

2020 Pulse Pest Survey Results

February, 2021

Surveys of pests in pulse crops are important for monitoring for new diseases and insects, as well as to follow the severity of pests over time. In 2020 pulse crops were surveyed across Saskatchewan for foliar and root diseases as well as insects in crop. A seed quality survey of commercial seed test labs was also initiated to evaluate diseases on seed samples from the 2020 production year.

Disease Surveys

Disease assessments were made by visually examining plants from predetermined sampling patterns within each field. It is important to note that diagnosis of foliar disease was only based on visual symptoms in the field and no lab confirmation was carried out (except where noted).

Incidence is calculated as the percentage of the total number of plants assessed that have symptoms of the disease. For example – 76 out of 100 plants or 76% incidence within a field which is then averaged over the fields evaluated in each region.

Prevalence is a measure of the presence or absence of the disease in the field and is expressed based on the percentage of fields positive for that symptom. For example – Anthracnose symptoms are found in 31 out of the 36 lentil fields which equates to 86.1% prevalence.

Lentils

A total of 68 lentil fields in Saskatchewan were surveyed between July 23 and August 13 which correlated with the R1 (early bloom, one open flower at any node) to R8 (90% of pods are golden-brown) stages. Results are presented in Tables 1 and 2.

Table 1. Prevalence of Disease in Saskatchewan Lentil Crops Surveyed in 2020

| Region ¹ | Number of Fields Surveyed | Percent Prevalence (Number of Fields with Symptoms) | | | | | |
|---------------------|---------------------------|---|------------------|------------------|------------------------------|---------------------------|--------------------|
| | | Root Rot Complex | Anthracnose | Ascochyta Blight | Sclerotinia Stem and Pod Rot | Botrytis Stem and Pod Rot | Stemphylium Blight |
| SW | 36 | 63.9 (23) | 86.1 (31) | 83.3 (30) | 16.7 (6) | 5.6 (2) | 72.2 (26) |
| SE | 9 | 100.0 (9) | 66.7 (6) | 77.8 (7) | 11.1 (1) | 44.4 (4) | 77.8 (7) |
| EC | 5 | 60.0 (3) | 100.0 (5) | 20.0 (1) | 40.0 (2) | 0.0 (0) | 0.0 (0) |
| WC | 16 | 81.3 (13) | 81.3 (13) | 68.8 (11) | 18.8 (3) | 0.0 (0) | 81.3 (13) |
| NW | 2 | 0.0 (0) | 100.0 (2) | 0.0 (0) | 50.0 (1) | 0.0 (0) | 100.0 (2) |
| Overall | 68 | 70.6 (48) | 83.8 (57) | 72.1 (49) | 19.1 (13) | 8.8 (6) | 70.6 (48) |

¹Region: SW – southwest, SE – southeast, EC – east central, WC – west central, NW – northwest

Source: Saskatchewan Pulse Disease Situation Report 2020 submitted to Western Forum on Pest Management by Alireza Akhavan from Saskatchewan Ministry of Agriculture

Table 2. Disease Incidence in Saskatchewan Lentil Crops Surveyed in 2020

| Region ¹ | Incidence of Disease (%) (Incidence in Only Infected Fields) ² | | | | |
|---------------------|---|------------------|------------------------------|---------------------------|--------------------|
| | Anthracnose | Ascochyta Blight | Sclerotinia Stem and Pod Rot | Botrytis Stem and Pod Rot | Stemphylium Blight |
| SW | 43.8 (50.8) | 20.2 (24.2) | 1.4 (8.2) | 0.3 (5) | 7.6 (10.5) |
| SE | 39.8 (59.7) | 14.6 (18.7) | 0.2 (2.0) | 10.9 (24.5) | 8.1 (10.4) |
| EC | 35.6 (35.6) | 0.2 (1.0) | 0.8 (2.0) | 0.0 (0) | 0.0 (0) |
| WC | 56.3 (69.2) | 4.5 (6.5) | 0.3 (1.7) | 0.0 (0) | 25.6 (31.5) |

| | | | | | |
|---------|-------------|-------------|-----------|------------|-------------|
| NW | 2.5 (2.5) | 0.0 (0) | 18.5 (37) | 0.0 (0) | 19.0 (19.0) |
| Overall | 44.4 (52.9) | 13.7 (19.0) | 1.4 (7.5) | 1.6 (18.0) | 11.7 (16.5) |

¹Region: SW – southwest, SE – southeast, EC – east central, WC – west central, NW – northwest

