



GLOBAL DEMAND FOR FLAX IS GROWING: WE'LL BE READY

In the past two years, Canada's flax industry has faced major challenges. Lost production due to severe flooding in our predominant flax-producing areas was one. The Triffid event, which caused significant trade disruptions with Europe, one of our largest customers, was another.

When facing these challenges, it can be easy to overlook the fact that Canadian flax as a beneficial food and feed ingredient has been steadily increasing in North America. Over the last decade in North America, the use of flaxseed in breads, bagels and other baked goods has tripled the demand for flaxseed in the food industry. Other niche markets for flax include healthy flax oils, omega-enriched food products (such as eggs) premium pet foods and a growing selection of natural industrial products utilizing flax fiber.

To meet this increasing demand, we need to enhance the competitiveness of flax with improved genetics and agronomy. Flax Council of Canada, Manitoba Flax Growers and Saskatchewan Flax Development Commission, along with government and other industry partners are working together to achieve these improvements through initiatives such as the Herbicide Tolerant Flax project, Northern Adapted flax varieties, Total Utilization Flax GE-Nomics (TUFGEN) and the Natural Fibres for the Green Economy Network (NAFGEN). For all of these, support from government and industry investors has been critical.

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Flax producers, industry and the federal government have pulled together to address the impacts of the Triffid event and have successfully decreased the number and intensity of positive tests. The testing protocol is a short-term solution to regain access to the existing European crusher market. The long term solution is a workable, science-based international policy regarding the low-level presence of genetically modified organisms in exported crops. Such a policy would allow trade to continue without the undue cost and risk associated with testing while at the same time ensuring food safety.

The research community, seed industry and flax organizations have initiated the reconstitution of flax varieties: namely Bethune, Sorrel, Sanctuary and Glas (FP 2300). This is an important step in restoring market confidence and demand for Canadian flax. These reconstituted varieties are scheduled for release in 2014.

Our organizations, in cooperation with producers, government, industry, seed developers and seed companies and other partners, are working to increase competitiveness and market access for Canadian flax to capture the expanding demand for flax in human and animal nutrition and bioindustrial markets globally. Together, we are moving the industry forward. ●

In 2011, some NAFVDP test plots were flowering more than one week before CDC Bethune. Some of the northern lines have white petals instead of blue.



PROMISING RESEARCH ON NORTHERN ADAPTED FLAX VARIETIES

Flax can be a solutions provider for health, environment, the economy and for agriculture itself. This traditional crop is transforming to meet the needs of global consumers and western Canadian producers.

It is well known that flax grown in a cooler climate has higher yield potential, higher oil content, higher levels of Omega-3 fatty acids and other nutrients positively affecting human and animal health. Sustainable agricultural practices involve flax as an important part of the rotation but also as an economically and environmentally viable oilseed crop alternative.

Recognizing these attributes and responding to changing global demand, Viterra and the Saskatchewan Flax Development Commission, together with Alberta Innovates Technology Futures, B.C. Grain Producers and Agriculture and Agri-Food Canada (AAFC) in Melfort, are spearheading this breeding and agronomic program. This comprehensive project is possible through the support of Saskatchewan's Agriculture Development Fund, Western Grains Research Foundation, Manitoba's Agri-Food Research and Development Initiative and AAFC's Canadian Agricultural Adaptation Program, delivered through the Investment Agriculture Foundation of British Columbia, Agriculture and Food Council of Alberta and the Agriculture Council of Saskatchewan.

Project objectives include development of enhanced traits, tolerance to seeding into cold soils and chill tolerance; determinate maturity; and the ability for straw to dry down rapidly. Now into its third year, the Northern Adapted Team is very excited to date with the evidence of good expression of vigour growth and early flowering in the northern strains—as much as a week earlier. Early observations also show that northern varieties exhibit some resilience to drought and to variable weather conditions.

The program continues into its third year under the direction of Viterra's flax Breeder, Dr. Michelle Beath in Saskatoon. "We're proud

Photo courtesy Quantum Genetix Canada

to be involved in this project," says Bruce Harrison, director of research and business development with Viterra. "Just three years in (to the project) we've identified unique germplasm that we're confident will allow us to meet our breeding objectives and we know will ultimately benefit growers."

This is truly a western Canadian initiative, with test plots in Dawson Creek, B.C.; Vegreville, Alberta; Rosthern and Lake Lenore, Saskatchewan and Roblin and Arborg, Manitoba. It's unique in that it has two goals: varieties adapted to northern climates and best management practices for flax production in central and northern prairies. Northern flax traits also provide producers with the option of capturing profit from the straw for the developing natural fibers industry.

