

Flax on the Farm

Disease Survey Results, Harvest and Seed Testing

A. DISEASE SURVEY RESULTS AND HARVEST

- Warm, dry growing conditions are typically not conducive to the development of high levels of disease and this was reflected in the flax disease survey[§] results:
 - All crops surveyed in Manitoba had pasmo but only 54% of the crops in Saskatchewan did. PasmO incidence and severity were at low to moderate levels in most of the flax crops surveyed.
 - Alternaria blight was the second most prevalent disease in the 2018 flax crop and was observed in approximately 70% of the flax fields surveyed in MB and SK with low incidence and severity.
 - A few flax crops showed very low levels of Fusarium wilt, powdery mildew and aster yellows.

- Early harvest conditions were close to ideal, but declined rapidly with cooler temperatures, rain and snow in early September and continuing into October.
 - Seed samples from early harvested crops are predicted to be of high quality and those that have been tested thus far have proven that to be true.
 - Poor mid-harvest conditions meant that a good proportion of the crop was binned at tough (10.1-13.5%) or damp (>13.5%) moisture contents and the levels of blighted seed (i.e. discoloured (dull grey to black), shrivelled, frosted or scabbed in appearance) are likely to be higher than normal.
 - Early predictions from seed testing labs are that storage moulds are likely to be common this year due to the challenging harvest conditions.
 - Seed storage challenges could mean that the supply of high-quality seed in the spring may be limiting.

[§]flax disease survey was conducted by staff of AAFC-Morden, the Saskatchewan Ministry of Agriculture, the Crop Development Centre and the Saskatchewan Flax Development Commission. The results were summarized by Khalid Rashid, AAFC Oilseed Pathologist.

B. SEED TESTING

Seed health directly impacts crop establishment and yield, and therefore seed testing can play an important role in measuring the quality of farm-saved seed and making decisions on the use of seed lots. Crop management decisions are ultimately based on the seed that was planted, so knowing more about its condition upon planting can be cost-saving information.

General

- Numerous tests are available for flax seed (Table 1).
- Most seed testing facilities recommend testing for germination, vigour and disease prior to seeding.
- A minimum of a week's time is typically required to conduct a germination, vigour or disease test.

- Earlier testing of seed quality affords more time to formulate a plan if the quality is poorer than expected (e.g. purchase a seed treatment, locate an alternative seed source, etc.)
- Re-testing of seed in the spring is recommended if the fall results indicated that:
 - Germination was lower than desired
 - The variability between the germination and vigour tests was higher than desired
 - Storage moulds were detected
- Seed testing results are only as good as the sampling procedure used for the seed lot. A good rule of thumb is that a cup of seed should be set aside from every load that goes into a bin to create a sample for that bin.

Table 1. Tests available for flax seed

Test	Description	Comments
Germination	The number of seeds that germinate under ideal conditions (i.e. temperature, moisture, growing media) expressed as a percentage.	Useful information for calculating seeding rate. Will quantify the % normal, % abnormal and % dead seeds.
Vigour	The number of seeds that germinate under less than ideal conditions expressed as a percentage.	Each lab has a slightly different procedure. Often conducted under cool temperatures and called a cold stress test. Will quantify the % vigorous, % non-vigorous and % no growth seeds.
Thousand seed weight (TSW)	The weight of 1000 seeds in grams. Also referred to as thousand kernel weight (TKW).	Useful information for calculating seeding rate.
Moisture	The moisture content of the seed expressed as a percentage.	
Test weight	The weight of a standard volume of seed. Also called bushel weight.	Expressed as kg/hL or g/0.5L. A measure of grain density. Useful information for calculating seeding rate.
Purity	A measure of the physical purity of a seed lot.	An indication of what else besides flax seed is in the sample (i.e. weed seeds and other crop kinds).
Dockage	The quantity of foreign material in a seed lot (e.g. chaff, weed seeds, soil, etc.)	An indication of what else besides flax seed (e.g. chaff, weed seeds, soil, etc.) is in the sample.
Disease	The percentage of seeds with a specific disease-causing organism on them.	Useful information that can influence seed treatment decisions. Seed-borne diseases in flax include: Alternaria blight, anthracnose (<i>Colletotrichum</i> spp.), Fusarium wilt, pasmo, stem break and browning (<i>Polyspora lini</i>).
Triffid*	A test for the presence of CDC Triffid flax (event FP967) in a seed lot.	

*there is no longer a farm stewardship program.

