

Barley Breeding, Variety Advancement, Disease & Pathology

Feed & Forage (2&6-row) and Malting Barley (2-row)	• Increased yield potential, better than the best check – maximizing yield potential and quality in alignment with regional conditions • Yield stability (environmental and regionally) – single stress performance vs multiple stress performance and a loss – Abiotic stress tolerance (i.e. drought tolerance, frost resilience, low temperature germination) • Advanced breeding strategies and field-based phenotyping to accelerate genetic gain and reduce time to producer adoption • Increased disease resistance targeting the PRCOB priority 1 diseases • Monitor emerging and established barley diseases to identify changes in pathogen populations and support effective disease management and durable resistance • Stem strength & lodging resistance • Portion of available varieties containing semi-dwarf characteristic • Increased plump and improved consistency in kernel size • Develop barley for eastern Canada: Refer to CFCRA Research Priorities for AgriScience Programming — Eastern Canadian Barley Research Priorities
Feed & Forage Barley (2&6-row)	• Maintain or improve feed and forage quality with other breeding targets listed above and including smooth awns and/or hooded (forage), improved fiber digestibility (forage), improved palatability, wider harvest window and increased disease resistance to ergot: Refer to the Canadian Beef Industry Research Strategy. Forage & Feed Production
Malting Barley (2-row)	• Maintain or improve malt quality with other breeding targets: Refer to BMBRI's Strategic Goals and Targets for Malting Barley Breeding and Research

Agronomy, Production, Disease & Pathology

Feed & Forage (2&6-row), Malting (2-row), and Food Barley	- Economically address agronomic practices to leverage G x E x M interaction in Western Canada's different agro-ecological zones to optimize yield and quality - Barley management practices to reduce weeds (i.e. herbicide resistant wild oats and kochia), disease and insect pests - Develop a modern, efficient, coordinated surveillance system to monitor and diagnose current, emerging, and new-to-Canada barley pathogens - Economic assessment and practical application of digital agriculture tools for improved on-farm decision making - Address inclusion of barley within rotation to maximize farm profitability, soil health and reduce the soil-seedbank for weeds, disease, pathogen and insect loads
Feed & Forage Barley (2&6-row)	- Identify cost-effective agronomic strategies to increase energy yield or biomass yield per acre for specific end uses (i.e. forage, silage, grain, feed) - Investigate forage barley as part of a cropping system, including in mixtures, blends, intercrops, with livestock and cover crops, to identify optimal systems for maximizing output, economics, and risks
Malting Barley (2-row)	Investigate agronomic and management factors that will improve the likelihood of selection for malting barley, including sustainable crop management practices to reduce emissions and improve carbon sequestration: Refer to BMBRI's Strategic Goals and Targets for Malting Barley Breeding and Research
Food Barley	- Crop management practices to maximize β-glucan and reduce pre-harvest sprouting, staining, microbial contaminants, DON and alkaloids - Improved germination of hulless barley in various agro-ecological zones

Diversified End Uses & Markets

Feed & Forage (2&6-row), Malting (2-row), and Food Barley	Technologies to remove, inactivate, bind, or mitigate the effects of ergot and other mycotoxins including deoxynivalenol (DON)
Feed & Forage Barley (2&6-row)	- Technologies to improve barley processing and enhance the consistency of starch availability - Technologies to strengthen and quantify animal health benefits of barley-based feed rations - Prediction models and diagnostic methods to determine feed value and characterize starch availability, including applications for variable-quality or blended barley and support for ration formulation
Malting Barley (2-row)	Innovative technology to improve malting and brewing process efficiency: Refer to BMBRI's Strategic Goals and Targets for Malting Barley Breeding and Research
Food Barley	- Improved palatability of barley food products - Development of technologies aimed at reducing the rancidity of food barley products - Innovative extraction and processing for healthy barley products from milling fractionations