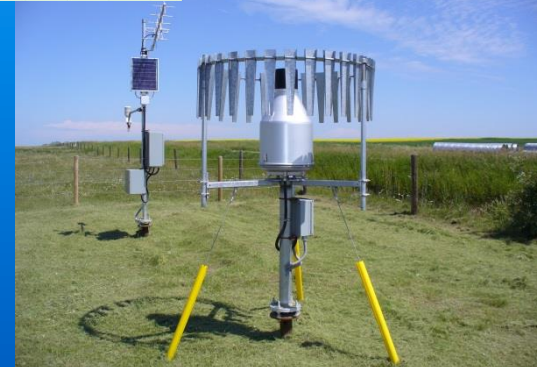
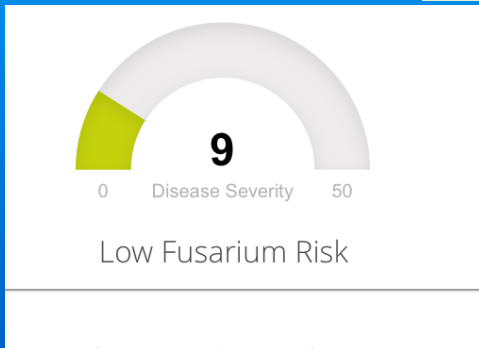
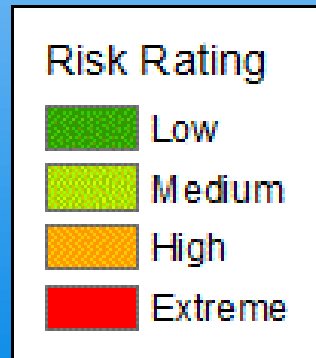
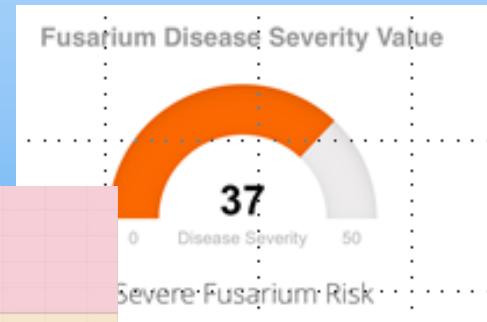
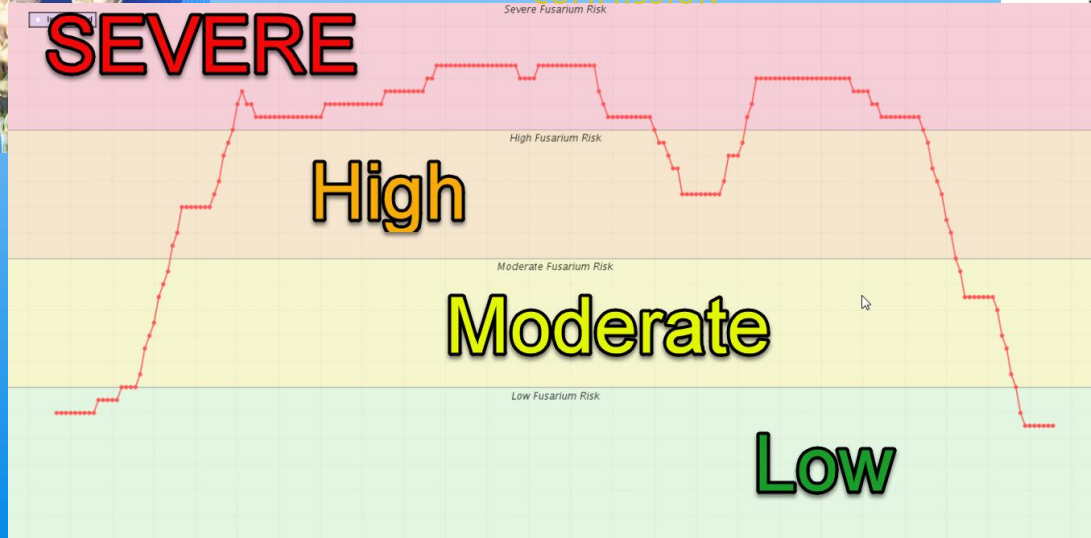


Alberta's Fusarium Infection Risk Assessment Tools



Fusarium Head Blight (FHB)

- ❖ FHB is a Fungal disease of cereal crops that affects kernel development
- ❖ 1999 declared a pest under the Agricultural Pest Act
- ❖ 2002 Alberta released Fusarium Risk Management Plan
 - ❖ Economic losses in Alberta
 - Irrigated land \$50/acre CWRS and \$50-\$132 for Durum Wheat
 - Dryland is less but still estimated to be up to \$50/acre

Alberta's Fusarium graminearum (Fg) Management Plan

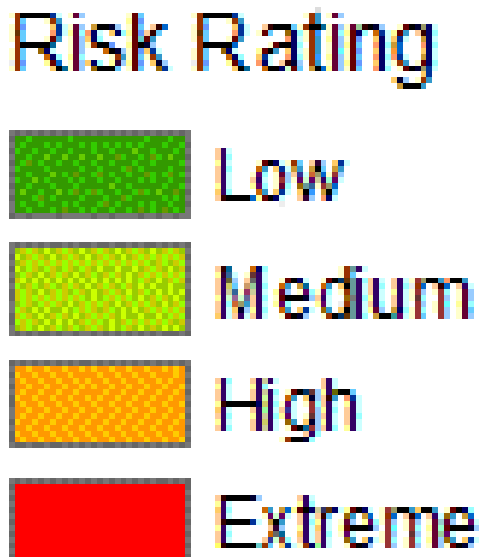
- ❖ Use FG free seed and treat cereal and corn intended for seed with a registered fungicide
- ❖ Leave two years between host crops (all small grain cereals and corn)
- ❖ Can spread from adjacent fields
- ❖ Stagger planting dates
- ❖ If the disease is present and there is an elevated infection risk consider the use of a **WELL TIMED** fungicide application.

Risk of infection is related to weather conditions during **flowering**

- ❖ Research has shown INFECTION risk is related to moisture and temperature over the past 7-days
- ❖ Precipitation
- ❖ High humidity (> 80 %)
- ❖ Warm temperatures (15 to 30 C)
- ❖ Currently both Manitoba and Saskatchewan produce daily risk maps during the **flowering period**

Manitoba's Fusarium Risk Map

Four Risk levels



Get Started

- Home Page
- About
- Animals
- Business and Economics
- Crops
- Environment
- Financial Assistance
- Food and Ag Processing
- Food Safety
- Growing Forward 2
- Industry Leadership
- Innovation and Research
- Land
- Livestock
- Local Food
- Markets and Statistics
- Permits and Licences
- Rural Communities
- Surveys and Consultations
- Weather
- Online Resources
- Contact
- Reports and Expenses

Stay Connected to Manitoba Agriculture

Follow @MBGovAg on Twitter

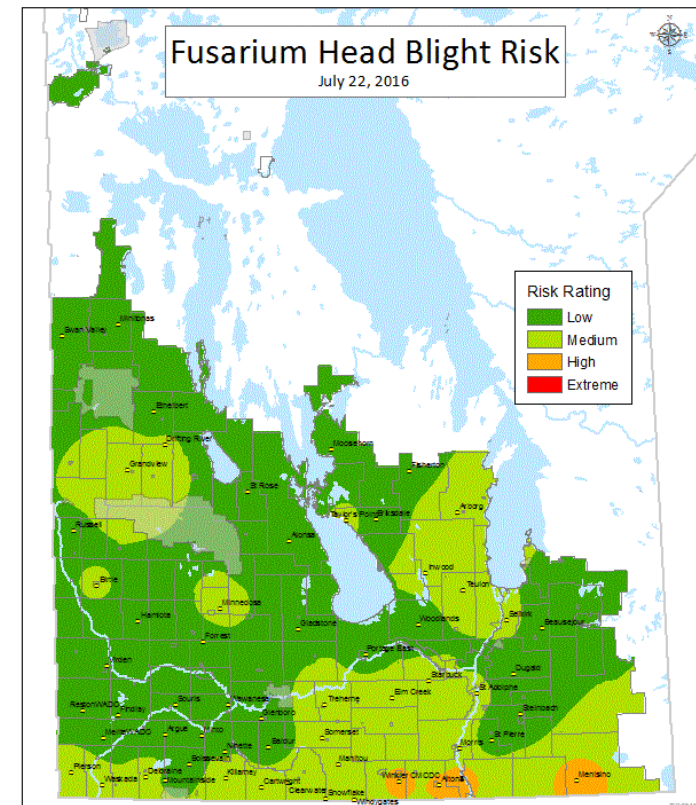
View our videos on YouTube

Stay Connected to the Manitoba Government

Fusarium Head Blight Risk Forecast

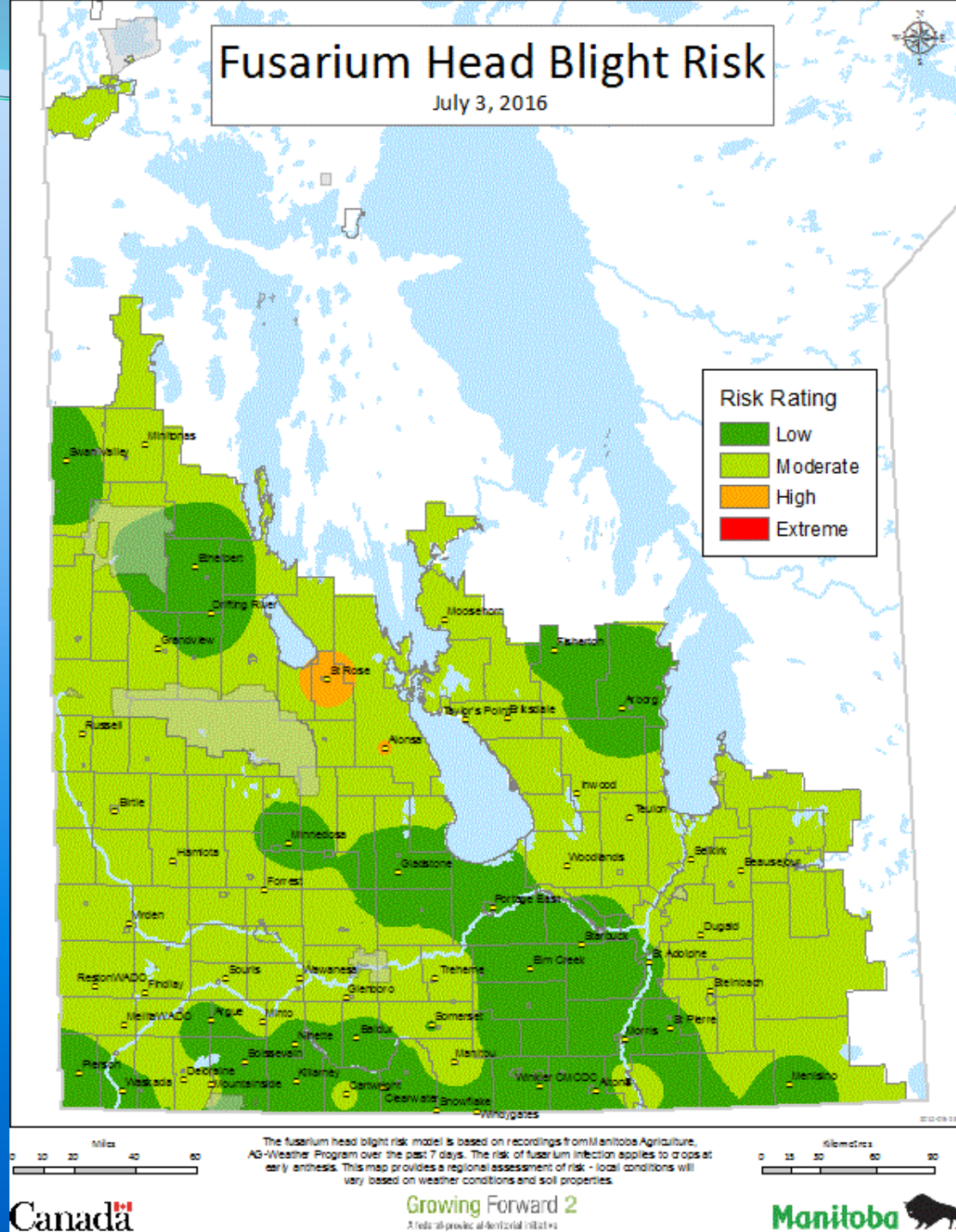
The Fusarium Head Blight Risk Forecast maps are posted daily, from the beginning of winter wheat flowering until the end of the flowering period for spring wheat. Maps will be updated daily.

The first map below shows the current risk for the development of fusarium head blight based on the previous seven days of temperature and moisture data. The second map is an animation of the risk maps over the last seven days showing how the risk has progressed. Warm, humid conditions favour the development of this disease especially around the flowering stage of the crop.



