



Flax on the Farm

Harvest, Seed Testing and Fall-Applied Herbicides

A. HARVEST

- Harvest conditions early on were favourable and rain has caused only minimal delays in most areas. A good portion of the flax crop has been harvested and the weather forecast for the next month is promising. It is expected that only a small amount of the flax crop will remain unharvested until spring.
 - The hot, dry conditions during flowering and late in the season led to a flax crop with smaller seed.
 - Most flax crops were at an advanced stage when the killing frost of September 8 hit, meaning that frost damage to seed is expected to be limited.
 - Favourable harvest conditions to date, and forecasted into late September, should limit the weathering of seed and produce a crop with significantly improved quality over the 2019 crop.
- Harvest Sample Program
 - The Canadian Grain Commission's annual [Harvest Sample Program](#) generates harvest and export quality data on the Canadian grain crop.
 - Growers who submit samples of flax seed will receive an unofficial grade in addition to the oil and protein content and the iodine value (IV) for the flax seed lot.
 - This process serves to provide quality data that is used to promote the high quality of Canadian grain and to aid in the marketing of Canadian grain.
- Samples will be accepted until November 30, 2020.

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. Refer to the [September edition of Flax on the Farm](#) for a summary of seed testing results for the 2019 flax crop.

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.

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.

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 seed and some labs will also list the number of dormant, fresh and hard seeds. Labs may offer germination tests on treated seed or in soil.
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. Can be used to calculate seeding rate depending on the recommendation of the testing lab.
Tetrazolium chloride	An estimate of the number of viable seeds in a seed lot (i.e. the maximum number of seeds that are capable of producing a seedling).	A rapid germination test with results often available in 1 to 2 days.
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 and for calibrating the seed drill.
Moisture	The moisture content of the seed expressed as a percentage.	Commercial flax seed typically has a moisture content of 10% or less.
Test/bushel 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).
Grade	A measure of seed quality based on purity and germination.	Different than the grading done on grain at the elevator. Seed grades defined by the CFIA.
Dockage	The quantity of foreign material in a seed lot.	An indication of what else besides flax seed is in the sample (e.g. chaff, weed seeds, soil, etc.).
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: <i>Alternaria</i> blight, anthracnose (<i>Colletotrichum</i> spp.), Fusarium wilt (<i>Fusarium oxysporum</i> f. sp. <i>lini</i>), grey mould (<i>Botrytis cinerea</i>), pasmo (<i>Septoria linicola</i>), stem break and browning (<i>Polyspora lini</i>).
Triffid	A test for the presence of CDC Triffid flax (event FP967) in a seed lot.	Check with your buyer before having seed tested as some buyers will only accept test results from certain laboratories.
Herbicide residue	A measure of the concentration (e.g. ppm) of a pesticide in a sample of seed.	Typically tested for by exporters but may be used by producers in years where application timing of desiccants and pre-harvest herbicides was difficult to judge. Quantities of seed required range between 250g to 1kg.

- 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. Some testing labs indicate that vigour results can be directly applied to seeding rate calculations by using as the emergence rate while others suggest that the difference between a germination test result and a vigour test result represents the expected mortality rate in the field.
- Heated seeds can often be identified in a germination test as well as those seeds damaged by frost, chemicals and equipment and those infected with *Alternaria*.



Disease

- Disease testing of seed can indicate the presence of seed-borne diseases, while fungal scans of seed can also 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. If planted, 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.
- If you have your flax seed tested for disease, talk through the results with your lab because each may have different recommendations for seed treating or abandoning a seed lot based on pathogen levels. A common rule of thumb for seed treatment is to do so if the level of disease of a seed lot is 30% or more.

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.



