

## Barley Breeding, Variety Advancement, Disease & Pathology

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| <p><b>Feed &amp; Forage (2&amp;6-row) and Malting Barley (2-row)</b></p> | <ul style="list-style-type: none"> <li>• Increased yield potential, compared with the best check, by at least 1.5% per year targeting &gt;7% yield increase over the 5-year program – maximizing yield potential and quality in alignment with regional conditions</li> <li>• 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)</li> <li>• Advanced breeding strategies and field-based phenotyping to accelerate genetic gain and reduce time to producer adoption</li> <li>• Increased disease resistance targeting the PRCOB priority 1 diseases</li> <li>• Monitor emerging and established barley diseases to identify changes in pathogen populations and support effective disease management and durable resistance</li> <li>• Stem strength &amp; lodging resistance</li> <li>• Portion of available varieties containing semi-dwarf characteristic</li> <li>• Increased plump and improved consistency in kernel size</li> <li>• Advance the development of high-yielding, disease- and stress-resistant barley varieties for eastern Canada, enhance genomic selection to improve breeding efficiency, and assess winter and malt barley germplasm for regional agronomic and market suitability in eastern Canada: Refer to <a href="#">CFCRA Research Priorities for AgriScience Programming — Eastern Canadian Barley Research Priorities</a></li> </ul> |
| <p><b>Feed &amp; Forage Barley (2&amp;6-row)</b></p>                     | <ul style="list-style-type: none"> <li>• 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 <a href="#">Canadian Beef Industry Research Strategy. Forage &amp; Feed Production</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p><b>Malting Barley (2-row)</b></p>                                     | <ul style="list-style-type: none"> <li>• Maintain or improve malt quality with other breeding targets: Refer to <a href="#">BMBRI's Strategic Goals and Targets for Malting Barley Breeding and Research</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## Agronomy, Production, Disease &amp; Pathology

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| <b>Feed &amp; Forage (2&amp;6-row), Malting (2-row), and Food Barley</b> | <ul style="list-style-type: none"> <li>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</li> <li>Barley management practices to reduce weeds (i.e. herbicide resistant wild oats and kochia), disease and insect pests</li> <li>Develop a modern, efficient, coordinated surveillance system to monitor and diagnose current, emerging, and new-to-Canada barley pathogens</li> <li>Economic assessment and practical application of digital agriculture tools for improved on-farm decision making</li> <li>Address inclusion of barley within rotation to maximize farm profitability, soil health and reduce the soil-seedbank for weeds, disease, pathogen and insect loads</li> </ul> |
| <b>Feed &amp; Forage Barley (2&amp;6-row)</b>                            | <ul style="list-style-type: none"> <li>Identify cost-effective agronomic strategies to increase energy yield or biomass yield per acre for specific end uses (i.e. forage, silage, grain, feed)</li> <li>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</li> </ul>                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Malting Barley (2-row)</b>                                            | <ul style="list-style-type: none"> <li>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 <a href="#">BMBRI's Strategic Goals and Targets for Malting Barley Breeding and Research</a></li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Food Barley</b>                                                       | <ul style="list-style-type: none"> <li>Crop management practices to maximize <math>\beta</math>-glucan and reduce pre-harvest sprouting, staining, microbial contaminants, DON and alkaloids</li> <li>Improved germination of hulless barley in various agro-ecological zones</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## Diversified End Uses &amp; Markets

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| <b>Feed &amp; Forage (2&amp;6-row), Malting (2-row), and Food Barley</b> | <ul style="list-style-type: none"> <li>Technologies to remove, inactivate, bind, or mitigate the effects of ergot and other mycotoxins including deoxynivalenol (DON)</li> </ul>                                                                                                                                                                                                                                                                                     |
| <b>Feed &amp; Forage Barley (2&amp;6-row)</b>                            | <ul style="list-style-type: none"> <li>Technologies to improve barley processing and enhance the consistency of starch availability</li> <li>Technologies to strengthen and quantify animal health benefits of barley-based feed rations</li> <li>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</li> </ul> |
| <b>Malting Barley (2-row)</b>                                            | <ul style="list-style-type: none"> <li>Innovative technology to improve malting and brewing process efficiency: Refer to <a href="#">BMBRI's Strategic Goals and Targets for Malting Barley Breeding and Research</a></li> </ul>                                                                                                                                                                                                                                     |
| <b>Food Barley</b>                                                       | <ul style="list-style-type: none"> <li>Improved palatability of barley food products</li> <li>Development of technologies aimed at reducing the rancidity of food barley products</li> <li>Innovative extraction and processing for healthy barley products from milling fractionations</li> </ul>                                                                                                                                                                   |