

## **Improving Production for New and Growing Markets**

### **Flax Council of Canada**

#### **BACKGROUND AND OBJECTIVES:**

Flax is an important crop for Manitoba. It has high value as a rotation crop providing a break for disease, insect and weed populations. It is a lower input cost crop and is a competitive alternative oilseed crop on a net return basis. Manitoba is home to many small to medium sized food ingredient processing companies and an emerging bio-fibre and bio-industrial sector that relies on a consistent supply of product for their businesses.

Canadian (and Manitoba) flax production and the market have changed significantly since the discovery of seed from the genetically modified flax variety Triffid in the EU in 2009. This event never received approval in the EU and since the discovery of Triffid in Canadian shipments, our imports of Canadian flax into this market have been drastically reduced. Shipments to the food market in the EU are now virtually non-existent. New competitors, in particular from Kazakhstan, Russia and the Ukraine, have entered traditional Canadian markets in the EU and are now competing with Canada as primary suppliers.

Canadian flax exports in 2013/14 are forecast to rise slightly from 2012/13, reaching 515,000 tonnes. This would continue the recovery since the lows of 2011/12 but we are still below the volumes seen prior to the detection in the EU of Triffid in 2009. The EU historically accounted for 65% of Canada's exports, with the bulk of the product being crushed in or shipped through Belgium. This business has been significantly reduced and there is an obvious need to build demand elsewhere.

Flax has not kept pace with yield improvements of most major crops in western Canada (Appendix A - Table 1). Commercial flax yields have increased 0.5% per year for the last 30 years, compared to canola (1.7%/year), corn (2.4%/year) and soy (2.5%/year).

Flax yields in Manitoba (0.38%/year) have increased the least compared to Saskatchewan (0.53%/year) and Alberta (2.27%/year). Average flax yield for the five year period from 2008-2012 was 23.5 bushels/acre- Manitoba, 23.3 bushels/acre-Saskatchewan and 34.3 bushels/acre-Alberta (Appendix A - Table 2).

To address reductions in yield and lost acreage, as well as the loss of the EU as a major export market for Canadian flax, this application has as its focus two important goals:

- 1: Flax Production: Improving Production for the Market
- 2: Flax Market: Support Current Markets and Develop (and grow) New Markets

#### **PROJECT ACTIVITIES:**

##### **Goal 1: Flax Production: Improving Production for the Market**

The genetic potential for flax yield is much higher than the average commercial yields (21 bushels/acre). For example, Seed Manitoba 2014 yield comparison table for flax states that the highest yielding flax cultivar at Rosebank was 76 bushels/acre equivalent. This is corroborated by the 2013 Annual Report of

the Parkland Crop Diversification Foundation (Roblin) where the overall average yield of flax in field trials was 61 bushels/acre with the range being 41 to 73 bushels/acre.

Flax production is also characterized by erratic yields. Increases in yield and improvements in yield stability are critical for the viability of the flax industry in order for flax to effectively compete with other Canadian crop choices and to ensure continued global marketing success. Improvements in these two critical areas will lead to improved returns for Manitoba farmers and provide a reliable supply of product to the processing and exporting companies that are dependent on their production.

Flax acres have plummeted in Manitoba over the last 30 years; from 1,000,000 acres in mid-1980's to 85,000 acres in 2013. It is critical to identify the factors that have caused Manitoba producers to dramatically reduce their flax production, identify current production tools available that can lead to a resurgence of flax acreage, communicate those best management practices (BMP's) to new and existing growers, and identify and fill the gaps that exist in current agronomic research.

This project was undertaken to identify best management practices that are critical to improving the yield and yield stability of flax in Manitoba (farmer survey), to demonstrate these BMP's to farmers (field demo program) and communicate and report to growers on these BMP's as a process of continuous improvement.

## **Goal 2: Flax Market: Support Current Markets and Develop New Markets**

In order for Canada's flax market to return to levels seen before Triffid was detected, Canada needs to support current domestic markets and develop other markets such as the U.S. and China, both of which currently buy 39% of Canada's flax supply. Two major factors lay the foundation for future growth throughout the flaxseed value chain and are opportunities that this application addresses: 1) the strong growing demand for healthy food; and 2) a new Health Canada approved claim linking flaxseed products to a reduction of blood cholesterol.

