligetu
Associate Professor


Dr. Adam Carter
Assistant Professor


Dr. Pierre Huci
Emeritus Professor


Dr. Valentyna Klymiuk
Assistant Professor


Dr. Randy Kutcher
Professor


Dr. Curtis Pozniak
Distinguished Professor


Dr. Bunyamin Tar'an
Professor


Dr. Ana Vargas
Assistant Professor


Dr. Tom Warkentin
Professor

Research Highlights and Industry Impact

Crop Varieties for Agriculture's Future

CDC's Strategic Research Theme Areas are focused on the challenges and opportunities facing Western Canadian growers. CDC uses an integrated approach that combines plant breeding, pathology, genomics, quality evaluation and agronomic research to develop seed varieties for prairie conditions.

While research activities vary across crops and disciplines, the highlighted outcomes demonstrate a shared purpose to keep Canadian agriculture competitive and at the forefront of global innovation.

PLANT BREEDING ACHIEVEMENTS

*In March 2026, CDC and CDC-affiliated breeding programs submitted **15 new cultivars for registration support**.*

COMMERCIALIZATION

A total of 12 new cultivars were commercialized through royalty-bearing agreements with two public releases in 2025/26.

FARMERS ARE CHOOSING CDC

*CDC genetics had strong market performance in Western Canada, with **over 11 million acres planted to CDC varieties** and substantial market share in major crop types, including barley, oat, flax, pea, lentil, chickpea, durum and wheat.*

Impact Helping Western Canadian Growers Manage Production Challenges

2025-2026 Annual ADF Report

Improving Farm Profitability

Each growing season, farmers set goals: maximize grain yield and quality to generate profit.

While weather, disease, and markets remain unpredictable, seed variety is one of the few management tools farmers can control that directly influences yield, standability, disease resistance, market quality, and their bottom line. The CDC is committed to commercializing varieties that positively impact farm profitability.

A recent ROI analysis found that ***for every $1 invested in the CDC, wheat breeding program, farmers received an estimated $23 in return.***

EY Economic Footprint Assessment Report

High-yielding lentil lines with IMI tolerance

The Lentil and Faba Bean Program, managed by Ana Vargas, received registration support from the Prairie Recommendation Committee for four lentil lines in 2026. This included CDC23.10s, which boasts imidazolinone (IMI) herbicide tolerance and a significant yield advantage over CDC Marble.

Barley and oat varieties submitted for registration

The Barley and Oat strategic research group, managed by Aaron Beattie, submitted registrations for CDC Juno oat, and CDC Dillinger and CDC Harness two-row feed barley varieties. Each of these varieties offers profitability through higher yields, better harvestability via improved lodging resistance and a decreased need for fungicides due to a superior disease resistance package.

Saskatchewan-adapted, early maturing bean varieties

The Dry Bean Breeding Program, led by Principal Investigator Kirstin Bett, is working to develop reliable maturity across Saskatchewan growing regions for Black, Navy, Pinto and Yellow beans. All varieties being released in each market class will have tolerance to common bacterial blight. These breeding programs ensure that producers have access to Saskatchewan-adapted varieties, thereby increasing crop rotation diversity.

Disease & Pest Resistance

Disease and pest pressure are major production risks.

Producers recognize that fungicides and pesticides alone cannot solve these challenges, and long-term success depends on genetic resistance combined with robust disease and pest management strategies. CDC researchers are working to ensure that new seed varieties include robust resistance packages to manage pathogens and pests.

Over 35% of Western Canadian crop acres planted to CDC genetics.

Next generation of CWRS with resistance to lodging and diseases

The spring wheat breeding program, led by Adam Carter and Pierre Hucl, had two candidate varieties supported for registration support from the Prairie Recommendation Committee in February 2026. PT5019 has a 5cm height reduction (compared to AAC Brandon), excellent lodging tolerance, leaf and stem rust resistance, and resistance to the orange wheat blossom midge. BW5135 is a reduced-height line (2 cm shorter than AAC Brandon), of excellent quality (including flour protein, falling number, and flour yield), and with desirable agronomics and a strong rust resistance package.

Combined midge and sawfly resistance in wheat

The Durum and Wheat Breeding Research program, managed by Curtis Pozniak focused on improving CWAD and CPS tolerance to pests by stacking resistance genes for multiple layers of insect and disease protection. Researchers used marker-assisted selection to incorporate both the *Sm1* gene conferring midge resistance and the solid-stemmed trait conferring wheat stem sawfly resistance in lines that express improved resistance to fusarium head blight.

