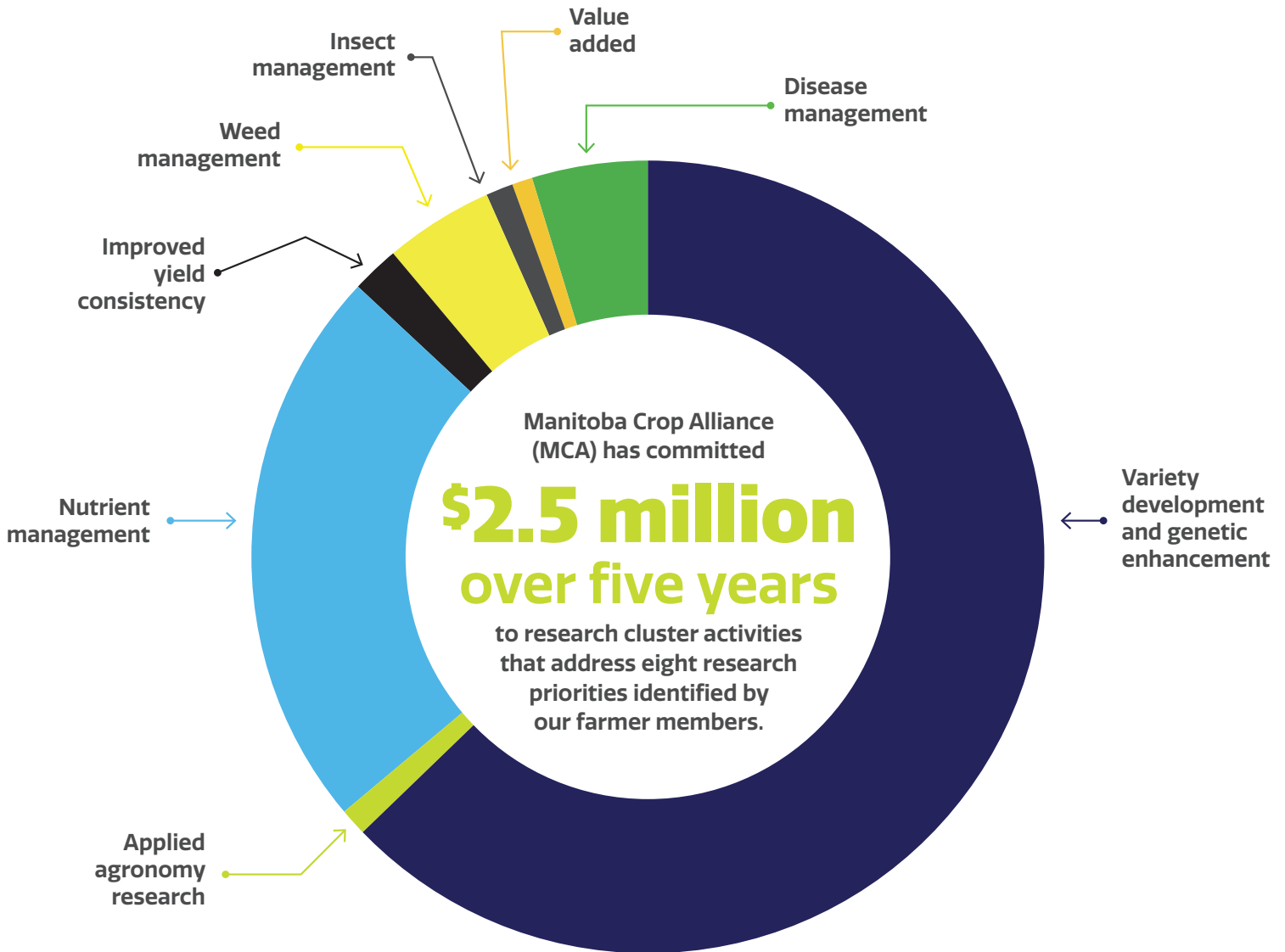


2023-28

RESEARCH CLUSTER FUNDING BREAKDOWN



VARIETY DEVELOPMENT AND GENETIC ENHANCEMENT

Variety development is a long-term endeavour that requires breeders to be future-focused, ensuring new varieties are resilient to evolving pest, disease and weather threats. Researchers must balance yield, grain quality, disease resistance and other factors to produce high-performing and marketable varieties for farmers. Traditional breeding approaches are used alongside modern genetic tools, such as DNA marker-assisted selection and genomic selection, improving the efficiency and success of crop breeding programs. This research will ensure farmers in Manitoba have access to competitive varieties that are adapted to production challenges now and in the future.

