Project Identification

1. **Project Title:** *Sclerotinia* Risk Assessment Tools for Spray Decision Support in Canola
2. **Project Number:** 20211024
3. **Producer Group Sponsoring the Project:** Indian Head Agricultural Research Foundation (IHARF)
4. **Project Location(s):**
   - R.M. of Indian Head No. 156
   - R.M. of of Trampling Lake No. 380
   - R.M. of Star City No. 428
5. **Project start and end dates (month & year):** March 2022 to February 2023
6. **Project contact person & contact details:**

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Objectives and Rationale

7. **Project objectives:**

The objectives of this project are:

1) To demonstrate various tools for assessing Sclerotinia stem rot risk in canola;
2) To assess their value in supporting producers with the decision to spray fungicide for Sclerotinia management.

The tools being demonstrated include the Spornado Sampler, DNA-based petal testing, an online Decision Support Tool (CanolaDST.ca), and the Sclerotinia Stem Rot Checklist from the Canola Council of Canada. These tools have the potential to help producers avoid unnecessary fungicide applications.

8. **Project Rationale:**

The risk of Sclerotinia stem rot infecting a canola crop ("host") depends on 1) conditions leading up to flowering being conducive to sclerotial germination and apothecia development ("pathogen"), and 2) conditions being favourable for disease development during and after the flowering period ("environment"). Fungicide use decisions for Sclerotinia management need to be made before visible symptoms are present in the canola crop. Without reliable, accurate, and timely methods and data to measure or predict the presence and abundance of the pathogen, or to predict environmental conditions during crop development, producers often opt for a routine fungicide application as a risk-management strategy.

Many factors have been shown to influence the risk of disease developing, in particular, the amount of moisture leading up to and during flowering, ascospore presence, forecasted weather, canopy density and yield potential, cultivar resistance, and field disease history (Canola Council 2020, McLaren et al. 2004, Turkington et al. 2011). Using these factors, several methods and tools have been developed for Sclerotinia forecasting and risk analysis:

- The Sclerotinia stem rot checklist is recommended by the Canola Council of Canada and is accessible on their website. Points are added for several risk factors and the total score indicates the probability of a positive economic return to a foliar fungicide application. This method includes a limited consideration of the potential for apothecia development and weather forecast.
- The Canola Decision Support Tool (CanolaDST.ca) is a free online-based application that

was developed by Weather Innovation Network (WIN) to model Sclerotinia stem rot risk in canola fields based on regional weather data and weather forecasts, and user-inputted agronomic data including specific field location, seeding date, cultivar, field history, and plant density.

While these two tools rely on the prediction of apothecia development, there are a few methods that directly measure the presence and abundance of ascospores:

- Petal testing initially required plating the petals on selective agar to observe if the petals were infected (Turkington et al. 1991). The method was fairly accurate in predicting disease incidence (Turkington & Morrall 1993) but the process was too time-consuming for producers to use practically as a spray decision tool. The development of DNA marker technology to identify and quantify the level of ascospores has made petal testing more practical for producers as the results can be obtained in one or two days (Freeman et al 2002, Ziesman et al 2016). These petal tests are offered commercially as kits from Discovery Seed Labs or from Quantum Genetix.
- Spore trapping samplers capture airborne spores and also effectively use DNA marker technology to assess the presence of ascospores (Freeman et al 2002). The Spornado Sampler uses this technology and is available from 20/20 Seed Labs.

When using tools that only measure the presence and abundance of ascospores, environmental conditions during and after flowering still need to be considered when making the decision to spray. A combination of two or more tools may be the most effective for supporting producers in making the decision to spray.

The technologies being demonstrated in this project have the potential to help producers feel more confident in their decision to spray and may help prevent non-economic fungicide applications. Preventing unnecessary fungicide applications would also have environmental benefits, would help prevent fungicide resistance, and would boost public trust.

Canola Council of Canada. 2020. Canola Encyclopedia. [Online] https://www.canolacouncil.org/canola-encyclopedia/diseases/sclerotinia-stem-rot/

Freeman, J., Ward, E., Calderon, C., and McCartney, S. 2002. A Polymerase Chain Reaction (PCR) Assay for the detection of inoculum of Sclerotinia sclerotiorum. European Journal of Plant Pathology. 108: 877-886.

McLaren, D.L., Conner, R.L., Kutcher, H.R., Platford, R.G., Lamb, J.L., and Lamey, H.A. 2004. Predicting diseases caused by Sclerotinia sclerotiorum on canola and bean – a western Canadian perspective. Can J Plant Path 26:489-497.

Turkington, T.K., Kutcher, H.R., McLaren, D., and Rashid, K.Y. 2011. Managing Sclerotinia in Oilseed and Pulse Crops. Prairie Soils and Crops Journal. 4:105-113.