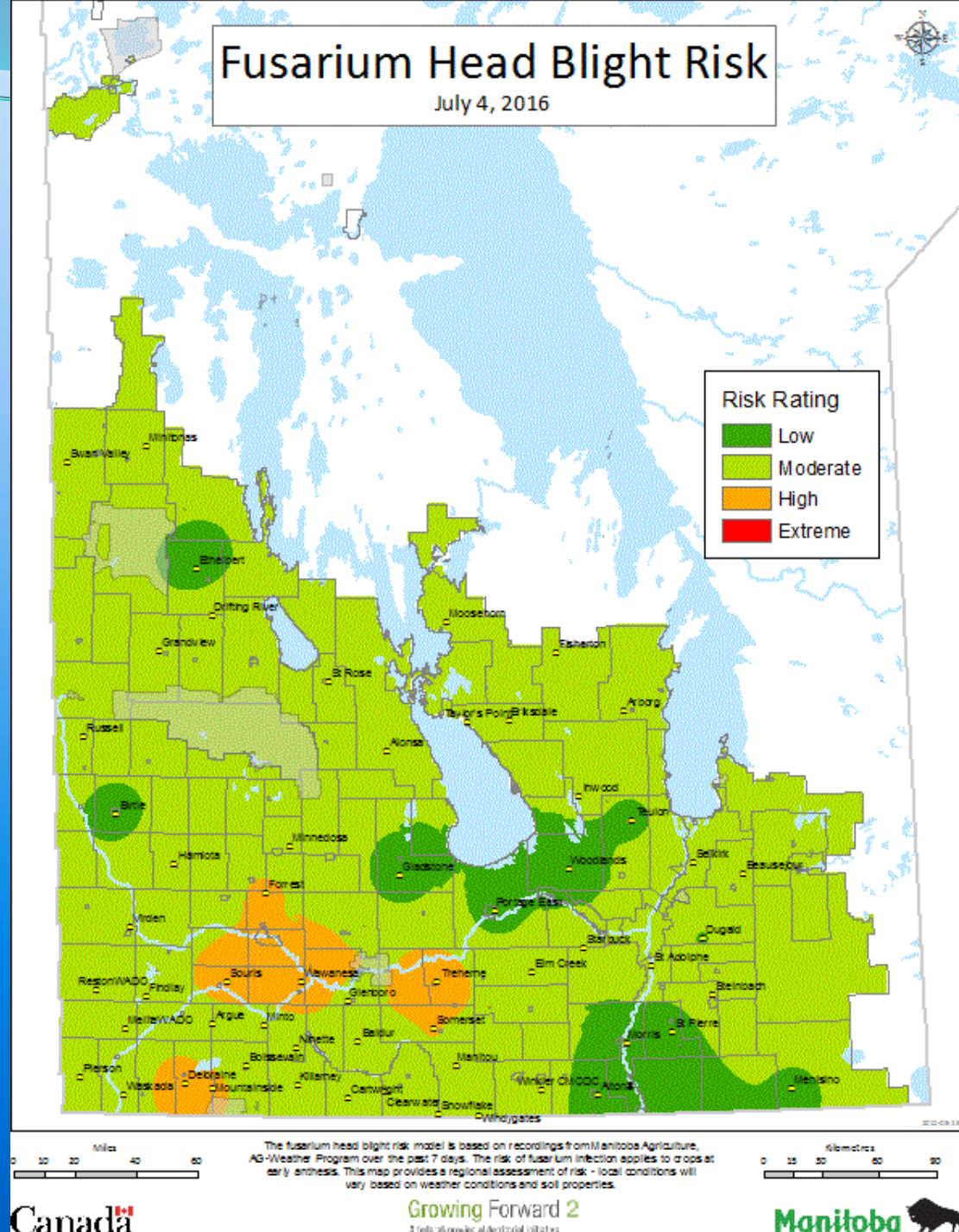
Manitoba's Fusarium Risk Map

July 3, 2016



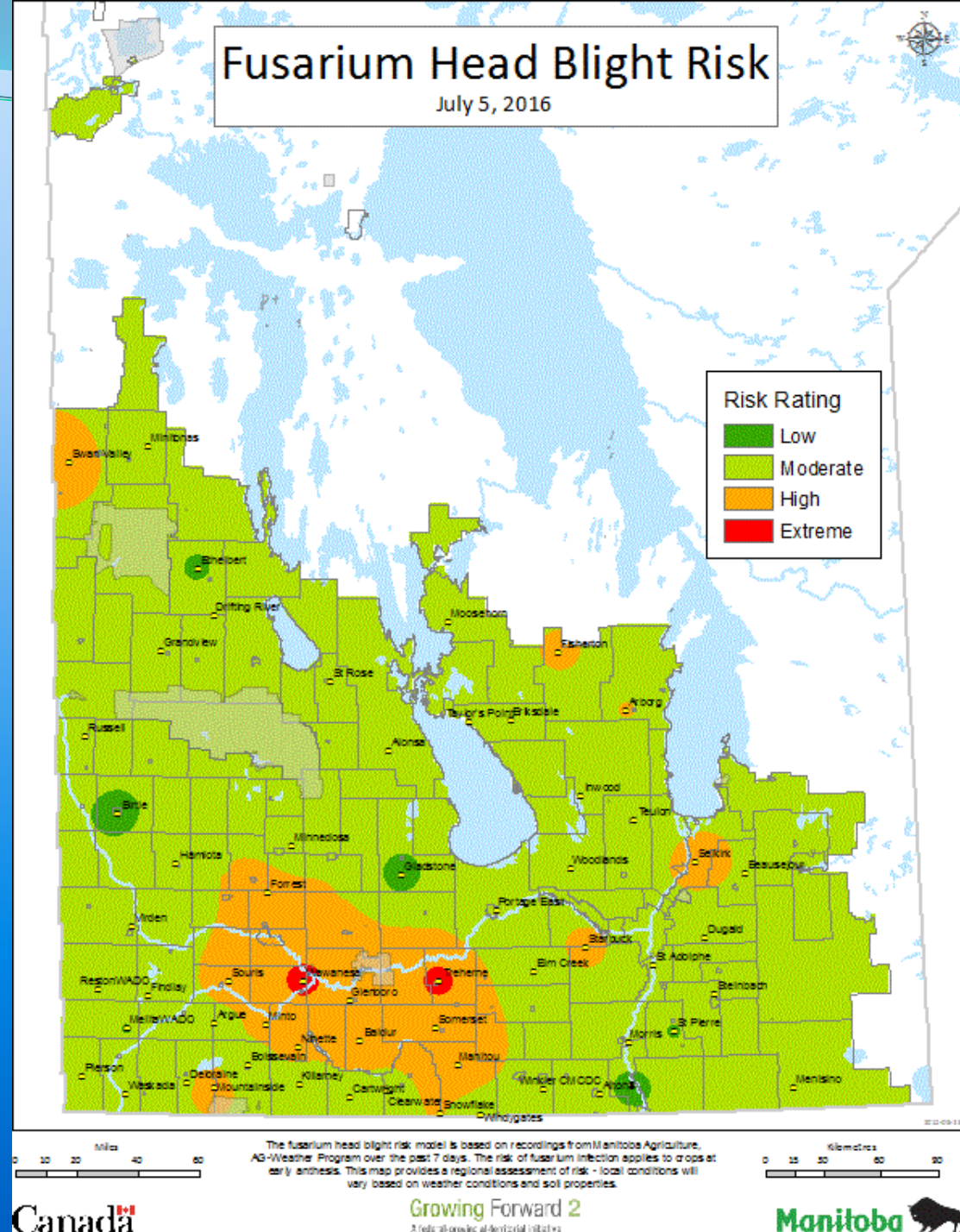
Manitoba's Fusarium Risk Map

July 4, 2016



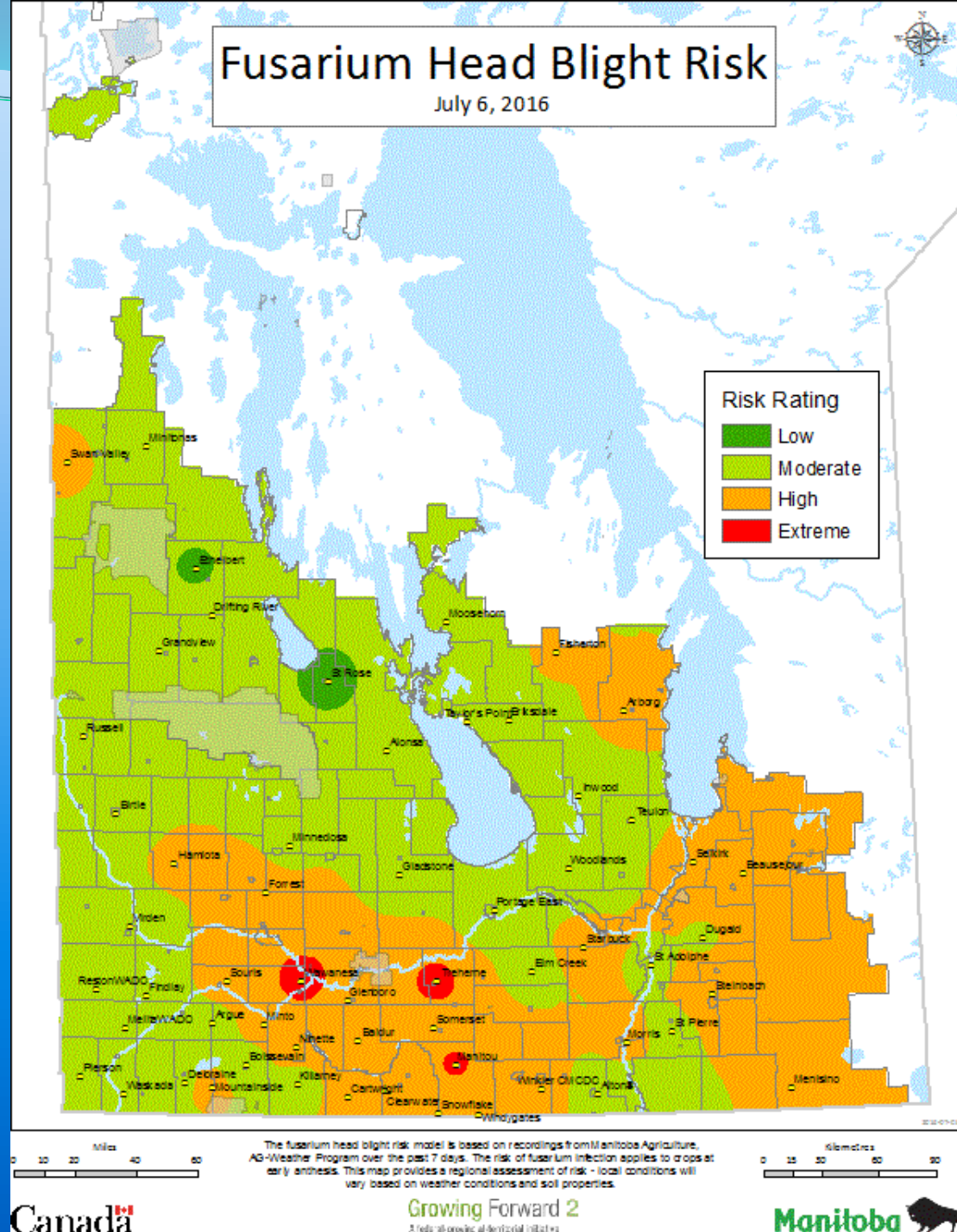
Manitoba's Fusarium Risk Map

July 5, 2016



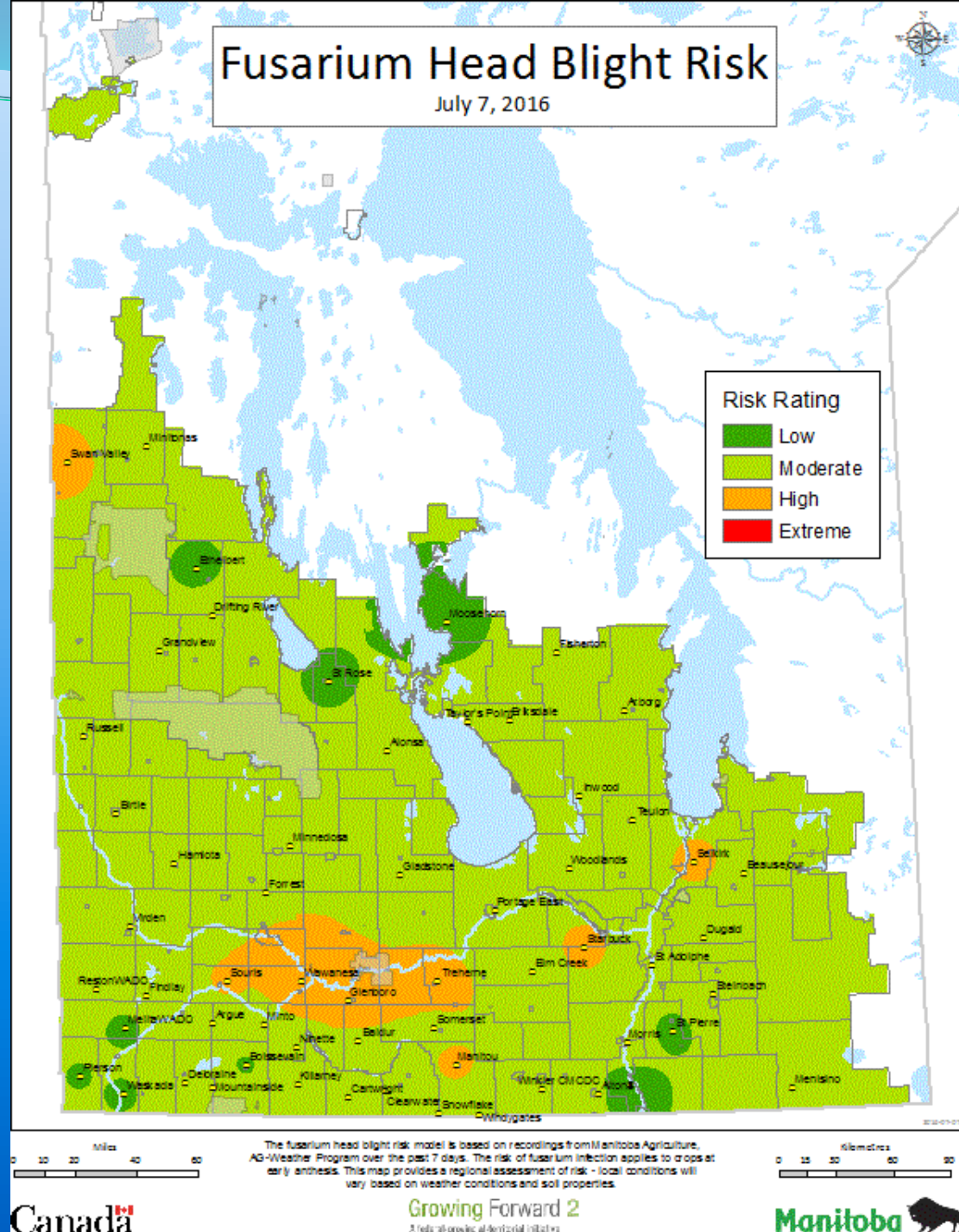
Manitoba's Fusarium Risk Map

July 6, 2016



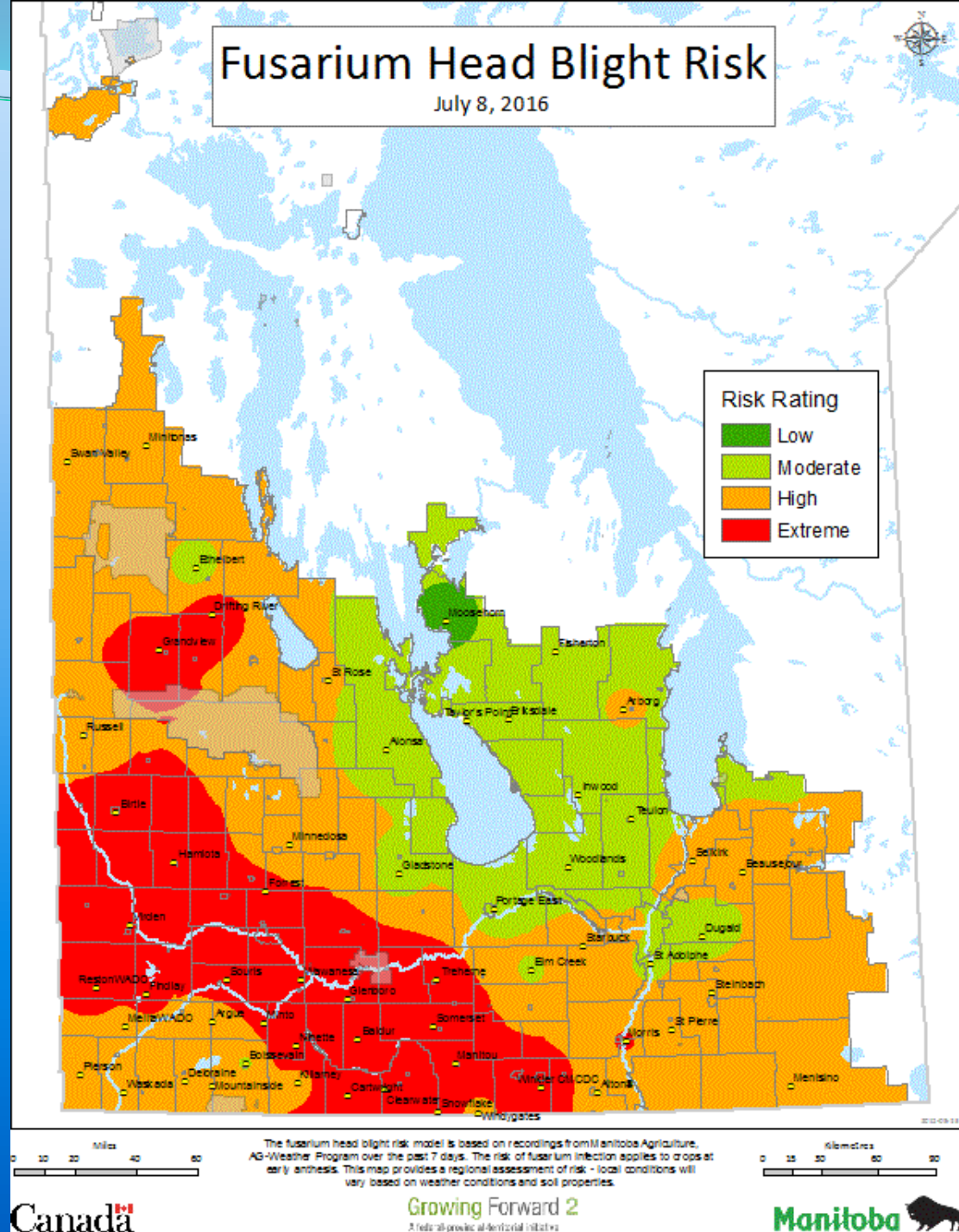
Manitoba's Fusarium Risk Map

July 7, 2016



Manitoba's Fusarium Risk Map

July 8, 2016



Alberta's Climate Information Service (ACIS)



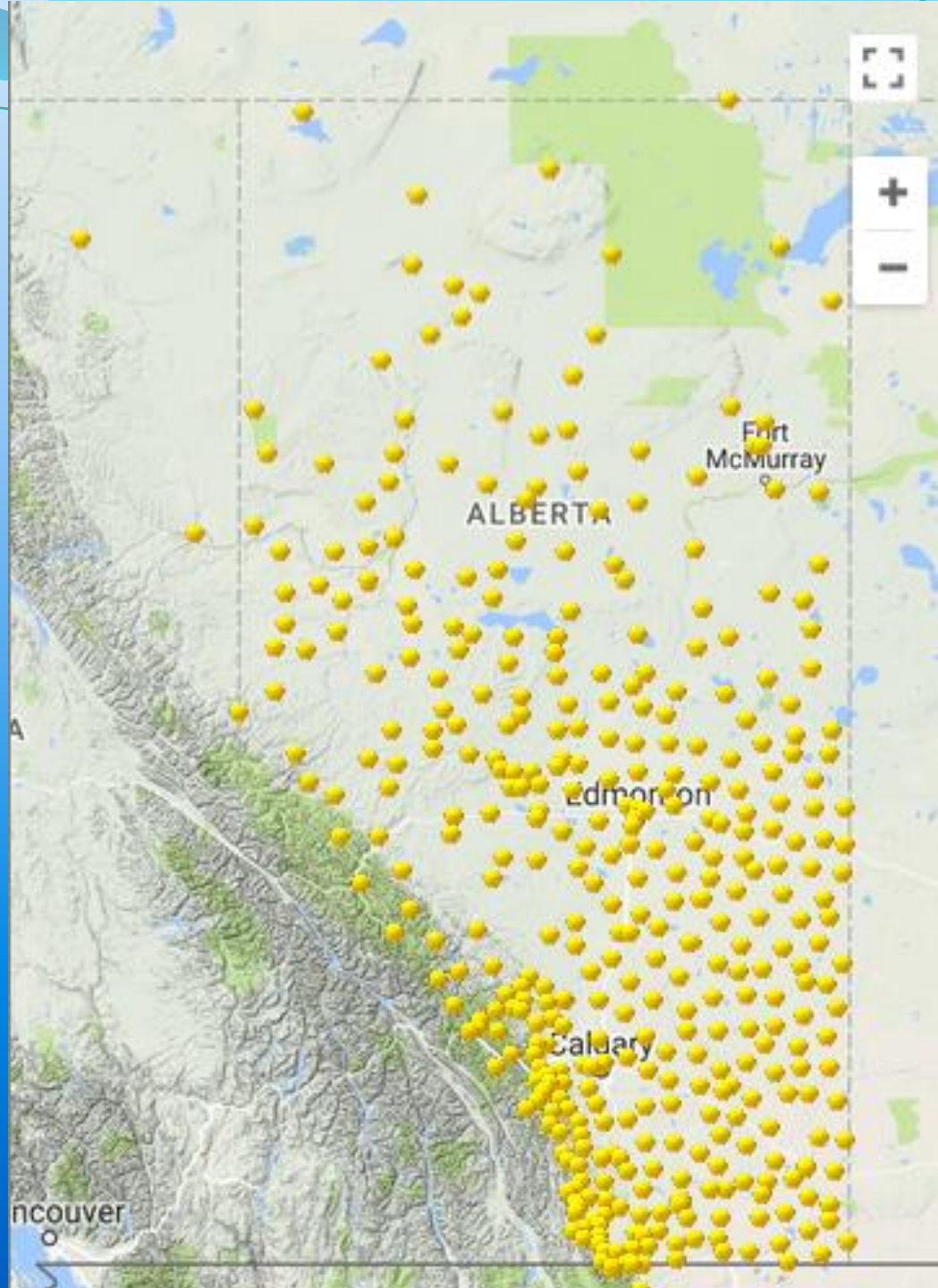
Agro-Meteorological Applications and Modelling Unit
Environmental Stewardship Branch
Alberta Agriculture and Forestry (AF)

www.weatherdata.ca

Alberta's Meteorological Network

- ❖ > 400 near real time hourly reporting stations
- ❖ Since 2002 added 170 stations in the Ag. areas
- ❖ 240 are used to support crop insurance
- ❖ Data is all available on line

Weatherdata.ca



Alberta's Fusarium Infection Risk Assessment tools

- ❖ Adopted the Manitoba model (Dewolf et al 2003)

- ❖ Disease Severity Value (DSV)

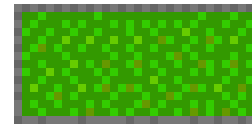
$$\text{DSV} = (\text{Rain hrs.}/39 * \text{Temp. 15-30 hrs.}/168) * 100$$

- Rain hrs. = count of hours when precipitation occurred over the past 7-days
- Temperature 15-30 hrs = count to hours when temperature was between 15 and 30 C, over the past 7-days

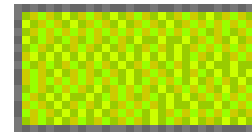
Risk Rating for the Disease Severity Value

- ❖ Low.....0 to 12
- ❖ Moderate....12 to 22
- ❖ High.....22 to 32
- ❖ Extreme.....32

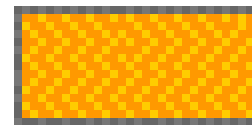
Risk Rating



Low



Medium



High



Extreme


Alberta's Infection Risk Tools

❖ Hourly vs Daily Updating

1. Computer friendly platform
 - allows plotting, 60-days of infection risk, back to 2008
 - host of other products
2. Mobile Friendly Platform
 - Current infection risk
