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Improving blackleg resistance durability through rotation of major-gene resistance groups in commercial canola fields on the Canadian prairies.

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The Canadian canola industry contributes $26.7 billion to the Canadian economy each year and great emphasis has been placed on protecting the industry from all threats. Leptosphaeria maculans causes blackleg, one of the most economically important diseases of canola (Brassica napus L.). Management for the disease has focused on pathogen race monitoring, extension of crop rotation, and use of resistant (R) cultivars. R cultivars have been deployed since the 1990s in Canada, which helped to minimize the disease impact by using major-gene and race-nonspecific resistance. Recently, an increase in blackleg incidence has been observed on the prairies, even on R-rated cultivars. The recommendation for canola producers finding increased blackleg was to select a different cultivar, which could be a gamble; it may or may not be effective since the new cultivar may carry the same resistance gene(s). The Canadian canola industry has decided to adopt a new resistance labelling scheme to identify the major resistance genes deployed in canola cultivars. If substantial increases in blackleg are seen with one cultivar, producers are recommended to switch to a cultivar with an alternative major-gene resistance group to target the dominant L. maculans races within their fields.

This project looks at measuring the effectiveness of deploying different major resistance groups in commercial canola fields across the prairies and the effect major resistance groups have on the avr-profile of the blackleg pathogen. Avr-profiles were determined in the spring by collecting old canola residue to determine the predominant races across the field prior to canola seeding. Producers grew cultivars with identified resistance gene groups. Cultivars were assessed for blackleg incidence and severity in the fall prior to swathing and samples were taken to determine the avr-profile. Avr-profiles were compared to identify race shifts from the spring and fall sampling. This is one of the first projects to look at shifts in BL races in commercially grown canola crops. Results will help producers make varietal decisions to manage and even mitigate blackleg on their farms.