For more information, go to www.saskflax.com and click on "Northern Adapted Flax." ●

EFFORTS CONTINUE ON NON-GMO FLAX WITH HERBICIDE TOLERANCE

In 2010, the Flax Council of Canada embarked on an alliance with the company Cibus Global to develop new non-GMO flax varieties that are higher-yielding and have improved weed resistance. The partnership is supported by the Government of Canada.

Non-transgenic herbicide tolerance is a trait that would add immediate value to the Canadian flax crop. In addition, flax is a poor competitor for weeds and few chemical options exist for weed control. Several leading Canadian flax researchers have estimated that herbicide tolerance would provide an option for much-needed weed control, add convenience to the cropping system and could potentially increase yields by 15-20%.

Cibus Global has a non-transgenic technology called the Rapid Trait Development System (RTDS) which can be used to develop value-added traits, including herbicide tolerance for flax. Cibus has already successfully developed and demonstrated the RTDS technology in herbicide-tolerant canola (BASF's Clearfield® canola).



The project is comprised of a multi-step process, including characterization of the glyphosate-tolerant genes in flax, and application of the RTDS technology to promising flax genotypes. Then the trait will be confirmed in greenhouse and field trials before seed multiplication.

Currently, millions of specially cultured individual cells are being selected and screened for the presence of the glyphosate tolerance trait. The next step will be to regenerate a plant from those converted cells. In order to accelerate the introduction of the glyphosate tolerance trait into a wide range of flax germplasm, techniques are being used to make new varieties amenable to the RTDS conversion process.

To enable efficient molecular screening of large numbers of cell samples, Cibus has recently implemented an automated robotic platform capable of screening thousands of samples per day. This platform will also be used as this important herbicide tolerance trait is bred into additional elite varieties, with the initial varieties expected to be commercialized in 5 to 7 years.

Development of this initial trait in flax will enable the more rapid development of additional innovative traits and enhanced germplasm, leading to increased competitiveness and new markets, such as: life-science based products and processes; improved quality for human health, animal health and productivity; and new industrial and fiber products. ●

Non-GMO flax varieties with herbicide tolerance could be available in 5 to 7 years.

FARM STEWARDSHIP PROGRAM ACHIEVING RESULTS

The detection of Triffid, a genetically modified variety, in a Canadian flax shipment to Europe in 2009 triggered immediate market disruptions with Canada's top export destinations. The Canadian flax industry responded immediately to find resolutions to this market access issue, including the Farm Stewardship program.

First, a testing protocol that was agreeable to the EU was established, which involves testing of railcars loading at country elevators and at the time of unload at terminal elevators. Under the terms of the protocol, the Canadian Grain Commission takes samples and forwards them to an approved lab for testing. The lot is declared negative when all four subsamples test negative. Any positive lots are diverted from the EU and Japan markets.

The Canadian flax industry introduced a Farm Stewardship Program that included the testing of flax planting seed and on-farm production. All flaxseed destined for export to the EU requires two test certificates, one confirming that the seed planted has tested negative and the other showing that the resulting flax production has tested negative. Agriculture and Agri-Food Canada (AAFC) provides funding to industry and flax growers for 50% of the cost of testing through the Canadian Agricultural Adaptation Program (CAAP).

Magnetic bead isolation of flaxseed DNA as part of the procedure for Triffid testing in flax.