 - 10-day hourly plots of
 - recent risk
 - precipitation/temperature/humidity
 - past risk
 - Fusarium management information
 - Radar
 - Weather Alerts


Alberta Climate Information Service

Weatherdata.ca



Alberta.ca > Alberta Agriculture and Forestry > Alberta Climate Information Service > About the Alberta Climate Information Service (ACIS)

About the MinistryAgricultureForestryFind StaffDecision Making ToolsDirectoriesGeneral StoreMaps & Multimedia



About ACISData DisclaimerNewsGlossaryReference Documents

Weather DataWeather Station Data ViewerHistorical Weather DataWeather Station SummaryAlmanac

MapsWeather Conditions MapClimate and Atlas MapsWeather Radar Imagery

Irrigation (IMCIN)About IMCINIRRI-CastAIMM SoftwareAIMM Climate FilesAIMM Crop ET Data

ForecastsWeather ForecastFusarium Disease Severity

ReportsMoisture Situation UpdatesWeekly Crop Water Use

Geographic RegionAlberta


Alberta Climate Information Service (ACIS)

Bringing you up-to-date Alberta weather and climate data

Welcome to ACIS, an interactive tool that helps producers, farm consultants, and researchers to see Alberta weather forecasts, browse over 10000 maps of Alberta weather and Alberta climate related information, and access near real time station data from over 350 meteorological stations operating in the province of Alberta. The maps and weather data describe Alberta's weather, climate and related agriculture features to help with your long-term planning and decision-making throughout the growing season.


Alberta Weather Station Conditions Summary

Obtain up-to-date current weather conditions measured by the weather station of your choice. Interact with dynamic graphs that resize to the time period that you select. Additionally, view at-a-glance weather derivatives for the current growing season to make more informed operational decisions.