On October 30 2013, Health Canada's Food Directorate indicated the approval of a health claim for flaxseed and serum cholesterol lowering. Such a claim will allow food manufacturers to clearly state on labels the relationship of flax consumption to a reduction of serum cholesterol, a major risk factor for coronary heart disease. A health claim is a very positive step in promoting new as well as increasing current, food use for flaxseed.

It is important to note that this claim is one of only ten allowed in Canada for foods and ingredients, which demonstrates the significant rigor that is placed upon the scientific criteria demanded by Health Canada. The acceptance by Health Canada of a health claim will be another science-based tool for the promotion of flax into this significant marketplace - both domestically and internationally and will lend strength to our market development efforts of flax as a healthy food ingredient. In addition, a similar claim request dossier is being developed for the U.S. Food and Drug Administration. We anticipate that such a claim will also be successful in the US based on Health Canada's high level of requirements. The proposed activities outlined in this project will be of benefit to capitalizing on an eventual claim in the US as well.

In order to take advantage of this opportunity, and to assist the Canadian flax processing industry and ingredient suppliers to fully capitalize on the use of the claim, the education of key stakeholders will be incorporated into a "healthy flax message" to:

1) Raise awareness about the existence of the health claim;

2) Provide information to food manufacturers on how to formulate foods that are eligible to carry the health claim.

The minimum amount of milled (ground) flax required to make the health claim is 13 g (or about 2 Tbsp.) consumed three times per day for a total of 40 g. This amount may be a challenge for some food manufacturers as smaller levels (usually less than 2 tsp) are often used to make 'nutrient content claims'. Such claims are not health related but simply state on the label the amount and source ('rich in', 'source of' etc.) of a recommended nutrient. Flaxseed products are often marketed as containing an "Excellent source of Omega 3 Alpha-linolenic acid (ALA)". The minimum amount of ALA required for a nutrient content claim is 300 mg per serving in Canada (which can be obtained in 1.5 tsp of ground flaxseed).

The industry must be able to demonstrate that tasty food products can be developed containing the health claim amount of flaxseed which is 13 g. In addition, the oxidative stability must also be demonstrated so that food companies will have confidence that the flaxseed products will have good stability and shelf-life. To meet this goal, the FCC will commission the Food Development Centre (FDC) to create delicious tasting food products with enough flax to achieve a health claim according to Health Canada's guidelines. The FDC has the industry links and expertise to accomplish this goal. Their full proposal is included as Appendix C.

The food development activities outlined in this application are focused on providing small and medium-sized flax companies in Manitoba with novel "recipes" that they can use to ensure that their customers have the appropriate information to make the health claim. An outcome of this project is to assist Manitoba suppliers in educating the larger multi-national food and ingredient companies as to the overall value proposition of flax (both health and functionality) as well as the health claim.

The objectives of Goal 2 of this project are to:

1. Promote the Health Canada Health Claim and the functionality, health and nutritional benefits of flaxseed;
2. Develop food prototypes that contain the required levels of flax (13g per serving) to be eligible for the claim. This work will be done at the Food Development Centre in Portage and the University of Manitoba. The full proposal describing this research is attached as Appendix A.; and
3. Provide informational materials and content that outline the use of ground flaxseed in food prototypes, as well as materials and recipes, using the required levels for the health claim.

## **DELIVERABLES:**

### **Goal 1: Flax Production: Improving Production for the Market**

1. Refreshed Grower Survey. Completed by Insightrix Research. Data was compiled on a regional basis in late 2014 and early 2015 including a survey of current Manitoba flax producers (72) and interviews with nine producers that no longer grow flax. The information gathered was used in part to develop the best management practices (BMP's) directed towards increasing yields and improving yield stability. The survey provided information regarding why Manitoba farmers are opting out of flax in their rotation and identified the critical factors required to include flax back into their rotation.