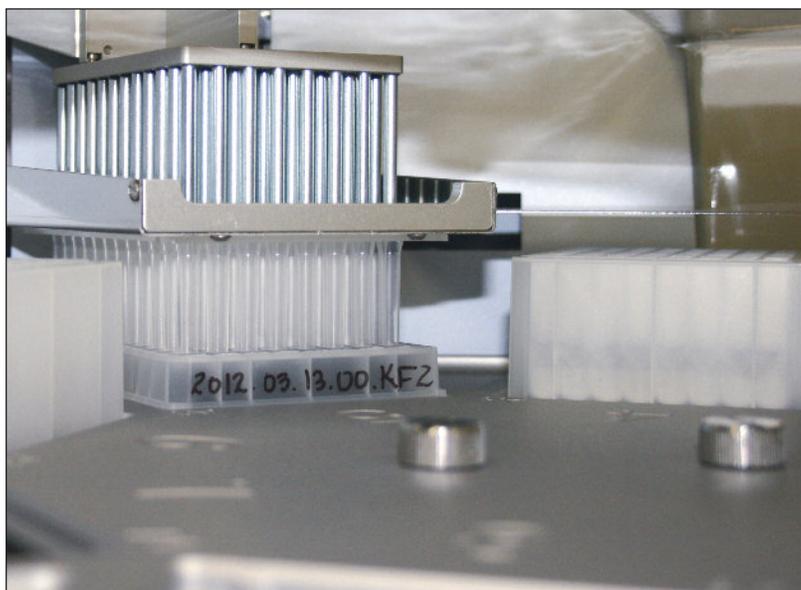


Photo courtesy Quantum Genetix Canada

The industry has identified labs qualified to complete the work and their proficiency is verified by the Canadian Grain Commission. See www.saskflax or www.flaxcouncil.ca for a list of approved labs.

The Flax Council of Canada has tracked the Farm Stewardship Program since it began and reports that 10% of producer stocks tested positive in 2009; 7% in 2010/11 and 3% in 2011/12 to date. Planting seed showed the same downward trend from the initial 14% to the current 3% (year to date). Test results for pedigreed seed stocks have fallen from initial results of 7% positive to zero.

SaskFlax was able to communicate the program and encourage producer participation in Saskatchewan with the help of the CAAP program delivered through Agriculture Council of Saskatchewan.

Canada's flax industry can be proud of its conscientious producers who have continually worked to improve the quality of our flaxseed supply through this voluntary program. Producers are advised to continue testing procedures in order to maintain Canada's reputation as a reliable supplier of quality flax. ●

NEW 'RE-CONSTITUTED' FLAX SEED COMING IN 2014

The Flax Council of Canada, in partnership with Agriculture and Agri-Food Canada, is working to address trade difficulties arising from the 2009 detection of Triffid, a genetically modified flax variety, in shipments to the European Union. The industry has identified that over the short term, the definitive solution to the Triffid issue requires the adoption of a new seed supply.

The Flax Council has partnered with the University of Saskatchewan's Crop Development Centre (CDC) and SeCan, which is the largest supplier of Certified seed to Canadian farmers to create a new seed supply of CDC varieties of flax.

The Crop Development Centre, in conjunction with SeCan, has taken steps to "re-constitute" the breeder seed from the two flax

varieties that are most widely grown and the best-known, CDC Bethune and CDC Sorrel, as well as two new varieties, CDC Sanctuary and CDC Glas (FP 2300). This will help ensure that western Canadian flax growers have access to a Triffid-free seed source of these varieties.

This spring (2012), the CDC and SeCan are overseeing a winter increase in New Zealand to produce the re-constituted flax seed. "Our goal is to bring this material back and release it to SeCan members to multiply in 2012 and 2013, so that by the spring of 2014, flax growers will have a seed source with zero Triffid background as a starting point," explained Todd Hyra, SeCan's Business Manager for western Canada.

In the next two years, seed growers will work through their existing stocks of CDC Sorrel and CDC Bethune and will then dispose of all of remaining stocks before the spring of 2014 when the new re-constituted seed becomes available. "We don't want to have two seed sources of the same varieties in the marketplace at the same time," Hyra points out.

It's likely that the re-constituted seed will be named 'CDC Sorrel 14' and 'CDC Bethune 14' or something similar to represent the year of their release and distinguish it from the previous stock. The seed will be exactly the same varieties, but from the new seed origin.

Growers are encouraged to continue to follow the protocols in the Flax Council's Farm Stewardship Program for 2012 and 2013, and to be prepared to take up the new Certified seed in 2014.

"The whole industry has worked together on this very difficult subject," Hyra says. "It will be nice for the group to put it all behind us and move forward." ●

FLAX COUNCIL OF CANADA EXPANDING FLAX MARKETS

FCC has taken an active role alongside of industry in expanding the knowledge base of global and domestic customers in the areas of human food and health, animal health and productivity, and industrial applications of Canadian flax.

With the support of Agriculture and Agri-Food Canada (AAFC), FCC continues to provide information about issues related to market access as a result of the Triffid event, at various forums in the major markets of the US, China, Japan and Europe while at the same time promoting the numerous benefits of flax for various market segments in the health and food area that are seeing continued growth in demand.

FCC and Glanbia Nutritionals partnered to extensively update our Flax Research Database for Human Health and Nutrition. With scientific evidence about the health benefits of flax and its constituents expanding at a rapid pace, this valuable resource enables the industry; health professionals and the scientific community to keep up with the increasing volume of information (*See www.flaxcouncil.ca*). We are exploring the development of a similar database for animal health publications.

