

Pest Survey Results from 2018

Pest surveys are important for identifying new pests and monitoring existing ones to allow growers and agronomists to make informed decisions. Surveys are also used to provide samples for current research projects. In 2018 there were six formal surveys as outlined below including disease levels on seed, Phytophthora stem rot, Ascochyta blight in chickpeas, foliar diseases in faba beans, lentil foliar diseases, and root rots in peas and lentils.

Disease Levels on Seed

Disease levels on seed from four seed test labs are documented on an annual basis to help identify seed quality concerns for planting the following year, as well as to identify trends or concerns with seed quality over the long term. The reports are published in Canadian Plant Disease Survey Journal and available to use as reference material when looking to source seed. In years with higher disease pressure, the results can be used to identify areas in the province where higher seed quality may be found.

Initial results from 2018 harvested seed will be available in January.

Seed quality varies by year due to environmental conditions at the time of harvest and disease pressure during the growing season. Samples from the 2017 growing season had a high level of disease-free samples compared to the previous four years where higher disease levels were found on seed.

Thank you to the labs that participated in this survey: 20/20 Seed Labs Inc., Prairie Diagnostic Seed Lab, Discovery Seed Labs Ltd., and Lendon Seed Lab.

Phytophthora Stem Rot

With Phytophthora stem rot in soybeans there was one out of 15 suspect samples that were positive for Phytophthora root rot from 20 field samples submitted in 2018 to Dr. McLaren's lab at Agriculture and Agri-Food Canada (AAFC) Brandon. Further race identification will occur over winter. From this survey we know that Phytophthora is present in Saskatchewan at low levels and is a disease growers should continue to watch for. In higher risk situations where more soybeans have been grown in rotations, growers can consider varieties with improved resistance to this disease and use seed treatments registered for control of Phytophthora.

Table 1 Summary of Disease Levels on Pulse Seed Samples Tested from 2013 to 2017 in Saskatchewan

Five-Year Provincial Summary											
Crop	Pathogen	2017		2016 ¹		2015 ¹		2014 ¹		2013 ¹	
		% PFS ²	Mean % ³	% PFS	Mean %	% PFS	Mean %	% PFS	Mean %	% PFS	Mean %
Lentil	<i>A. lentis</i>	98.1	0.9	97.8	0.4	98.5	0.1	99	0.01	96	nd ⁴
	<i>C. lentis</i>	95.1	0.7	60.4	0.8	72.4	1.0	78	0.2	88	>0.1
	<i>Botrytis</i> spp.	90.3	1.1	14.8	3.3	54.8	1.8	45	nd	65	nd
	<i>S. sclerotiorum</i>	95.4	0.8	33.3	1.0	90.3	0.4	49	0.5	65	nd
Pea	<i>Ascochyta</i> spp.	66.0	1.6	8.4	5.4	36.5	2.4	4	6.8	28	2.0
	<i>Botrytis</i> spp.	93.3	0.6	61.1	0.9	74.8	1.6	84	0.1	73	nd
	<i>S. sclerotiorum</i>	98.5	0.4	78.3	0.7	90.6	0.3	85	0.1	95	nd
Chickpea	<i>A. rabiei</i>	97.2	0.6	65.6	4.7	40	4.1	nd	0 - 2.8	60	nd
	<i>Botrytis</i> spp.	100	0	37.0	8.4	42.4	3.77	nd	0.2	39	nd
	<i>S. sclerotiorum</i>	100	0	74.1	2.0	83.3	0.5	nd	0 - 1.3	75	0.5

¹ 2016 (Olsen et al. 2019a); 2015 (Olsen et al. 2019b); 2014 (Morrall and Carriere 2015); 2013 (Morrall et al. 2014).

² %PFS = per cent pathogen-free

³ Mean % = mean per cent infection

⁴ nd = no data



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Figure 1. Phytophthora root rot on soybeans.
Source: Dr. McLaren, AAFC Brandon

Faba Bean Foliar Disease Survey

All of the leaf samples submitted to Dr. Syama Chatterton, at AAFC Lethbridge, from faba bean fields in Saskatchewan and Alberta, had foliar disease symptoms in 2018 at mid- to-late podding stages. However, disease severity was very low across all fields, and was found to be most severe lower in the canopy, compared to the upper part of the plant. Three types of lesions were found in the faba bean samples:

- **Flecked or small** discrete reddish lesions that are characteristic of the non-aggressive phase of chocolate spot caused by *Botrytis fabae*
- **Medium-size lesions** that have a necrotic area in the middle where *Stemphylium* spp. were frequently isolated
- **Large necrotic** or blackened areas on the leaf surface

Alternaria spp. were isolated from almost all types of lesions, but commonly isolated from large necrotic lesions because it is often present with other fungi, particularly *Botrytis* or *Stemphylium*. It is suggested that *Alternaria* likely acts as a secondary pathogen or saprophyte on lesions caused by more pathogenic species. *Fusarium* spp. was isolated with less frequency as compared to previous years.