²Average incidence of disease for all crops surveyed (disease incidence averaged across only fields with disease symptoms)

Source: Saskatchewan Pulse Disease Situation Report 2020 submitted to Western Forum on Pest Management by Alireza Akhavan from Saskatchewan Ministry of Agriculture

Anthraxnose (*Colletotrichum lentis*) was the most prevalent disease in 2020 and was identified in 83.8% of the surveyed fields with an overall average incidence of 44.4%. Incidence was highest in the west central (56.3%) followed by southwest (43.8%) regions of Saskatchewan. The next foliar disease in lentils was Ascochyta blight (*Ascochyta lentis*) which was observed in 72.1% of surveyed fields with an average incidence of 13.7% (Tables 1 and 2). Across the regions the prevalence ranged from 0% (in the northwest where only two fields were surveyed) to 83.3% (southwest), while the average incidence ranged from 0% in the northwest to 20.2% in the southwest. Stemphylium blight (*Stemphylium* spp.) was observed in 70.6% of fields with an average incidence of 11.7%. Across the regions the prevalence of Stemphylium blight ranged from 0% (east central) to 100% (northwest where only two fields were surveyed) of surveyed crops.

The levels of other foliar diseases were relatively low across all regions. Sclerotinia stem and pod rot (*Sclerotinia sclerotiorum*) was observed in 19.1% of fields with an average incidence of 1.4% (Tables 1 and 2). Several surveyors reported Sclerotinia stem rot being visible, but with atypical symptoms. Symptoms were not confirmed at the lab, but were suspected to be a secondary infection of Sclerotinia stem rot. Symptoms of Botrytis stem and pod rot (*Botrytis cinerea*) were also observed in 8.8% of fields with an average incidence of 1.6% (Tables 1 and 2).

Root rot complex (*Fusarium* spp./*Pythium* spp./*Rhizoctonia solani*/ *Aphanomyces euteiches*) symptoms were present in 70.6% of the surveyed fields with prevalence ranging from 0% of fields (0 out of the two fields surveyed in the northwest) to 100% of fields (southeast). No further identification of the species involved were completed.

Soybeans

A total of 16 soybean fields were surveyed between August 11 and 25 while crops were between growth stage R3 (beginning pod) to R6 (full seed). The majority of surveyed fields were located in the southeast (13) with three fields surveyed in east central Saskatchewan. Results are presented in Table 3.

The most prevalent disease in Saskatchewan was bacterial blight (*Pseudomonas savastanoi* pv. *glycinea*) which was present in all fields with an average incidence of 41.3% when averaged across all surveyed fields. The average disease severity of infected plants in fields with symptoms present was only 1.8 based on rating scale of 0 (healthy) to 5 (most severely infected).

Symptoms consistent with brown spot (*Septoria glycines*) were also fairly high at a prevalence of 93.8% of surveyed fields with an overall average incidence of 14.3%, and an average severity of infected plants in fields with symptoms present at 1.6. Frog eye leaf spot (*Cercospora sojina*) symptoms were observed in 68.8% of surveyed crops with an overall average incidence of 10.4%.

Other foliar diseases found at lower levels include downy mildew (*Peronospora manshurica*) found in two fields, pod and stem blight (*Diaporthe sojae*) in one field, and iron deficiency chlorosis observed in three of the fields surveyed. Soybean rust (*Phakopsora meibomia* and *P. pachyrhizi*), charcoal rot (*Macrophomina phaseolina*), white mould (*Sclerotinia sclerotiorum*), and Anthracnose (*Colletotrichum* spp.) were not identified in any of the fields surveyed.

Roots with symptoms consistent with Phytophthora root rot (*Phytophthora* spp.) were found outside of the survey area in six fields in southeast Saskatchewan and were submitted to Dr. Debra McLaren with Agriculture and Agri-Food Canada for further analysis. Also, symptoms suggesting sudden death syndrome (*Fusarium virguliforme*) were observed in three crops, but no lab confirmation was obtained.