2. Flax Agronomic Literature review. Completed a review of 576 scientific papers and spanning from 1890 to 2014.
3. Flax Grower Guide update. The production guide was reviewed and updated by expert agronomists, researchers and Government specialists. It summarizes production and management practices to optimize yield and quality of the crop. 5000 hard copies were printed and distributed to farmers as well as federal, provincial and industry agronomists. It is also available electronically on the Flax Council website.
4. Field Demo Program. Flax agronomic demonstration field trials were established at the Parkland Crop Diversification Centre (PCDC) Roblin and ICMS site at Portage in 2015 through 2017 growing seasons. Flax BMP field trials were showcased at collaborator Field Days in 2015, 2016 and 2017.
5. Grower Campaign – Communications and website updates. A communications strategy was developed for the posting of '**Flax TIP's**' (timely monthly best management practices) and **Alerts** (urgent issues that require immediate producer attention). An expert panel was assembled that included Oilseed Specialists from Manitoba, Saskatchewan and Alberta. As well, relevant specialists were included as expert reviewers when appropriate (i.e. entomologist when a TIP on insects was done, etc.). A conference call between the Oilseed Specialists and Rachel Evans (Agronomist with Flax Council) occurred on a monthly basis to obtain regionally specific information pertaining to the topic. FCC will act as technical editor to ensure format is consistent and appropriate for our producers. TIP's and Alert articles were posted monthly on the Flax Council of Canada website, as well as distributed via email to subscribers (~3000).

## **Goal 2: Flax Market: Support Current Markets and Develop (and grow) New Markets**

1. Literature Review. A literature review was completed to identify the challenges of developing shelf-stable food products with 13 grams of ground flax per serving. A scan of regulation, health benefits, and processing properties was included. The literature review is included in the Appendix.
2. Prototype Development. The Food Development Centre in Portage la Prairie created 4 food prototypes including a muffin, bread, dry smoothie mix and baked nutrition bar. All prototypes met the goal of including 13g of ground flax per serving.
3. Test Market. Phase Three and Four saw further scale up of the prototypes, specifically the muffin, the dry smoothie mix and the nutrition bar. The HAACP plans for each prototype are completed.
4. Final Report. The final report from the Food Development Centre is included in the Appendix.

## PROJECT IMPACT

### Goal 1: Flax Production: Improving Production for the Market

Prior to the completion of this project, there was a significant gap in agronomic resources available to flax producers. The previous version of the Flax Production guide was 20 years out of date, reflecting the steady decline of flax acres in Manitoba over the last 30 years. The Flax Industry trailed behind other commodity associations in supporting their producers with relevant production information to maintain competitiveness. The reviewed Flax Production Guide now contains up-to-date information for producers and agronomists to increase the competitiveness of flax with other crops, and increase production. A smaller, more farmer-friendly TIP's booklet was also printed and distributed at producer focused events. The Grower Survey provided an in-depth understanding of why producers grow flax, why they choose not to, and which agronomic practices separate the high-yielding producers and the low-yielding producers. This has provided valuable insight and was used in the development of treatments for the field trials for a targeted communication strategy. The field trials have gathered data to support the use of BMPs in Manitoba (Appendix), which has been communicated through fields days, newsletters, print and social media. The communications campaign that included flax TIP's and Alerts was emailed to 1654 recipients, as well as through the Flax Council of Canada and Flax Agronomist social media accounts, with thousands of views per post. A list of where and in what format the project results were discussed are listed below:

- Distribution of print material
  - Manitoba Ag Days 2016 and 2017
  - Crop Connect 2016 and 2017
  - Farming Smarter 2016
  - Sask Oilseed meetings 2016 and 2017
  - Manitoba Agronomist Conference 2016 and 2017
  - Arborg, MB (PESAI) – 2016 and 2017
  - Roblin, MB (PCDF) – 2015, 2016 and 2017
  - Melita, MB (WADO) – 2016 and 2017
  - Carberry, MB (CMCDC) – 2016 and 2017
  - Portage la Prairie (ICMS) – 2015 and 2016
- Presentations
  - The 66th Flax Institute of the United States conference – “The Canadian flax industry’s agronomic strategy” March 31 – April 1<sup>st</sup>, 2016
  - Crop Talk Westman (webinar) – “Flax BMPs: Key tips to improve flax yield” May 18, 2016
  - Crop Talk Eastman (webinar) – “Flax Update and Agronomy” June 30<sup>th</sup>, 2016
  - Crop Sphere 2017 – “What’s your flax yield target” January 10th, 2017
  - Crop Connect 2017 - “What’s your flax yield target: 32 bu/ac by 2025” February 16th, 2017
- Field Days
  - Arborg, MB (PESAI) – 2016 and 2017
  - Roblin, MB (PCDF) – 2015, 2016 and 2017
  - Melita, MB (WADO) – 2016 and 2017
  - Carberry, MB (CMCDC) – 2016 and 2017
  - Portage la Prairie (ICMS) – 2015 and 2016