Cluster	Project Name	Principal Investigator(s)	Project Value	MCA Contribution
Wheat	High quality wheat germplasm development to mitigate climate change risks and promote clean environment	Santosh Kumar & Richard Cuthbert	\$3,942,451	\$174,724
Wheat	Cultivar enhancement through the application of biotechnology	Firdissa Bokore	\$990,000	\$44,707
Wheat	Integrated approaches to develop climate resilient Canada Prairie Spring Red wheat cultivars for Western Canada	Harpinder Randhawa	\$168,004	\$9,993
Wheat	Winter wheat with enhanced economic, environmental and ecological sustainability for Western Canada	Harwinder Sidhu	\$798,503	\$41,247
Wheat	Gene editing to accelerate delivery of improved genetics	Andrii Bilichak	\$567,996	\$25,960
Wheat	Sustainable control of wheat diseases through marker-assisted and resistance gene discovery	Colin Hiebert	\$594,000	\$33,947
Barley	Enhancing the adaptation of western Canadian barley to climate change	Yadeta Kabeta & Jennifer Zantinge	\$700,000	\$10,000
Barley	Improving the value and environmental impact of barley through breeding	Aaron Beattie	\$883,432	\$12,000
Barley	Development of improved western Canadian barley robust to climate change	Ana Badea	\$1,354,350	\$17,295
CFCRA	Corn germplasm development focused on key diseases	Aida Kebede	\$899,976	\$81,507
DFCC	Integrated approaches for genetic improvement of flax	Bunyamin Tar'an	\$1,622,074	\$122,019
DFCC	Herbicide and disease resistant sunflower hybrids: a climate-smart crop	MCA	\$1,894,096	\$947,049

APPLIED AGRONOMIC RESEARCH

Through the Sustainable Canadian Agricultural Partnership (Sustainable CAP), MCA will fund an applied agronomy project in barley. The project will provide recommendations on best management of nitrogen rates, fungicide and plant growth regulator (PGR) applications to improve yield, increase economic return and reduce greenhouse gas emissions.

Cluster	Project Name	Principal Investigator(s)	Project Value	MCA Contribution
Barley	Improving barley sustainability through integrated genetic diversity, nitrogen and PGR management	Kui Liu	\$744,350	\$12,113

NUTRIENT MANAGEMENT

MCA will fund six projects through the Sustainable CAP cluster program that address nutrient management. The outlined projects will evaluate fertilizer application strategies, efficiency and potential for greenhouse gas emissions reductions in wheat, barley, corn, flax and sunflower.

Cluster	Project Name	Principal Investigator(s)	Project Value	MCA Contribution
Wheat	The role of wheat growth habit in reducing GHG emissions and fostering climate resiliency without compromising yield, quality and 4R principles	Brian Beres	\$1,403,555	\$21,864
Wheat	A Prairie assessment of nitrogen stabilizers and split fertilizer application in sustaining spring wheat yield, protein and production economics while reducing nitrous oxide emissions	Mario Tenuta	\$1,434,140	\$25,938
Barley	Nitrification inhibition on GHG emissions, soil health and barley performance	Linda Gorim	\$873,528	\$9,921
CFCRA	Cover crops and 4R strategies to mitigate GHG emissions	Craig Drury	\$2,223,725	\$207,610
DFCC	Greenhouse gas program for diverse field crops	Kate Congreves	\$2,809,747	\$93,658
ICAC2	Real-time decision support: linking optimal nitrogen management practices to soil moisture conditions	Ramona Mohr	\$1,157,068	\$93,400

IMPROVED YIELD CONSISTENCY

MCA will fund one project addressing the research priority of improving yield consistency. The potential for genetic influence of nitrogen use efficiency (NUE) and resulting N₂O emissions in wheat has not previously been studied in Canada. The proposed study will address this knowledge gap, identifying possibilities for genetic regulation of NUE, thereby reducing greenhouse gas emissions in wheat production.