FCC is providing additional support to flax suppliers in the value-added sector through the establishment of the Value Added Committee, the focus of which is to support flax suppliers in addressing both challenges and opportunities in the marketplace.

Very exciting for the flax industry is the submission by the FCC to Health Canada of an application for a health claim relating the consumption of flaxseed to lowered blood cholesterol levels. The submission of the application is itself a significant achievement as it includes over 500 pages of critical review and analysis of scientific evidence. Health claims are an extremely important way to educate consumers about the value of a product and encourage greater consumption. Health claims are very difficult to achieve! Canada currently allows less than ten such claims. If approved, Canada would be the first global jurisdiction to allow a significant health-related claim for flaxseed that can be used on food labels. This makes total sense as flax is Canada's crop and we take great pride in producing and promoting this amazing oilseed! The Food Regulatory Issues Division in the Market and Industry Services Branch was a critical partner in this submission and their support and efforts were invaluable to the FCC. ●

FLAX VARIETY CHANGES

The Canadian Grain Commission advises that the following flaxseed varieties will be deregistered effective August 1, 2013:

CDC Mons CDC Normandy

After August 1, 2013, these varieties will only be eligible for the grade Flaxseed, 3 Canada Western/Canada Eastern. See www.grainscanada.gc.ca for more information.

In February 2012, three new flax varieties have been recommended for registration:

FP 2314

(Crop Development Centre)
Higher yielding, greater seed weight, higher alpha-linolenic acid content, higher iodine values, greater oil yield.

FP 2325

(Viterra)
Higher yielding, higher alpha-linolenic acid content, higher iodine values, strong disease resistance, larger seed size.

FP 2308

(Agriculture and Agri-Food Canada)
Higher yielding, especially in Black and Grey soil zones, larger seed size, immune to rust.

SASKATCHEWAN FLAX DEVELOPMENT COMMISSION LOOKS TO THE FUTURE

The Saskatchewan Flax Development Commission (SaskFlax) has taken a leadership role in industry dialogue, keeping our members and others informed and providing a producer voice to industry-based solutions. Over the past several years, SaskFlax has been instrumental in communicating testing information for the Farm Stewardship Program and has surveyed stakeholders to learn from the Triffid event. Funding for the communication strategy and survey was provided by Agriculture and Agri-Food Canada through the Canadian Agricultural Adaptation Program (CAAP). In Saskatchewan, this program is delivered by the Agriculture Council of Saskatchewan.

SaskFlax, through its membership in the Flax Council of Canada and its relationships with industry and provincial partners, is helping to develop a viable international policy to regulate the low-level presence of genetically modified events in grain and oilseed shipments.

A vibrant, sustainable industry depends on investing in the future. To that end, SaskFlax is teaming up with Viterra and other industry partners to spearhead a project to develop varieties better adapted to the northern Canadian prairies. A larger, more diversified geographical area, combined with determinate traits, will mitigate production supply risk. We're pleased with the progress of the Northern

Adapted Variety Development Program to date and are excited about the opportunities this will lead to in the years to come.

That's not the only SaskFlax investment in the future. In addition, SaskFlax contributes toward research into new agronomic methods and weed control options for flax producers. We continue to support the Total Utilization Flax GENomics (TUFGEN) program to sequence the flax genome and the Flax Council's herbicide tolerant flax variety development project.

In addition to our research commitments, SaskFlax invests grower dollars to facilitate new markets and processing opportunities in Saskatchewan, as well as in communication activities to keep growers informed. Our mandate is to serve growers by promoting growth in farm profitability and the flax industry generally. SaskFlax is but one of Saskatchewan's leading commodity organizations working together for the province's agri-food sector. ●

MFGA INVESTS IN LONG-TERM RESEARCH

2011 was a challenging year for Manitoba producers. Unseeded acres due to excess soil moisture, a wet spring, followed by heat, drought and the ongoing Triffid issue all contributed to a decrease in flax production. Estimates indicate that Manitoba flax acres decreased from 153,000 in 2010 to 78,000 acres in 2011.

Considerable progress is being made in the industry's efforts to eliminate Triffid from the Canadian flax seed supply, as evidenced by the percentage of samples testing positive is decreasing. MFGA congratulates producers for their high level of cooperation in the testing program and encourages producers to make every effort to eliminate Triffid from the handling system.

