What's Lurking in Your Canola Field?

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Background

What is the most significant canola disease in Manitoba? If you guessed sclerotinia, you would be correct in most years, but blackleg incidence has been steadily increasing. The management for the two diseases is quite different and if dead plants are not inspected and the cause identified properly, management dollars in subsequent years may not be spent in the most cost-efficient way.

Canola is one of the most economically important crops produced in Manitoba. To continue to grow profitable canola crops, yield reducers such as diseases need to be identified.

Disease incidence and severity will change yearly based on environmental conditions, use of genetic resistance in varieties, crop rotation and fungicide use. Annual surveys of commercial canola crops provide valuable information on the distribution of canola diseases and on the impact of farming practices on disease incidence and severity. Results of disease surveys 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

A total of 424 canola crops were surveyed for diseases during 2009 to 2011. In 2009, Manitoba canola producers were contacted through the Canola Growers Association (MCGA) about participation in a canola disease survey. From the response, 140 crops of canola were selected. In 2010 and 2011, a number of farmers from the 2009 survey continued to participate by providing canola crop locations. Each year, farmers new to the survey and interested in participating were identified through MCGA, Agriculture and Agri-Food Canada and/or MAFRI.

Surveys occurred after flowering was complete and before swathing occurred. Crops were assessed for the prevalence (percent crops infested) and incidence (percent plants infected per crop) of sclerotinia stem rot (*Sclerotinia sclerotiorum*), aster yellows (AY phytoplasma), foot rot (*Fusarium* spp. and *Rhizoctonia* sp.), blackleg (*Leptosphaeria maculans*), fusarium wilt (*F. oxysporum* f.sp. *conglutinans*) and clubroot (*Plasmodiophora brassicae*). The prevalence and percent severity (percent of area covered with lesions) (Conn et al. 1990) of Alternaria pod spot (*Alternaria* spp.) were also determined.

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

Sclerotinia stem rot: Each plant was scored based on the possible impact of infection on yield using a disease severity scale of 0 (no symptoms) to 5 (main stem lesion with potential effects on seed formation and filling of entire plant) (Kutcher and Wolf, 2006).

Blackleg: Lesions that occurred on the upper portions of the stem were assessed separately from basal stem cankers. Stem lesions were recorded as present or absent. Basal stem cankers were scored using a disease severity scale based on area of diseased tissue in the cross-section of the stem where 0 = no diseased tissue visible in the cross section and 5 = diseased tissue occupied 100% of cross section with plant dead (WCC/RRC, 2009).

Alternaria pod spot: prevalence and percent severity (PS) determined.

When diseases were observed in the crop, but not in the surveyed area, they were recorded as "trace" and counted as 0.1%. In addition to the visual assessments, approximately 60, 79, and 70 soil samples were collected from fields in 2009, 2010 and 2011, respectively for DNA analysis (Cao et al. 2007) to test for the presence of clubroot.

Table 1. Diseases observed in Manitoba canola crops (2009-2011).

Year		Sclerotinia Stem Rot	Blackleg		Aster Yellows	Fusarium wilt	Clubroot	Alternaria Pod Spot
			Stem Lesion	Basal Canker				
2011	%Prevalence	45	64	69	18	9	0	21
	Mean Incidence	5	7	9	<1	1	0	1(PS)
2010	%Prevalence	88	66	58	14	3	0	64
	Mean Incidence	31	11	13	2	2	0	2 (PS)
2009	%Prevalence	91	56	55	15	4	0	40
	Mean Incidence	18	4	4	<1	<1	0	<1 (PS)

Results and Discussion

Sclerotinia and blackleg were the most prevalent diseases observed in the survey and therefore will be discussed here. Data on other diseases are reported in Table 1.

Sclerotinia: On average, 45% of canola fields had sclerotinia in 2011, versus >85% in both 2009 and 2010 (Table 1). Reduction in incidence is most likely due to the hot and dry conditions in July and August of 2011. In 2012, if cooler weather occurs during flowering and the canopy remains damp from rainfall or heavy dew, sclerotinia risk may increase. Assessment of crops for disease risk should based on the weather, crop stage and history of sclerotinia in past canola crops.

Blackleg: Lesions located at the base of the plant and on the stem were found in as many or more fields in 2011. The presence of this disease is mostly related to previous infection and crop rotation. If blackleg is present and canola is grown every other year, potential for disease incidence increases, which may result in yield reductions. Choosing an 'R' rated canola variety and lengthening canola rotations to 1 in 3 years or 1 in 4 years are the most effective ways of controlling the blackleg and potentially reducing the amount of over-wintering spores in your field.

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