FALL ISSUE 2021

SASKFLAX NEWSLETTER

SaskFlax

CHAIR'S REPORT

Greg Sundquist, Chair

"Farming is a profession of hope." *— Brett Brian*

In farming hope springs eternal. We are always hoping for great prices and exceptional production. A year ago flax could be traded in the $16 a bushel range. By May of this year it was being priced around $25 a bushel. As we wrap up harvest for 2021 flax is trading at $40+ a bushel.

Spring planting started well. Seeded acres for flax was up. Farmers were concerned due to a lack of moisture. A timely rain in late May alleviated some of those concerns. Then it turned dry and almost all of Western Canada experienced one of the worst droughts ever. The estimated flax production in March was 675,000 tonnes for Western Canada. The current estimate is down to 379,000 tonnes. Flax production on our farm was a little better than 10 bushels per acre.

The drought in Canada and Kazakhstan has created a different market for flax compared to a year ago. Logistics are not functioning well and the cost of shipping by sea has increased about 300% since spring. Availability of containers is impacting the ability to move flax to markets. Right now, moving flax into the US market is much easier, but still expensive, compared to overseas markets.

With the easing of COVID restrictions there was a return to some in-person events this past summer. Several field days were held. At the Agri-ARM field days you had the opportunity to see flax trials. Despite the dry conditions, the trials will provide valuable information for the flax breeding program at the Crop Development Centre for new varieties, as well as agronomic information for flax growers.

Flax straw remains a priority for SaskFlax in that we are trying to make flax easier to harvest. Please see the report on the short flax trials. The closure of SWM in Winkler, Manitoba is a loss of the major buyer of flax straw. However, there are new companies, such as Prairie Clean Energy, that may become as significant purchaser of flax straw.

For the past four years SaskFlax has been very fortunate to have Michelle Beaith as SaskFlax agronomist to help answer your questions. She also worked on numerous issues including minor use products, provided guidance on agronomy and variety development – to name a few. SaskFlax thanks Michelle for her contributions over the last four years and wishes her the best in her new position with FP Genetics.

Over the summer SaskFlax collaborated with the Grain Growers of Canada to submit comments about the federal government review of the Grain Act. In Saskatchewan we have been working with a consortium of producer organizations to bring the concerns of farmers about grain contracts, export sales reporting and carbon issues to the provincial government. These topics are important to the provincial government, but at the federal level it is taking more time to see movement because the fall federal election put a hold on many of these issues.

Even though flax production is down this year, that does not mean trade issues have gone away. You will find a report from the Flax Council of Canada in this newsletter describing some of the issues facing the flax trade.

The reduced flax production due to the drought will have an impact on levy income. The SaskFlax Board has been diligent to use the levy to fund research and not continue to increase financial reserves. The Board will be making some difficult funding decisions in the coming months to keep making positive progress on priority items. New activities will need to be put on hold until the budget returns to the positive side of the ledger.

As we head into the new year, it is my hope for all of us that prices remain high and production returns to normal next year. Until the new crop comes off in 2022 this is going to be a very interesting time for flax.

FLAX COUNCIL OF CANADA REPORT

The Flax Council of Canada has been addressing several trade issues in 2021 and preparing for the future.

The European Union proposed limits for cadmium and hydrocyanic acid in flax. The Flax Council of Canada worked with the Government of Canada and EU partners to provide information and support about why the limits are not of concern in flax. Despite this effort, the EU proceeded to implement regulations as of August 30, 2021 for cadmium in flax for food. Canadian flax processors and exporters are striving to manage exports of flax and meet the regulations. The EU has also proposed a limit for hydrocyanic acid, a naturally occurring product in flax. They have received information from Canada and we are waiting for further engagement to discuss the proposed limit.

We are dealing with new food packaging regulations to be implemented by China on January 1, 2022. Other trade issues have been slow to progress in 2021 because of the focus on the pandemic. However, these issues are top of mind for resolution at the Flax Council of Canada.

Looking beyond 2021, the Flax Council of Canada is preparing to take advantage of the opportunities in Canada and around the world. The demand for flax has not decreased during the pandemic. Consumers are becoming more aware of the health benefits of flax and the Council will continue to lead and support efforts to help everyone learn more. The livestock sector is also demanding more flax, both to have healthier animals but also for improved productivity.