Root rot and Ascochyta resistance genetics

Pulse root rot continues to threaten profitable pea and lentil rotations. Within the Pulse Crop Pathology Pulse group led by Sabine Banniza, the team is developing long-term solutions by identifying lentil lines with resistance to Aphanomyces and Fusarium and creating breeding populations with the goal of combining root rot pathogens in a single variety.

Abiotic Stress Tolerance

Growers are regularly forced to deal with the effects of prolonged drought, extreme heat during flower and grain fill, saline soils, and frequent weather extremes, which limit a plant's ability to reach its yield potential.

Genetics provides an effective long-term tool to manage environmental stress.

Across virtually every breeding program, CDC researchers are now incorporating climate resilience as a core breeding objective to maintain yield consistency under a wide range of growing conditions.

12 new cultivars commercialized.

Reliable durum yields during dry conditions

Within the Durum Wheat Breeding and Genetics Program, Curtis Pozniak and team are evaluating early generation durum breeding lines capable of maintaining productivity in moisture-limited environments. This work is part of a larger breeding line strategy that combines yield, disease resistance and end-use quality with adaptation to environmental stress.

Chickpea heat tolerance

The Chickpea and Flax Breeding and Genetics program, led by Bunyamin Tar'an, identified sources of heat tolerance by completing multiple rounds of screening. Heat-tolerant selections were crossed back into elite breeding lines to accelerate the development of commercially viable varieties. The same varieties are also being evaluated for phosphorus-use efficiency, with researchers selecting lines that maintain performance under low-phosphorus conditions.

Pea varieties with improved yield during drought and heat

The Pea Breeding and Genetics Program, managed by Tom Warkentin, is developing stress-resilient pea germplasm through the PEACE (Pea Climate-Efficient) Initiative: Developing climate-resilient, low carbon footprint field pea as a preferred rotation crop through inter-disciplinary integration of genomic technologies. The purpose is to identify breeding material for heat and drought tolerance to expand the genetic diversity available to breeders and to identify traits that support productivity under increasingly variable Prairie growing conditions.

End-Use Quality Traits to Meet Market Demand

High yields alone do not guarantee profitability if crops fail to meet expectations of processors, exporters, millers, maltsters, food manufacturers and consumers.

To remain competitive, Canadian crop varieties must deliver both strong agronomic performance and the end-use characteristics required by domestic and international markets.

CDC's research priorities help growers meet these expectations. Researchers and seed breeders are developing varieties with desirable quality attributes and, at the same time, advancing novel traits that create opportunities in premium and value-added markets.

Durum for premium markets

A key objective of the Durum and High-Yielding Wheat Breeding program, led by Curtis Pozniak, is to develop varieties that meet processors' quality expectations. The program received support for variety registration at the 2026 PGDC meeting in February 2026. DT1043 combines strong agronomics with the quality attributes demanded by processors, including high semolina content, high gluten index, low cadmium concentration and a desirable colour index.

The program also received support for the first high-amylose durum variety with amylose content double that of normal durum varieties.

Malt barley with flavour stability

Maintaining access to high-value malt contracts requires varieties that meet the evolving quality demands of brewers and maltsters. Aaron Beattie, chair of Barley & Oat Breeding and Genetics, advanced TR23848 and TR24853, through the CDC-Sapporo program. These malt barley lines carry the proprietary null-lipoxygenase (LOX-less) trait, which improves beer flavour stability and offers a unique quality characteristic sought by premium brewing markets.