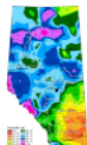
Alberta Weather Station Data and Graphs

Find out where the meteorological stations are in Alberta and download, graph and compare near-real-time data from more than [350 stations](#). Both hourly and daily data is available with the hourly data usually only about 2 hours old and daily data current as of yesterday. The data has been quality controlled and missing or erroneous data values have been filled and flagged. Data flags that are included with the downloaded data indicate if the data is actual, computed or missing.




Alberta Climate and Atlas Maps

As of February 2013, there were over 12,000 maps in the archive. Many of these maps date as far back as 1961. Each week about 40 new maps are added to the viewer, describing current conditions and trends. Explore Alberta's current and historical climate trends and extremes. Currently map categories include precipitation, temperature, soil moisture, snowpack, drought indices and others. AF is committed to adding new categories all the time. Give us some feedback and if we can benefit a wide enough audience, you may see a brand new set of maps.




Alberta Weather Conditions Map

View a map of current weather conditions near any location or across the province. See values for a variety of weather elements plotted on an interactive map interface. You can also go through historical records and see how the weather conditions were spatially distributed in the past.




Alberta Weather Radar Imagery

View current weather radar imagery on an easy-to-use, interactive map interface. You can zoom the radar map right to any location to see if it received precipitation in the last few hours or if a storm system is headed in its direction. You can also view the entire province at a glance to get the big picture. The radar viewer also lets you display the most recent radar image, automatically fetching new data as it becomes available.



Alberta Weather Forecast

View a week-long forecast for several locations as issued by the Environment Canada Weather Office.



Weather Station Data Viewer

Weatherdata.ca

Current and Historical Alberta Weather Station Data Viewer

Brought to you by the Alberta Climate Information Service (ACIS)

Show Directions

Legend

- ☐ Available for all selected stations
- ☐ Not available for some selected stations
- ☐ Not available for any selected stations
- Station with data available through ACIS
- Station with all requested elements available
- Selected station with all requested elements available
- Selected station with one or more requested elements not available
- Station with one or more requested elements not available

Popular Elements Derivatives Normals Almanac

Select Station(s):

Clear Selection Clear All Tabs Definitions

	Observed	Normal
Precipitation (mm)	<input type="checkbox"/>	
Accumulated Precipitation (mm)	<input type="checkbox"/>	<input type="checkbox"/>
Temperature (°C)	<input type="checkbox"/>	<input type="checkbox"/>
Minimum Temperature (°C)	<input type="checkbox"/>	<input type="checkbox"/>
Maximum Temperature (°C)	<input type="checkbox"/>	<input type="checkbox"/>
Relative Humidity at 2m (%)	<input type="checkbox"/>	
Wind Speed at 2m (km/h)	<input type="checkbox"/>	
Wind Direction at 2m (deg)	<input type="checkbox"/>	
Wind Speed at 10m (km/h)	<input type="checkbox"/>	
Wind Direction at 10m (deg)	<input type="checkbox"/>	
Corn Heat Units	<input type="checkbox"/>	<input type="checkbox"/>
Potato Heat Units	<input type="checkbox"/>	<input type="checkbox"/>
Growing Degree Days (5°C)	<input type="checkbox"/>	<input type="checkbox"/>
Reference Evapotranspiration (mm)	<input type="checkbox"/>	
Frost Probability 0°C (%)		<input type="checkbox"/>

Please select station(s)

Include Flags: ☒ Completeness ☒ Source ☒ Comments

Period: Hourly (from Sept 2008) Precip Unit: mm

View

Graph

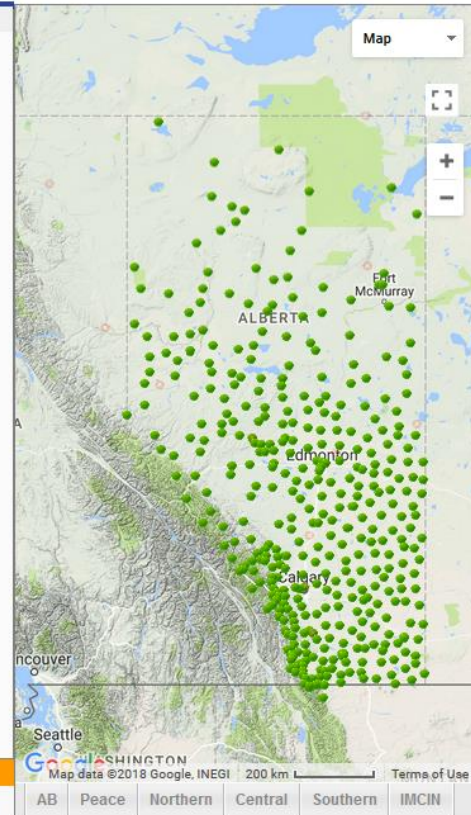
Download

Data has been quality controlled up until Dec 20, 2017, inclusive.

By retrieving data, you agree to the [ACIS Data Disclaimer & Terms of Use](#)

Start Date: 2017-12-20 End Date: 2018-01-03

Today Yesterday Week Two Weeks Three Weeks Month



Selected Stations (up to 500 max.)

Weather Station Data Viewer

Weatherdata.ca

Current and Historical Alberta Weather Station Data Viewer

Brought to you by the Alberta Climate Information Service (ACIS)

Show Directions

Legend

- ☒ Available for all selected stations
- ☐ Not available for some selected stations
- ☐ Not available for any selected stations
- Station with data available through ACIS
- Station with all requested elements available
- Selected station with all requested elements available
- Selected station with one or more requested elements not available
- Station with one or more requested elements not available

Popular Elements Derivatives Normals Almanac

Select Station(s):

Clear Derivatives Clear All Tabs Definitions

- ☒ Dew Point Temp. at 2m (°C)
- ☒ Wind Chill Index (°C)
- ☒ Humidex
- ☐ Estimated Solar Radiation (MJ/m2)
- ☐ Growing Degree Days (0°C)
- ☐ Growing Degree Days (2°C)
- ☐ Growing Degree Days (5°C)
- ☐ Growing Degree Days (10°C)
- ☐ Corn Heat Units
- ☐ Potato Heat Units (Potato Days)
- ☒ Fusarium Disease Severity Value (June 1-Aug 15)
- ☐ ET. STD-grass
- ☐ Morton's Shallow Lake Evaporation (mm)
- ☐ Morton's Potential Lake Evaporation (mm)
- ☐ Morton's Areal Evapotranspiration (mm)
- ☐ Morton's Potential Evapotranspiration (mm)

FFMC ISI

Fire Weather Index ☐ ☐

Ready to view, graph or download

Include Flags: ☒ Completeness ☒ Source ☒ Comments

Period: Hourly (from Sept 2008) Precip Unit: mm

View

Graph

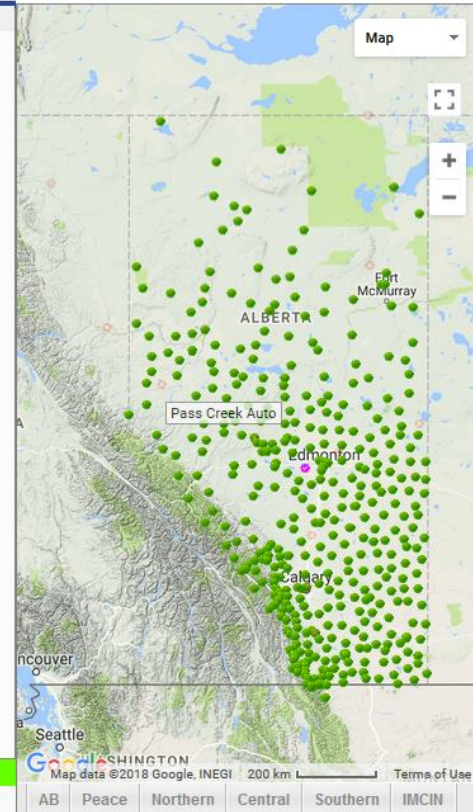
Download

Data has been quality controlled up until Dec 30, 2017, inclusive.

By retrieving data, you agree to the [ACIS Data Disclaimer & Terms of Use](#)

Start Date: 2017-06-01 End Date: 2017-08-15

Today Yesterday Week Two Weeks Three Weeks Month

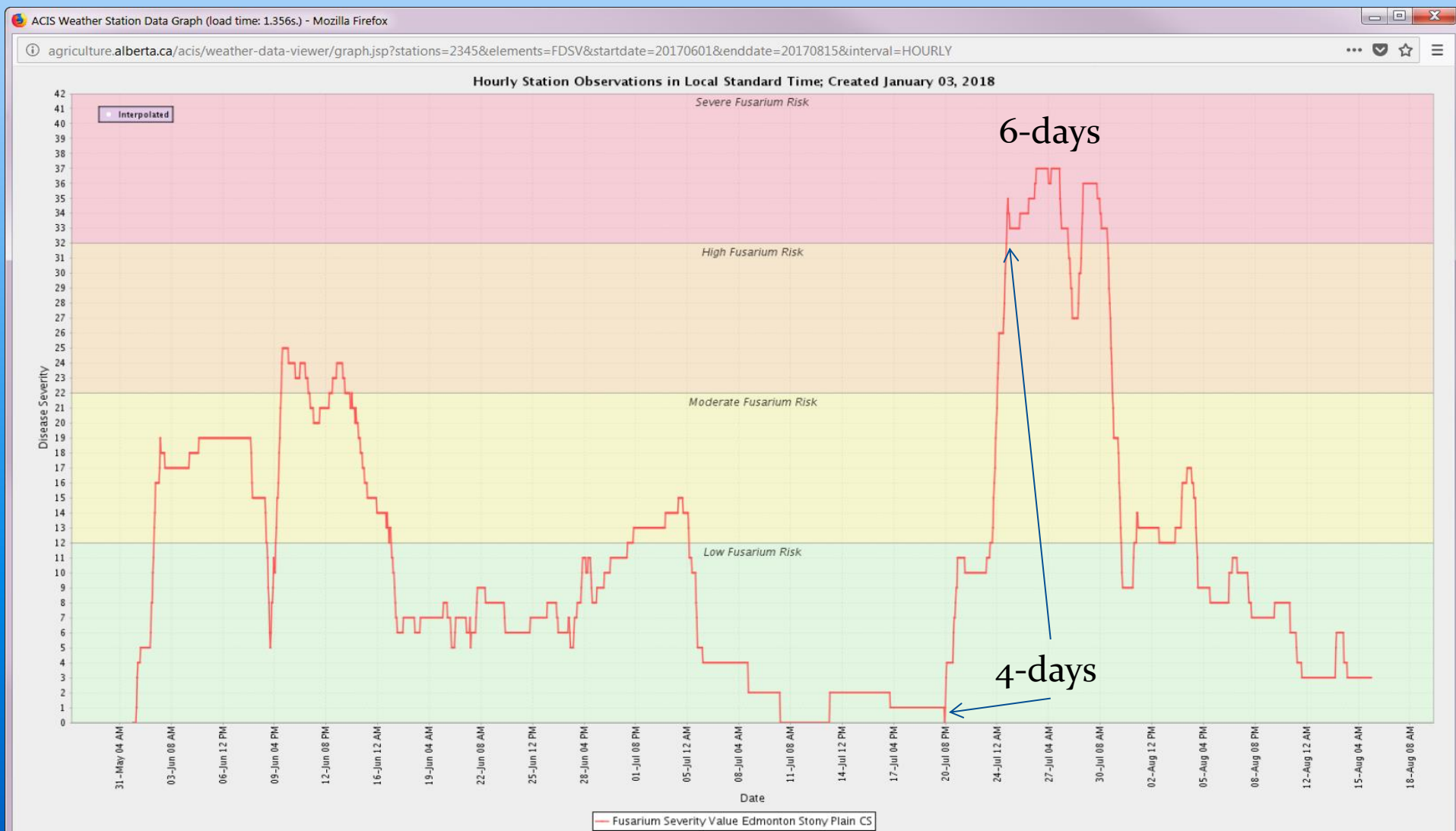


Selected Stations (up to 500 max.)