The voluntary producer check-off on flax continues at the rate of 0.5% of sales. Naturally, a drop in production decreases funds available to MFGA, but the Board continues to responsibly invest producer check-off dollars

Grower organizations invest heavily in varietal research, along with marketing and communications.



Photo courtesy SeCan

in much-needed flax research projects. One of these is the Total Utilization Flax GENomics (TUFGEN) project aimed at mapping the flax genome which will assist breeders in developing higher quality varieties. MFGA also contributes to a joint venture with the Flax Council of Canada and Agriculture and Agri-Food Canada that is developing a non-GMO, herbicide tolerant flax. Most recently, MFGA approved a flax research project designed to increase flax yields through an expanded plot program, screening for traits such as increased plant vigor, resistance to disease and other attributes to improve economic returns to producers. The program will be led by Dr. Scott Duguid of AAFC Morden in consultation with MFGA and Manitoba Agriculture, Food and Rural Initiatives.

In January, the MFGA Board developed a strategic framework with medium and long-term plans for our association. This plan is part of an ongoing process to help guide the Manitoba flax industry. ●

PUBLIC-PRIVATE PARTNERSHIPS KEY TO SUCCESS

Over the last decade, there have been several national and provincial efforts to coordinate research and development in the areas of food, feed and fiber for the flax industry. Flax Canada 2015 was a cooperative initiative of the Governments of Canada, Alberta, Manitoba and Saskatchewan, the Flax Council of Canada, and the Manitoba and Saskatchewan flax grower organizations. It was instrumental in developing and executing a strategy for human and animal nutritional research—outside its traditional role as an industrial oil. Flax Canada 2015 was one of many initiatives that demonstrate how public and private partnerships together equal progress.

Today, public contributions to advance the flax industry cover a broad area, from investments in new flax varieties, to improving current seed stocks to mapping the flax genome and investigating innovative bioproducts. To date, the Government of Canada has invested a com-

Project	Government of Canada
Natural Fibres for the Green Economy Network (NAFGEN)	\$9.6 Million
Total Utilization Flax GENomics (TUFGEN)	\$5.6 Million <i>(plus \$6.1 M from industry)</i>
Herbicide tolerant non-GMO flax varieties	\$3.9 Million
Industry and producer testing for the presence of Triffid	\$5 Million
Northern Adapted Flax Variety Development Program	\$500,000 <i>(plus \$1.4 M from other funders)</i>
Total to date:	\$24.6 Million

bined \$24.6 million. This kind of ongoing support ensures a bright future for our industry.

The Government of Canada has invested almost \$4 million from the Developing Innovative Agri-Products Program (DIAP) for the Flax Council's initiative to develop non-transgenic flax varieties with improved weed resistance. Canadian Agricultural Adaptation Program has invested \$500,000 in the Saskatchewan led Northern Adapted Flax Variety Development project. Testing assistance received from the Canadian Agricultural Adaptation Program related to Triffid has been instrumental to that program's success.

Companies within the flaxseed industry, including the North American crushers and Canadian processors and exporters, have agreed to provide additional support to the Flax Council of Canada by increasing the voluntary levy they pay from \$1.00 per tonne to \$2.00 per tonne for a period of two years beginning April 1, 2012. Recognizing the importance of the non-transgenic herbicide tolerant (HT) flax program to the future of the Canadian flax industry and the important role Canada plays in the international trade of flax, five EU crushing and handling companies with membership in the Flax Council have contributed \$20,000 US each for a total of \$100,000 US to support the Council's efforts and the non-transgenic HT flax project.

The future for flax remains bright. Through technological innovation, research and awareness, agronomic best practices, international recognition of flax attributes to human and animal health and the emerging natural fibers industry, Canada's position as a world leader in oilseed flax will be sustainable. ●



FLAX COUNCIL OF CANADA

The Flax Council of Canada is a broad-based, non-commercial association with a mandate to promote the use of flax and flax products globally. Located in Winnipeg, the Council operates at the hub of Canada's grains and oilseed trade.

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Manitoba Flax Growers Association supports initiatives in production, marketing, extension and research. MFGA works to coordinate and execute programs benefiting flax producers and the industry as a whole, from breeding and research to human and animal health, fiber and other industrial uses for flax. MFGA recently moved offices and now shares space with the Flax Council of Canada.

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SaskFlax

SaskFlax was established in 1996 and represents over 7,600 registered flax producers in Saskatchewan. Directed by flax growers, 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 grower members and advance Saskatchewan's flax industry.

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