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Background:

Clubroot, caused by the obligate parasite *Plasmodiophora brassicae*, is a serious threat to the canola industry in Canada and globally. It is recommended in Canada that canola growers follow an integrated strategy for clubroot management. A key component of that strategy is the use of clubroot resistant cultivars. Informative resistance labels are essential for making decisions on controlling *P. brassicae* pathotypes in the field. This new approach for clubroot resistance labelling in Canada seeks to standardize screening methods and label descriptions.

Objective:

To label clubroot resistance in canola cultivars based on their phenotypic resistance to the most predominant *P. brassicae* pathotypes currently present in Western Canada. A standardized phenotypic description will mitigate confusion for growers when selecting effective resistance in *P. brassicae* infested fields.

Methods:

Uniform inoculum from single-spore isolates of *P. brassicae* pathotype 3H (Strelkov *et al*, 2018) and from field populations representing pathotypes 3A and 3D will be developed at the University of Alberta. These single source inocula will be distributed to seed companies to screen their germplasm against standardized homozygous check lines that carry single clubroot resistance genes and show differential reactions to the strains of *P. brassicae*. Data collected will be assessed by the Clubroot Steering Committee, a cross-industry clubroot advisory body to ensure quality control initially.

Results:

The benefit to the canola industry in Canada as a result of this new approach will be harmonized phenotypic clubroot resistance information, which is more informative to producers than labelling the resistance genes involved in canola cultivars. The first clubroot labels for *P. brassicae* pathotypes 3A, 3D, and 3H will be made public and released to the industry in 2024. The Canola Council of Canada will publish the information on their websites and public channels and discuss the proposal and labelling outcomes at the Canola Week Conference in December 2024. Additional pathotypes that could emerge as a threat will be addressed and labelled in subsequent years.

Conclusions:

Currently, canola seed companies in Canada each employ clubroot labels developed internally, which are not consistent between companies to what resistance genes are involved nor what pathotypes are controlled. Resistant cultivars are an important tool in controlling clubroot disease. As clubroot continues to spread across Canada and resistance breakdown occurs, careful stewardship of our genetics is essential. Creating a standardized clubroot labelling system will allow growers to make informed choices and steward resistance to avoid limiting their canola crop rotations. These new clubroot labels require a collaborative approach with all industry partners to work together to help Canadian producers continue to successfully grow canola for years to come.

References:

1. Stephen E. Strelkov, Sheau-Fang Hwang, Victor P. Manolii, Tiesen Cao, Rudolph Fredua-Agyeman, Michael W. Harding, Gary Peng, Bruce D. Gossen, Mary Ruth McDonald & David Feindel (2018). Virulence and pathotype classification of *Plasmodiophora brassicae* populations collected from clubroot resistant canola (*Brassica napus*) in Canada, *Canadian Journal of Plant Pathology*, 40:2, 284-298, DOI: 10.1080/07060661.2018.1459851