Turkington, T.K., and Morrall, R.A.A. 1993. Use of petal infestation to forecast Sclerotinia stem rot of canola: the influence of inoculum variation over the flowering period and canopy density. Phytopathology. 83:682-689.

Turkington, T.K., Morrall, R.A.A., and Gugel, R.K. 1991. Use of petal infestation to forecast sclerotinia stem rot of canola: Evaluation of early bloom sampling, 1985-1990. Can J Plant Pathol 13:50-59.

Ziesman, B.R., Turkington, T.K., Basu, U., and Strelkov, S.E. 2016. A quantitative PCR system for measuring Sclerotinia sclerotiorum in Canola (Brassica napus). Plant Disease 100:984-990.

Methodology and Results

9. Methodology:

One of the objectives of this project was to demonstrate the risk assessment tools in the field, and so the methodology will be described in detail for this purpose.

The tools and procedures being demonstrated were designed to be utilized at the field scale. The demonstration was conducted in commercial fields, in cooperation with local producers at each location (R.M. of Indian Head no. 156, R.M. of Trampling Lake no. 380, R.M. of Star City no. 428).

Producers were asked to leave an unsprayed strip in their canola fields for the purpose of this demonstration. There were three fields at each of the three locations, a total of 9 fields across the province.

Each of the following tools were utilized to assess Sclerotinia stem rot risk in each field, at both optimal spray timing (20-30% flower) and late spray timing (50% flower):

I. Spornado sampler from 20/20 Seed Labs:

The sampler is installed in a location in the field where wind flow is unobstructed and free from road dust. The sampler turns with the direction of the wind, like a weather vane, and collects airborne particles on a filter in the cassette. The cassette is inserted in the sampler 2 to 4 days before the desired crop timing (Figure 1). The lab provides a link where the cassette is registered when inserting and removing it from the sampler. The cassettes are dropped off or couriered to 20/20 Seed Labs in Nisku, Alberta, and the results are available within 24 hours of the lab receiving them. The lab report indicates the level of sclerotinia as "not detected", "trace levels detected", or "detected", and it is suggested to use this information in combination with other weather-based risk assessment tools (Figure 2).

Figure 1. Spornado spore sampler installation and cassette insertion.

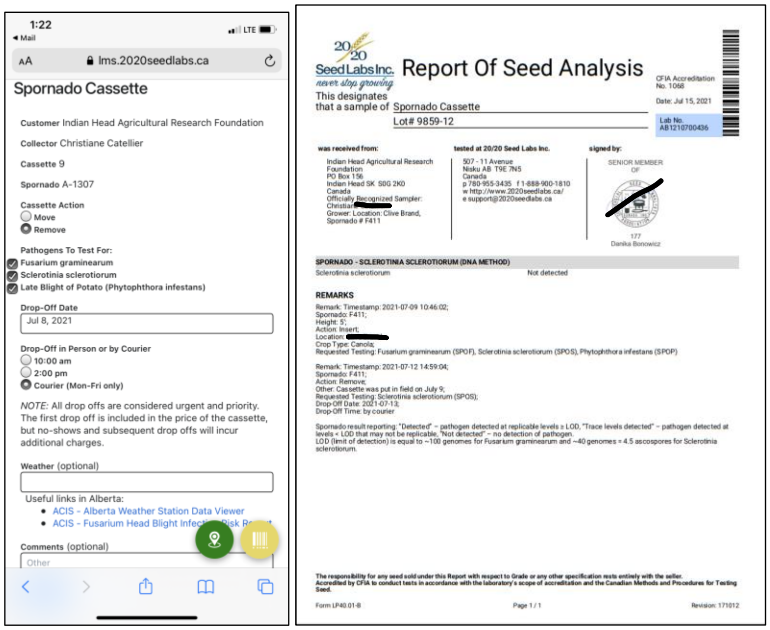
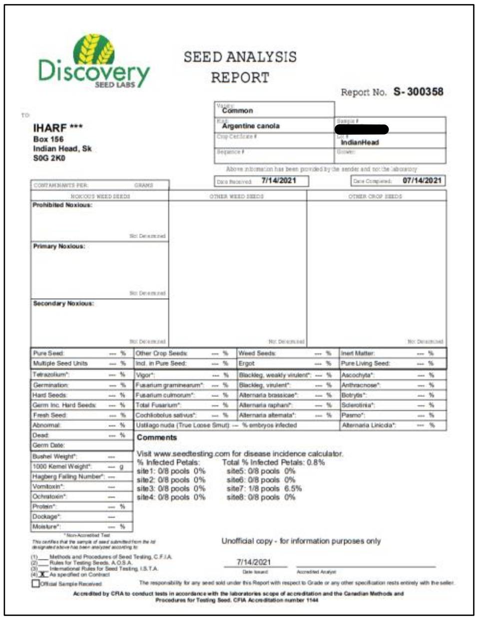


Figure 2. Screen shot of cassette registration and example of lab report provided by 20/20 Seed Labs for each cassette submission.