Germination and Vigour

- Percent germination of a seed lot can decrease over time in storage, so if tested in the fall and the results are less than optimal, re-testing again in the spring may be valuable.
- Increasing the seeding rate to compensate for poor germination will not always solve the problem because the reduction in germination could be due to disease instead.
- A vigour test will provide additional information related to the ability of the seed to germinate under challenging conditions and may be especially informative if planning to seed early.
- Heated seeds can often be identified in a germination test as well as those seeds infected with *Alternaria*.

Disease

- Disease testing of seed can indicate the presence of seed-borne diseases, while fungal scans of seed can detect storage moulds.
- The presence of pathogens on the seed often leads to decreased germination and vigour. Disease testing can be done after receiving the results of germination tests or can often be purchased as a package with germination and vigour tests.
- Some labs recommend that if there is more than a 10% difference between the germination and vigour test results, it is a good idea to test for disease.
- Disease testing gives an indication of the disease levels that were present in the field during the growing season. Diseased seed acts as a source of inoculum for this year's crop, so applying a seed treatment can help prevent the spread of disease.
- There are no official recommendations regarding the disease levels on flax seed that require seed treatment, but in general less than 10% diseased seed is preferred for seeding. Different labs may have different recommendations for seed treating or abandoning a seed lot.
- If you have your flax seed tested for disease, talk through the results with your lab because each may have different recommendations for seed treatment based on pathogen levels.

Testing Facilities

- A large number of labs across Western Canada offer seed testing services for flax (Table 2).
- These facilities can be accredited by the CFIA for germination, purity, grading and dockage tests as well as disease identification, and as such, use standardized protocols for these tests.



Don't forget to check on your stored flax seed this month! More frequent monitoring is critical if flax seed was binned when tough (10.1-13.5% moisture) or damp (>13.5% moisture), as it will be more susceptible to heating and deterioration due to storage mould growth. Remember that the size and shape of flax seed makes it very dense in storage so maintaining good airflow is important. Refer to the [August edition of Flax on the Farm](#) for more advice on flax seed storage.

For more information contact the following:

Michelle Beath
Agronomist
Saskatchewan Flax Development Commission
(306) 664-1901
michelle@saskflax.com

Dane Froese
Industry Development Specialist – Oilseeds
Manitoba Agriculture
(204) 750-2840
dane.froese@gov.mb.ca

Matthew Bernard
Provincial Specialist, Oilseed Crops
Saskatchewan Ministry of Agriculture
(306) 787-4668
matthew.bernard@gov.sk.ca

Murray Hartman
Oilseed Specialist
Alberta Agriculture and Forestry
(403) 782-8024
murray.hartman@gov.ab.ca

Useful links:

Seed Smart Alberta: <http://seedprocessors.ca/seed-smart/>

Photos of flax seed quality issues: <https://flaxcouncil.ca/growing-flax/chapters/seed-and-seeding-practices/>

Grain aeration information: <http://grain-aeration.com/?author=1>

Crop storage advice: <http://pami.ca/crops/storage/>

Official grain grading guide: <https://www.grainscanada.gc.ca/oggg-gocg/11-flaxseed-2018-eng.pdf>



Table 2. Flax seed testing facilities in western Canada by province.