- Newspaper and Magazine articles
  - “Breathing life into flax” – Germination April 17, 2017
  - “Flax agronomy in the spotlight” – Manitoba Co-operator August 28, 2017
- Newsletters
  - Flax Council of Canada – Flax Focus July 2017
  - Flax Council of Canada – Flax Focus February 2017
  - Flax Council of Canada – Flax Focus July 2016
  - Flax Council of Canada – Flax Focus July 2015
- Social media
  - Twitter activity going out to 821 followers (@FlaxCouncil and @Flax\_Agronomist), with thousands of retweets generated.
- Radio
  - Golden West “Aim for shallow planting depth when seeding flax” May 24, 2017
  - Golden West “Flax starting to flower” July 24, 2017

## **Goal 2: Flax Market: Support Current Markets and Develop (and grow) New Markets**

The Food Development Centre successfully executed the work plan, resulting in significant contributions to the Manitoba’s agri-food processing as well as the flax industry. The literature review compiled evidence supporting the nutrition benefits of flaxseed, not limited to the Health Canada health claim. It also identified important processing implications of incorporating flaxseed into food products that will enable other agri-food processors to do so more efficiently, and will provide a platform for innovation.

The prototypes that were developed were all able to meet the objective of 13 grams of ground flaxseed as per the Health Canada health claim. Once developed, the muffin, smoothie mix and bar were moved to scale-up by the Flax Council of Canada. The prototypes were then included in an extensive marketing campaign, events are listed below:

- The Flax Council, through its marketing arm HealthyFlax.org, featured the muffin at a breakfast at the Dietitians of Canada Conference in Winnipeg in June 2016. Feedback was excellent and over 500 copies of the consumer recipe and 125 versions of the commercially scaled recipes were distributed. The muffin was also featured again at the 2017 Dietitians of Canada Conference in Newfoundland and an additional 500 copies were distributed. We also provided over 1500 recipes to dietitians via mailout requests.
- The recipes were also distributed at the Food and Nutrition Conference and Expo conference (over 10,000 dietitians) in Boston in October 2016. Follow up continues from this event. The recipe is also featured on our HealthyFlax.org website and frequently in our social media calendar.
- We were also successful through the efforts of the Food Centre to partner with the Winnipeg Regional Health Authority to incorporate the muffin into their meal program. The muffin provides an excellent source of energy, is low in saturated fats, has five grams of protein and four grams of fibre per muffin making it very beneficial in meeting the needs of those in hospital or care facilities. See Media release: <http://healthyflax.org/news/development-of-four-flax-based-food-products-that-may-help-lower-cholesterol>

- The Food Development Centre also provided samples of the nutrition bar which have been distributed to flax industry representatives including producers, food manufacturers, exporters and selected dietitians. Again, feedback was positive.
- We are in the process of adding the consumer bread recipe and bar recipe to our website and social media schedule. We have also posted the final reports on our website in the food professionals section.

This project significantly contributed to developing awareness of the health benefits of flaxseed, both in the general public and by food professionals.

### **CONCLUSIONS:**

The Flax Council of Canada and Manitoba's flax industry has positively benefited from this project. In January 2016, the Flax Council of Canada met for a Strategic Planning Session, which identified agronomy as an important objective to increase productivity and subsequently, flax acres. The goals established were to increase Canada's flax yield to 32 bushels/acre by 2025. Through our project goals, we have identified important BMPs for producers to adopt to support these industry targets. According to preliminary Manitoba Crop Insurance data, 2017 provincial average yields in Manitoba are 30 bushels/acre, up from 22.5 bushels in 2015 (Dane Froese, personal communication). This is a significant improvement which may or may not be directly related to the increased education and extension delivered as a result of this project. This project has resulted in increased knowledge and capacity of our agronomist, who has implemented project activities, and whilst doing so, garnered a presence as Canada's Flax Agronomist. The field trials have quantified the yield benefit of adopting BMPs, while also building the capacity of Manitoba's Diversification Centres in conducting flax agronomy trials. Through the development of the muffin recipe, we have partnered with the Winnipeg Regional Health Authority who will now distribute flax muffins as part of their meal program. This is an important recognition for the flax industry amongst Manitoba's health professionals and the general public. We have created opportunities for scale up and further development by engaging with food manufacturers, exporters and dietitians. There is strong demand for healthy food by conscious millennial and aging baby boomer population. This project marks an important step forward in developing our domestic food markets for flaxseed.

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