☒ Edmonton Stony Plain CS

Fusarium Infection Risk

June 1, 2016 to Aug 15 2016



Mobile Friendly Web Pages

- ❖ Maps, risk dials
- ❖ weather analysis
- ❖ Management information
- ❖ Radar
- ❖ Weather warnings

Weatherdata.ca/m

Weatherdata.ca/m#!fusarium



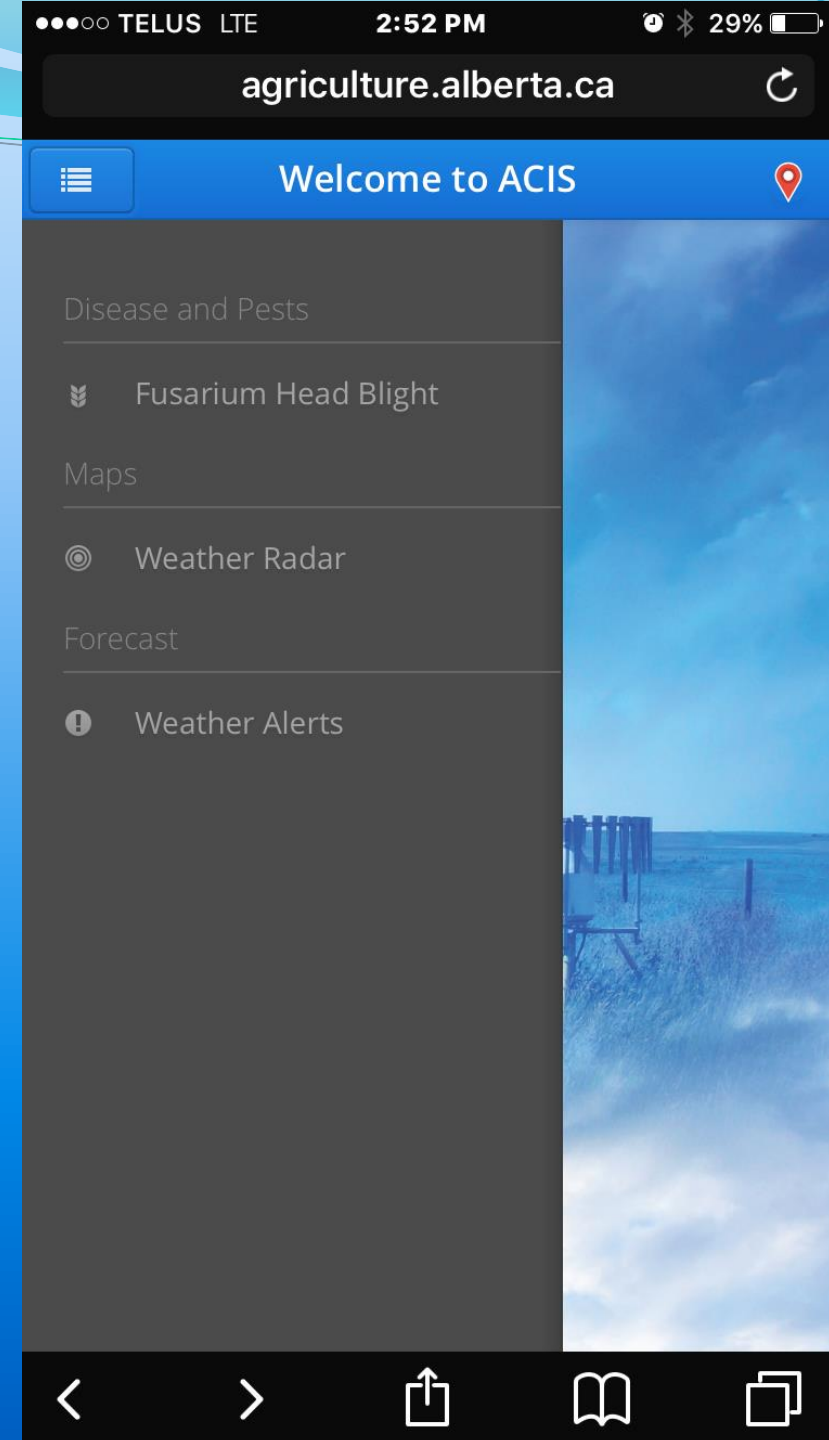
Mobile Friendly Web Pages

Navigation Menu

- ❖ Fusarium Head Blight
- ❖ Weather Radar
- ❖ Weather Alerts

Weatherdata.ca/m

Weatherdata.ca/m#!fusarium



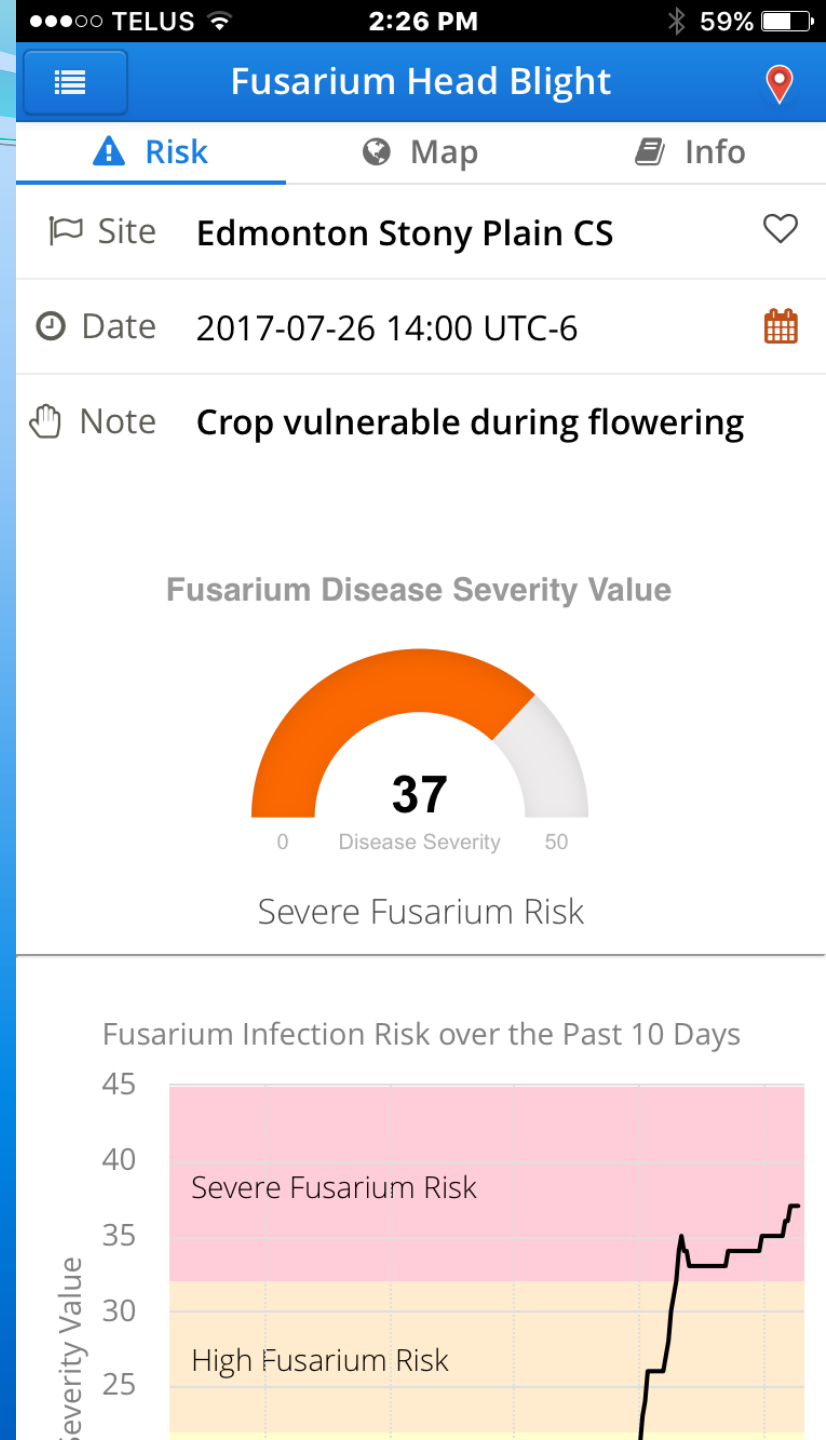
Mobile Friendly Web Pages

Risk Dial

- ❖ Current hourly disease infection Risk at a station

Weatherdata.ca/m

Weatherdata.ca/m#!fusarium



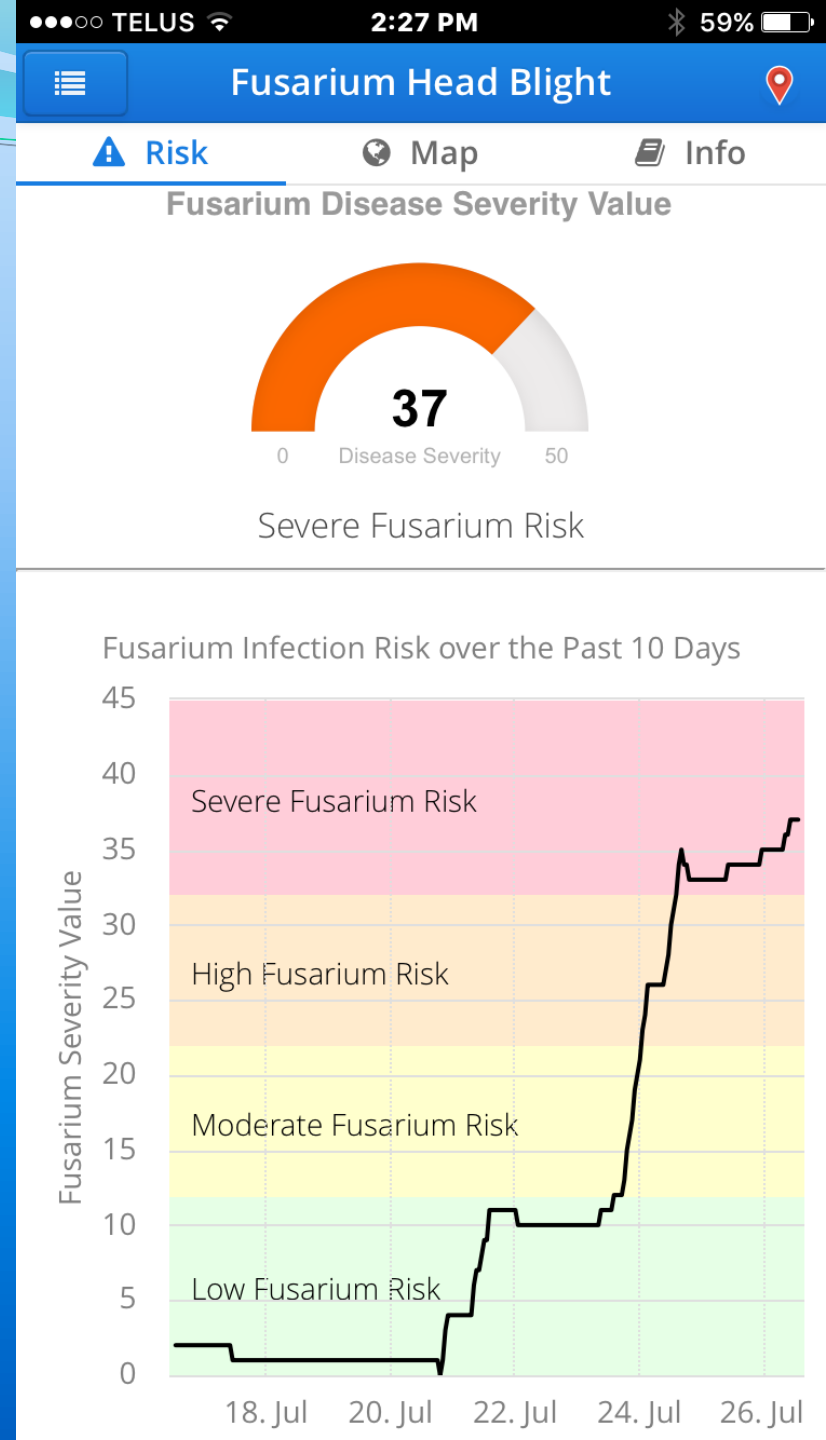
Mobile Friendly Web Pages

Risk Graph

- ❖ Past 10-days hourly disease infection risk

Weatherdata.ca/m

Weatherdata.ca/m#!fusarium



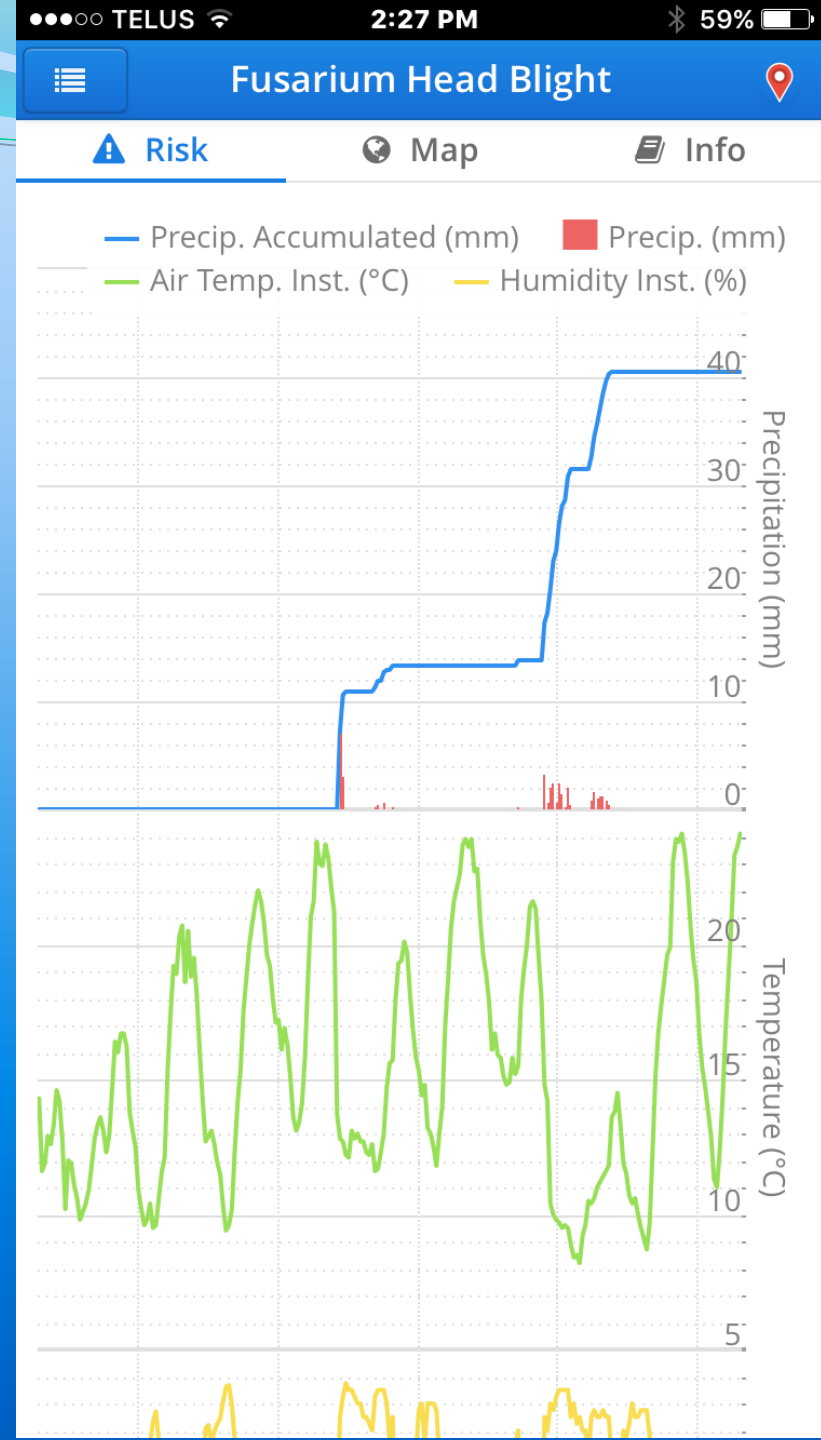
Mobile Friendly Web Pages

Weather Analysis

- ❖ Precipitation accumulations
- ❖ Temperature
- ❖ Humidity

Weatherdata.ca/m

Weatherdata.ca/m#!fusarium