II. Petal test kit from Discovery Seed Labs:

The kit includes sample vials, forceps, and a submission form. Petals are collected from 8 different plants in 8 different locations in each field. Two petals are collected from each plant, from the lower and upper part of the stem (older and newer petals) (Figure 3). The samples are dropped off or couriered to Discovery Seed Labs in Saskatoon, and results are available within 24 hours of the lab receiving the samples. The user is directed to a Sclerotinia calculator via the Discovery Seed Labs website. The total percent infected petals from the report is entered along with crop density and a weather assessment to obtain an estimate for probable % diseased plants and probable percent yield loss (Figure 4).

Figure 3. Petal collection procedure using Discovery Seed Labs' petal test kit.



Discovery SEED LABS

SEED ANALYSIS REPORT

Report No. S-300358

TO:
IHARF ***
Box 156
Indian Head, Sk
S0G 2K0

Variety: Common	
Kind: Argentine canola	Sample #: [redacted]
Crop Certificate #	Lot #: IndianHead
Sequence #	Grower:

Above information has been provided by the sender and not the laboratory

Date Received: 7/14/2021 | Date Completed: 07/14/2021

CONTAMINANTS PER: GRAMS

NOXIOUS WEED SEEDS	OTHER WEED SEEDS	OTHER CROP SEEDS
Prohibited Noxious: Not Determined		
Primary Noxious: Not Determined		
Secondary Noxious: Not Determined	Not Determined	Not Determined

Pure Seed: --- %	Other Crop Seeds: --- %	Weed Seeds: --- %	Inert Matter: --- %
Multiple Seed Units --- %	Incl. in Pure Seed: --- %	Ergot --- %	Pure Living Seed: --- %
Tetrazolium*: --- %	Vigor*: --- %	Blackleg, weakly virulent*: --- %	Ascochyta*: --- %
Germination: --- %	Fusarium graminearum*: --- %	Blackleg, virulent*: --- %	Anthracnose*: --- %
Hard Seeds: --- %	Fusarium culmorum*: --- %	Alternaria brassicae*: --- %	Botrytis*: --- %
Germ Inc. Hard Seeds: --- %	Total Fusarium*: --- %	Alternaria raphani*: --- %	Sclerotinia*: --- %
Fresh Seed: --- %	Cochliobolus sativus*: --- %	Alternaria alternata*: --- %	Pasmo*: --- %
Abnormal: --- %	Ustilago nuda (True Loose Smut): --- % embryos infected		Alternaria Linicola*: --- %
Dead: --- %			
Germ Date:			
Bushel Weight*: ---			
1000 Kernel Weight*: --- g			
Hagberg Falling Number*: ---			
Vomitoxin*: ---			
Ochratoxin*: ---			
Protein*: --- %			
Dockage*: ---			
Moisture*: --- %			

Comments

Visit www.seedtesting.com for disease incidence calculator.
% Infected Petals: Total % Infected Petals: 0.8%
site1: 0/8 pools 0% site5: 0/8 pools 0%
site2: 0/8 pools 0% site6: 0/8 pools 0%
site3: 0/8 pools 0% site7: 1/8 pools 6.5%
site4: 0/8 pools 0% site8: 0/8 pools 0%

* Non-Accredited Test

This certifies that the sample of seed submitted from the lot designated above has been analyzed according to:
(1)___ Methods and Procedures of Seed Testing, C.F.I.A.
(2)___ Rules for Testing Seeds, A.O.S.A.
(3)___ International Rules for Seed Testing, I.S.T.A.
(4) X As specified on Contract
☐ Official Sample Received

Unofficial copy - for information purposes only

7/14/2021
Date Issued | Accredited Analyst

The responsibility for any seed sold under this Report with respect to Grade or any other specification rests entirely with the seller.

Accredited by CFIA to conduct tests in accordance with the laboratories scope of accreditation and the Canadian Methods and Procedures for Testing Seed. CFIA Accreditation number 1144

Click the Buttons Below to Calculate Sclerotinia Infestation

Canola Petal Infested with Sclerotinia	0-45	45-90	90-100
	1	0	0
Crop Density	Low	Med	High
	0	1	0
Weather Patterns Durring Flowering	Dry	Avg	Wet
	1	0	0