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

Prov.	Company	Contact information			Tests performed											
		Address	Phone	Email	Germ	Vigor	TZ*	TSW	Moisture	Test wt.	Purity	Grade	Dockage	Disease	Triffid	Herbicide Residue
AB	20/20 Seed Labs Inc. ^λ https://2020seedlabs.ca/	507-11th Ave. Nisku , AB T9E 7N5	1-877-420-2099 780-955-3435	info@2020seedlabs.ca support@2020seedlabs.ca carey@2020seedlabs.ca	✓	✓	✓	✓			✓	✓		specific diseases upon request	✓	
	Canadian Grain Commission https://www.grainscanada.gc.ca	14-6130 4th St. SE Calgary AB T2H 2B6	403-292-4211	judy.elias@grainscanada.gc.ca					✓			✓	✓			✓
	Precision Seed Testing	Box 210 Beaverlodge , AB T0H 0C0	780-354-2259	precisionseed@explornet.com	✓			✓			✓	✓				
	Seed Check Technologies Inc. https://www.seedcheck.net/	101, 5906-50 Street Leduc , AB T9E 0R6	780-980-8324 1-866-980-8324	info@seedcheck.net office@seedcheck.net morgan@seedcheck.net	✓	✓	✓	✓	✓	✓	✓	✓		Alternaria, Fusarium, Botrytis anthracnose		
	SGS BioVision Seed Research Ltd. [¶] https://biovision.ca/	Unit 310, 280 Portage Close Sherwood Park , AB T8H 2R6	780-436-8822 1-800-952-5407	biovision.sherwoodpark@sgs.com holly.gelech@sgs.com	✓	✓	✓	✓	✓	✓	✓	✓	✓	Alternaria, Fusarium; fungal scan available	✓	✓
	SGS BioVision Seed Research Ltd. https://biovision.ca/	Unit 106, 10136 128 Ave. Grande Prairie, AB T8V 1E9	780-532-8890 1-877-532-8889	biovision.grandeprairie@sgs.com	✓	✓	✓	✓	✓	✓	✓	✓	✓	Alternaria, Fusarium; fungal scan available	✓	✓
SK	Ag-Seed Laboratory	Box 998 Carrot River , SK S0E 0L0	306-768-3335	agseedlab@nutrien.com	✓	✓					✓					
	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	bds.laboratories@sasktel.net										Alternaria, Fusarium, Botrytis anthracnose		
	Canadian Grain Commission https://www.grainscanada.gc.ca	103-108 Research Dr. Saskatoon, Saskatchewan S7N 3R3	306-975-5714	joey.vanneste@grainscanada.gc.ca					✓			✓	✓			✓
	Canadian Grain Commission https://www.grainscanada.gc.ca	#105-117 3rd St. NE Weyburn SK S4H 0W3	306-848-3350	judy.elias@grainscanada.gc.ca					✓			✓	✓			✓
	Discovery Seed Labs Ltd. [§] https://www.seedtesting.com/	450 Melville Street Saskatoon, SK S7J 4M2	306-249-4484	info@seedtesting.com	✓	✓	✓	✓				✓		Alternaria, anthracnose pasmo	✓	
	Lendon Seed Lab ^λ www.lendonseeds.com	147 Hodsmen Rd. Regina, SK S4N 5W5	306-585-7333	test@lendonseeds.com lendon.seeds@gmail.com	✓	✓		✓			✓	✓	✓	Alternaria		
	Quantum Genetix/Biosciences https://quantumgenetix.com/	HWY 16 E & Floral Rd Site 501 Comp 11 RR 5 Station Main Saskatoon, SK S7K 3J8	306-956-2071	dna@quantumgenetix.com s.james@quantumgenetix.com												✓
	Parkland Laboratories [§] http://parklandlabs.com/	143 – 11th Avenue West Melville, SK S0A 2P0	306-508-0151 306-728-5395	desireeprice76@gmail.com mel.ev@sasktel.net	✓	✓	✓	✓	✓	✓		y		Alternaria, Fusarium		
	Prairie Diagnostic Seed Lab Inc. ^λ http://www.pdsl.net/index.html	1105 Railway Avenue Weyburn , SK S4H 3H5	306-842-7375	pdsi@sasktel.net	✓	✓		✓			✓	✓	✓			
Prairie Diagnostic Services Inc. http://pdsinc.ca/Home.aspx	52 Campus Drive Saskatoon, SK S7N 5B4	306-966-7952 306-966-7316	pds.info@usask.ca karen.moline@pds.usask.ca												✓	