Table 3. Prevalence, Incidence, and Severity of Bacterial Blight, Brown Spot, and Downy Mildew in Saskatchewan Soybean Fields in 2020

| Disease | Prevalence (%) ¹ | Average Incidence (%) ² | Average Incidence in Only Infected Fields (%) ³ | Average Severity ^{4, 5} |
|--------------------|-----------------------------|------------------------------------|--|----------------------------------|
| Bacterial Blight | 100 | 41.3 | 41.3 | 1.8 |
| Brown Spot | 93.8 | 14.3 | 15.2 | 1.7 |
| Frog Eye Leaf Spot | 68.8 | 10.4 | 15.2 | NA ⁶ |
| Downy Mildew | 12.5 | 2.3 | 18 | 1.1 |

¹ Prevalence = the percent of crops surveyed with symptoms of the disease

² Average incidence of the disease averaged across all surveyed crops

³ Average incidence of the disease averaged across crops with disease symptoms

⁴ Average severity based on 0 to 5 rating scale (0 = healthy; 5 = most severely infected)

⁵ Average severity of infected plants averaged across crops with disease symptoms

⁶ Not Assessed

Source: Saskatchewan Pulse Disease Situation Report 2020 submitted to Western Forum on Pest Management by Alireza Akhavan from Saskatchewan Ministry of Agriculture

Peas

In total, 41 pea fields were surveyed in Saskatchewan in 2020 and results are presented in Tables 4 and 5. The survey was completed between July 6 and 23 with crop growth stage ranging from the first few flowers open on some plants, to fields with pods fully formed and filled.

Root rot complex was present in 100% of the surveyed field pea crops with an average incidence of 61% across the province (Tables 4 and 5). Average disease incidence ranged

from 36% (east central) to 88% (southeast). Disease severity was generally low with an average severity of 2.5 across the province.

Mycosphaerella blight (*Didymella pinodes*) was the most prominent foliar disease present with 100% of surveyed fields showing visual lesions on the leaves. Average incidence was 83% and ranged from 72.9% (southwest) to 93% (west central) with average severity of 2.4 across the province.

Ascochyta foot rot (*Didymella pinodella* and *Phoma medicaginis* f.sp. *pinodella*) was present in 92.7% of surveyed fields and was assessed based on stem lesions. Average incidence was 36.2% and ranged from 16.6% (southwest) to 63.3% (northwest). Severity was generally low with an average of 1.7 across the province.

Sclerotinia white mould (*Sclerotinia sclerotiorum*) was only present in 14.6% of surveyed fields with very low average incidence of 0.9%. White mould symptoms were not present in northeast and southeast Saskatchewan.

Symptoms consistent with bacterial blight (*Pseudomonas syringae* pv. *pisi*) were present in 51.2% of crops. Bacterial blight was not observed in northeast Saskatchewan. Presence of this disease may be influenced by crop damage due to adverse weather.

Table 4. Prevalence of Root Rot Complex, Mycosphaerella Blight, Ascochyta Foot Rot, White Mould, and Bacterial Blight in Saskatchewan Field Pea Crops in 2020

| Region ¹ | Number of Fields Surveyed | Percent Prevalence (Number of Fields) | | | | |
|---------------------|---------------------------|---------------------------------------|-----------------------|--------------------|-------------|------------------|
| | | Root Rot Complex | Mycosphaerella Blight | Ascochyta Foot Rot | White Mould | Bacterial Blight |
| SE | 6 | 100 (6) | 100 (6) | 83.3 (5) | 0 | 50 (3) |
| SW | 7 | 100 (7) | 100 (7) | 100 (7) | 14.29 (1) | 42.9 (3) |
| EC | 10 | 100 (10) | 100 (10) | 100 (10) | 20 (2) | 20 (2) |
| WC | 11 | 100 (11) | 100 (11) | 100 (11) | 18.2 (2) | 81.8(9) |
| NE | 3 | 100 (3) | 100 (3) | 33.3 (1) | 0 | 0 |
| NW | 4 | 100 (4) | 100 (4) | 100 (4) | 25 (1) | 100 (4) |
| Province | 41 | 100 (41) | 100 (41) | 92.7 (38) | 14.6 (6) | 51.2 (21) |

¹Region: SE – southeast, SW – southwest, EC – east central WC – west central, NE – north east, NW – northwest

Source: Saskatchewan Pulse Disease Situation Report 2020 submitted to Western Forum on Pest Management by Alireza Akhavan from Saskatchewan Ministry of Agriculture