Cluster	Project Name	Principal Investigator(s)	Project Value	MCA Contribution
Wheat	Towards climate-smart, resilient wheat	Curtis Pozniak	\$2,252,850	\$52,482

WEED MANAGEMENT

MCA will fund two projects that address weed management.

A project funded through the wheat cluster will evaluate cropping systems strategies that will control weeds while reducing herbicide use. Identifying novel crop management in no-till wheat that suppress weeds and reduces reliance on glyphosate will help slow herbicide resistance – maintaining effective weed control and preserving the efficacy of glyphosate.

The second weed management project is funded through the Integrated Crop Agronomy Cluster and will continue support to the Prairie Weed Monitoring Network, which was supported in the previous five-year cluster program. Monitoring networks provide immense amounts of knowledge to farmers, agronomists, industry, researchers and policy-makers, which aids in the preservation of weed management tools. The Prairie Weed Monitoring Network project will develop this network and implement a comprehensive weed biovigilance strategy, including weed monitoring, risk assessment and forecasting for the Canadian Prairies.

Cluster	Project Name	Principal Investigator(s)	Project Value	MCA Contribution
Wheat	Developing weed-suppressive no-till wheat systems with reduced glyphosate use	Charles Geddes & Dilshan Benaragama	\$854,670	\$63,986
ICAC2	The Prairie Weed Monitoring Network: building a strong biovigilance foundation	Charles Geddes	\$1,779,052	\$35,500

INSECT MANAGEMENT

This insect management project focuses on a three-pronged approach to wheat midge. This includes incorporation of specific genes for egg laying deterrence, as well as genes for hairy glumes for mechanical resistance, into wheat, and enhanced surveying of wheat midge to detect insects that may have overcome the Sm1 resistance gene. Finding this and understanding the scope will be critical as an early warning system to protect the Sm1 gene.

Cluster	Project Name	Principal Investigator(s)	Project Value	MCA Contribution
Wheat	Wheat midge: enhanced surveys, wheat resistance traits and midge genetic variation to preserve the Sm1 gene	Tyler Wist	\$225,019	\$6,912

VALUE ADDED

This value-added project aims to use barley grain and its fibre fractions in swine nutrition to reduce feed cost, enhance feed efficiency, improve gut health and protect against E. coli.

Cluster	Project Name	Principal Investigator(s)	Project Value	MCA Contribution
Barley	Enhanced use of barley and its fractions in monogastric nutrition	Martin Nyachoti & Ruurd Zijlstra	\$562,065	\$10,232

DISEASE MANAGEMENT

These projects focus on diseases affecting cereal crops. Topics include genetic improvement for disease resistance, genetic screening to identify sources of disease resistance and surveys of leaf spot diseases to develop a culture collection that supports future research and germplasm enhancement.

Cluster	Project Name	Principal Investigator(s)	Project Value	MCA Contribution
Wheat	A dual-pronged approach to mitigate Fusarium head blight and DON production	Gopal Subramaniam	\$999,680	\$80,565
Barley	Disease resistance to address environmental issues, economics and sector resiliency	Kelly Turkington & James Tucker	\$1,907,099	\$9,538
Barley	Barley pathogen variations and implications for managing disease via host resistance	Xiben Wang & Kelly Turkington	\$512,501	\$10,251

Note: MCA contributions to individual research activities listed in this document do not add up to \$2.5 million, as some funding is allocated to administrative fees and mandatory activities (i.e., science co-ordination, knowledge and technology transfer, and impact assessment)) associated with each research cluster.