

Wheatland Conservation Area Inc.
Swift Current, SK.

Faba bean Inputs

Project #20150400

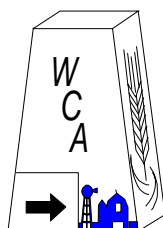
Start Date: April 1, 2016

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ADOPT 2016

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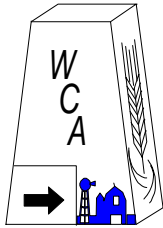
Final Report



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2016 Report

Abstract

In 2016 a trial was done in Swift Current titled "Faba bean Inputs". The objective of this demonstration is to identify and illustrate to producers the best combination of inputs for producing a high yielding and high quality faba bean crop. In this trial we found no effect of seeding rates or fungicides on yield, however, we did see a significant yield response to increasing phosphorus rates.

Project Objectives

The objective of this demonstration is to identify and illustrate to producers the best combination of inputs for producing a high yielding and high quality faba bean crop.

Project Rationale

The practices selected for this demonstration have all been used to produce a successful faba bean crop. In Melfort 2015, it was found that the smaller size faba beans needed to be seeded at a higher rates to better compete with weeds, as it was better able to close the crop canopy. The level at which this was found was almost twice the recommended seeding rate. However, this maybe not be a factor if good weed control is achieved with herbicides. In addition, it is known that faba beans are a high user of phosphorus. With Faba beans it is recommended that only 25 kg/ha P be seed placed, however in 2015 at NARF it was found that placing 50 kg/ha of P in the seed row did not appear to have any negative consequences. Thus if we can place higher amounts of phosphorus with faba beans this should ensure adequate fertilization of the crop and leave some for the following crop. Potassium and sulphur are nutrients that are often considered sufficient so that these fertilizer nutrients are not needed. However, faba beans are responsive to sulphur fertilization and Manitoba Agriculture recommends 14 kg/ha of sulphur fertilizer to be placed at seeding. Chocolate spot is a disease of concern for this crop. Previously it was only a minor concern, but with the increase in acres, inoculum and favourable weather conditions for the inoculum, it may become a major concern. However, it did not seem to be a great factor affecting bean quality in 2015. Thus producers will question if fungicides are necessary or if disease control is beneficial.

Faba beans have been grown in limited acres on the Prairies for decades and have long been considered to be well adapted to the moister, cooler regions of Saskatchewan such the Black soil zone. While acres continue to be small, interest in this crop has been strong due to its high yield potential and ability to withstand prolonged wet periods much better than more traditional pulse crops like field pea and lentil. With the potential for increased uptake, producers need increased exposure to some of the management factors that should be considered when growing this crop. With producers being relatively new to the crop, in addition to new varieties and technologies, the optimal amount and type of inputs for successful faba bean production is relatively unknown. Therefore, the intended benefit of this demonstration is to illustrate the importance of individual inputs needed to produce a successful faba bean crop.

Methods

To facilitate a comprehensive report, this project was set up the same as that proposed by NARF, as a factorial in a randomized complete block design with four replicates and seeded with a Fabro plot seeder. Factors included 2 seeding rates, 2 rates of seed placed fertilizer P, with and without foliar fungicides. All beans seeded had the appropriate seed treatment and inoculant. The treatments in this trial included the following:

1. 44 plants/m², no fertilizer, no fungicide
2. 44 plants/m², 25 kg/ha P seed-placed, 43 kg/ha K and 14 kg/ha S side-banded, no fungicide
3. 44 plants/m², 25 kg/ha P seed-placed, 43 kg/ha K and 14 kg/ha S side-banded, dual fungicide
4. 44 plants/m², 50 kg/ha P seed-placed, 43 kg/ha K and 14 kg/ha S side-banded, no fungicide
5. 44 plants/m², 50 kg/ha P seed-placed, 43 kg/ha K and 14 kg/ha S side-banded, dual fungicide
6. 88 plants/m², no fertilizer, no fungicide
7. 88 plants/m², 25 kg/ha P seed-placed, 43 kg/ha K and 14 kg/ha S side-banded, and no fungicide
8. 88 plants/m², 25 kg/ha P seed-placed, 43 kg/ha K and 14 kg/ha S side-banded, dual fungicide
9. 88 plants/m², 50 kg/ha P seed-placed, 43 kg/ha K and 14 kg/ha S side-banded, and no fungicide
10. 88 plants/m², 50 kg/ha P seed-placed, 43 kg/ha K and 14 kg/ha S side-banded, dual fungicide

Data collected included the following:

Soil test: composite sample from the site at two depths to assess residual nutrient levels.

