

## Figuring out the future of foliar fungicide decisions: developing the Sclerotinia stem rot risk assessment tool

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### Background:

Sclerotinia stem rot is the greatest yield robbing disease of Canadian canola production, and our chief management tool involves timely application of foliar fungicides during the flowering period. The decision to apply fungicides is difficult and can be costly, as many factors contribute to the overall risk of sclerotinia infection and severity. Today, growers are looking for reliable and unbiased risk assessment tools to aid in their decision-making.

### Objective:

Through coordination with the Canola Council of Canada (CCC), Agriculture and Agri-Food Canada, and the canola industry, a sclerotinia stem rot risk assessment tool that can accurately assess whether a grower should apply a fungicide will be developed and made publicly available.

### Methods:

The CCC's Agronomy team leveraged industry contacts across the Prairies along with members of the Sclerotinia Steering Committee to gather beta-testers to validate the risk assessment tool based off Twengstrom's (1998) model from Sweden. Users input six risk factors (past precipitation, forecasted precipitation, last host crop/severity in that host crop, crop density, and presence of spore-producing apothecia) and outputs a risk score (to a maximum of 70 risk points, 40 being the threshold) that recommends whether a fungicide should be applied. These beta-testers then revisit these fields later and calculate the disease severity index (DSI) in both sprayed and un-sprayed portions of the field to validate the initial decision.

### Results:

The first major year of testing began in 2022, where drought-stricken areas prevented a full-scale validation of the model. Assessments were made in 144 fields, with 17% suggesting a fungicide treatment, and 60% not to. DSI in 32 of those fields indicates the model is valid for both low- and high-risk situations (<30 and >40 points). One or more risk factors were missing in 23% of fields, preventing a recommendation at 30 and 35 risk points. The broad approach used to solicit beta-testers likely contributed to the high initial participation, but low follow-through resulted in incomplete data. A more focused approach was used in 2023, which fully utilized the CCC's Agronomy team to connect with agronomists and other participants across the Prairies. With a target goal of over 100 fields with DSI data, this tool will provide high level of utility to growers and agronomists and lessen sclerotinia's impact on canola production.

### Conclusions:

While pathogen risk models are not novel, there has been a gap in the Prairies to provide a validated model that can provide accurate recommendations across a variety of environments. This current model is the next step in forecasting risk across the Prairies, leading the way for more advanced models that include wind-dispersed ascospore detection, remote sensing-based risk maps, and other risk factors to be adopted by the industry. This risk assessment tool serves as a call to action for industry partners to develop and implement validated disease risk models to enable improved on-farm decisions.

### Reference:

Twengstrom E, Sigvald R, Svensson C, and Yuen J. (1998). Forecasting *Sclerotinia* stem rot in spring sown oilseed rape. *Crop Protection*, 17 (5), 405-411