Table 5. Incidence and Severity of Field Pea Diseases in Saskatchewan in 2020

| Region ¹ | Root Rot Complex | | Mycosphaerella Blight | | Ascochyta Foot Rot | | White Mould | Bacterial Blight |
|---------------------|-----------------------|-------------------------------|-----------------------|-------------------------------|-----------------------|-------------------------------|-----------------------|-----------------------|
| | Average Incidence (%) | Average Severity ² | Average Incidence (%) | Average Severity ² | Average Incidence (%) | Average Severity ² | Average Incidence (%) | Average Incidence (%) |
| SE | 88.0 | 3.1 | 85.8 | 2.4 | 24.5 | 1.3 | 0 | 19.5 |
| SW | 49.4 | 2.2 | 72.9 | 2.2 | 16.6 | 1.2 | 0.1 | 18.1 |
| EC | 36.0 | 1.8 | 80.5 | 2.1 | 28.5 | 1.3 | 3.0 | 1.2 |
| WC | 70.2 | 3.1 | 93.0 | 2.8 | 56.6 | 2.3 | 0.3 | 32.5 |
| NE | 78.3 | 2.4 | 81.7 | 2.2 | 19.7 | 1.3 | 0 | 0 |
| NW | 65.5 | 2.4 | 75.8 | 2.9 | 63.3 | 2.7 | 0.8 | 47.3 |
| Province | 61.0 | 2.5 | 83.0 | 2.4 | 36.2 | 1.7 | 0.9 | 19.6 |

¹Region: SE – southeast, SW – southwest, EC – east central WC – west central, NE – northeast, NW – northwest

² Severity scale based on 1 (no disease) to 7 (severely infected or plant dead) rating scales specific to the diseases evaluated

Source: Saskatchewan Pulse Disease Situation Report 2020 submitted to Western Forum on Pest Management by Alireza Akhavan from Saskatchewan Ministry of Agriculture

Chickpeas

The annual chickpea Ascochyta (*Ascochyta rabiei*) survey included 52 fields across southern Saskatchewan during flowering stages. Visual ratings were assessed in the field and Ascochyta infected tissues were collected and submitted to Dr. Michelle Hubbard, Research Scientist with Agriculture and Agri-Food Canada at Swift Current. Results to date were presented at the Western Forum of Pest Management in October 2020 by Dr. Hubbard. The visual assessments showed a prevalence of 91% of Ascochyta across Saskatchewan chickpea fields. The average provincial severity was fairly low in 2020 at 2.1 (based on 0-9 rating scale where 0 is healthy and 9 is severely infected). The highest severity was found in crop district 3ASW around Assiniboia at 3.5 where there was also a chickpea health issue occurring.

Field histories were obtained on many of the fields and a comparison of the two most popular varieties CDC Leader (19 fields) and CDC Orion (14 fields) did not show any statistical differences in disease severity or prevalence. Fields with intercropped chickpea/flax did show similar prevalence of *Ascochyta* across the fields as the monocropped fields. However, the chickpea/flax fields did have lower disease severity at 1.4 compared to the monocrop fields at 2.1, which suggests there could be a benefit on reducing disease through intercropping.

Chickpea root samples were also collected during the foliar surveys and sent for analysis to Dr. Sabine Banniza at the University of Saskatchewan as part of a research project. Analysis of the samples is still underway but results to-date show that the most common root rot pathogens identified are *Fusarium solani*, *F. redolens*, *Phytophthora*, and *F. avenaceum*.

The plant health issue in chickpeas was identified across southern Saskatchewan in 2020 with similar symptoms as identified in 2019. Samples from 16 fields were analyzed at a commercial lab for the presence of foliar and root pathogens through PCR (DNA) analysis. A summary of the prevalence is shown in Table 6. The presence of the DNA does not mean the plants were severely infected by any of these pathogens but rather that the organisms were present. Various organisms were found in the root tissues supporting the need for more survey work on root rots in chickpeas. There was high prevalence (94%) of *Fusarium redolens* and *Rhizoctonia solani*, followed by *Pseudomonas syringae* (81%), *Fusarium solani* (75%), *Pseudomonas aeruginosa* (69%), and *Phytophthora* spp. (31%).

Foliar analysis showed all samples contained *Ascochyta rabiei* which is not surprising as visually there were lesions present on most plants. The other foliar pathogens detected include *Alternaria alternata* (81%), *Stemphylium botryosum* (81%), *Cladosporium* spp. (63%), and also a lower prevalence of *Botrytis cinera* and *Verticillium albo-atrum*. More work is needed to understand the potential for many of the organisms identified and their ability to affect chickpea health and impact yield.