Plant Density: 2 one meter paired rows in the front and back to assess plant density.

Disease Ratings: 1 to 10 scale of leaf area affected by disease on treatments 1, 7, 8, and 11. Before each fungicide application and two weeks after the last application.

Yield: Clean weight of entire sample from each plot

Quality: TKW

Other field notes were as follows:

13-May-16 Pre-seed burnoff with RT 540 @ 0.67 l/ac

Previous crop: durum
wheat

17-May-16 **Seeded Fababean Input
Trial**

Variety: **CDC Snowdrop**

Granular Inoculant for Fababean: applied at 3.6 lb/ac

target rate: 44 plants/m² and 88 plants/m² and added 15% extra to account for mortality

Seeding
rates: 44 plants/m² = 140 lb/ac
88 plants/m² = 280 lb/ac

Apron Maxx seed treatment applied to seed @ 325 ml/100kg

Seeded with fabro built 9 row plot drill, 9 inch row spacing, atomjet knife openers.

6-Jun-16 Incrop sprayed with Odyssey @ 17.3 g/ac + Poast Ultra @ 190 ml/ac + Merge @ 0.5 l/100L

16-Jun-16 Plant densities done. (1m x 2 rows) x 2 per plot

29-Jun-16 Rated for disease prior to application of Priaxor

29-Jun-16 Priaxor @ 180 ml/ac at 10% flower

12-Jul-16 Rated for disease prior to application of Acapella

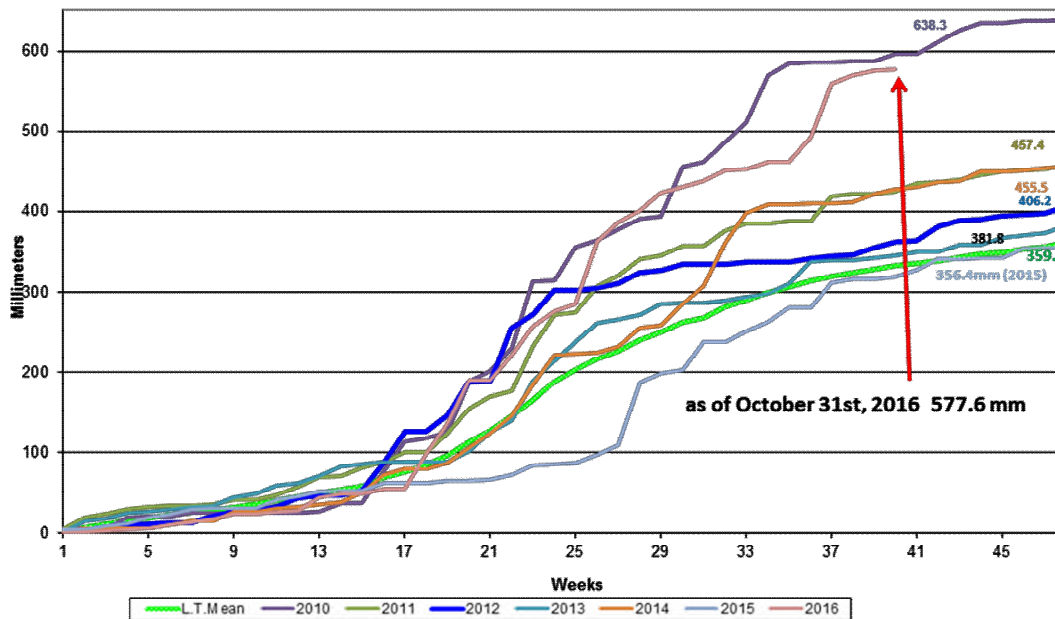
12-Jul-16 Acapella applied @ 350 ml/ac (50% flower)