Table 2. Continued

Prov.	Company	Address	Phone	Email	Germ	Vigor	TZ*	TSW	Moisture	Test wt.	Purity	Grade	Dockage	Disease	Triffid	Herbicide Residue
SK	Seed Solutions Seed Labs Inc. ^λ http://www.seedolutionsseedlabs.com/	Box 1420 Swift Current , SK S9H 3G6	306-741-9309 1-866-990-7333	seedolutions@xplornet.com	✓	✓		✓	✓	✓	✓	✓	✓	Alternaria, Fusarium		
	SGS Saskatoon	Unit 2, 3327 Lambert Crescent Saskatoon, SK S7K 1K4	306-934-3559	jonathan.brooks@sgs.com tajinder.grewel@sgs.com					✓	✓	✓	✓	✓	Alternaria, Fusarium; fungal scan available	✓	✓
MB	20/20 Seed Labs Inc. ^λ https://2020seedlabs.ca/	3489 Pembina Hwy Winnipeg, MB R3V 1A4	204-261-3755 1-866-540-7333	shari@2020seedlabs.ca	✓	✓	✓	✓			✓	✓		specific diseases upon request	✓	
	Accu-Test Seed Lab [§] http://redsper.ca/accu-test/	102 2nd Ave. East Box 579 Rivers , MB R0K 1X0	204-328-5313	dgerrard@redsper.ca kcunningham@redsper.ca	✓	✓		✓	✓	✓	✓	✓	✓			
	Canadian Grain Commission https://www.grainscanada.gc.ca	1404-303 Main Street Winnipeg, MB R3C 3G8	204-984-4582	tigst.demeke@grainscanada.gc.ca					✓			✓	✓		✓	
	Integrity Seed Lab Ltd. http://integrityseedlab.com/	8040 Park Royale Way Box 17, Grp 210, RR2 Winnipeg , MB R3C 2E6	204-774-1882	g.green@integrityseedlab.com s.kolthof@integrityseedlab.com j.penner@integrityseedlab.com	✓	✓	✓	✓			✓	✓				
	SGS BioVision Seed Research Ltd. https://biovision.ca/	930, 167 Lombard Ave. Winnipeg, MB R3B 0V3	204-942-8557	biovision.winnipeg@sgs.com	✓	✓	✓	✓	✓	✓	✓	✓	✓	Alternaria, Fusarium; fungal scan available	✓	✓

*tetrazolium chloride

^λCan apply a seed treatment to determine the effect on germination and vigour

[¶]Can apply a nutrient enhancement product to determine effect on germination and vigour

[§]Offer a soil germination test



C. FALL-APPLIED HERBICIDES

- Good weed control is critical for maximizing the yield of your flax crop and pre-seed herbicides can be highly effective. A number of herbicides are registered for post-harvest application prior to seeding flax the following spring (Table 3).