Figure 1. *Ascochyta* lesions on chickpea leaves.
Source: Saskatchewan Pulse Growers

Table 6. Prevalence of Various Potential Foliar and Root Pathogens from 16 Chickpea Fields as Part of the Chickpea Health Issue Evaluations

| Potential Root Pathogens Detected | % Prevalence | Potential Foliar Pathogens Detected | % Prevalence |
|-----------------------------------|--------------|-------------------------------------|--------------|
| <i>Pseudomonas syringae</i> | 81% | <i>Alternaria alternata</i> | 81% |
| <i>Pseudomonas aeruginosa</i> | 69% | <i>Ascochyta rabiei</i> | 100% |
| <i>Xanthomonas campestris</i> | 6% | <i>Botrytis cinerea</i> | 19% |
| <i>Fusarium oxysporum</i> | 13% | <i>Cladosporium</i> spp. | 63% |
| <i>Fusarium solani</i> | 75% | <i>Stemphylium botryosum</i> | 81% |
| <i>Fusarium redolens</i> | 94% | <i>Verticillium albo-atrum</i> | 13% |
| <i>Rhizoctonia solani</i> | 94% | | |
| <i>Phytophthora</i> spp. | 31% | | |
| <i>Pythium</i> spp. | 6% | | |

Source: Adapted from the Chickpea Plant Health Update 2020

Faba Beans

An informal survey was done to identify and document disease presence in faba bean fields through the submission of leaf samples to Saskatchewan Ministry of Agriculture's Crop Protection Lab, as well as identification of the pathogens through microscopy. There were 17 fields sampled from late June to late August. *Stemphylium* spp. and *Botrytis* spp. were both found in 61% of the total samples submitted. *Alternaria* spp. and *Fusarium* spp. were found in 28% and 6% of the samples submitted.

Diseased leaves in late-June and into July were mainly the large blotches in the bottom of the canopy and all of the samples in July from the northwest and northeast regions of Saskatchewan were identified as having *Stemphylium* spp. present (Figure 1). The samples from the northeast region also had *Botrytis* spp. identified along with *Stemphylium* spp. in 4 out of 6 samples. *Botrytis* spp. (Chocolate spot) and *Alternaria* were the only pathogens identified in seven fields later in the season. Symptoms were small chocolate-like spots covering the whole plant (chocolate spot) and larger dark blotches (*Alternaria*) (Figure 2).

One field was sampled at two different time periods to see the disease progression. That field had *Stemphylium* spp. present in mid-July in the lower part of the canopy but by the end of August the upper canopy was covered in spots and the larger lesions were identified as *Botrytis* spp. and *Alternaria* spp. These findings suggest that in 2020 *Stemphylium* was present earlier and *Botrytis* (chocolate spot) and *Alternaria* came in later in the season with some regional differences noted.



Figure 2. Leaf samples from Edam (left) and Lloydminster (right) taken mid-July confirmed *Stemphylium* spp. by microscopy.

Source: Saskatchewan Pulse Growers



Figure 3. Dried leaf samples from Lashburn taken mid-August showing large lesions (left) confirmed as *Alternaria* spp. and smaller lesions (right) confirmed as *Botrytis* spp. (chocolate spot) by microscopy.

Source: Saskatchewan Pulse Growers

Table 7. Pathogens Detected on Faba Bean Leaf Samples Collected July – August, 2020 from 17 Fields Across Northern Saskatchewan

| Field | Area ¹ | Date Sampled | <i>Stemphylium</i> spp. | <i>Botrytis</i> spp. | <i>Fusarium</i> spp. | <i>Alternaria</i> spp. |
|--------|-------------------|---------------|-------------------------|----------------------|----------------------|------------------------|
| 1 | NW | Mid July | x | | | |
| 2 | NW | Mid July | x | | | |
| 3 | NW | Mid July | x | | | |
| 4 | NW | Mid July | x | | | |
| 5 | NW | Mid July | x | | | |
| 6 | NE | End of July | x | | | |
| 7 | NE | End of July | x | x | x | |
| 8 | NE | End of July | x | | | |
| 9 | NE | End of July | x | x | | |
| 10 | NE | Early-Mid Aug | x | x | | |
| 11 | NE | Early-Mid Aug | x | x | | |
| 12 | NE | Early-Mid Aug | | x | | |
| 13 | NE | Early-Mid Aug | | x | | |
| 1 | NW | Mid Aug | | x | | x |
| 14 | NW | Late Aug | | x | | x |
| 15 | NW | Late Aug | | x | | x |
| 16 | NW | Late Aug | | x | | x |
| 17 | NW | Late Aug | | x | | x |
| Totals | | | 11 | 11 | 1 | 5 |

| Field | Area ¹ | Date Sampled | <i>Stemphylium spp.</i> | <i>Botrytis spp.</i> | <i>Fusarium spp.</i> | <i>Alternaria spp.</i> |
|------------|-------------------|--------------|-------------------------|----------------------|----------------------|------------------------|
| Prevalence | | | 61% | 61% | 6% | 28% |

¹Area: NE – northeast, NW – northwest

Source: Saskatchewan Pulse Growers

Insect Surveys

Various insect surveys were coordinated by Saskatchewan Ministry of Agriculture and results are presented below along with additional comments.