4-Aug-16 Rated for disease two weeks after last foliar application

15-Oct-16 Combined trial with Zurn plot combine (7 rows x individually measured plot lengths)

General Site Conditions

Accumulative Weekly Precipitation for Years 2010-2016

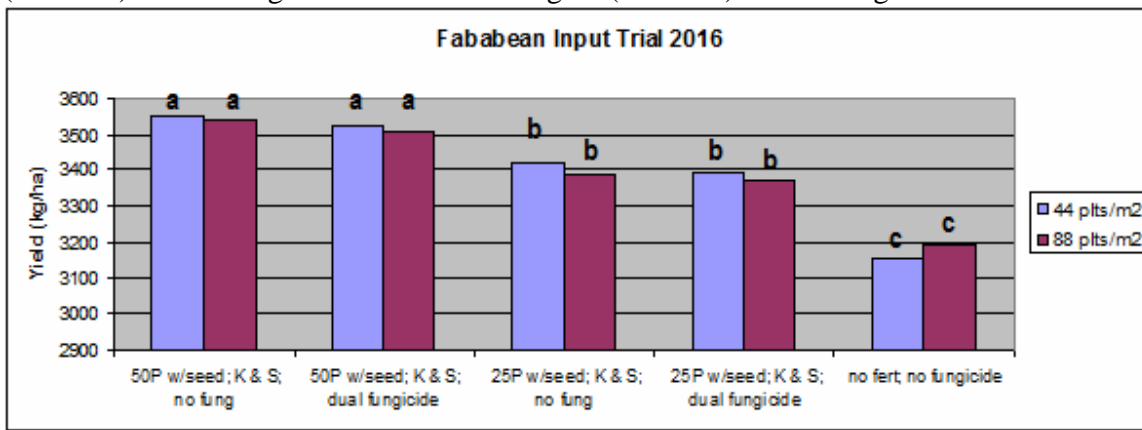


Accumulative weekly precipitation for years 2010-2016 (AAFC Swift Current).

Spring precipitation and soil moisture was poor, which enabled us to complete early field preparation and seeding without delay. Rain started to fall in May and continued into the growing season and through harvest. This generally resulted in good crop development and yield, however, disease and harvest delays were an issue in some cases due to abundant precipitation and two bouts of wet heavy snowfall midway through harvest.

