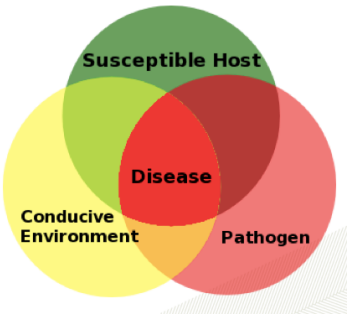
# Crop Intelligence Insight:
# Disease Risk

**Fungicide Decisions:**

- Fungicide Decisions are some of the most difficult you make on the farm each year.
- Your **Field Connect** weather station and the **Crop Intelligence** app can provide supporting information to help make fungicide decisions.
- Environmental Conditions play an important role in disease risk.
- Yield Potential can bring clarity to the economics of the decision.




**Disease Risk:**

***Susceptible Host:***

- Varietal resistance ratings
- Crop stage

***Pathogen:***

- Field history and rotation
- Regional risk
- Pathogen biology

***Conducive Environment:***

- Current environmental conditions.
- Future environmental conditions (weather forecast).

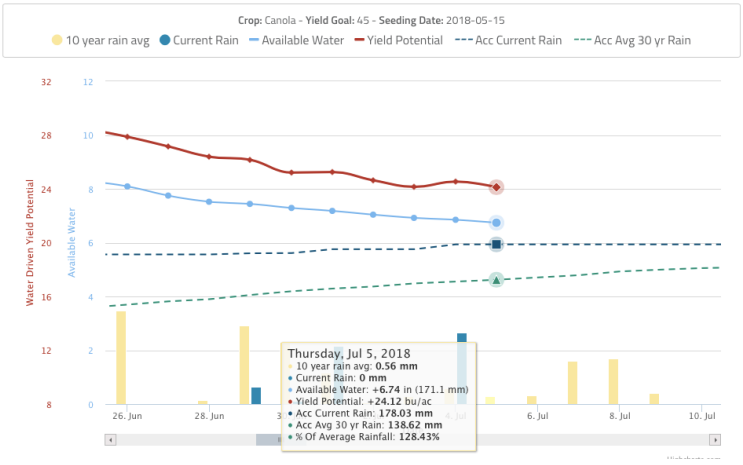
## Environmental Conditions:
## Field Connect Data

- ***Rain:*** rain events in the two weeks prior to potential spray timing should be considered. Even small rain events <5 mm can contribute to disease risk.
- ***Soil Moisture:*** moist soil at the surface increases disease risk.
- ***Air Temperature:*** moderate temperatures 15-25?C are ideal for most pathogens.
- ***Soil Temperature:*** soil temperature around 20?C.
- ***Relative Humidity:*** greater that 50%.
- ***Leaf Wetness:*** values above 5K indicate moisture in the crop canopy. When leaf wetness is sustained for >12 hours – disease risk increases.

# Yield Potential:

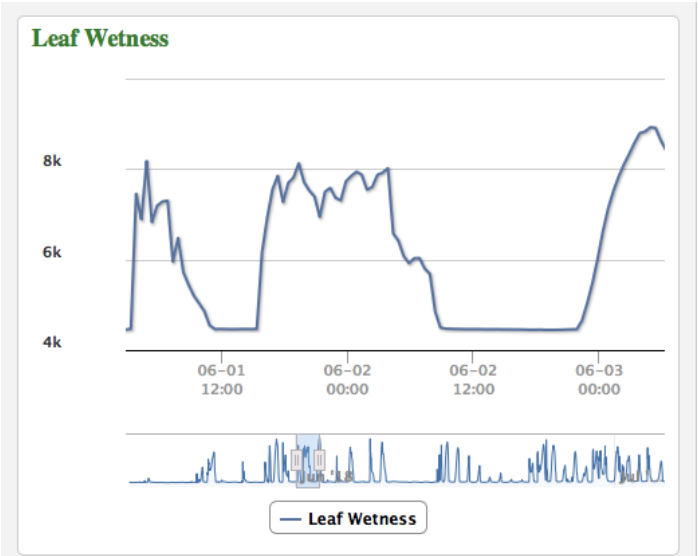
### Crop Intelligence Data

***Water Driven Yield Potential*** can provide an indication of how much yield potential there is to preserve.




## Leaf Wetness Sensor:

- Quantifies the amount of water on its surface, which can be a good approximation of the amount of water on the leaves in the canopy.
- A leaf is considered dry around 4200 and at 5000 there is moisture within the canopy.
- Greater than 5000 over 12hrs indicates increased disease risk