In 2021 the Flax Council of Canada made some changes while renewing the membership. The office moved to Saskatoon and is co-located with the Saskatchewan Flax Development Commission. The Board hired Wayne Thompson as Chief Executive Officer. The intention of all the changes has been to create a more streamlined complement of organizations for the flax industry. The connections between the Flax Council of Canada, Manitoba Crop Alliance and Saskatchewan Flax Development Commission will help serve processors, exporters and growers in the long run. With new members joining the Flax Council of Canada, we know the organization will be here to work for the flax value chain for many years to come.

Notice of SaskFlax

ANNUAL GENERAL MEETING

SaskFlax

8:30 am, Tuesday, January 11, 2022 at Prairieland Park, Hall A

The SaskFlax Annual General Meeting (AGM) allows for Directors to report on finances as well as actions undertaken on behalf of grower members in the areas of research, communications and market development. Resolutions will be brought forward for review, discussion and decision.

There is no charge to attend.

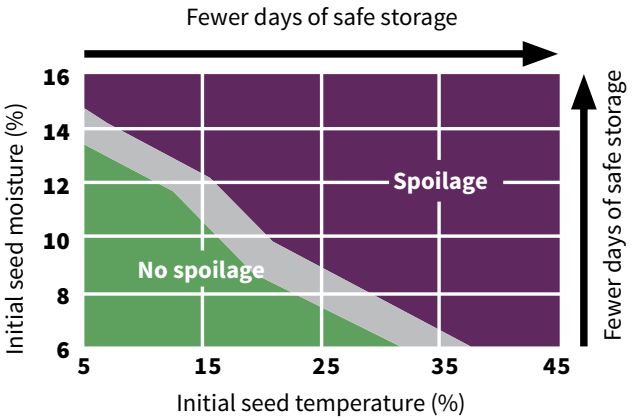
TO REGISTER and for more information, see:
www.saskcrops.com

CONSIDERATIONS FOR STORING FLAX SEED

It's been a tough year, and growers can't afford to lose any seed once it's in the bin. Managing how you store flax is important to keep seed dry and prevent spoilage. Here are a few things to keep in mind this fall.

1 Reference safe storage charts.

Temperature and moisture are important factors that contribute to the risk of stored grain spoilage. Knowing the temperature and moisture content of your flax seed at binning will allow you to determine how long the seed can safely be stored and if additional action such as cooling or drying is necessary to prolong the safe storage window. **The higher the temperature and moisture at the time of binning, the shorter the safe storage period.**



An updated safe storage chart for flax should be available in 2022 thanks to research being conducted at the University of Manitoba.

2 Moisture is bad news for flax seed.

Flax is considered dry when the seed moisture content is less than 10%. If flax is to be stored for long periods of time, the moisture content should be between 8 and 9% to reduce the risk of spoilage and heating. Even dry flax seed is at risk of spoilage due to its high oil content.

When seed moisture is above the safe long term storage level (10% or higher), aeration and natural air can be used to condition flax. It is important to monitor the bin for changes in moisture and temperature by sampling the top, bottom and middle of the bin separately.

3 Bin seed with as little dockage as possible.

The percentage of flax grading Canada #1 is frequently very high, but dockage is often up to 10%. Dockage contains moisture and therefore can increase the moisture content of stored flax. **When possible, dockage should be removed prior to long term storage.**

Another consideration is that insect pests are typically more plentiful in grain that has higher dockage.

4 Airflow is important.

Ventilation of stored flax seed is critical as damp, damaged and sprouted flax seed produces hydrogen cyanide gas.

Due to its size and flat shape, flax seed has strong airflow resistance (static pressure), meaning that a higher air pressure is required to achieve the same airflow rates as other crops. **To ensure good airflow through flax seed bulks, it is important not to overfill bins. Larger fans may also be required.**

Refer to the table below for the target airflow rates required for different grain storage management practices.

Process	% above "dry"	Recommended airflow rate (L/s) m3 (cfm/bu)	Recommended minimum perforated floor area (%)	Transfer for final storage
Aeration	0	1-2 (0.1-0.2)	15%	No
Unheated Air Drying	1-6	5-30 (0.5-3)	100%	No
Dehydration	2-3	5-10 (0.5-1)	40% 100%	Yes No
In-Storage Cooling	1	5-10 (0.5-1)	40%	No

From: Manitoba Agriculture, Food and Rural Development

5 Flax is prone to heating in storage.

Stored flax requires more attention than does other crops like wheat. Freshly harvested seed can maintain a high respiration rate for up to six weeks before becoming dormant. This, coupled with mould growth if the relative humidity of the air in the spaces between the seeds rises above 70%, can lead to heating.