Table 3. Fall applied herbicides available for use prior to seeding flax

Product(s)	Active ingredient(s)	Group	Tank mix partners	Re-cropping interval	Comments
Agri Star Crush'R 540, ClearOut 41 Plus, Co-op Vector 540, Credit 45, Credit Xtreme, Crush'R Plus, Flame Glyphosate 360, Glyforce WDG, Glyphosate 360, Guardsman Glyphosate, IPCO Factor 540, Matrix, MPower Disruptor, MPower Disruptor Glyphosate 540, Roundup Transorb HC Liquid, Roundup WeatherMax with Transorb 2, R/T 540 Liquid, Smoke 41%, Sharda Glyphosate 360, StartUp, Stonewall, Vector, Vector 540, VP480	glyphosate		9 bromoxynil	none	
Amitrol 240	amitrole		11 glyphosate	8 months	
Avadex MicroActiv	triallate		8	none	apply after Oct. 1 when soil is <4°C and 3 wks prior to freeze-up; not recommended on minimum till soils with <2% OM content; if heavy residue present harrowing prior to application recommended; do not apply when crop residue has been burned in the previous 12 months
BlackHawk	2,4-D, pyraflufen-ethyl		4,14	none if applied prior to freeze up	maximum of 2 applications of Blackhawk, GoldWing or Conquer II within a 2 year span
Bonanza 10G, Bonanza 480EC, Rival 10G, Rival EC, Treflan Liquid EC, Treflan MicroActiv	trifluralin		3	none	do not apply if previous crop was treated w a trifluralin product in the previous summer or fall; breakdown slowed by extended dry periods during the year of application and the following spring, more damage tends to occur with granular formulations; do not direct seed (zero till) into standing stubble on land that was treated for the previous crop; cultivation prior to seeding is strongly recommended; low organic matter soils (< 2%) and soils with highly variable texture or organic matter may cause injury to rotational crops; weakened or stressed seedlings are more susceptible to damage from residue so seed flax into a shallow, warm and moist seedbed
Checkmate, Co-op MCPA Ester 600, IPCO MCPA Ester 600, MCPA Ester 600, MPower MCPA Ester 600, Nufarm MCPA Ester 600	MCPA		4	none	
Distinct	dicamba, diflufenzopyr		4,19 glyphosate	30 days	maximum application rate of 115g/ac per season
Eptam Liquid EC	EPTC		8	none	not recommended for use on flax in SK; do not apply to soils with <3% or >15% OM content; harrowing and incorporation required; potential crop injury under stress conditions (i.e. cold wet soils, drought, excessive heat)
Express SG + glyphosate	tribenuron, glyphosate		2,9	2 months	must be applied by Oct. 1; maximum of 15g/ha of tribenuron per year
Fortress MicroActiv	trifluralin, triallate		3,8	none	fall surface applications should be made when average soil temperature at the 5 cm depth is 4°C or less and within 3 weeks of soil freeze up (typically around Oct. 1); if incorporating apply after September 15 and until soil freeze-up; apply to soils in a state of low soil erodibility; surface applications should not be made to fields covered with snow or excessive crop residue
Heat LQ, Heat WG	saflufenacil, glyphosate		9,14	none	
Sword, Target, Tracker XP	dicamba, mecoprop, MCPA		4	none (Sword, Target), 30 days (Tracker)	maximum of 2 applications per year

Compiled from the 2020 AB, SK and MB crop protection guides and product labels. Check product labels for application rates and restrictions (environmental conditions, soil characteristics, adjuvant and surfactant requirements, number of applications, PPE, water volume, re-cropping, weed stages, re-entry periods, buffer zones and incorporation/tillage requirements).



For more information about fall-applied herbicides, harvesting or storing flax contact the following:

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Saskatchewan Ministry of Agriculture
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Useful links:

1. Seed Quality

- [Photos of seed quality issues \(Flax Council of Canada\)](#)
- [Canadian Food Grade Flax \(Flax Council of Canada\)](#)
- [Effect of Frost on Seed Quality \(Saskatchewan Ministry of Agriculture\)](#)
- [Marketing, Grading and Seed Quality of Flax \(Saskatchewan Flax Development Commission\)](#)
- [Seed Smart Alberta](#)

2. Seed Storage

- [Manage Stored Grain \(Canadian Grain Commission\)](#)
- [Grain Storage \(Alberta Agriculture & Forestry\)](#)
- [Grain Storage Considerations \(Alberta Agriculture & Forestry\)](#)
- [Crop Storage \(PAMI\)](#)
- [Grain Drying and Storage \(NDSU\)](#)
- [Drying and Storage of Damp Grain \(Manitoba Agriculture\)](#)
- [The Process of Grain Aeration \(Ron Palmer\)](#)
- [Grain Drying Calculator \(Ron Palmer\)](#)
- [Grain Drying \(NDSU\)](#)
- [Fan Selection for Grain Bins \(University of Minnesota\)](#)
- [Moisture Content of Canadian Grains \(Canadian Grain Commission\)](#)
- [Flax Moisture Meter Conversion Table \(Canadian Grain Commission\)](#)
- [Natural Air Grain Drying \(Saskatchewan Ministry of Agriculture\)](#)

3. Grain Grading

- [Official Grain Grading Guide-Flaxseed Chapter \(Canadian Grain Commission\)](#)
- [Variety Designation List for Canada Western Flaxseed \(Canadian Grain Commission\)](#)
- [Harvest Sample Program information \(Canadian Grain Commission\)](#)

4. Straw Buyers

- [Schweitzer Mauduit \(SWM\)-Winkler, MB](#)
- [Prairie Clean Energy-Regina, SK](#)

5. PMRA Pesticide Product Label Search:

- [Online](#)
- [App](#)

