



QUALITY ANALYSIS OF SPRING WHEAT TREATED WITH A PLANT GROWTH REGULATOR

KEY POINTS

- ▶ Overall, differences were minimal in wheat, flour, and end-product quality of varieties treated with and without a PGR
- ▶ Variety had more of an effect on quality than PGR application
- ▶ The presence of downgrading factors likely played a role in any observed differences

Plant growth regulators (PGRs) are a crop protection product used to reduce plant height and improve standability in wheat. While PGRs have been tested to ensure they do not compromise agronomics or disease resistance, minimal testing has been completed to determine the effect PGRs have on the quality of wheat and flour. The objective of this study was to assess the quality of wheat, flour and end-products of spring wheat varieties treated with a PGR.

MATERIALS & METHODS

- Seven spring wheat varieties (6 CWRS & 1 CNHR) were grown at 21 locations across Manitoba during 2019 and 2020
- 2019—AAC Brandon, AAC Cameron VB, AC Cardale, SY Rowyn, Faller
- 2020—AAC Brandon, AAC Redberry, AAC Starbuck VB, Faller
- Two treatments: a single application of a PGR (Manipulator™—AI: chlormequat chloride) at GS 31-32 and an untreated check
- Grading was completed on all samples to identify downgrading factors, and the following analyses were performed:
 - **Wheat:** protein content, falling number (FN), wet gluten, gluten index (GI), ash content, particle size index (PSI)
 - **Lab milling**
 - **Flour:** protein content, ash content, wet gluten, colour, starch damage, Amylograph peak viscosity, Farinograph, Extensograph
 - **End-product:** two baking procedures—no time dough (NTD) and long-time fermentation (LTF)

RESULTS

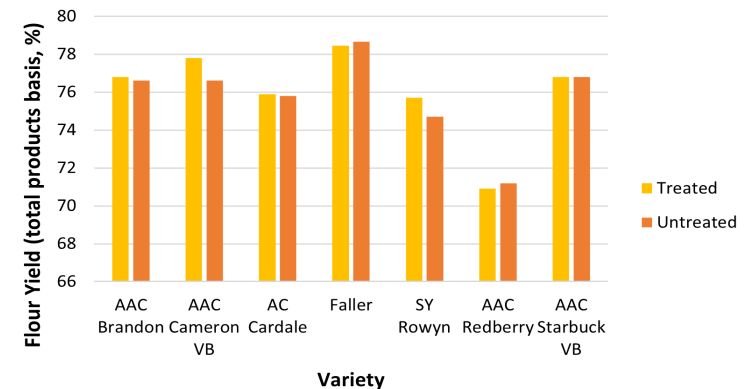


Figure 1. Mean comparison of flour yield (total products) of PGR-treated and untreated spring wheat varieties from 2019 & 2020. Results for AAC Brandon and Faller are a 2-year average.

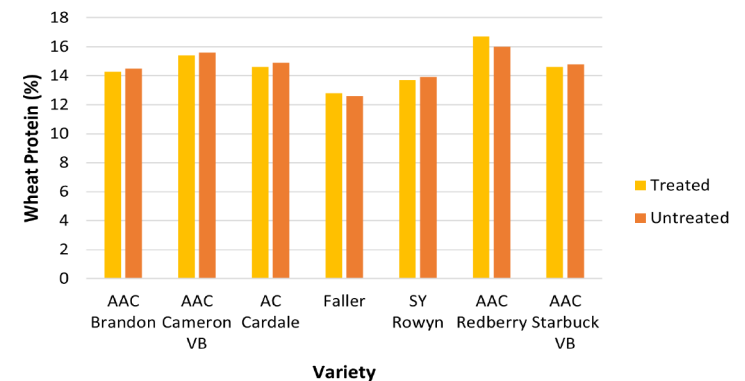


Figure 2. Mean comparison of wheat protein content (CNA—corrected to 13.5% moisture) of PGR-treated and untreated spring wheat varieties from 2019 & 2020. Results for AAC Brandon and Faller are a 2-year average.





