



GrowBarley

Conseil de
l'orge du
Canada



Barley
Council of
Canada

A close-up photograph of a barley ear, showing the golden-brown grains and the green awns, set against a blurred background of more barley plants. The image is overlaid with a semi-transparent green and orange gradient.

BUILDING BETTER BARLEY

An Overview of the National
Barley Research Cluster
2018-2023

THE CLUSTER

The cluster is a component of Agriculture and Agri-Food Canada's AgriScience program under the Canadian Agricultural Partnership.

The National Barley Research Cluster brings together twelve research activities from across Canada. The overall goals of the research are to ensure that barley production remains competitive with other major crops in Canada and to improve the quality traits of Canadian barley to satisfy the diverse and evolving needs of our customers.

Research areas within the cluster include variety development, agronomic productivity, disease resistance, quality and performance, and sustainability.

INDUSTRY FUNDERS



**Alberta
Barley**



**Brewing and Malting
Barley Research Institute**



CFCRA
CANADIAN FIELD CROP
RESEARCH ALLIANCE

ARCCC
ALLIANCE DE RECHERCHE SUR LES
CULTURES COMMERCIALES DU CANADA

CFCRA members supporting barley research include: Grain Farmers of Ontario, Producteurs de grains du Québec, Atlantic Grains Council and SeCan



**CANADIAN
AGRICULTURAL
PARTNERSHIP**

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PROJECTS

VARIETY DEVELOPMENT

BREEDING BARLEY FOR HIGH YIELD AND RESISTANCE TO FUSARIUM HEAD BLIGHT FOR EASTERN CANADA

Project lead: Dr. Raja Khanal, Agriculture and Agri-Food Canada, Ottawa Research and Development Centre

Timeline:
2018-2023

There is demand for barley in eastern Canada, but it can be challenging to grow the crop in the region.

This project aims to address this problem by evaluating new varieties that are high quality, high yielding, fusarium-resistant and also have good standability over current varieties. The overall goal is increased profitability for producers, increased competitiveness for barley in crop rotations and decreased input costs.

BREEDING MALTING AND FOOD BARLEY VARIETIES FOR WESTERN CANADA

Project lead: Dr. Ana Badea, Agriculture and Agri-Food Canada, Brandon Research and Development Centre

Timeline:
2018-2023

In order to increase the growth of barley in western Canada it is critical to continue to develop varieties that are adapted to our growing conditions and offer ideal end-use qualities.

This project aims to create new varieties for western Canada with better protection from biotic and abiotic stresses, higher yields and greater marketability. Ultimately this will increase profitability for producers and end users.

PROJECTS

VARIETY DEVELOPMENT (CONTINUED)

BREEDING TWO-ROW MALT, FEED AND FOOD VARIETIES

Project lead: Dr. Aaron Beattie,
University of Saskatchewan Crop
Development Centre

Timeline:
2018-2023

Demand for Canada's high quality malt and feed barley is increasing. To prepare for and nurture this growth, it is critical that we continue to develop barley varieties with improved traits.

This project aims to improve current two-row barley varieties for established markets and develop new varieties to capitalize on opportunities in new and emerging markets. This will ensure barley remains a viable crop within producers' rotations while providing value to maltsters, brewers, and the feed and food industries.

CROPSNPS: AN ULTRA-LOW COST GENOTYPING APPROACH IN BARLEY AND SOYBEAN

Project lead: Dr. François Belzile,
Université Laval

Timeline:
2018-2023

Genetic markers have allowed breeders to more rapidly develop new and improved varieties. However, there is potential to increase the efficiency of this technology even more while also decreasing the cost associated with it.

This research aims to develop low-cost, medium-coverage genotyping tools for barley and soybean that will reduce genotyping costs, speed up the usage of DNA markers by breeders, and enhance our ability to select superior lines in response to a changing climate and other emerging threats.



PHENOTYPING BARLEY BREEDING LINES AND GERMPLASM FOR DISEASE RESISTANCE

Project lead: Dr. Thomas Kelly Turkington, Lacombe Research and Development Centre, Agriculture and Agri-Food Canada

Timeline:
2018-2023

Barley production across Canada continues to be threatened by diseases.

This research aims to address this by developing disease-resistant barley varieties. The overall outcome of this research will be varieties with increased disease resistance, which will decrease biotic production risks, improve crop yields and quality, lower production costs, reduce pesticide inputs and ultimately lead to more marketable products.