Grasshoppers (various species)

The survey was completed on 1,170 sites throughout the province in August. Preliminary results indicate light populations throughout the province with some exceptions. Heavy populations (15 m²) were detected near Birsay. Populations greater than 10 m² were detected near Birsay and Dinsmore. Moderate counts (5-10 m²) were found in the southwest (in the following rural municipalities: RM 141, RM 19, RM 169, RM 51), southeast (RM 7, RM 98, RM 37), west central (RM 290, RM 351, RM 321, RM 256), and central (RM 225) regions. Two-striped grasshoppers were indicated as dominant in many regions where species identification occurred. Clearwing grasshopper numbers were very high in pasture land (40 m²) in the RM of Laurier (southeast) in late-July. This population was also affecting nearby cereal crops. This grasshopper population and others in the province were experiencing an outbreak of *Entomophthora grylli* that dramatically reduced grasshopper numbers.

Although moderate populations of grasshoppers were found in lentil fields in the south, there were no reports of spraying. There was one occurrence of a large population of clearwing grasshoppers near Laurier that apparently was decimated by *Entomophthora grylli*. There was no apparent damage to the crop. During the lentil disease surveys there were only 4 of the 68 fields where grasshoppers were identified.

Pea Aphids (*Aphididae Acyrthosiphon pisum* (Harr.))

Insect issues were relatively low in lentils for 2020 but reports of aphids in various regions indicated a continuing issue with pea aphids. Lentils, peas, and faba beans are all hosts to pea aphids. Spraying for the control of pea aphids was reported in late-July and early-August on some peas and lentils. During the lentil disease surveys there were 12 out of 68 fields where aphids were present (Table 8).

Continued work on economic thresholds for aphids is ongoing and as-yet unregistered chemistries for both peas and lentils, especially with newer crop varieties, is warranted.

Table 8. Aphids and Grasshoppers in Lentils

| Region ¹ | Fields Sampled | Fields with Aphids | Fields with Grasshoppers |
|---------------------|----------------|--------------------|--------------------------|
| EC | 5 | 0 | 0 |
| NW | 2 | 0 | 0 |
| SE | 9 | 4 | 2 |
| SW | 36 | 8 | 1 |
| WC | 16 | 0 | 1 |
| Total | 68 | 12 | 4 |

¹Region: EC-east central, NW-northwest, SE-southeast, SW-southwest, WC-west central

Source: Saskatchewan Ministry of Agriculture 2020 Disease Survey as reported by Dr. James Tansy

Lygus spp.

Lygus populations were sporadic but present in many fields, particularly late in the season. Survey work led by Dr. Sean Prager from University of Saskatchewan was conducted across 32 fields and showed approximately half (15/32) of fields had lygus bugs present. The most densely infected field had 44 per 10 sweeps with an average of 6.5 per 10 sweeps across all 32 fields. The most densely infected fields were located in central Saskatchewan between Highway 16 and Highway 3.

Pea Leaf Weevil (*Sitona lineatus* (L.))

The survey of pea crops covered most of the growing regions of the province, including north to North Battleford and east to Manitoba. Although faba bean is also a host for pea leaf weevil, the survey was limited to dry peas. There was a late season occurrence of pea leaf weevil in faba beans that was reported. The 2020 survey indicated that numbers continue to be low (Figure 4).

Seed Quality Survey

The interim results of commercial plate tests for seed-borne pathogens of 403 field pea, 439 lentil, and 36 chickpea samples are summarized in Table 9. The number of pathogen-free samples continues to be very high with the exception of Anthracnose on lentil, Ascochyta on pea, and Ascochyta on chickpea. Anthracnose levels on lentils are showing higher levels of infection at an average of 1.1% with a crop district average range of 0.0 to 3.3 (Table 9). Anthracnose is not considered high risk for seed-to-seedling transmission but should be considered when planting infected seed into clean fields as it could be a source of inoculant. Ascochyta levels on seed in chickpeas were also fairly low in 2020 but there were crop districts with numbers higher than the accepted threshold of 0.3%.

The six-year summary of the seed quality survey in Table 10 shows 2020 interim data compared to 2015-2019 full results. For lentils the levels of pathogen-free samples was relatively high with the exception of Anthracnose as mentioned above. Ascochyta infection on pea seed was comparable to other years in terms of the percent disease-free seed and levels of infection, whereas Botrytis and Sclerotinia infection appeared to be lower. With chickpeas the level of infection for Ascochyta was on the lower end in 2020 compared to other years.

