Variation in Bread-Making Quality of CWRS Wheat from Producer Fields in Western Canada

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Objective

The purpose of this study is to illustrate the wide variation in bread-making quality of Canada Western Red Spring (CWRS) wheat grown in producer fields across western Canada.

Introduction

The crop growing region of western Canada is a vast area that produces an average of 18M mt of CWRS wheat each year from a variety of environments. The spatial and temporal variability in growing conditions creates the potential for a wide range in wheat grade and quality. This variation can have significant implications on Canada’s ability to provide its importers with wheat of desired consistent quality. An extensive investigation is needed to fully understand the extent of variability in bread-making quality of wheat grown in producer fields in western Canada.

Materials and Methods

- Collected 100 harvested wheat samples of two varieties, AC Barrie and Superb, from producer fields all across western Canada, an area of 10M Ha (Figure 1).
- Wheat samples were analyzed for grain properties by Canadian Grain Commission.
- Wheat was milled using Buhler experimental mill.
- Dough properties were determined using a 10-gram Mixograph.
- Dough strength index was calculated using Mid-Line Peak Height * Mid-Line Band Width from each sample's mixogram.
- Flour protein was fractioned into 3 fractions using 50%prop-1-ol and 50%prop-1-ol + 0.1%DTT.

Results

Although AC Barrie had a higher average protein content (Figure 2), Superb possessed a higher average dough strength index for those samples having a protein content range between 13.0 - 14.0% (Figure 3). This shows dough strength properties are not solely determined by protein content. Superb also had a higher level of high molecular weight glutenin (3.47% ± 0.25 compared to 3.21% ± 0.25). This observation can lead us to conclude that protein quality is also very influential on dough quality.

Conclusion

This presentation exhibits the wide variation that exists in final-use quality of wheat despite samples displaying similar grain quality properties. This means that although wheat grown on two different fields can be of the same value at the elevator, they may not have similar end-use value.

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