Once flax starts heating in a pocket, the heat will spread quickly – possibly throughout the entire bin. For this reason, flax seed should be cooled down after it is put into storage. **Aeration of the seed immediately after binning or drying is recommended to begin the cooling process.**

Check your bin bi-weekly during the fall and spring, and at least monthly over the winter.

For more information on flax storage, see https://flaxcouncil.ca/tips_article/flax-management-tips-flax-harvest-storage/

2021 CURRENT & UPCOMING FLAX VARIETIES

				YIELD							
				MB	SK Area 1&2	SK Area 3 South	SK Area 3&4 North	SK Irrigation	AB		
Variety*	Year of registration	Distributor	Certified seed status	bu/ac	% CDC Bethune	% CDC Bethune	% CDC Bethune	% CDC Bethune	% CDC Bethune	Days to maturity (+/- CDC Bethune)	Lodging resistance ratingµ
AAC Bright **New in 2019**	2017	SeCan Association	currently available	34	98	91	95	-	95	+2	G
CDC Dorado **New in 2019**	2017	SeedNet Inc.	currently available	32	91	93	92	-	94	-1	FG
AC Nugget	2015	Springfield Mills Inc.	limited availability	-	-	-	-	-	-	-	-
Omega	2015	Corbo Agro Ltd.	limited availability	-	-	-	-	-	-	-	-
VT50	2009	Nutrien Ag Solutions	currently available	34	100	102	99	93	103	+4	VG
CDC Rowland **New in 2022**	2018	SeCan Association	limited availability	37	108	109	108	102	113	+4	G
WestLin 60 **New in 2021**	2016	Nutrien Ag Solutions	limited availability	32	95	95	94	88	100	-1	G
AAC Marvelous **New in 2020**	2017	FP Genetics	currently available	36	101	107	106	101	107	+2	G
AAC Prairie Sunshine **New in 2019**	2016	SeCan Association	very limited availability	34	102	99	103	-	99	+3	VG
CDC Buryu **New in 2019**	2016	SeCan Association	limited availability	34	97	105	100	88	100	+1	G
Topaz **New in 2019**	2016	Alliance Seed Corporation	currently available	33	98	109	102	93	101	0	G
CDC Plava	2015	SeCan Association	currently available	34	99	103	99	90	101	-2	G
WestLin 72	2014	Nutrien Ag Solutions	currently available	34	101	105	103	95	100	+3	VG
CDC Neela	2013	Canterra Seeds Ltd.	currently available	34	105	98	99	92	109	+1	G
AAC Bravo	2012	FP Genetics	currently available	34	103	101	99	93	104	+1	G
CDC Glas	2012	SeCan Association	currently available	36	107	102	105	98	107	+1	G
CDC Sanctuary	2010	SeCan Association	limited availability	35	103	91	94	95	-	+3	G
Prairie Thunder€	2006	Canterra Seeds Ltd.	limited availability	-	93	99	97	99	-	0	G
CDC Sorrel	2005	SeCan Association	currently available	35	96	93	97	96	104	+1	F
Prairie Blue	2003	SeCan Association	limited availability	-	-	-	-	-	-	+1	VG
Lightning§	2001	Canterra Seeds Ltd.	limited availability	34	-	-	-	-	-	+1	G
CDC Bethune	1998	SeCan Association	limited availability	34	100	100	100	100	100	0	G
CDC Kernen (FP2573)	2021	SeCan Association	available in 2023	34	-	-	-	-	-	+1	VG

Other registered flax varieties are: AC Carnduff, AC Emerson€, AC Linora, AC McDuff, AC Watson, CDC Melyn, Hanley€, Macbeth, McGregor, NorLin, Prairie Grande, Prairie Sapphire, Taurus, Vimy, WestLin 70§, WestLin 71¥
Varieties scheduled for de-registration in 2021: AC Carnduff and AC Watson

Agronomic data was compiled from the 2021 Manitoba, Saskatchewan and Alberta seed guides.
Individual varieties are only directly comparable to CDC Bethune because not all varieties were grown in the same field trial in the same year.
**all varieties are immune to flax rust and are moderately resistant (MR) to Fusarium wilt and powdery mildew unless otherwise noted.*
§resistant (R) to powdery mildew
€resistant (R) to Fusarium wilt
¥moderately susceptible (MS) to powdery mildew
µF=fair, FG=fair to good, G=good, VG=very good

DIRECTOR SHARES VALUE OF BOARD EXPERIENCE

Jordon Hillier is a flax grower from Southey, Saskatchewan who is serving his 7th year on the SaskFlax Board of Directors. He farms with his son and grandson growing flax, barley, canola, wheat, peas and oats, as well as raising Angus-cross cattle.