FEED BARLEY

ENHANCING THE COMPETITIVE VALUE OF BARLEY IN SWINE DIETS

Project lead: Dr. Ruurd T. Zijlstra, University of Alberta

Timeline:
2019-2023

Barley holds great value for the feed industry but it is still not the first choice for many livestock producers.

This research aims to increase the competitiveness of barley for swine diets by substantiating how and why barley provides value-added benefits to swine as more than just a source of energy. Promoting barley as a healthy ingredient could help reduce the need for antibiotics in livestock diets thereby addressing the growing public demand for meat produced without antibiotics. The impact of this research will be an increase in demand for barley as an ingredient in swine feed.

PROJECTS

DISEASE MANAGEMENT

BARLEY PATHOGEN VARIATION AND SURVEILLANCE: IMPLICATIONS FOR MANAGING HOST RESISTANCE AND FUNGICIDES

Project lead: Dr. Thomas Kelly Turkington, Lacombe Research and Development Centre, Agriculture and Agri-Food Canada

Timeline:
2018-2023

Barley production across Canada continues to be threatened by diseases, and the increasing resistance and adaptation of these diseases to fungicides.

This project aims to address this by building a better understanding of pathogen variation, which will help breeders develop resistant varieties and integrated strategies to prolong the effectiveness of host resistance and fungicide applications.

DEVELOPING BARLEY GERMLASM WITH IMPROVED RESISTANCE TO FUSARIUM HEAD BLIGHT AND OTHER BIOTIC STRESSES FOR WESTERN CANADA

Project lead: James Tucker, Agriculture and Agri-Food Canada, Brandon Research and Development Centre

Timeline:
2018-2023

In order for barley to stay competitive it is crucial to continually develop new varieties that will increase yields while also addressing disease threats and changing environmental, economic and market conditions.

This project aims to improve competitiveness of malting and food barley varieties for western Canada by improving resistance to fusarium head blight, cereal leaf diseases and other biotic stresses that currently affect barley production.



MALTING & BREWING

EXAMINING AND DEFINING FLAVOURS AND AROMAS IN MALTING BARLEY VARIETIES

Project lead: Dr. Yueshu Li,
Canadian Malting Barley Technical Centre

Timeline:
2018-2021

Canadian malting barley is in demand worldwide. One of the reasons for that is its contribution to beer flavour.

This research aims to help us fully understand the sensory and flavour profile of different malting barley varieties and identify which sensory attributes (flavours and aromas) in beer are benefited by specific barley characteristics.

IMPROVING MALT BARLEY'S PERFORMANCE FOR THE BREWING PROCESS

Project lead: Dr. Yueshu Li,
Canadian Malting Barley Technical Centre

Timeline:
2018-2021

A common problem for brewers globally is premature yeast flocculation (PYF). This research will help us understand how PYF works so that we can generate better solutions to the problem.

The results will help Canadian malting and brewing companies avoid production loss and will provide the entire malting barley value chain with better testing methods. The results may also encourage more barley to be selected for malting use, particularly in years with less favourable growing conditions.

PROJECTS

CROP MANAGEMENT

REDUCING THE IMPACT OF FUSARIUM HEAD BLIGHT IN BARLEY THROUGH IN-CROP MANAGEMENT STRATEGIES

Project lead: Dr. Thomas Kelly Turkington, Lacombe Research and Development Center, Agriculture and Agri-Food Canada

Timeline:
2018-2023

Fusarium head blight (FHB) now affects most of Canada and can be a devastating disease.

While there is currently a lack of effective management or prevention options, we know that using an integrated crop management approach can lessen the impact. This research aims to determine how we can better reduce FHB and potential mycotoxin contamination in barley and ultimately improve the quality of the resulting malt. Overall this will make barley a more attractive cropping option for producers and improve the end product for maltsters.

STUDYING THE INFLUENCE OF PRECEDING LEGUMES AND NITROGEN MANAGEMENT ON MALT BARLEY YIELD AND QUALITY ACROSS CANADA

Project lead: Dr. Aaron Mills & Dr. Breanne Tidemann, Agriculture and Agri-Food Canada

Timeline:
2018-2022

Part of the challenge of growing malting barley is managing protein in the crop.

This study aims to develop better guidelines for managing protein levels, by determining how to successfully grow malting barley after legume crops across Canada. The results from this research will help barley producers make more informed choices regarding their cropping systems and potentially increase yield while maintaining quality, thereby increasing profits. It will also help develop practices to minimize nitrogen inputs, reducing the environmental impacts of growing malting barley.