Prov.	Company	Contact information				Tests performed									
		Address	Phone	Fax	Email	Germ	Vigor	TSW	Triffid*	Moisture	Test weight	Purity	Grade	Dockage	Disease
AB	20/20 Seed Labs Inc. https://2020seedlabs.ca/	507-11th Ave. Nisku , AB T9E 7N5	1-877-420-2099 780-955-3435	1-888-900-1810	info@2020seedlabs.ca support@2020seedlabs.ca carey@2020seedlabs.ca	✓	✓	✓	✓			✓	✓		upon request
	Precision Seed Testing	Box 210 Beaverlodge , AB T0H 0C0	780-354-2259	780-354-8955	precisionseed@xplornet.com	✓		✓				✓	✓		
	Seed Check Technologies Inc. https://www.seedcheck.net/	101, 5906-50 Street Leduc , AB T9E 0R6	780-980-8324	780-980-8375	info@seedcheck.net morgan@seedcheck.net	✓	✓	✓		✓	✓	✓	✓		Alternaria Fusarium pasmus
	SGS BioVision Seed Research Ltd. https://www.biovision.ca/	#310, 280 Portage Close Sherwood Park , AB T8H 2R6	780-436-8822 1-800-952-5407	780-437-6875	biovision.sherwoodpark@sgs.com	✓	✓	✓	✓	✓	✓	✓	✓	✓	upon request
	SGS BioVision Seed Research Ltd. https://www.biovision.ca/	Unit 106, 10136 128 Ave Grande Prairie, AB T8V 4H3	780-532-8890	780-513-0115	biovision.grandeprairie@sgs.com	✓	✓	✓	✓	✓	✓	✓	✓	✓	upon request
SK	Ag-Seed Laboratory	Box 998 Carrot River , SK S0E 0L0	306-768-3335	306-768-2169	agseedlab@nutrien.com	✓	y					✓			
	BDS Laboratories http://www.bdslabs.com/	Northern Bank Building #13 Qu'Appelle Street P. O. Box 363 Qu'Appelle, SK S0G 4A0	306-699-2679 1-888-237-5227	306-699-7190	bds.laboratories@sasktel.net										Alternaria anthracnose Fusarium
	Discovery Seed Labs Ltd. https://www.seedtesting.com/	450 Melville Street Saskatoon, SK S7J 4M2	306-249-4484	306-249-4434	info@seedtesting.com	✓	✓	✓	✓			✓			Alternaria anthracnose pasmus
	Lendon Seeds Ltd. www.lendonseeds.com	147 Hodsman Rd Regina, SK S4N 5W5	306-585-7333	306-585-7337	test@lendonseeds.com	✓	✓	✓			✓	✓	✓		Alternaria
	Quantum Genetix/Biosciences https://quantumgenetix.com/	HWY 16 & Floral Rd Site 501 Comp 11 RR 5 Station Main Saskatoon, SK S7K 3J8	306-956-2071	306-956-2066	dna@quantumgenetix.com				✓						
	Parkland Laboratories http://parklandlabs.com/	143 – 11th Avenue West Melville, SK S0A 2P0	306-508-0151	306-728-3918	mel.ev@sasktel.net desireeprice76@gmail.com	✓	✓	✓		✓	✓	y			Alternaria Fusarium
	Prairie Diagnostic Seed Lab Inc. http://www.pdsl.net/index.html	1105 Railway Avenue Weyburn , SK S4H 3H5	306-842-7375	306-842-7376	pdsl@sasktel.net	✓	✓	✓			✓	✓	✓		
	Saskatchewan Research Council (SRC) https://www.src.sk.ca/	Biotechnology Laboratories c/o Saskatchewan Research Council 125 - 15 Innovation Boulevard Saskatoon, SK S7N 2X8	306-385-4170	306-933-7446	info@src.sk.ca				✓						
	Seed Solutions Seed Labs Inc. http://www.seedolutionsseedlabs.com/	Box 1420 Swift Current , SK S9H 3G6	306-741-9309	306-773-4460	seedolutions@xplornet.com	✓	✓	✓			✓	✓	✓	✓	Alternaria Fusarium
	SGS Saskatoon	Unit 2, 3327 Lambert Crescent Saskatoon, SK S7K 1K4	306-934-3559		jonathan.brooks@sgs.com				✓	✓	✓	✓	✓	✓	

Table 2. Continued.

Prov.	Company	Address	Phone	Fax	Email	Germ	Vigor	TSW	Triffid*	Moisture	Test weight	Purity	Grade	Dockage	Disease
MB	20/20 Seed Labs Inc. https://2020seedlabs.ca/	3489 Pembina Hwy Winnipeg, MB R3V 1A4	204-261-3755	1-888-900-1810	shari@2020seedlabs.ca	√	√	√	√			√	√		upon request
	Accu-Test Seed Lab http://redsper.ca/accu-test/	Box 579 Rivers, MB R0K 1X0	204-328-5313	204-328-7400	dgerrard@redsper.ca	√	√	√		√	√	√	√	√	
	Integrity Seed Lab Ltd. http://integrityseedlab.com/	8040 Box 17, Grp 210, RR2 Winnipeg, MB R3C 2E6	204-774-1882	204-774-1881	g.green@integrityseedlab.com	√	√	√				√	√		
	SGS BioVision Seed Research Ltd. https://www.biovision.ca/	Unit 2, 25 Scurfield Blvd Winnipeg, MB R3Y 1G4	204-775-6463	204-775-6614	biovision.winnipeg@sgs.com	√	√	√	√	√	√	√	√	√	upon request

*there is no longer a farm stewardship program to subsidize the cost of Triffid testing but testing for it is still recommended to ensure the Canadian flax crop remains Triffid free