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Pedigree, recombination, and selection shape Canadian bread wheat diversity

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Investigating allelic variation across Canadian bread wheat germplasm can explain why cultivars are genetically differentiated and predict how the current distribution of allelic variation will affect future genetic progress. Photo courtesy of Flickr/Marilylle Soveran.

Canadian bread wheat cultivars generate close to 25 million tonnes of wheat every year. Investigating allelic variation across this germplasm can explain why cultivars are genetically differentiated and predict how the current distribution of allelic variation will affect future genetic progress.

In *The Plant Genome*, Hargreaves et al. report that allelic variation across Canadian wheat germplasm is in large part the result of breeding lines with shared attributes. Chromosomal sites also have distinct patterns of allelic variation. Alleles flanking genes known to differ between wheat lines often differ but are sometimes the same. Alleles at specific homoeologous chromosomal regions have notably diverged between germplasm, indicating plant breeders selected for homoeologous loci. Finally, lines with shared attributes have low allelic diversity across very long, recombination-poor chromosomal regions, a pattern that likely reduces future breeding potential.

Accessing allelic variation in low-recombining chromosomal regions and across germplasm will be important for future breeding progress, maintaining or improving the production of Canadian bread wheat.

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Hargreaves, W., N'Daiye, A., Walkowiak, S., Pozniak, C.J., Wiebe, K., Enns, J., & Lukens, L. (2021). The effects of crop attributes, selection, and recombination on Canadian bread wheat molecular variation. *Plant Genome*, *14*, e20099. **https://doi.org/10.1002/tpg2.20099**

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