Hillier let his name stand for the SaskFlax board because he believes he can have an impact on the future of agriculture. "Farmers on the boards of grower organizations contribute a great deal to the direction of agriculture in the province. As farmers, we get to provide direct input into where we want to go."

Shaping the future through research

Hillier points to two key issues that made him want to become involved with SaskFlax: flax yields and flax straw. "Flax has low yields compared to crops like wheat and canola – you're lucky if you get 23 bushels to the acre. It's not enough to encourage growers to invest in it. Somehow we need to find a way to increase yield."

"As far as flax straw goes, the only way to get rid of it is to burn it, or bale it for livestock bedding. Burning flax straw is going to be a problem with the environment down the road. It's such a waste – there should be some value as an auxiliary fuel."

Hillier adds, "After the closure of the processing plant in Manitoba, we really need a plant here in Saskatchewan. But there's also the challenge of the distance involved in hauling straw to processors."

"There's potential to develop short straw varieties. Certainly, the flax we grow now is not nearly as tall as the type grown earlier by farmers, but there's still lots of room for improvement. Ideally, breeders could develop a short straw flax that yields well."

The vast majority of SaskFlax levy funds are earmarked for research, much of which is carried out at the Crop Development Centre at the U of S. But SaskFlax is limited in the impact they can have because of a tight budget and limited dollars. "It takes 10 years or more to develop new variety that could have outstanding yield," emphasizes Hillier, "and we have a very small farmer base and thus limited funds."

A valuable commodity

"Although flax is one of the smallest crops grown in the province, it's still a very valuable one," states Hillier. "It fits into a rotation really well, which gives you another option to canola. It's also high value in terms of health. Consumers see the health benefits of flax oil and there's a demand for it."

"Flax has so much potential – the sky's the limit in terms of the health factor. But it's really hard to promote flax when you can't grow a lot – there's only so much you can produce and yields are traditionally lower. We're throwing as much money as we can at research, but we also have only one breeder looking at the whole issue."

Influencing trade

Hillier confirms that SaskFlax has done an admirable job of managing trade issues.

"The board has been on several trade mission through STEP to places like Mexico, Korea, Japan and China. We have to maintain commitment from these customers, but must also be looking at new markets all the time to expand our customer base. And we have to be able to service our own processing industry, while being able to export to other countries."

"You also never know what's going to happen with regulations in other countries in terms of contaminants." An example is the cadmium issue and how much it's affected flax imports.

Giving farmers a voice

Hillier says that he has really enjoyed his time on the SaskFlax board because it's been an opportunity to be part of a team, to work with the other board members and the plant breeder to move flax ahead. "I appreciate talking with people from other parts of the province, from different crop areas and getting different perspectives."

"We are farmers first, elected by farmers," comments Hillier. This gives us creditability and we are well-respected. We have a stake in the game."

"SaskFlax gives flax farmers a voice. Without it, we wouldn't be able to have any influence, or research potential improvements to flax varieties. And we can join with the other commissions to amplify that voice, to make a difference in agriculture in Saskatchewan."

EXOTIC

GERMPLASM BREATHES NEW LIFE INTO THE CANADIAN FLAX BREEDING PROGRAM

This year SaskFlax provided a scholarship to Xinjie Yu, a PhD student in plant science at the University of Saskatchewan who is researching flax genetics. Yu began her research program in January 2021.

Plant domestication is the process of developing wild crops into cultivated crops through artificial selection of traits. The domestication of flax dates back approximately 9,000 years. However, the selection process, typically related to yield, has resulted in genetic bottlenecks because of lack of genetic variation.

The Canadian flax breeding program is attempting to increase genetic diversity through the introduction new germplasm. This is necessary because a pedigree analysis revealed that Canadian flax cultivars shared an average of only 8.8 common ancestors and, therefore, have low genetic diversity. In other words, all current domestic flax cultivars are basically the same.

An ancient crop with new world problems

One of the problems with low genetic diversity is a lack of disease resistance. Pasmo is by far the most common foliar disease of flax that is prevalent in Western Canada. It can cause significant flower and boll loss, which results in reductions in seed size and seed weight thereby reducing yields. Introducing pasmo resistant genes into Canadian flax cultivars will potentially provide new sources of pasmo resistance.