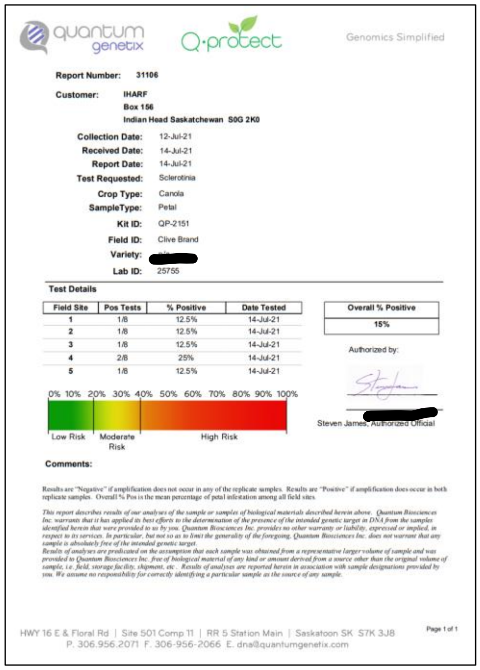
Final Rating	
Probable % Diseased Plants in the Crop	0% to 20%
Probable Percent Yield Loss	0% to 10%

Figure 4. Example of lab report provided by Discovery Seed Labs for each petal test, and online tool for interpreting results and assessing Sclerotinia risk.

III. Q-Protect petal test kit from Quantum Genetix:

The Q-Protect Kit includes sample vials, a sample ID form, instruction booklet, and a set of forceps for collecting petals. Petals are collected from 8 different plants in five different sites in each field. From each plant, three petals are collected from the lower, middle, and top of the plant (mixture of older and newer petals) (Figure 5). The samples are dropped off or couriered to the Quantum Genetix lab in Saskatoon and results are available within 24 hours of the lab receiving the samples. An example of the lab report is shown in Figure 6. An explanation on how to interpret reported results was provided in the instruction booklet. A percent positive sclerotinia presence is translated to a risk level shown on the grid. It is indicated that Q-Protect results of 40% correlate to a yield loss of 7.5% of more and would justify a fungicide application.

Figure 5. Petal collection procedure using Quantum Genetix's Q-Protect Kit.



quantum genetix Q·protect Genomics Simplified

Report Number: 31106

Customer: IHARF
Box 156
Indian Head Saskatchewan S0G 2K0

Collection Date: 12-Jul-21
Received Date: 14-Jul-21
Report Date: 14-Jul-21
Test Requested: Sclerotinia
Crop Type: Canola
SampleType: Petal
Kit ID: QP-2151
Field ID: Clive Brand
Variety: [redacted]
Lab ID: 25755

Test Details

Field Site	Pos Tests	% Positive	Date Tested
1	1/8	12.5%	14-Jul-21
2	1/8	12.5%	14-Jul-21
3	1/8	12.5%	14-Jul-21
4	2/8	25%	14-Jul-21
5	1/8	12.5%	14-Jul-21

Overall % Positive
15%

Authorized by:

[redacted]
Steven James, Authorized Official

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Low Risk | Moderate Risk | High Risk

Comments:

Results are "Negative" if amplification does not occur in any of the replicate samples. Results are "Positive" if amplification does occur in both replicate samples. Overall % Pos is the mean percentage of petal infestation among all field sites.

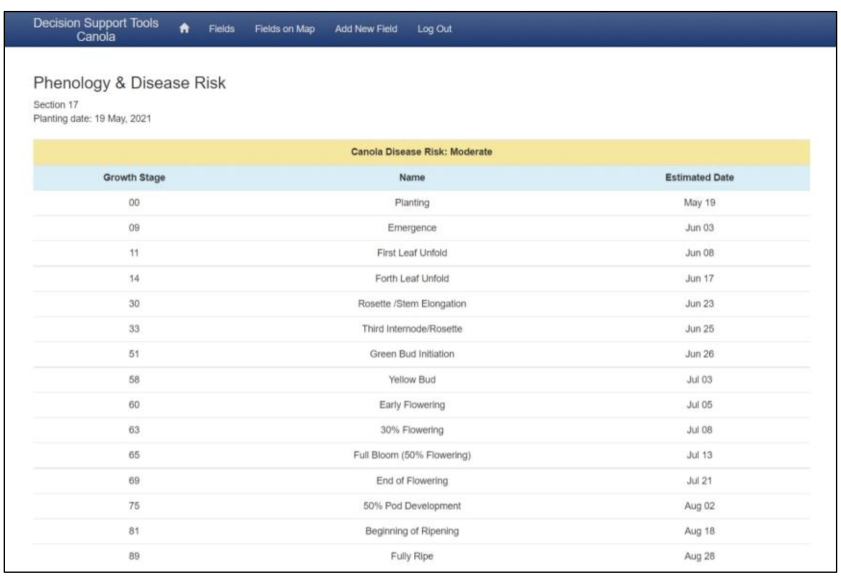
This report describes results of our analyses of the sample or samples of biological materials described herein above. Quantum Biosciences Inc. warrants that it has applied its best efforts to the determination of the presence of the intended genetic target in DNA from the samples identified herein that were provided to us by you. Quantum Biosciences Inc. provides no other warranty or liability, expressed or implied, in respect to its services. In particular, but not so as to limit the generality of the foregoing, Quantum Biosciences Inc. does not warrant that any sample is absolutely free of the intended genetic target.
Results of analyses are predicated on the assumption that each sample was obtained from a representative larger volume of sample and was provided to Quantum Biosciences Inc. free of biological material of any kind or amount derived from a source other than the original volume of sample, i.e. field, storage facility, shipment, etc. Results of analyses are reported herein in association with sample designations provided by you. We assume no responsibility for correctly identifying a particular sample as the source of any sample.