Results from this survey increases our knowledge on faba bean foliar diseases and helps agronomists and growers with better identification of pathogens involved to assist with management strategies. It also demonstrates the need for further research to evaluate the impact of the various pathogens or potential pathogens alone, and in combination, on yields of faba beans.



Figures 2 and 3. Lesion types found in faba bean samples.
Left: Flecked or small, discrete reddish lesions.
Right: Medium-size lesions that have a necrotic area.
Source: Dr. Chatterton, AAFC Lethbridge

Table 2. Foliar Fungi Isolated from 2018 Faba Bean Survey

Fungal Genera	% of Total Fungi
<i>Alternaria</i> spp.	54.5
<i>Ascochyta</i> spp.	-
<i>Botrytis</i> spp.	7.8
<i>Cladosporium</i>	6.0
<i>Colletotrichum</i> spp.	0.1
<i>Epicoccum</i>	1.6
<i>Fusarium</i> spp.	2.6
Other Saprophytes	54.5
<i>Stemphylium</i> spp.	21.0
Unidentified	6.5

*Saskatchewan (16 fields) and Alberta (9 fields).
Source: Dr. Chatterton, AAFC Lethbridge

Figure 4. Large necrotic or blackened areas on the faba bean leaf surface.

Source: Dr. Chatterton, AAFC Lethbridge



Chickpea Ascochyta Survey

The level of fungicide resistance in *Ascochyta rabiei* of chickpea was evaluated in 2018 from a survey of Southern Saskatchewan. Chickpea samples (leaves, stems, pods, and/or seeds) showing Ascochyta infection were submitted to Dr. Hubbard with AAFC at Swift Current. *Ascochyta rabiei* was confirmed as present in the sample and then evaluated through PCR for strobilurin resistance. To date all six samples analyzed are confirmed resistant to strobilurin fungicides. These results indicate that in Saskatchewan there may be a high level of strobilurin resistance in chickpea Ascochyta, which means fungicide plans need to be re-evaluated to ensure alternative modes of action are being used. Results from the limited samples from 2018 indicate that strobilurin fungicides may no longer provide effective control of Ascochyta in chickpeas. A larger survey is being planned for 2019, so please watch for opportunities to participate.

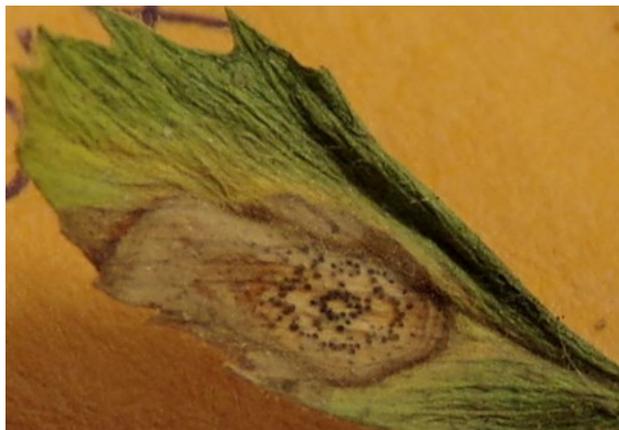


Figure 5. Ascochyta lesion on chickpea leaf.
Source: Michelle Hubbard, AAFC Swift Current

Lentil Foliar Diseases

Dr. Barb Ziesman with the Saskatchewan Ministry of Agriculture (SMA) presented results from the lentil disease survey in Saskatchewan at the Western Forum of Pest Management Meeting in October. A total of 70 lentil fields were evaluated from mid-July to mid-August for presence of foliar diseases and root rot symptoms. During the survey, approximately 44 per cent of the lentils were reported as good to very good in terms of crop health. Environmental stress, including moisture and heat stress, was noted in 24 and 20 per cent of the surveyed fields, respectively. Anthracnose was the most prevalent disease in 2018 across the province, particularly in southwest Saskatchewan. Drier conditions across the lentil growing regions resulted in low incidence of Botrytis, Sclerotinia, and Stemphylium.

Pea and Lentil Root Rots

Dr. Chatterton, AAFC Lethbridge submitted results on the pea root rot samples collected from Saskatchewan in 2018. All of the 25 pea fields had root rots present, and severity ranged from 1 to 6.6 on a scale of 1 to 7, with 7 being the worst. Visual symptoms were consistent primarily with *Fusarium* spp. and/or *Aphanomyces euteiches*. Further DNA analysis will be performed during the winter months to confirm pathogens present.

Lentils had a slightly lower incidence of root rot as SMA's lentil survey identified root rot symptoms visually in just over half (57 per cent) of the 70 fields surveyed. The lower incidence could be related to the drier conditions in the lentil growing regions where the samples were obtained, compared to the pea growing areas of the province.