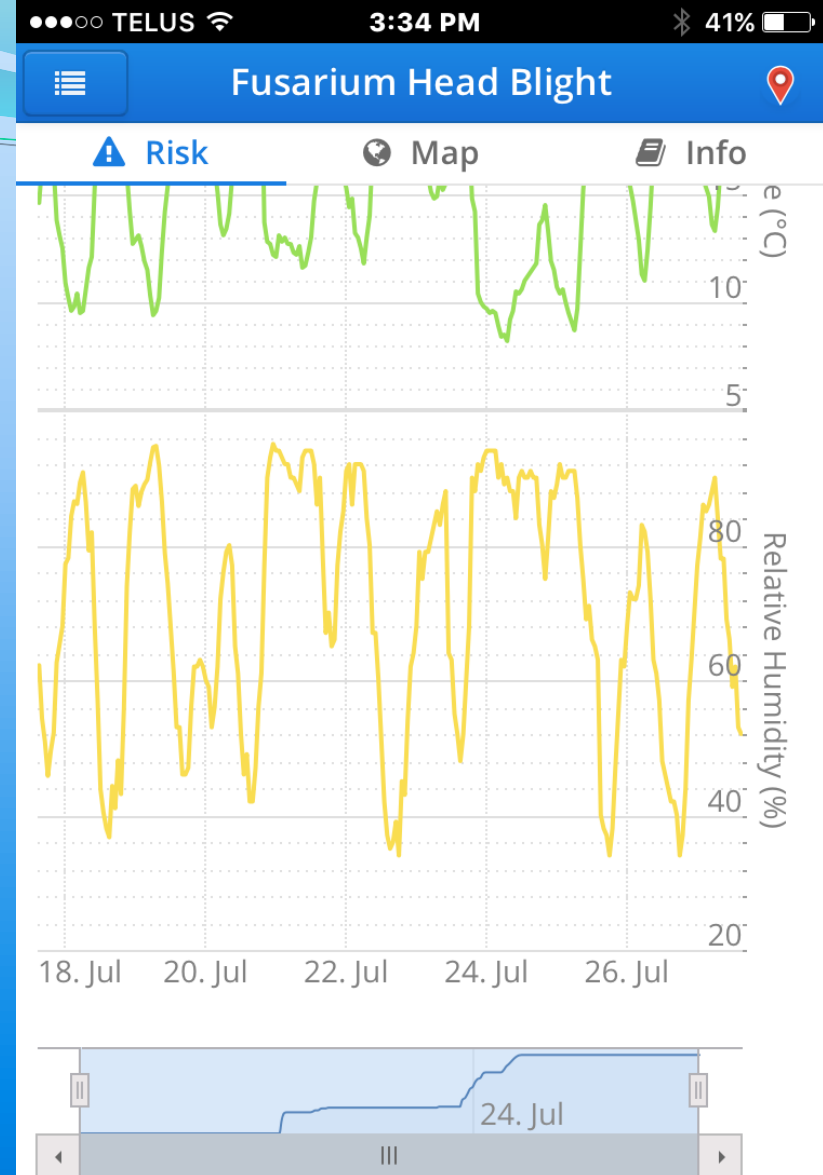
Mobile Friendly Web Pages

Weather Analysis

- ❖ Precipitation accumulations
- ❖ Temperature
- ❖ Humidity

Weatherdata.ca/m

Weatherdata.ca/m#!fusarium



Supported by


Alberta Wheat
COMMISSION

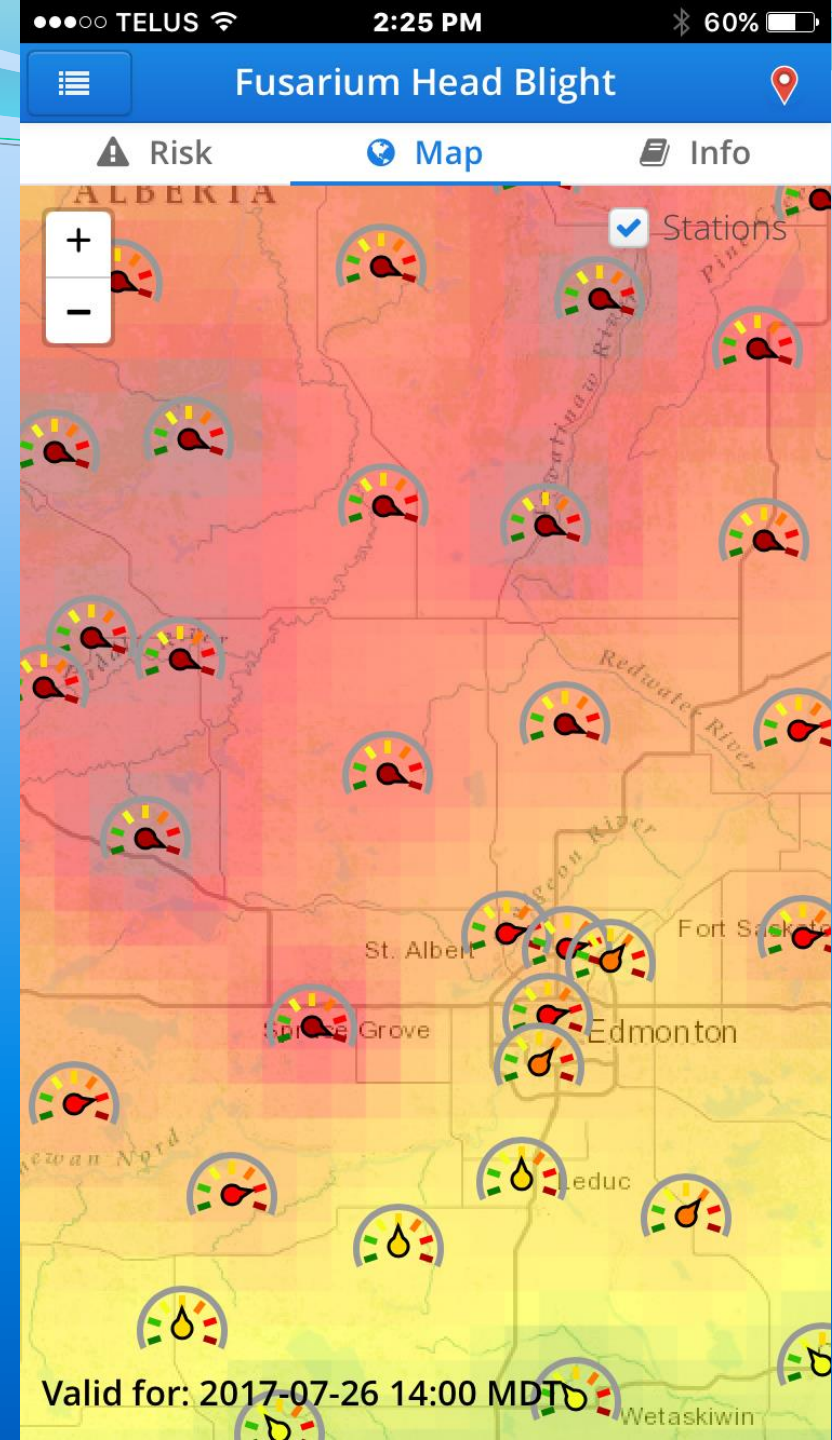
Mobile Friendly Web Pages

Hourly Map

❖ Fusarium Infection Risk

Weatherdata.ca/m

Weatherdata.ca/m#!fusarium



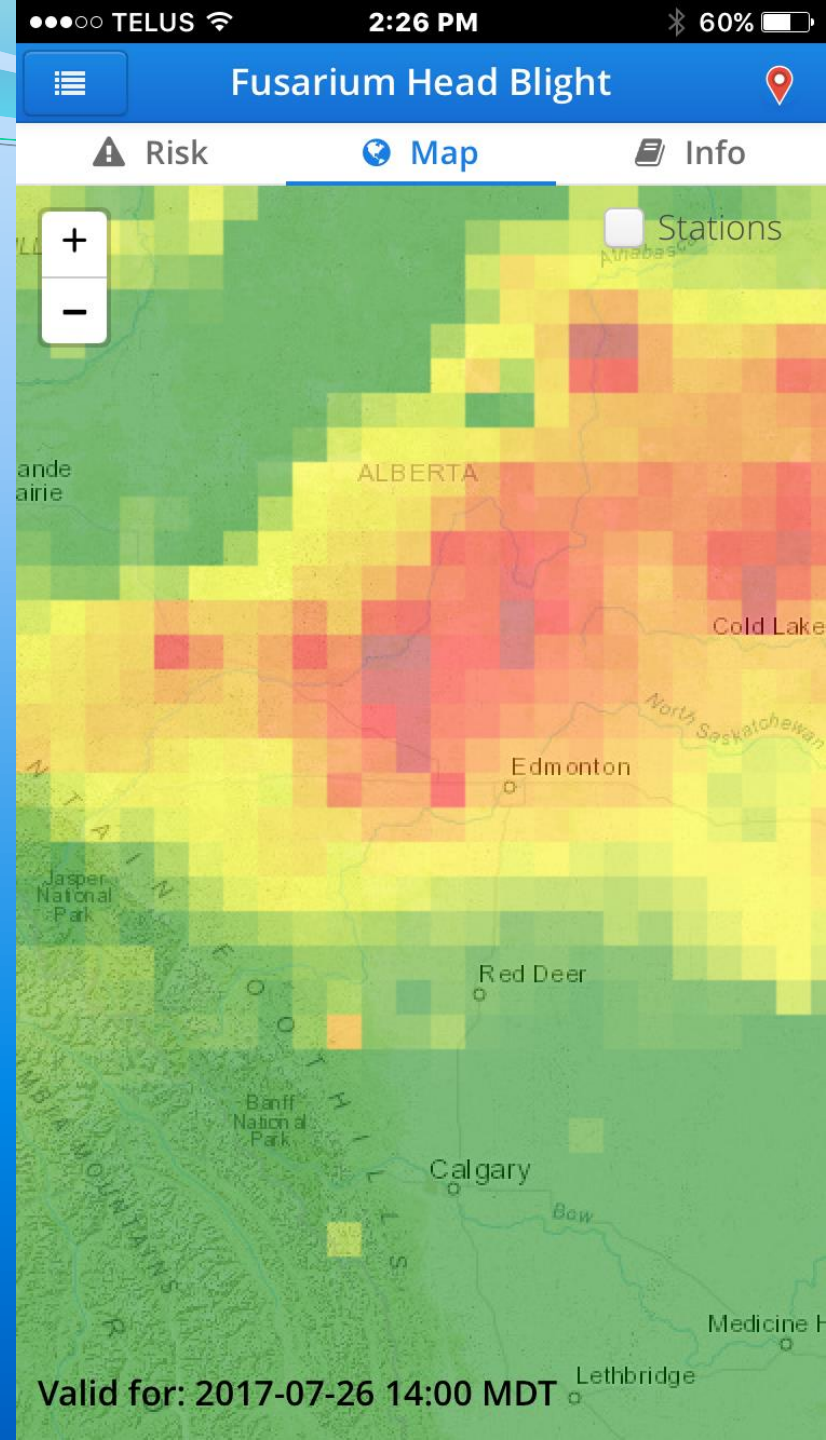
Mobile Friendly Web Pages

Hourly Map

❖ Fusarium Infection Risk

Weatherdata.ca/m

Weatherdata.ca/m#!fusarium



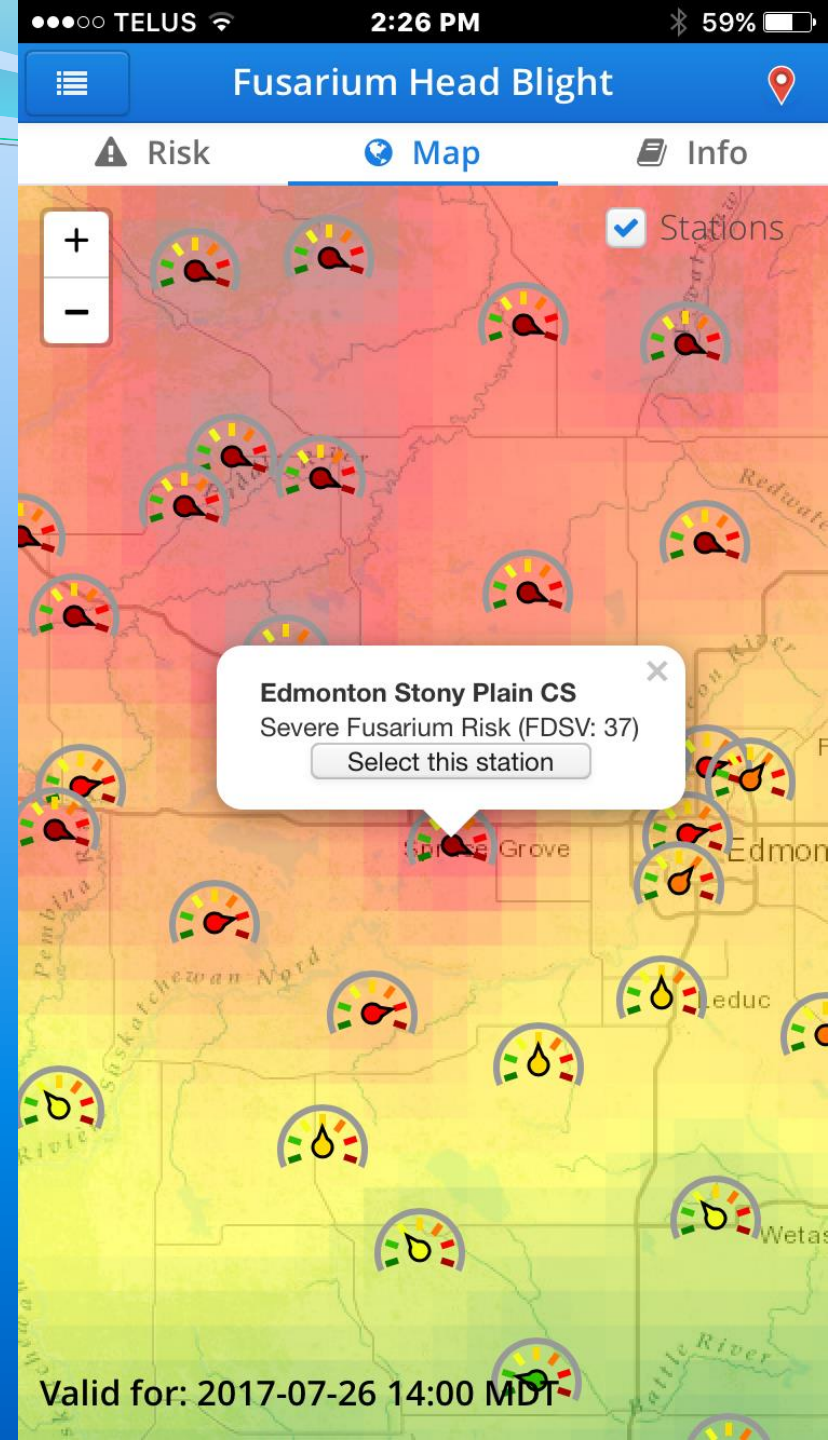
Mobile Friendly Web Pages

Hourly Map

❖ Fusarium Infection Risk

Weatherdata.ca/m

Weatherdata.ca/m#!fusarium



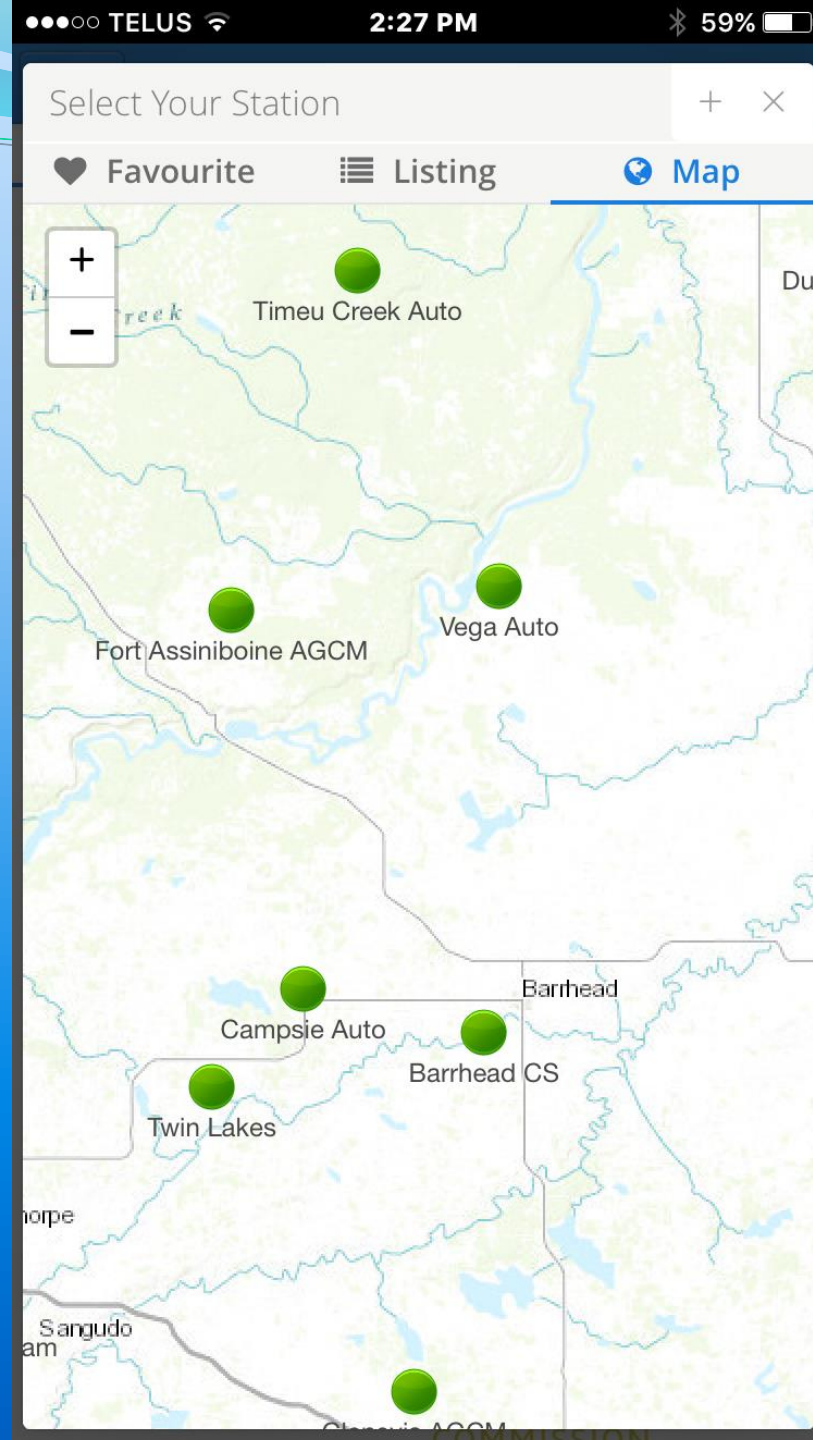
Mobile Friendly Web Pages

Station Selector

❖ Fusarium Infection Risk

Weatherdata.ca/m

Weatherdata.ca/m#!fusarium

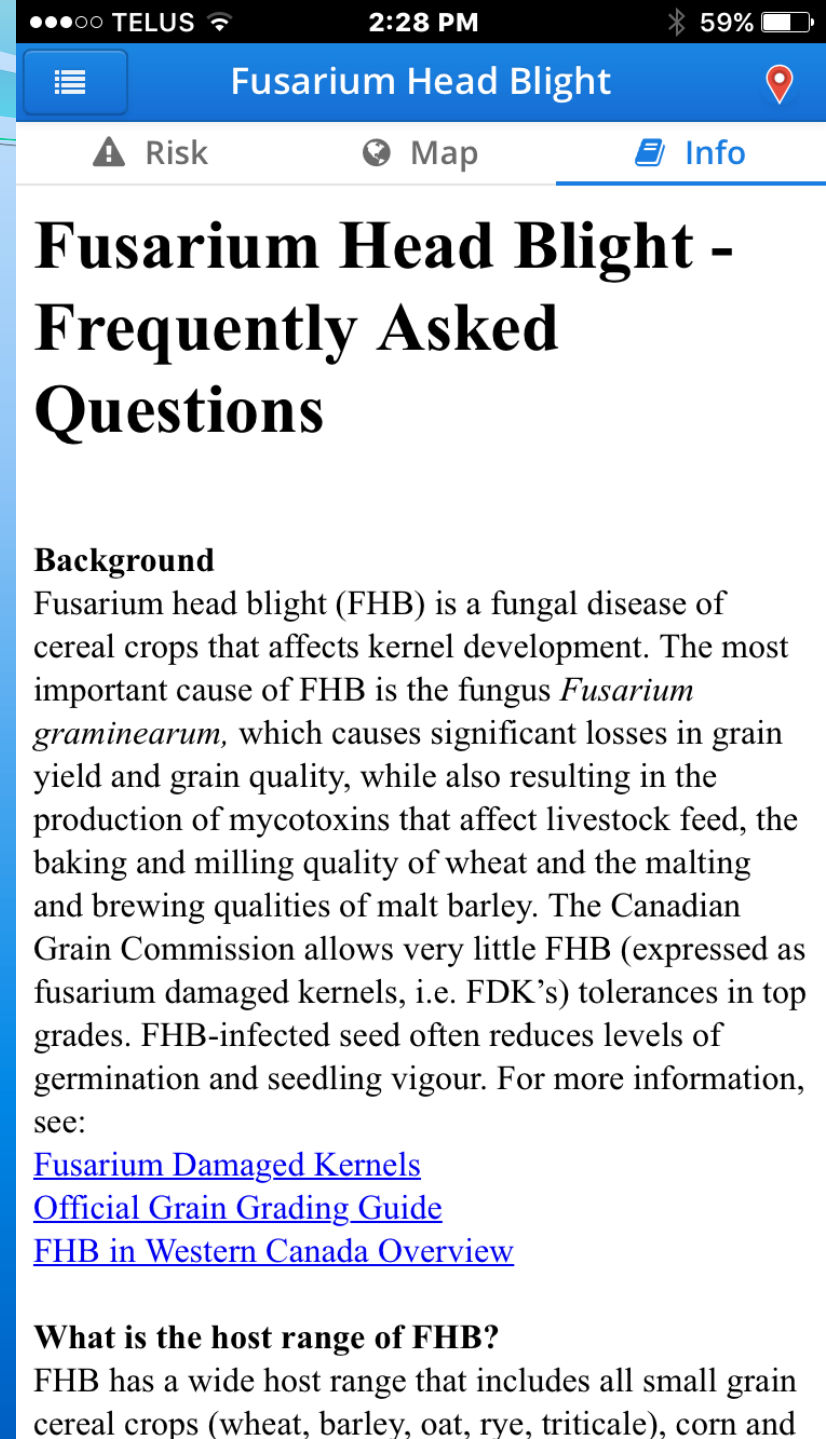


Mobile Friendly Web Pages

Disease Information

Weatherdata.ca/m

Weatherdata.ca/m#!fusarium



The screenshot shows a mobile web application interface. At the top, the status bar displays 'TELUS', signal strength, time '2:28 PM', and battery level '59%'. Below this is a blue header bar with the title 'Fusarium Head Blight' and a location pin icon. Under the header is a navigation bar with three tabs: 'Risk' (with a warning icon), 'Map' (with a location pin icon), and 'Info' (with a document icon). The 'Info' tab is currently selected. The main content area has a title 'Fusarium Head Blight - Frequently Asked Questions'. Below this is a section titled 'Background' which contains a paragraph of text about Fusarium head blight (FHB) and its impact on cereal crops. At the end of the paragraph are three blue underlined links: 'Fusarium Damaged Kernels', 'Official Grain Grading Guide', and 'FHB in Western Canada Overview'. Below the links is another section titled 'What is the host range of FHB?' followed by a paragraph describing the wide host range of FHB, including wheat, barley, oat, rye, triticale, corn, and other small grain cereal crops.