HWY 16 E & Floral Rd | Site 501 Comp 11 | RR 5 Station Main | Saskatoon SK S7K 3J8 Page 1 of 1
P. 306.956.2071 F. 306-956-2066 E. dna@quantumgenetix.com

Figure 6. Example of lab report provided by Quantum Genetix for each petal test.

IV. Canola Decision Support tool (CanolaDST.ca):

The free online-based application uses regional weather data and weather forecast from the Weather Innovation Network (WIN) weather stations to model Sclerotinia stem rot risk in canola fields. Users input agronomic data including the specific field location (to relate to the nearest weather station), the cultivar (to assess disease resistance and to predict crop development stage throughout the growing season), seeding date, plant density, disease incidence in the last host crop, and the number of years with host crops. Sclerotinia risk is assessed as low, moderate, or high risk (Figure 7). It is not clear how to interpret the differences between the risk categories.



Decision Support Tools Canola | Fields | Fields on Map | Add New Field | Log Out

Phenology & Disease Risk
Section 17
Planting date: 19 May, 2021

Canola Disease Risk: Moderate

Growth Stage	Name	Estimated Date
00	Planting	May 19
09	Emergence	Jun 03
11	First Leaf Unfold	Jun 08
14	Forth Leaf Unfold	Jun 17
30	Rosette /Stem Elongation	Jun 23
33	Third Internode/Rosette	Jun 25
51	Green Bud Initiation	Jun 26
58	Yellow Bud	Jul 03
60	Early Flowering	Jul 05
63	30% Flowering	Jul 08
65	Full Bloom (50% Flowering)	Jul 13
69	End of Flowering	Jul 21
75	50% Pod Development	Aug 02
81	Beginning of Ripening	Aug 18
89	Fully Ripe	Aug 28

Figure 7. Web browser view of Canola Decision Support tool risk assessment model result for a single field.

V. Sclerotinia stem rot checklist:

Points are added for risk factors including the number of years since the last canola crop, disease incidence in last host crop, crop density, rain in the last 2 weeks, weather forecast, and regional risk for apothecia development (Figure 8). The score indicates the probability of a positive economic return to a foliar fungicide application. A score of 30 to 35 would be the point at which producers would want to consider an application.

Sclerotinia Stem Rot Checklist

(For each risk factor, circle the risk points that apply to your field).

RISK FACTOR	POSSIBLE ANSWERS	RISK POINTS
NUMBER OF YEARS SINCE LAST CANOLA CROP	More than six years	0
	Three to six years	5
	One to two years	10
DISEASE INCIDENCE IN LAST HOST CROP	None	0
	Low (1 to 10%)	5
	Moderate (11 to 30%)	10
	High (31 to 100%)	15
CROP DENSITY	Low	0
	Normal	5
	High	10
RAIN IN THE LAST TWO WEEKS	Less than 10 mm (0.4")	0
	10 to 30 mm (0.4 to 1.2")	5
	More than 30 mm (1.2")	10
WEATHER FORECAST	High pressure	0
	Variable	10
	Low pressure	15
REGIONAL RISK FOR APOTHECIA DEVELOPMENT	None found	0
	Low numbers	10
	High numbers	15

TOTAL RISK POINTS FOR ALL RISK FACTORS =

Figure 8. Sclerotinia Stem Rot Checklist.

10. Results

Results of each of the tools are provided for each of the 9 fields at 20-30% flower (Table 1) and 50% flower (Table 2).

At both timings, all of the tools generally predicted a low disease risk overall. A stem rot check list value over 35 indicates a more significant risk, and there were a few fields at this level. There was only one field assessed as moderate disease risk with the decision support tool. Petal test results from Quantum Genetix were all within the low risk category. Percent infection values from Discovery seed labs petal test were all in the lowest bracket in their calculator. Only one sample came back with trace levels for the Spornado samples. Results were very similar between the two timings.

Table 1. Sclerotinia risk assessment values for each field at optimum spray timing (20-30% flower) for each of the tools evaluated in the project in 2022.