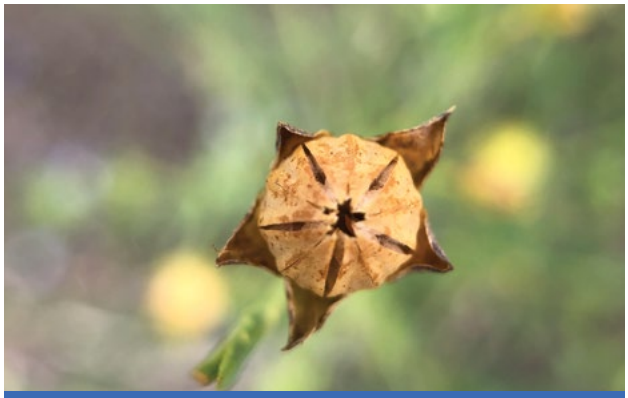
Going wild?

Yu's research is investigating the introduction of genetics from wild crop relatives – including pasmo resistance – to improve genetic diversity and address limitations of currently cultivated varieties. Research will use pale flax *(Linum bienne Mill)*, a wild flax species closely related to today's cultivated flax, to identify genes associated with pasmo resistance.

*"As the wild progenitor of cultivated flax, **L. bienne** is easily crossable and produces fertile offspring with cultivated flax," Yu explains. "It has been observed to have higher resistance to pasmo than other cultivars."*

Yu will be using genetic linkage maps, which map out the tendency of DNA sequences on a chromosome, and quantitative trait locus (QTL) information to find pasmo resistance genes. QTL analysis is a statistical method that links two types of information – phenotypic data (trait measurements) and genotypic data (usually molecular markers) – to explain the genetic basis of variation in complex traits.

Offspring of cultivated flax and pale flax



Dehiscent boll about to lose seeds

Indehiscent bolls

Wild flax has its challenges too.

While wild varieties have the potential to contribute disease resistant genetics, they may also have unfavourable characteristics, such as smaller seeds and seed weight, which result in less yield and lower oil content.

"Another issue," says Yu," is boll dehiscence, commonly referred to as pod shattering, which can contribute to significant yield losses. Boll dehiscence is a trait of wild flax, particularly *L. bienne*, so it will be important to understand how this trait is inherited so that we can breed that out while breeding for pasmo resistance."

Not only does L. bienne offer potential for better resistance to pasmo and powdery mildew than contemporary Canadian flax varieties, its branched structure actually has the potential for improving seed yield by producing more flowers.

Introducing more genetic diversity can be difficult.

Less closely related wild species can provide higher level of genetic diversity than pale flax; however, they also present additional challenges for hybridization.

Previous research concluded that successful crosses were achieved among species with the same chromosome number, yet failed among species with different chromosome numbers. These present barriers to hybridization, such as pollen that cannot germinate on the stigma, low pollen viability and quality, and stigma that cannot grow to reach the ovule of the flower. Yu will be identifying which barriers exist and mechanisms to overcome them.

Crossing species from less closely related gene pools is extremely challenging using known applications, and requires highly sophisticated techniques.

Research has direct benefits for growers.

Wild species give breeders more access to new genes, new combinations and variations. These advanced genetics offer tremendous opportunities for breeding programs to improve traits such as yield. The early conclusion? This research will provide a better understanding of plant genetics and help develop more productive flax cultivars for generations of Saskatchewan flax growers.

SaskFlax Experiment for Short Stature Flax Plant and Harvest

Finding a solution to straw management and eliminating problems for seeding into flax stubble the following spring is important to flax growers.

SaskFlax is working with the Crop Development Centre to look into short flax plants as a possible flax straw management solution by comparing short (10 to 18") flax plants to current varieties. One particular experiment investigated whether or not a flex header could combine short flax. The results were positive because the short flax did not hang up on the flex header. Rather, it fed onto the draper and into the combine without issue. The residue left on the field was either very fine chaff or short enough that it would not be expected to hairpin on seeding equipment the following spring.

SaskFlax will be sharing this information with flax breeders so they may decide if there are ways to develop short flax plants in new varieties. Although the test did show that short flax may be desirable for combining, there are many other considerations, including weed control in shorter flax and if the yield in short flax is equal to or better than current varieties.

SIGN UP FOR SASKFLAX COMMUNICATIONS
including the *Flax on the Farm* agronomy newsletter by entering your e-mail address in the box at the bottom of the SaskFlax website, **www.saskflax.com**.

SaskFlax

SaskFlax was established in 1996 and represents registered flax producers in Saskatchewan. Directed by flax producers, SaskFlax operates via a mandatory but refundable producer levy on flaxseed and straw. These dollars are leveraged whenever possible to execute programs ultimately geared to increase net returns to its producers members and advance Saskatchewan's flax industry.

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