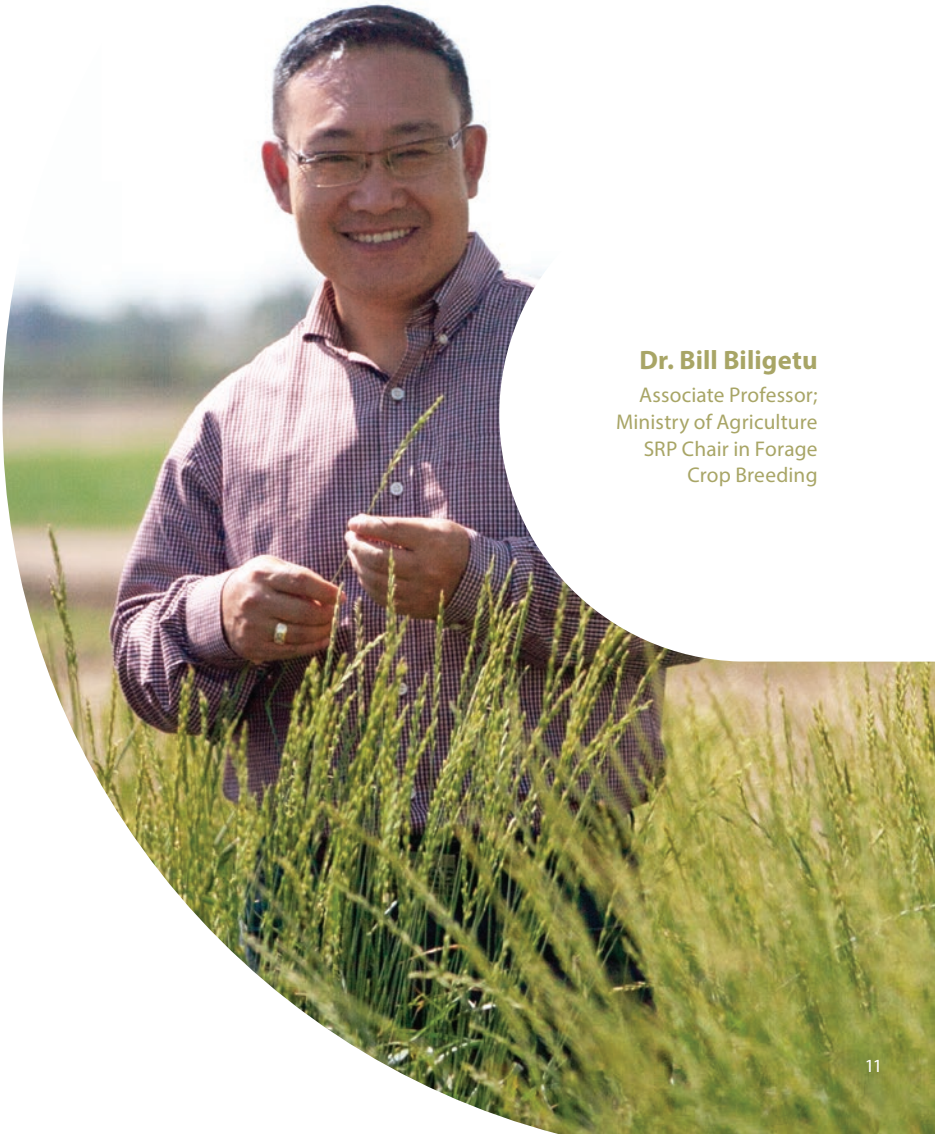
Improved lentil traits and LVC faba bean varieties

A focus of the Lentil and Faba Bean Breeding Program, managed by Ana Vargas, is to ensure the marketability of lentils with value-added potential in terms of visual appearance, seed coat chemistry (for by-product utilization), protein content and quality, nutritional value, and culinary properties. CDC Albberg , licensed to SeCan in 2025, has an improved dehulling efficiency of 20% compared to the leading lentil variety, along with a 20% yield improvement.

Processors are interested in fractioning faba beans for their high protein content, but food manufacturers are reluctant to incorporate faba bean fractions due to the risk associated with vicine/convicine. CDC 2030 was supported for registration in 2025. It is a small-seeded, low-vicine, low-convicine faba bean variety in the market.

Improving pea varieties for protein extraction

Tom Warkentin's Pea Breeding and Genetics program has focused on improving seed quality since its inception. This priority focus is working to improve pea varieties for protein extraction, to better understand opportunities for starch co-products from protein extraction, and to improve pea flavour using innovative gene-editing techniques.



Dr. Bill Biligetu
Associate Professor;
Ministry of Agriculture
SRP Chair in Forage
Crop Breeding

Dr. Adam Carter
Assistant Professor;
Ministry of Agriculture
SRP Chair in Spring Wheat
and Canary Seed Breeding
and Genetics

Accelerating the Delivery of Future Varieties

This is the future-focused research most producers never see.

Throughout several Strategic Research Theme areas, CDC researchers are using advanced genomics, molecular breeding, phenotyping and predictive technologies to identify valuable traits earlier and accelerate the development of improved crop varieties.

***71** peer-reviewed publications*

***90+** conference presentations*

***85+** industry outreach activities*

Broadening the genetic diversity of wheat

Valentyna Klymiuk, lead of the Wheat Applied Genomics and Pre-Breeding Program, is developing new breeding populations and genomic tools using diverse global wheat germplasm. This program is expanding research into Fusarium Head Blight resistance, rust resistance, heat tolerance and drought adaptation while establishing new molecular breeding capacity to identify desirable traits quickly and efficiently.

