Flax on the Farm

Marketing, Grading and Seed Quality

A. MARKETING FLAX

Several factors from pre-harvest environmental conditions, to combine settings, to seed storage environment can affect seed quality and consequently the marketing options for flax seed. While the industrial sector continues to be the largest market for flax, the food and feed markets continue to grow.

Market considerations

- Brown seeded flax can enter the food, feed or industrial markets, while yellow seeded flax is predominantly produced for the food market due to its appealing colour.
- Many food flax buyers are looking for very high-quality flax that has tight specifications for visual appearance. Milling quality flax seed typically has low dockage, has uniform seed colour and size, is not damaged or diseased, is shiny and comes from the high end of No. 1 quality seed.
- High dockage and/or heated seed is acceptable for the feed market.
- Higher proportions of dark coloured seeds (e.g. variety, frost, disease, heating) may darken the colour of and increase the bitterness of the oil.

To find a list of flax buyers go to:
SaskFlax: https://saskflax.com/selling/buyers.php
MFGA: http://mfga.ca/farmers-resources/selling-production/
FCC: https://flaxcouncil.ca/suppliers-and-stakeholders/flax-suppliers/

Don't forget to check on your stored flax seed this month! Flax seed will continue to respire after harvest for several weeks and therefore requires regular monitoring of temperature and moisture content at the bottom, middle and top of the bin during the first couple of months to detect the first signs of spoilage (e.g. heating, moisture pockets, insect activity). More frequent monitoring is critical if the seed was binned at higher moisture and/or temperature. Refer to the August edition of Flax on the Farm for more advice on flax seed storage.

B. GRAIN GRADING

- The Canadian Grain Commission (CGC) is responsible for establishing and maintaining Canada's grain grading system, whereas the Canadian Food Inspection Agency (CFIA) is responsible for maintaining the seed grading system.
- Current designated classes of flax are: brown flaxseed (varieties with brown seed coats) and yellow flaxseed (varieties with yellow seed coats). Solin (low linolenic acid flax) is no longer a designated class of flax and there are currently no registered varieties of Solin.
- A grade of No. 1 CW (Canada Western) or No. 2 CW can only be assigned to registered varieties of flax in Canada that appear on the official variety designation list (see link below). The highest grade that grain of an unregistered variety can be assigned is No. 3 CW.

- Grain grading factors are visual characteristics used as indicators of the degree of soundness of a lot of grain. For flax these include: broken seeds, contaminated seeds, damaged seeds, earth pellets, ergot, excreta, fertilizer pellets, fireburnt seed, heated seed, inseparable seeds, odour, other classes of flaxseed, *Sclerotinia sclerotiorum*, soft earth pellets, stones, chemically treated seed and seed with a chemical residue.
- Grain grades are assigned based on an assessment of an official sample for test weight, dockage and the grading factors associated with that commodity. Grades are defined by limits associated with each grading factor, such that the highest grade has the least grading factor issues.

Table 1. Export grade determinants table for flax seed.

Grade name	Total removable material %	Foreign material included in dockage				Brown seeded flax	Yellow seeded flax	Damage		
		Ergot %	Sclerotinia %	Stones %	Total including inseparable seeds %	Yellow seeded flaxseed %	Brown seeded flaxseed %	Broken %	Heated %	Total %
No. 1 CW/CE	2.5	0.05	0.1	0.05	1	2	2	12.5	0.05	12.5
No. 2 CW/CE	2.5	0.05	0.2	0.05	1.5	3	2	25	0.2	25
No. 3 CW/CE	2.5	0.05	0.25	0.05	2	4	2	35	10	No limit within broken and heated tolerances

Adapted from the Canadian Grain Commission Official Grain Grading Guide (https://www.grainscanada.gc.ca/oggg-gocg/11/oggg-gocg-11f-eng.htm).

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 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.

C. SEED QUALITY

Flax seed lots are typically associated with dockage, but several other visual characteristics may also impact the ability to market the seed and the quality of the next flax crop if seeded. Refer to Table 2 for more information on the marketing and agronomy implications of the visual quality of your harvested flax seed.

Table 2. Impact of flax seed quality on marketing and agronomy.