Field	SSR checklist	canolaDST	Quantum (% Positive)	Discovery (% Infected Petals)	Spornado
Indian Head 1	40	High	15	12.5	Detected
Indian Head 2	50	High	2.5	9.9	Not Detected
Indian Head 3	55	High	5	11.6	Trace levels
Melfort 1	50	High	32.5	4.8	Not Detected
Melfort 2	30	Low	10	2.4	Detected
Melfort 3	30	Moderate	2.5	1.6	Trace levels
Scott 1	35	High	22.5	29.3	Trace levels
Scott 2	30	High	82.5	72	Detected
Scott 3	30	High	80	56.7	Trace levels

Table 2. Sclerotinia risk assessment values for each field at late spray timing (50% flower) for each of the tools evaluated in the project in 2022.

Field	SSR checklist	canolaDST	Quantum (% Positive)	Discovery (% Infected Petals)	Spornado
Indian Head 1	45	High	7.5	18	Trace levels
Indian Head 2	45	High	10	25	Trace levels
Indian Head 3	50	High	22.5	48.5	Trace levels
Melfort 1	35	High	5	11.6	Not Detected
Melfort 2	25	Low	2.5	2.4	Not Detected
Melfort 3	25	Moderate	10	16.2	Trace levels
Scott 1	35	High	10.3	7.3	Trace levels
Scott 2	30	High	57.5	44	Trace levels
Scott 3	30	High	65	38.8	Trace levels

Sclerotinia stem rot disease incidence was assessed in unsprayed areas in each field at 40-60% seed colour change. In each field, twenty plants from five different sites were collected, and the severity of *sclerotinia* stem rot symptoms was assessed for each plant on a scale of 0-5 based on the rating scale shown in Table 3.

Table 3. Sclerotinia Stem Rot Rating Scaling for visual symptoms in the field.

0 = None
1 = Superficial lesions or small branch infected
2 = Large branch dead – 25% of potential yield affected
3 = Main stem at least 50% girdled – 50% of potential yield affected
4 = main stem girdled but plant produced good seed – 75% of potential yield affected
5 = main stem girdled, much reduced yield – up to 100% of potential yield affected

The disease index was calculated by multiplying the incidence (proportion of total plants with symptoms) and severity (average rating of affected plants, converted to a value out of 100) of sclerotinia stem rot and indicated the % of crop affected by the disease (Table 4).

Table 4. Sclerotinia index based on incidence and severity of sclerotinia stem rot symptoms in each field.

Field	Sclerotinia Index (% crop affected)
Indian Head 1	5.6
Indian Head 2	10.2
Indian Head 3	18
Melfort 1	20.8
Melfort 2	8.6
Melfort 3	3.8
Scott 1	3.4
Scott 2	14.8
Scott 3	22.2

Each of the tools predicted sclerotinia stem rot incidence with varying levels of success (Figure 1). The SSR checklist indicates that a fungicide application is warranted with a score higher than 40, however some fields had scores below 40 and high disease levels. The petal tests seemed to have the most accurate prediction of disease risk, though there were a few incidences where higher levels of disease was found in fields with a low level of spore detection. It is possible that this would be related to the timing of the petal test. More research is being done to determine the best time to conduct sampling to more accurately predict the level of disease.

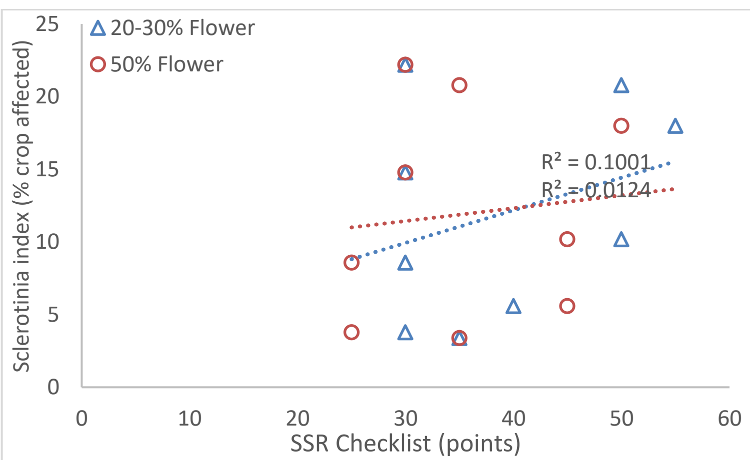


Figure 1. The relationship between assessed Sclerotinia stem rot checklist score and disease index for all fields.