Fusarium Head Blight - Frequently Asked Questions

Background

Fusarium head blight (FHB) is a fungal disease of cereal crops that affects kernel development. The most important cause of FHB is the fungus *Fusarium graminearum*, which causes significant losses in grain yield and grain quality, while also resulting in the production of mycotoxins that affect livestock feed, the baking and milling quality of wheat and the malting and brewing qualities of malt barley. The Canadian Grain Commission allows very little FHB (expressed as fusarium damaged kernels, i.e. FDK's) tolerances in top grades. FHB-infected seed often reduces levels of germination and seedling vigour. For more information, see:

[Fusarium Damaged Kernels](#)
[Official Grain Grading Guide](#)
[FHB in Western Canada Overview](#)

What is the host range of FHB?

FHB has a wide host range that includes all small grain cereal crops (wheat, barley, oat, rye, triticale), corn and

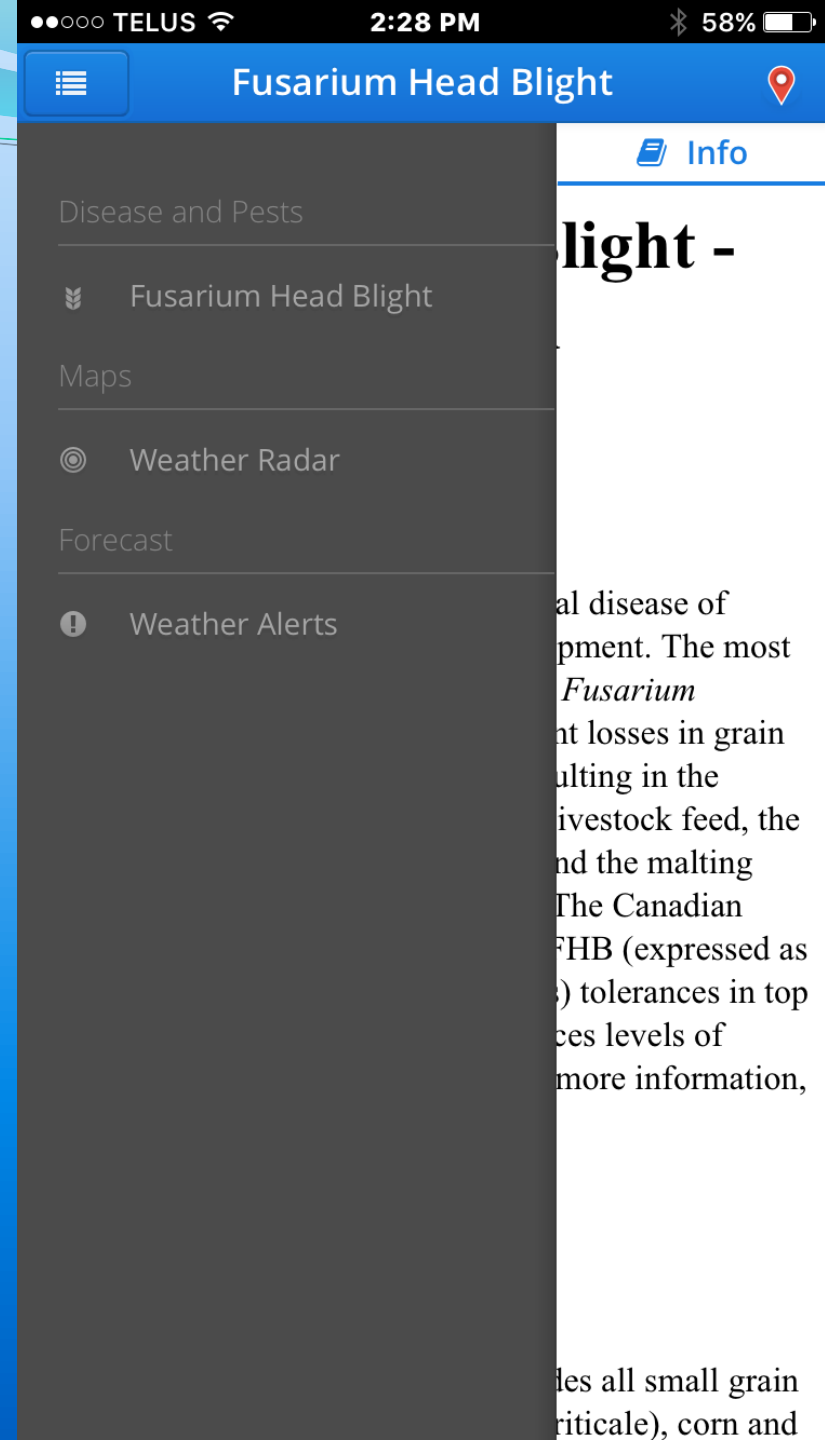
Mobile Friendly Web Pages

Navigation Menu

- ❖ Fusarium Infection Risk
- ❖ Weather Radar
- ❖ Weather Alerts

Weatherdata.ca/m

Weatherdata.ca/m#!fusarium



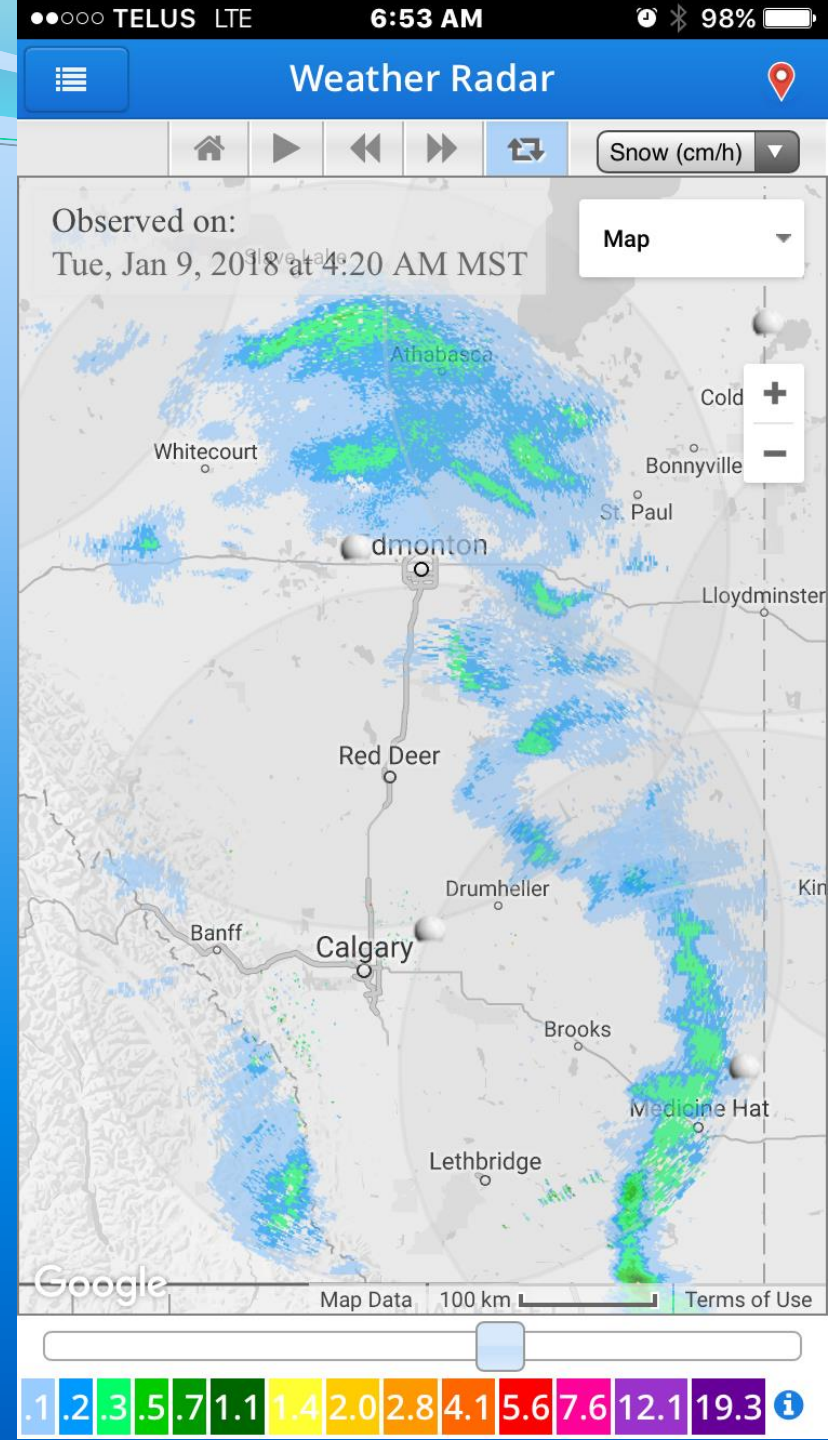
Mobile Friendly Web Pages

Weather Radar

- ❖ Updates every 10 mins
- ❖ Tracks past 6-hours

Weatherdata.ca/m

Weatherdata.ca/m#!fusarium



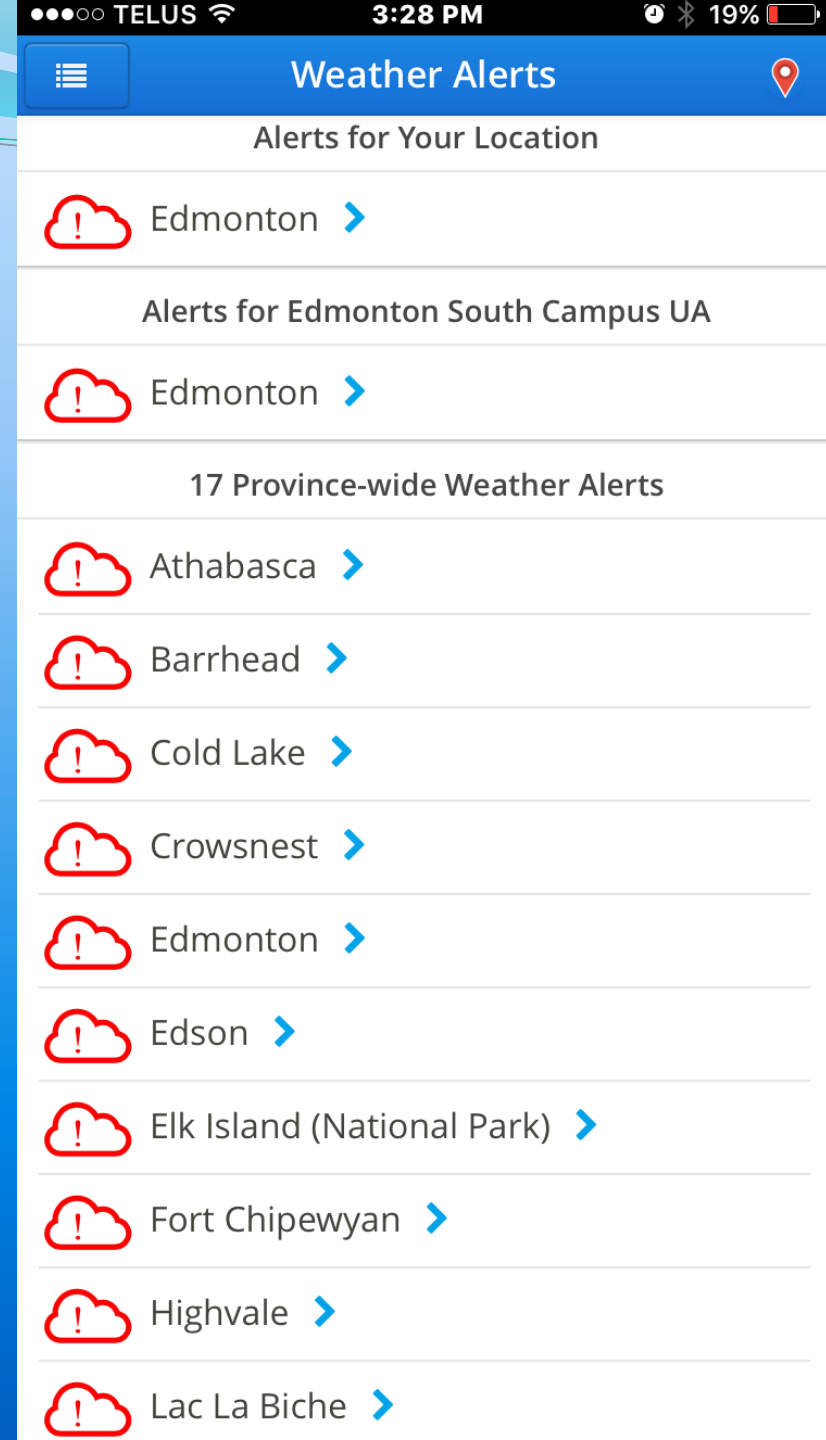
Mobile Friendly Web Pages

Weather Alerts

❖ Issued by Environment Canada

Weatherdata.ca/m

Weatherdata.ca/m#!fusarium



Alberta's Fusarium Risk Management Tools

- ❖ Weather Station Data Viewer

- ❖ Mobile friendly web pages

- These tools have been released on a trial basis only
- They are decision support tools,
- They are not decision making tools.
- Further work will go into enhancing usability and evaluating the science behind the DSV calculations.

Weatherdata.ca/m

Weatherdata.ca/m#!fusarium

Thank you!

Project Team:

- ❖ Pawel Pytlak, Kelly Turkington, Brian Kennedy, Michael Harding, Neil Whatley, Harry Brook, Manitoba Agriculture

Weatherdata.ca/m

Weatherdata.ca/m#!fusarium