

Leveraging On-Farm Research to Evaluate New Malting Barley Varieties for Production and Malting Selection in Manitoba



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Background

- Several new malting barley varieties have been registered for use by Canadian producers over the last five to 10 years.
- There was a need to evaluate new malting barley varieties in field scale trials, under Manitoba growing conditions to determine how well they perform agronomically, and in the malting and brewing process.
- MCA's Research on the Farm program conducts scientific research with farmer members – on their own fields and with their own equipment.

Material and Methods

- Seven trial locations were established across Manitoba between 2020 - 2022, for a total of 15 site-years.
- Each trial site had three or four randomized replicates (Figure 1).
- Management practices (ex. Seeding rate, nitrogen rate, tillage, seed treatment) were consistent across treatments and selected by farmers.
- Each strip was a minimum of 1000 ft in length. Each strip was at least one combine header in width (Figure 1).
- Malting and brewing quality characteristics were tested at the Canadian Malting Barley Technical Center (CMBTC) (Figure 2).
- AAC Synergy was used as a check variety.

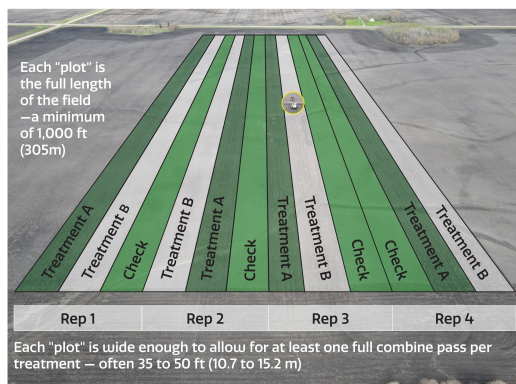


Figure 1. Example of randomized trial layout, with two treatments and a check. Each treatment is replicated four times.

Barley Agronomics

- Yield
- Protein
- Germination Energy
- Water Sensitivity
- Thousand Kernel Weight
- Plump Kernels
- Barley Deoxynivalenol (DON) Levels

Malt Processing

- Fine Extract
- Kolbach S/T Ratio
- Beta-glucan
- Diastatic Power
- Free Amino Nitrogen
- Malt DON Levels

Beer Quality

- Overnight Apparent Extract
- Overnight Fermentation

Figure 2. Selection of barley, malt and beer quality parameters measured.

Results and Discussion

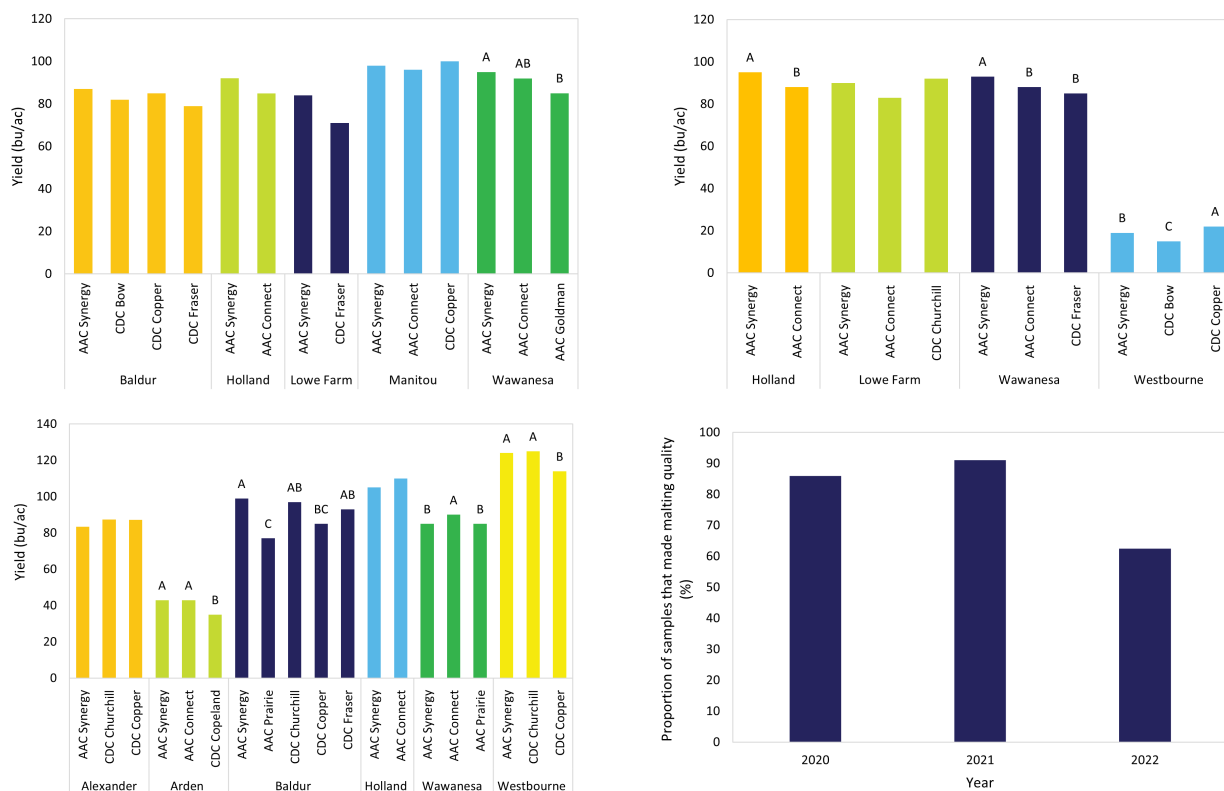


Figure 3. Top left – Summary of all 2020 site yield data across varieties. Top right – Summary of 2021 site yield data across varieties. Bottom left – Summary of 2022 site yield data across varieties. Bottom right – Percentage of samples that met malting criteria.

- All malting barley varieties evaluated were able to meet the criteria for malting selection. All varieties yielded well, with only CDC Churchill yielding higher than the check when averaged across trial years and sites, although the difference was not significant. The highest yielding variety differed between sites and years.
- CDC Copper had higher dormancy levels, with some samples not meeting germination energy requirements (data not shown).
- All varieties could be utilized to create high quality malt.
- CDC Fraser, CDC Bow, and AAC Connect all had fine extract levels above the check, AAC Synergy (data not shown).
- This data suggests that malting barley can be a valuable crop type within most cropping systems in Manitoba.

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