Table 9. 2020 Saskatchewan Seed Sample Results by Crop District for Seed-Borne Ascochyta and Anthracnose

| Crop District | Field Peas | | Lentils | | | | Chickpeas | |
|---------------|------------------|-------------------|-----------|------|-------------|------|-----------|------|
| | Ascochyta | | Ascochyta | | Anthracnose | | Ascochyta | |
| | PFS ¹ | Mean ² | PFS | Mean | PFS | Mean | PFS | Mean |
| (%) | | | | | | | | |
| 1A | 44.4 | 0.7 | 100 | 0 | 62.5 | 0.5 | - | - |
| 1B | 85.7 | 0.5 | - | - | - | - | - | - |
| 2A | 28.6 | 1.5 | 100.0 | 0.0 | 57.8 | 1.2 | 50.0 | 0.3 |
| 2B | 64.3 | 0.9 | 100.0 | 0.0 | 87.5 | 1.0 | 100.0 | 0 |
| 3AN | 100.0 | 0.0 | 100.0 | 0.0 | 62.5 | 3.3 | 0.0 | 0.4 |
| 3AS | 33.3 | 2.7 | 100.0 | 0.0 | 66.7 | 2.2 | 53.3 | 1.2 |
| 3BN | 61.5 | 1.3 | 100.0 | 0.0 | 64.9 | 0.6 | 100.0 | 0 |
| 3BS | - | - | 100.0 | 0.0 | 100.0 | 0.0 | - | - |
| 4A | - | - | 100.0 | 0.0 | 100.0 | 0.0 | - | - |
| 4B | 40.0 | 0.7 | 100.0 | 0.0 | 81.3 | 1.0 | 100.0 | 0 |
| 5A | - | - | 100.0 | 0.0 | 100.0 | 0.0 | - | - |
| 5B | 23.9 | 2.2 | - | - | - | - | - | - |
| 6A | 34.2 | 1.4 | 100.0 | 0.0 | 88.9 | 1.0 | 50.0 | 0.3 |
| 6B | 45.1 | 1.8 | 100.0 | 0.0 | 69.1 | 1.3 | 0.0 | 0.3 |
| 7A | 30.0 | 2.0 | 97.5 | 0.4 | 79.7 | 0.4 | 0.0 | 0.5 |

Saskatchewan Pea Leaf Weevil Survey - 2020

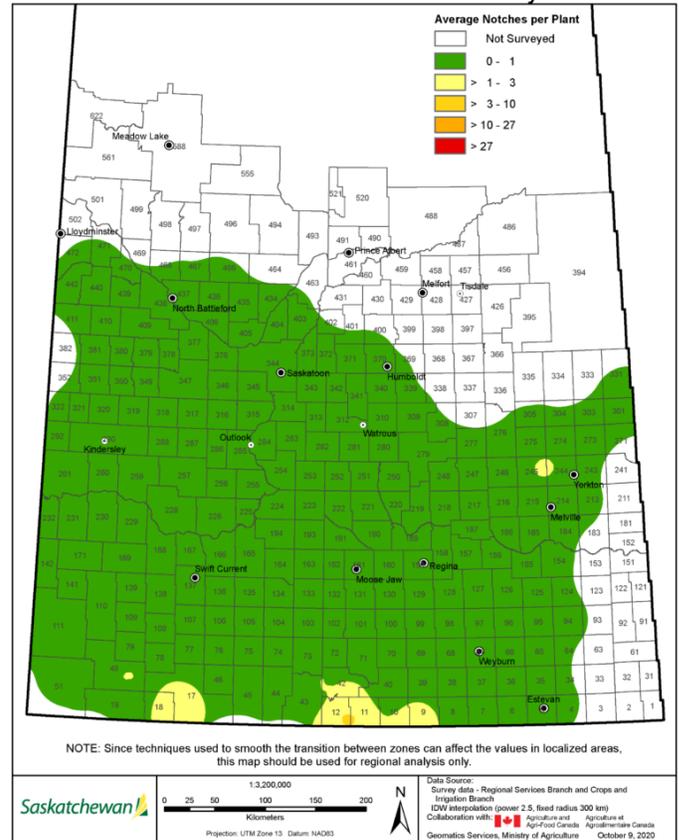


Figure 4. Findings of the 2020 Saskatchewan Pea Leaf Weevil Survey.
Source: [Saskatchewan Ministry of Agriculture](https://www.saskatchewan.ca/agriculture/pea-leaf-weevil)

