

# Over the Course of Time: Manitoba Canola Diseases 2009-2014

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## Background

Annual canola disease surveys have been occurring in Manitoba since 1971 with collaboration from Agriculture and Agri-Food Canada (AAFC), Manitoba Agriculture Food and Rural Development (MAFRD), University of Manitoba and Canola Council of Canada. Since 2009, 862 Manitoba canola crops were surveyed for diseases through the annual survey.

For many years, sclerotinia has been the most prevalent disease, but in the past four years, blackleg was found in more canola crops than sclerotinia stem rot. The management for these two diseases is quite different and therefore identification of the pathogen is critical for management dollars to be spent in the most cost-efficient manner in subsequent years.

Disease incidence and severity can change annually, based on use of varietal genetic resistance, environmental conditions, agronomic practices such as crop rotation and fungicide use. Annual surveys recording these changes, provide valuable information on the distribution and on the impact of farming practices on disease incidence and severity. Results can help agronomists and farmers prioritize where future resources need to be directed and justify applications for research funding. The surveys are also valuable as an early-warning system that provides information on the occurrence of disease/pesticide resistance breakdown.

## Survey Method

Producers are pre-surveyed to identify legal land description, variety, crop rotation and other crop management information. The in-field surveys occurred after flowering was complete, but before swathing. Crops were assessed for the prevalence (%crops infested) and incidence (%plants infected /crop) of :

- aster yellows (AY phytoplasma);
- foot rot (*Fusarium* spp. and *Rhizoctonia* sp.);
- fusarium wilt (*F. oxysporum* f.sp. *conglutinans*);
- clubroot (*Plasmodiophora brassicae*);

Prevalence and severity were assessed for:

- sclerotinia stem rot (*Sclerotinia sclerotiorum*);
- blackleg (*Leptosphaeria maculans*);
- alternaria pod spot (*Alternaria* spp.)

In each field, 100 plants were selected in a regular pattern starting at a corner of the field or at a convenient access point. The edges of the fields were avoided. Twenty plants were removed from each of five points of a “W” pattern in the field. Points of the “W” were at least 20 paces apart. All plants were pulled up, removed from the field and examined for the presence of diseases. For soil collection, samples were obtained from each of the five points of the “W”, or if the field entrance was visible, they were collected at 5 points near this entrance.

## Disease Evaluation and Discussion

**Sclerotinia stem rot:** Since 2009, on average, 70% of canola fields surveyed had sclerotinia, but prevalence varied from 45% in a dry year (2011) to >85% in 2009 and 2010 which were wet (Table 1). Incidence of sclerotinia in canola is dependent on environmental conditions, specifically the temperature, moisture and humidity in July and August when canola is flowering. Risk assessment of the potential for disease development is used by most producers to decide whether or not fungicide protection products need to be used. Incidence in fields remain low, indicating that sclerotinia is present but is being adequately controlled or environmental conditions are not conducive to disease development.

**Blackleg:** Lesions occurring on the upper stem were assessed separately from basal stem cankers at the crown (or soil line). Of the two assessment, greater concern and yield loss occurs when blackleg is found at the crown. In the past 6 years, blackleg prevalence has increased dramatically for both basal and stem lesions, from 55% to 93% and 56% to 71% respectively. Blackleg has moved from a disease in some fields to being considered endemic across Manitoba. Presence in a crop is directly related to inoculum in the field from previous infection. With tight canola rotations, disease incidence will increase and this was evident in the surveys. Mean incidence of blackleg in fields has also dramatically increased from 4% incidence in 2009 to 24% in 2014. To manage blackleg in the field, rotations need to be lengthened to canola every 3<sup>rd</sup> or 4<sup>th</sup> year, using newer varieties with better blackleg resistance and considering a fungicide specifically for blackleg suppression.

**Clubroot:** Soil samples were collected from fields to test for the presence of clubroot spores. No presence of clubroot was found in any soil sample prior to 2011. In the 2011 survey, two soil samples tested positive for clubroot, six samples tested positive in 2012 and one in 2013. As well, in 2013, one field contained symptomatic plants that tested positive for clubroot. No plants were found in 2014 to have clubroot and 95 soil samples were collected to test for the presence of clubroot spores. These results will be available early in 2015.

**Table 1: Results from the Annual Canola Disease Survey (2009-2014).**

Year		Sclerotinia	Blackleg		Aster	Fusarium	Clubroot		Alternaria
		Stem Rot	Stem Lesion	Basal Canker	Yellows	wilt	Plant	Soil	Pod Spot
2014	%Prevalence	67	71	93	2	2	0	Not	17
	Mean Incidence	6	8	24	<1	<1	0	Available	<1
2013	%Prevalence	66	63	75	7	4	1	1	30
	Mean Incidence	7	9	13	<1	<1	<1		<1
2012	%Prevalence	65	68	77	95	4	0	6	20
	Mean Incidence	9	9	17	10	<1	0		2
2011	%Prevalence	45	64	69	18	9	0	2	21
	Mean Incidence	5	7	9	<1	1	0		1(PS)
2010	%Prevalence	88	66	58	14	3	0	0	64
	Mean Incidence	31	11	13	2	2	0		2 (PS)
2009	%Prevalence	91	56	55	15	4	0	0	40
	Mean Incidence	18	4	4	<1	<1	0		<1 (PS)

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