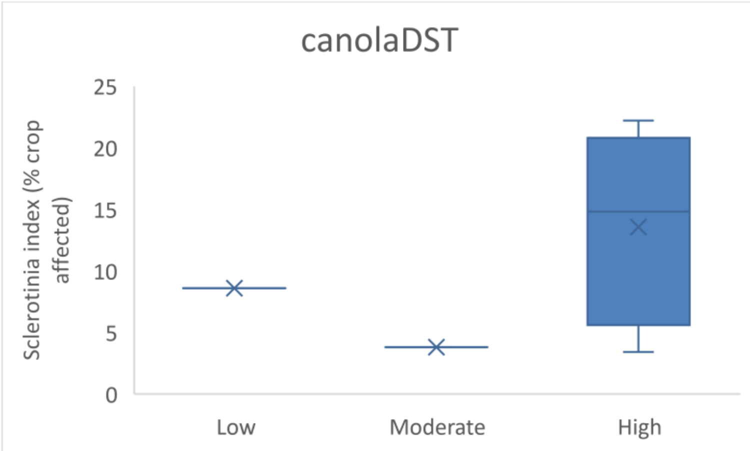


Figure 2. The relationship between canolaDST assessed risk level and disease index for all fields.

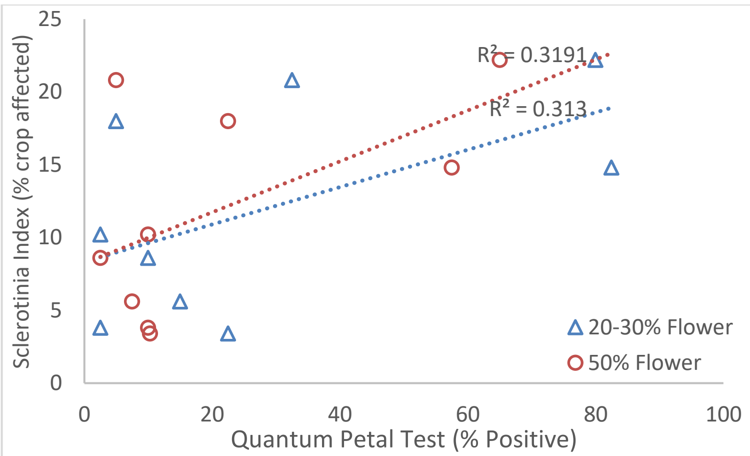


Figure 3. The relationship between Quantum Genetix petal test results and disease index for all fields.

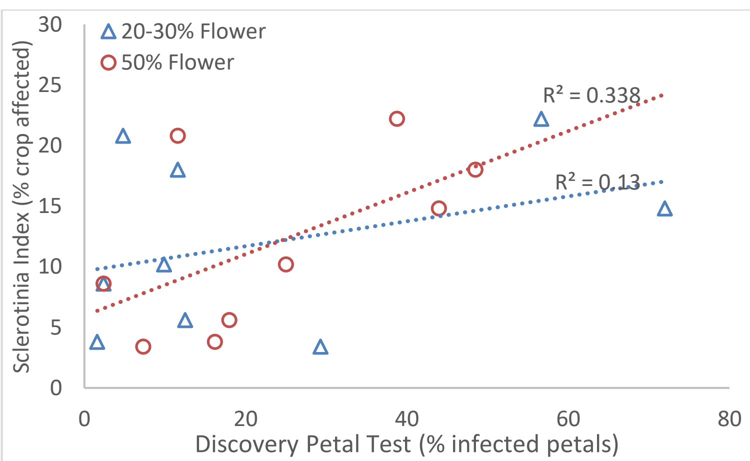


Figure 4. The relationship between Discovery Seed Labs' petal test results and disease index for all fields.

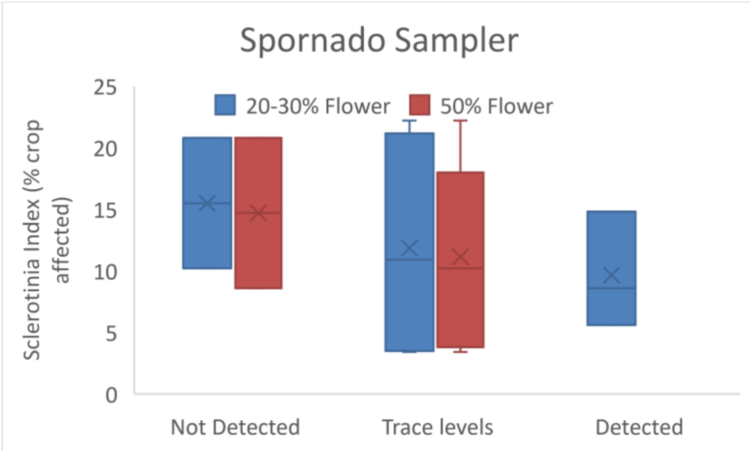


Figure 5. The relationship between Spornado sampler spore detection results and disease index for all fields.