CEREALS CANADA BAKING RESULTS

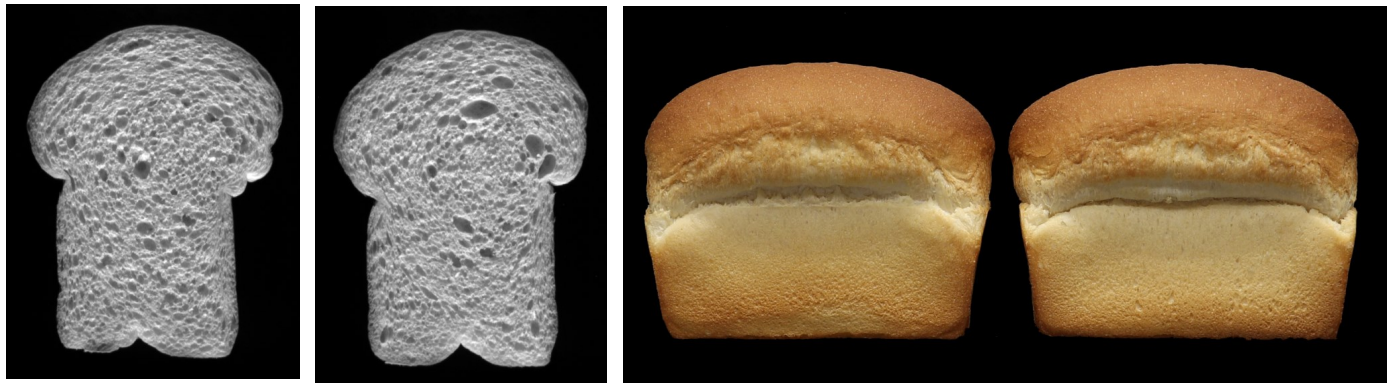


Figure 3. No time dough (NTD) baking procedure. Left: Internal crumb structure of AAC Brandon—treated with a PGR. Middle: Internal crumb structure of AAC Brandon—untreated. Right: Untreated (left) vs. treated (right) loaf comparison of AAC Brandon.

SUMMARY

- Most samples graded as either No. 1 or No. 2 CWRS or No. 1 CNHR
- Main downgrading factor in 2019 & 2020 was hard vitreous kernels (HVK)
- Minimal differences were observed between treated and untreated samples for milling yield, protein content, and wheat & flour wet gluten content
- There was minimal effect on gluten strength (measured with Farinograph & Extensograph Rmax) between treated and untreated samples. Variety had a larger impact on gluten strength than treatment with a PGR
- End-product testing revealed that the use of PGRs had minimal effect on flour baking performance and bread quality

ADDITIONAL RESOURCES

- <https://canadiancereals.ca/docs/2021AnalyticalMethods.pdf>
- <https://cerealscanada.ca/>
- <https://www.mbcropalliance.ca/>

COLLABORATOR RESPONSIBILITIES

Cereals Canada - milling, analytical testing, bread processing & evaluation

Manitoba Crop Alliance - establishment of trials, agronomic data collection, sample collection

FUNDING

Funded in part by the Government of Canada under the Canadian Agricultural Partnership's AgriScience Program, a federal, provincial, territorial initiative, with industry support from Cereals Canada and the Manitoba Crop Alliance. Thank you to Tone Ag Consulting for the research support.



**MANITOBA
CROP
ALLIANCE**

CONNECT WITH US

mbcropalliance.ca
hello@mbcropalliance.ca
P: 204.745.6661

@mb_cropalliance

FUNDING ACKNOWLEDGMENTS

Manitoba Crop Alliance gratefully acknowledges the funding support from the Government of Manitoba & Government of Canada through the CAP-Ag Action Manitoba program.