Canola Risk Assessment:

- The Canola Council has many useful resources to assist in fungicide decision making.
- Results suggest 40 or higher will likely see benefits but dependent on product and commodity pricing.
- www.canolacouncil.org/media/516526/canola_disease_scouting.pdf

## 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 =

**Assessing your score.** This checklist developed in Sweden can be useful in helping to assess disease risk in fields. Growers should fill out the checklist for each field shortly after first flower (when 75% of the canola plants have at least 3 open flowers). The greater the risk score for a field the higher the probability of a positive economic return. Results in Sweden have suggested that fields scoring 40 or higher will likely benefit from a fungicide, but this may vary a bit depending on fungicide cost and commodity price. Using this checklist effectively requires scouting for apothecia, usually in nearby cereal crops following canola or other host crops (e.g. beans, sunflowers) in the rotation. The same moist soil conditions conducive to apothecia production can also favor the development of many other types of mushrooms or fruiting bodies.

# FHB Risk Assessment:

- Precipitation or high humidity for at least 12 hours.
- Temperatures favouring infection range from 16 to 30°C.
- Spores are spread by rain-splash and wind.
- FHB infection is most likely to occur during July when the florets are open during flowering, allowing spores to come into contact with the floret.
- https://www.saskatchewan.ca/business/agriculture-natural-resources-and-industry/agribusiness-farmers-and-ranchers/crops-and-irrigation/disease/fusarium-head-blight
- SaskWheat has a weather-based fusarium head blight (FHB) risk maps that can be useful to determine risk.
- http://www.saskwheat.ca/producer-info/fusarium-risk-assessment-map/

# Pulse Risk Assessment:

### In pulses it is important to consider:

- Crop canopy/plant stand.
- Leaf wetness & humidity.
- Weather forecast.
- Field history.
- Plant symptomology.
- SaskPulse Growers produces a variety of fact sheets to help manage disease risk in pulse crop.
- http://saskpulse.com/files/newsletters/180501_Fungicide_Decision_Support_Sheet_for_Peas-compressed.pdf
- http://saskpulse.com/files/newsletters/1800601Fungicide_Decision_Support_Sheet_for_Chickpeas-compressed.pdf
- http://saskpulse.com/files/newsletters/180605_Fungicide_Decision_Support_Sheet_for_Lentils-compressed.pdf

| A. Crop Canopy | Risk Factor |
|---|---|
| Thin (high weed pressure, low yield expectations) | 0 |
| Moderate (some weeds, possibly low yield) | 10 |
| Normal (about 8 pea plants/$ft^2$ or 85/$m^2$) | 15 |
| Dense (more plants than normal, lush growth) | 30 |
| **B. Leaf wetness/humidity/dew at noon** | **Risk Factor** |
| None | 0 |
| Low | 10 |
| Moderate | 20 |
| High | 40 |
| **C. The five day weather forecast** | **Risk Factor** |
| Dry | 0 |
| Unpredictable | 10 |
| Light showers | 15 |
| Rain | 20 |
| **D. Symptoms on pea plants** | **Risk Factor** |
| No visible symptoms | 0 |
| Up to 20 per cent of plants showing symptoms | 10 |
| 20 to 50 per cent of plants showing symptoms | 15 |
| 50 to 100 per cent of plants showing symptoms | 20 |
| **TOTAL SCORE OF RISK FACTORS: (if 65 or more a fungicide application is recommended)** | |

**Source:** K. J. Lopetinsky[1] and S Strydhorst[2] 2002
[1]Ag Research Division, AARD, Barrhead [2]University of Alberta, Edmonton, Alberta, Canada

## Boots on the Ground:

Nothing replaces boots-on-the-ground when assessing disease risk.

- Crop Intelligence and Field Connect can provide supporting information – but the context of what is going on in the field is required to make an informed decision.
- Plant stand and canopy closure.
- Visual appearance – yield potential.
- Visual appearance – disease symptoms.
- Moisture on the soil surface and in the crop canopy.