The second objective of the project was to assess the value of the tools in supporting producers with the decision to spray fungicide for sclerotinia management. The current project was also conducted as an ADOPT demonstration in 2021. There was little or no sclerotinia development in any of the fields monitored in 2021, and all risk assessment methods correctly identified the risk of sclerotinia development as low in all fields. This is in contrast to the conditions experienced in 2022 and so a good opportunity to compare the benefits and effectiveness of the risk assessment methods under each situation.

Based on the results of the past two years, we have seen that a higher level of spore detection using either the petal tests or spore sampler is a good indicator that disease development in the crop is likely. However, a low level of spore detection has not been shown to be a good predictor of the probability of disease on its own, as higher levels of disease was found in fields with low levels of spores detected in all three tests. The SSR Checklist indicated a high level of risk in many of the fields in both years, above 30-35 points which is the level at which it is recommended producers consider a fungicide application. A new, improved Sclerotinia Risk Calculator online tool is in development and was tested as part of this project.

The proposed methodology included a basic economic analysis. The cost of each spore detection method is shown in Table 5. It is generally recommended to use one test per field for each of the tools, but the quantity of tests required is another question that is being addressed by other research studies.

Table 5. Cost of sclerotinia spore detection tools. The cost per acre is based on one test per 160 acres, however the recommendations for the number of tests required is still being investigated. These prices do not include courier costs to get the samples to the labs.

	First year cost		**Second year cost**	
Q-Protect Kit (Quantum Genetix)	$320 (Kit + test)	$2.00 /ac	Same as 1st year	
Petal Test Kit (Discovery Seed Labs)	$199 (kit + test)	$1.24 /ac	Same as 1st year	
Spornado Sampler (20/20 Seed Labs)	$490 (Spornado, Cassette, Test)	$8.17 /ac	$120 (Cassette + Test)	$0.75 /ac

Sclerotinia assessments were not done in sprayed crop to be able to assess the concurrent yield loss with fungicide application. However, under the 2022 crop and input price scenario (56 bu/ac canola at $18.50/bu and $23/ac fungicide), a fungicide application was warranted with only a 3 bu/ac yield loss, regardless of the cost of utilizing a spore detection method. This is because all the tools tested were a minimal cost in comparison to the cost of fungicide application and/or of the cost of potential yield loss from sclerotinia.

In regards to the usefulness of the tests in helping producers with the decision to spray, the main observation from this project was the importance of timing. For planning and logistics reasons, especially with larger operations, the decision to spray must be made at least a few days or more before the date of fungicide application. Thus, if the crop is to be sprayed at the optimum timing of 20-30% flower, samples should be submitted, and results obtained prior to the crop reaching this stage. Courier time is significant; depending on location, there may be an additional day required for samples to be received at the labs, and also couriers do not generally operate over the weekend. The appropriate amount of time ahead of a fungicide application required for effective spore detection is also being investigated in separate research.

Disease prediction models are now more widely available from digital agriculture providers. Different providers use different data for their models, which can include a combination of regional weather data, remotely sensed and satellite data, and data from local in-field sensors like soil moisture and leaf wetness. The increase in the availability of data from farm-based weather stations could possibly increase the accuracy of these models over time.

Extension activities

The demonstration was highlighted at the IHARF Field Day in July 2021.

11. Conclusions and Recommendations

The main conclusion of this project is that with the current use guidelines under field production conditions, the spore detection methods appear to be accurate under high levels of spore detection but less accurate under low levels of spore detection. The risk assessment tools are more helpful in assessing risk when combined with other tools and methods.

Supporting Information

12. Acknowledgements

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13. Appendices

None.

Abstract

14. Abstract/Summary

Fungicide use decisions for Sclerotinia management rely on accurate and timely methods and data to predict the probability of disease development and yield loss. Tools that have been developed for

Sclerotinia forecasting and risk analysis include the Spornado spore sampler, DNA-based petal testing, an online Decision Support Tool (CanolaDST.ca), and the Sclerotinia Stem Rot Checklist. The objective of this study was to demonstrate these tools under field production conditions and to assess their value in supporting producers with the decision to spray fungicide for Sclerotinia management. The tools were demonstrated in three fields at four locations (Indian Head, Melfort, and Scott). In 2022, conditions were conducive to sclerotinia development in all three locations, in contrast to 2021 when conditions were very dry and there was little to no disease observed. Each of the tools predicted sclerotinia stem rot incidence with varying levels of success. Timing was identified as an important aspect affecting the usefulness of the spore detection tools for spray decision support. The main conclusion of this project is that with the current use guidelines under field production conditions, the spore detection methods appear to be accurate under high levels of spore detection but less accurate under low levels of spore detection, when used alone. The risk assessment tools can be helpful in assessing risk when combined with other tools and methods.

Finances

15. Expenditure Statement

Provided in attached spreadsheet.