Novel approach to managing barley lodging

Researchers in the Barley and Oat Breeding program, managed by Aaron Beattie, have identified root architecture traits linked to lodging resistance, including root angle, root solidity and root distribution. Similar work in oats identified root and stem characteristics associated with improved standability. Information from this project will help breeders more effectively select for lodging-resistant traits.

Robust Fusariam resistance packages

During 2025/26, H.R. Kutchers' Cereal and Flax Pathology program identified two new sources of Fusarium Head Blight resistance. They completed studies on Fusarium-damaged kernels and DON accumulation, helping to identify genetic traits that maintain grain quality even under disease pressure. The program is also actively searching for global germplasm collections and wild relatives for new resistance genes to incorporate into future varieties.

Accelerating the delivery of higher-yielding forages

Within Forage Crop Breeding, Bill Biligetu is combining advanced field imaging, genomic evaluation and root architecture research to more quickly select promising forage genetics. These innovations will help breeders identify superior varieties more quickly shortening breeding timelines and the delivery of higher-yielding forages for livestock producers.

Operations Update

Crop Quality Report

The Crop Quality Laboratories are supported in large part by the CDC's core operating budget, funded by the Saskatchewan Ministry of Agriculture.

Together, the Oilseed & Pulse Quality, Barley & Oat Quality, and Wheat Quality Evaluation laboratories provided the comprehensive data foundation required to support breeder selection and advance varieties toward registration. Throughout the season, nearly 130,000 analyses were completed.

The Barley & Oat Quality Lab completed more than 38,000 analyses. The lab also undertook a significant modernization of calibration systems, complemented by staff training and quality-assurance improvements, to achieve greater consistency across instruments, operators, and breeding cycles.

Wheat represented the most analytically intense component of the program, with over 71,000 analyses completed. Durum accounted for the largest share of the workload, with analysis focused on traits critical to milling, gluten strength, colour, and pasta quality.

Within the Pulse & Oilseed Evaluation program, more than 2,100 linseed entries and 1,800 soybean samples were evaluated for quality traits. Peas accounted for the largest pulse quality workload with more than 12,000 breeding lines assessed for key nutritional and processing characteristics.

While the program's impact is measured through the thousands of analyses completed each year, its success depends on reliable analytical infrastructure. Significant effort was invested in equipment maintenance, software upgrades, and quality control systems to maintain the high standards of analytical excellence CDC is known for.

Kernen Crop Research Farm Update

The CDC farm operations are supported through the operating grant provided by the Saskatchewan Ministry of Agriculture.

The 2025 growing season marked a leadership transition, with Arling Kemppainen assuming the role of Field Superintendent and Jaret Horner assumed the role of Breeder Seed Manager. Despite challenging weather conditions early in the season, strategic crop management and timely rainfall later in the year helped sustain crop development, resulting in above-average yields and excellent grain quality.

The farm's success was strengthened by partnerships with industry supporters. Notably, Väderstad Industries, which generously provided access to a 60' Seed Hawk drill with PD680 air cart to help improve research capacity. Additional investment in equipment included three CVA trucks, a new grain trailer, a Zurn combine with H3 Harvest Master and a Vista colour sorter with 4K cameras.

As the CDC's research continues to expand, pressure on land, storage and harvesting resources is increasing while ongoing urban growth reduces available agricultural land within the city. Addressing these constraints will be important to ensure the CDC can lead world-class research into the future.

Dr. Valentyna Klymiuk

Assistant Professor; Saskatchewan Wheat Development Commission (Sask Wheat) Applied Genomics and Pre-breeding Chair

Dr. Sabine Banniza
Professor; Ministry of Agriculture SRP Chair in Pulse Crop Pathology

About CDC

The Crop Development Centre at the University of Saskatchewan develops crop varieties that bring value to the agriculture sector, through the development and application of scientific knowledge and technologies in partnership with stakeholders across the agriculture value chain. Recognizing the unprecedented need to enhance crop productivity, CDC scientists deploy the latest scientific advances to improve the agronomic and end-use performances of spring wheat, durum, canary seed, barley, oat, flax, pea lentil, chickpea, dry bean, fababean, soybean and forages. We empower agriculture to withstand the challenges of a changing world, securing the foundation of our food supply.

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