Visual characteristic	Cause(s)	Grading factor?	Marketing impact and remediation	Impact on agronomy	Comments
cracked	improper combine settings, seed very dry when combined		no market impact unless cracks highly visible	seed more prone to microbial attack, may result in oil degradation during storage, may have reduced germination and vigour if planted	large seeded and yellow seeded varieties can be more susceptible, damage not always visible to the naked eye
broken	improper combine settings, seed very dry when combined	√	undesireable for food market but easily removed through cleaning	seed will not germinate because embryo damaged	large seeded and yellow seeded varieties can be more susceptible
split	unknown (environmental conditions?)	√	no market impact	seed more prone to microbial attack, may result in oil degradation during storage, may have reduced germination and vigour if planted	characterized by the rolling back of the seed coat at the narrow end of the seed such that it looks like a fish's mouth, occurs during maturation of seed, typically only a problem with yellow seed in some years
shrivelled	prematurely aborted or ripened or colonized by saprophytic fungi	√	undesireable for food market but easily removed through cleaning	seed will not germinate because embryo not properly formed	often due to drought or disease (rust, pasmo, Fusarium, stem break and browning), commonly colonized by saprophytic fungi
frosted/scabbed/blistered appearance	high moisture conditions at harvest		undesirable for food market, boll tissue may fall off seed once seed begins to dry down in storage, a polisher may be able to remove boll tissue		boll membrane tissue may be attached, rough appearance of seed coat is due to mucilage in seed coat absorbing moisture and causing boll tissue to stick to the seed which removes the shine on the seed coat, no impact on oil quality
grey coloured	Pasmo infection	√	undesirable for the food market, may be able to use colour sorter to remove	may reduce germination and/or vigour or cause seedling blight, boll blight or premature ripening if seeded	
dull black coloured	Alternaria infection	√	undesirable for the food market, can use colour sorter to remove	may reduce germination and/or vigour or cause boll blight or premature ripening if seeded	
moderately shiny black coloured	frost damage to immature seeds	√	undesirable for food market, may produce a darker oil with a more bitter taste, can use a colour sorter to remove	may have reduced germination and vigour if planted or may not germinate at all due to damage to the embryo	immature seeds can be damaged by temperatures of -1°C but are more commonly damaged when temperatures dip below -3 to -5°C. Immature seeds may be green or light yellow or brown in colour and are still soft due to their high moisture content of (>30%).
very shiny dark brown to black coloured	heated during storage	√	undesirable for food market but fine for the feed market in limited quantities, will produce a darker oil with a bitter taste	seed will not germinate when seeded	cotyledons inside the seed have an orange to dark brown colour, and seed may have a heated odour to it
dull seed coat	unknown (genetic?, environmental?)		may not be desirable for the food market, may be able to restore shine by using a polisher		may be due to mucilage in seed coat absorbing moisture
germinated	high moisture conditions at harvest, genetics	√	undesirable for food market	seed will not germinate when seeded	radicle (embryonic root) is visible outside of the seed
bicoloured seeds	unknown (genetic?, environmental?)		undesirable for food market, can use a colour sorter to remove		typically only present in low quantities
brown seeds in a yellow seeded lot	improper cleaning of equipment between different coloured seed lots, off-coloured seeds are damaged yellow seeds, genetics, environment	√	undesirable for food market, can use a colour sorter to remove	if mixture seeded, the amount of off-type seed will increase significantly with every generation of production	a type of admixture
yellow seeds in brown seeded lot	improper cleaning of equipment between different coloured seed lots, off-coloured seeds are immature brown seeds, genetics, environment	√	undesirable for food market, can use a colour sorter to remove	if mixture seeded, the amount of off-type seed will increase significantly with every generation of production	a type of admixture
chaff	improper combine settings	√	low levels suitable for the food market, high dockage seed lots can be used for the crush or feed markets, easily removed through cleaning	chaff may act as a source of inocculum for a number of diseases (e.g. rust, pasmo, Fusarium) if planted with seed	can contribute moisture to seed that was dry when binned
weed seeds	ineffective weed control, herbicide resistant weeds, improper combine settings	√	low levels may be suitable for the food market, high dockage seed lots can be used for the crush or feed markets, some weed seeds are easier to remove through sieving than others	if seed lot planted, will contribute to the weed seedbank	common weed seeds in flax are canola, mustard, cereals, wild buckwheat, cleavers, lady's thumb and wild oats, can contribute moisture to seed that was dry when binned, can be a source of seed storage insect pests

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Useful links:

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

Canadian Grain Commission harvest sample program information: https://www.grainscanada.gc.ca/quality-qualite/hsp-per/hspm-mper-eng.htm

Canadian Grain Commission Variety designation list for Canada Western flaxseed: https://www.grainscanada.gc.ca/legislation-legislation/orders-arretes/variety/2018-28-en.html

Photos of 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/

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