

## Corn Goss's Wilt Nurseries Evaluation

**Project duration** May 2018 – November 2018

**Objectives** Establishment of a Goss's Wilt nursery in MB.

**Collaborators** Lana Reid Ph.D – AAFC Research Scientist Ottawa Research and Development Centre

### Background

Goss's wilt has been in Western Canada for only a few years, but plant pathologists, agronomists and breeders are already working to learn more about this corn disease and enhance management options for Prairie growers. Goss's wilt is caused by the bacterium *Clavibacter michiganensis* subspecies *nebraskensis*. "The bacteria overwinter on infected stubble, so the disease is a concern in fields with shorter corn rotations. But even in fields with longer rotations, it can be a problem because corn stubble is very mobile in the fall, blowing across the roadways and carrying the disease to new fields," Holly Derksen, field crop pathologist with Manitoba Agriculture, Food and Rural Development (MARD), says.

The disease usually occurs in a non-systemic form in which the pathogen infects the plant's foliage. "The bacterium enters the plant through a wound from hail or wind or sand blasting," Wilt Billing, DuPont Pioneer's area agronomist for central and eastern Manitoba, explains. "The infection usually appears on the upper canopy at first. Then with high humidity and rain splash, the disease moves very rapidly throughout the plant, usually from the top down."

The disease also has a systemic form where the bacteria infect the corn plant's vascular tissues. However, Billing and Derksen have not seen the systemic form in commercial corn fields in Manitoba. A relatively new disease, Goss's wilt was first identified in Nebraska in 1969. In the 1970s and early 1980s, the disease spread through Nebraska and into some surrounding states. Then very little disease occurred until about 2006 when Goss's wilt resurged and began spreading into new areas.

Billing notes, "Goss's is continuing to expand. In the U.S. it has moved right across most of the Corn Belt as far south as Louisiana. It moved into the southwestern edge of Michigan, so it has moved east of the Mississippi River." In Western Canada, the disease was first found in Manitoba in 2009 and in Alberta in 2013.

In Manitoba over the past five or six years, we've seen anything from an insignificant infection which doesn't have any yield loss all the way up to the most severe fields experiencing close to 50 to 60 per cent yield loss. So it can be very impactful," Billing says. The severity of the disease depends on weather conditions, the amount of inoculum in the field and the susceptibility of the hybrid to Goss's wilt. Fortunately, late summer conditions in Manitoba in 2014 didn't favour the disease. Billing says, "In 2014, we found the disease in many fields in mid to late July. However, we had a dry spell during late July to early August, so the disease was really limited in its impact."

## Managing Goss's wilt:

Symptoms of Goss's wilt may sometimes be confused with problems like drought, frost damage or sunscald, or with other diseases like Stewart's wilt or northern corn leaf blight. To identify Goss's wilt, Billing advises, "When you're walking through your corn field, look for greyish brown lesions with water-soaked margins. The telltale sign of Goss's wilt is the black freckling that shows up along the lesion edges. If you scout during drier conditions, you'll see that black freckling. If conditions are damp, like a heavy dew in the early morning, you'll sometimes see a glossy sheen on the lesion."

Derksen notes fungicides are not effective for controlling Goss's wilt because it is a bacterial disease. She has two main recommendations for managing the disease: "One is to lengthen your crop rotation. However, that may not always be enough to prevent the disease if neighbouring fields have Goss's wilt. The other key is to grow a resistant corn variety. At this time there isn't any third-party testing to compare varieties from different companies, but most companies have a range of tolerances to Goss's wilt, so you can check with your seed supplier for information."



**Fig. 1** The bacterium enters the corn plant through a wound on a leaf and then spreads from there.

## **Project findings**

This project is part of a long-term, multi-site study led by Lana Reid. Research findings will be made available by Lana Reid and team.

## **Materials & Methods**

Experimental Design	100 row observation nursery
Entries	100
Seeding	May 17, 2019
Harvest	September 27, 2019

<b>Data collected</b>	<b>Date collected</b>
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Tasseling Date	Jul 02 – Aug 01
Silking Date	Jul 08 – Aug 19
Ear Formation	Jul 29 – Aug 26
Heights	Jul 30
Moisture	September 27
Yield	September 27

## **Agronomic info**

Standard recommended agronomic protocols were adopted for each crop. Fertilizers were applied with respect to soil test results. Herbicide were applied, when required.