Impact of seeding rate, seeding date, and nutrient management on flax agronomy

Project duration - May 2017 – October 2017
Objective - To provide data on the validity and priority of select BMPs and to illustrate these BMPs to growers. Demonstrate and quantify yield differences from varying fertilizer management practices.
Collaborators - Flax Council of Canada

Results
For results and project findings, please see Flax Council of Canada Agronomy Trials - 2017 Final Report

Background
Flax is an important crop for improving or maintaining on-farm diversity and sustainability in Manitoba. It has scientifically proven value as a rotational crop providing a break for disease, insect and weed populations. It is relatively lower input cost crop making it a competitive alternative oilseed crop on a net return basis. However, flax has not kept pace with yield improvements of most major crops in western Canada. 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 have increased the least (0.38% yield increase/year) compared to Saskatchewan (0.53%/year) and Alberta (2.27%/year).
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. However, 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.
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 the gaps that exist in current agronomic research.

Materials & Methods
This project has been broken down into four trials:

A. Fertilizer and seed treatment
B. Seeding rate, date, depth and row spacing
C. Herbicide and fungicide
D. Crop rotation

Each demo project includes an “ideal plot” treatment, which incorporates an optimal combination of agronomic inputs and management practices. The other treatments in each project will have one factor removed from the ideal plot combination, to measure the yield impact of each individual BMP.

The factors associated with the “ideal” plot are as follows:

1. Choose well drained soil with very little salt
2. Soil tested for macro and micro nutrients
3. Sown on pulse or cereal stubble
4. Pre-plant glyphosate/Authority® (Authority – 118 ml/acre, glyphosate – recommended rate for corresponding formulation)
5. 9.6” row spacing or similar ‘regular’ commercial row spacing
6. Seed treatment - Insure Pulse® (300 ml per 100 kg of seed)
7. Fertilizer target of 45 bushels/acre
8. Optimum start-up fertilizer (seed placed - 15 lbs/acre actual phosphate as MAP 11-52-0 or 12-51-0). Side-band or mid band the rest of the fertilizer if possible
9. Optimum seeding date target May 15th
10. Seeding rate 45 pounds/acre
11. Seeding depth < 1 “
12. High yielding variety: CDC Glas
13. Priaxor® (Headline EC® + Xemium) (120 ml/acre) for pasmo control
14. All recommended herbicides as required (regardless of cost)
15. Desiccate at maturity with glyphosate (360 grams active ingredient per acre) or Reglone®