| | | | | | | | | |
|----------------|------|-----|-------|-----|-------|-----|------|-----|
| 7B | 21.2 | 5.8 | 100.0 | 0.0 | 88.9 | 0.8 | - | - |
| 8A | 18.8 | 2.5 | 100.0 | 0.0 | 100.0 | 0.0 | - | - |
| 8B | 30.6 | 2.0 | 100.0 | 0.0 | 85.7 | 0.3 | - | - |
| 9A | 6.9 | 4.0 | 100.0 | 0.0 | 75.0 | 0.3 | - | - |
| 9B | 7.0 | 6.1 | 100.0 | 0.0 | 100.0 | 0.0 | - | - |
| Average | 31.3 | 3.0 | 99.5 | 0.4 | 73.9 | 1.1 | 55.6 | 0.7 |

¹ PFS – percent of samples that are pathogen free (pathogen-free samples)

² Mean – average infection from non-pathogen free samples

Source of seed quality data for 2020: Prairie Diagnostic Seed Lab, 1105 Railway Ave., Weyburn, SK; 20/20 Seed Labs Inc., 507 – 11th Ave., Nisku, AB; and Discovery Seed Labs Ltd., 450 Melville St., Saskatoon, SK

Table 10. Six-Year Summary of Pulse Seed Samples Tested at Accredited Labs from Seed Grown From 2015-20 in Saskatchewan (2020 data is interim results as of Dec 21, 2020)

| Crop | Pathogen | 2015 | | 2017 | | 2019 | | 2015 | | 2017 | | 2019 | |
|-----------|-------------|------------------|-------------------|------|------|------|------|------|------|------|------|------|------|
| | | PFS ¹ | Mean ² | PFS | Mean |
| | | (%) | | | | | | | | | | | |
| Lentils | Ascochyta | 98.5 | 0.1 | 97.8 | 0.4 | 98.1 | 0.9 | 98 | 0.4 | 95.5 | 0.8 | 99.5 | 0.4 |
| | Anthraxnose | 72.4 | 1 | 60.4 | 0.8 | 95.1 | 0.7 | 94.1 | 0.5 | 89.2 | 0.9 | 73.9 | 1.1 |
| | Botrytis | 54.8 | 1.8 | 14.8 | 3.3 | 90.3 | 1.1 | 96.2 | 1 | 93.2 | 1 | 97.3 | 0.4 |
| | Sclerotinia | 90.3 | 0.4 | 33.3 | 1 | 95.4 | 0.8 | 97.7 | 0.5 | 96 | 0.7 | 96.6 | 0.5 |
| Peas | Ascochyta | 36.5 | 2.4 | 8.4 | 5.4 | 66.4 | 1.6 | 59 | 2.4 | 36.3 | 4.7 | 31.3 | 3 |
| | Botrytis | 74.8 | 1.6 | 61.1 | 0.9 | 93.3 | 0.6 | 99.1 | 0.9 | 93.6 | 1 | 88.5 | 0.8 |
| | Sclerotinia | 90.6 | 0.3 | 78.3 | 0.7 | 98.5 | 0.4 | 99.2 | 0.6 | 99 | 0.6 | 99 | 0.7 |
| Chickpeas | Ascochyta | 40 | 4.1 | 65.6 | 4.7 | 97.2 | 0.6 | 74.9 | 1.2 | 51.3 | 3.2 | 55.6 | 0.7 |
| | Botrytis | 42.4 | 3.8 | 37 | 8.4 | 100 | 0 | 96.3 | 1.1 | 86.6 | 1.9 | 90.9 | 0.5 |
| | Sclerotinia | 83.3 | 0.5 | 74.1 | 2 | 100 | 0 | 98.1 | 2.2 | 89.8 | 0.9 | 97 | 0.3 |

¹ PFS – percent of samples that are pathogen free (pathogen-free samples)

² Mean – average infection from non-pathogen free samples

Source: Saskatchewan Pulse Growers

Acknowledgements

Saskatchewan Pulse Growers would like to thank the many people that helped with the coordination and carrying out of the surveys in 2020 including: Saskatchewan Ministry of Agriculture, Saskatchewan Crop Insurance Corporation, Saskatchewan Association of Rural Municipalities Plant Health Officers, Agriculture and Agri-Food Canada, University of Saskatchewan, and the many industry partners and agronomists. Thank you to those growers who signed up their fields to allow the surveys to be completed.

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