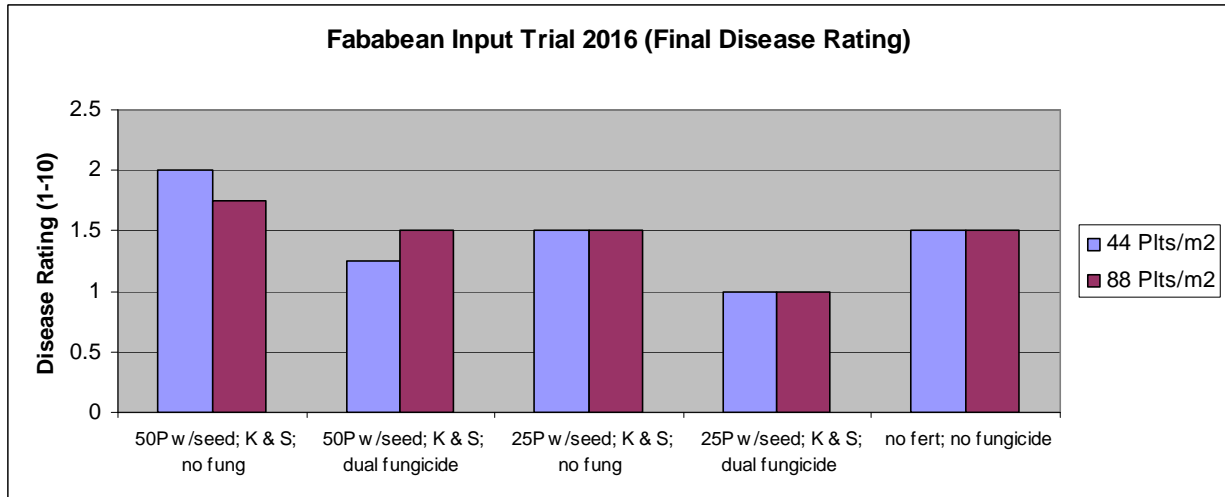
Results

In 2016, we saw no significant yield response to varying seeding rates or fungicide use. We did see significant yield response to phosphorus (*Graph 1.*). Crop yield responded well to increasing rates of seed placed phosphorus from 0 kg/ha P up to 50 kg/ha P regardless of the seeding rate or fungicide use. Yields averaged 3173 kg/ha (47 bu/ac) at the 0 P rate and increased to 3392 kg/ha (50 bu/ac) at the 25 kg/ha P rate and 3530 kg/ha (53 bu/ac) at the 50 kg/ha P rate.

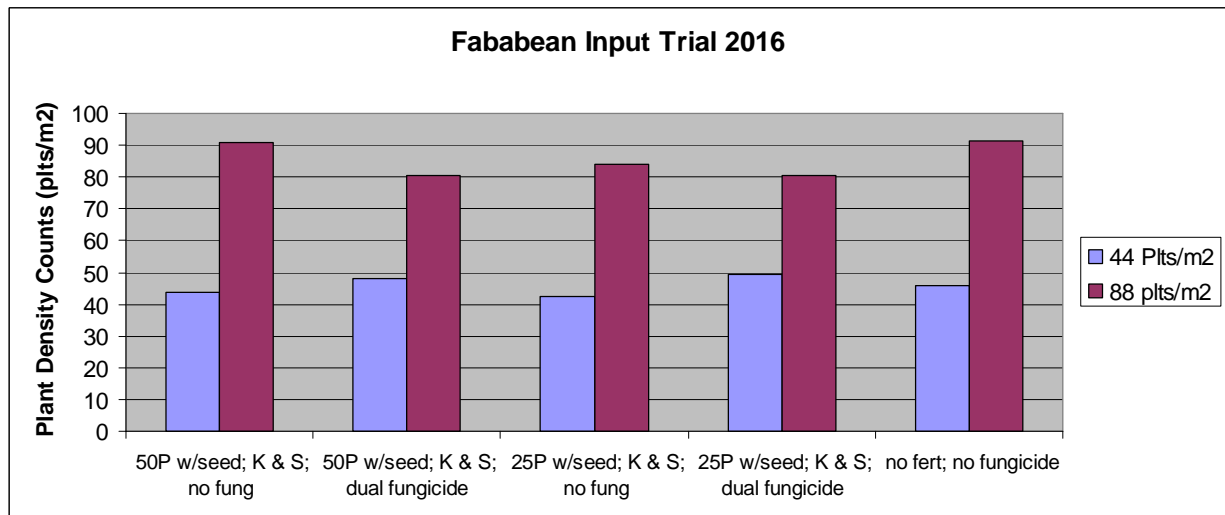


Graph 1.

Although we found no effect of fungicides on yield we did observe lower disease levels in treatments with two applications of fungicide compared to the no fungicide treatments (*Graph 2.*) Seeding rates appeared to have little effect on disease levels even though the higher seeding rates did result in increased plant densities (*Graph 3.*) which can create an environment conducive to disease.



Graph 2.



Graph 3.



Conclusions

Increased plant densities can potentially create an environment conducive to disease in a variety of crops if a pathogen and a host crop is present. In 2016, higher seeding rates increased plant densities in the faba bean trial but did not effect either disease levels in the crop or crop yield. The use of fungicides did reduce disease levels in the faba bean crop but the lower disease levels did not translate into increased faba bean yield. The only input that affected yield in 2016 was phosphorous. Crop yield responded well to increasing rates of seed placed phosphorus from 0 kg/ha P up to 50 kg/ha P regardless of the seeding rate or fungicide use. The high rates of seed applied phosphorous did not appear to have any negative effect on emergence or establishment.

Acknowledgements

We thank the Ministry of Agriculture for all our ADOPT projects including plot signage and verbal acknowledgement at field days and on PowerPoint slides during presentations. This will continue at each venue where an extension activity occurs. We also thank Shannon Chant (Saskatchewan Ministry of Agriculture) for her help.

Summary

In 2016 a trial was done in Swift Current titled "Faba bean Inputs". The objective of this demonstration is to identify and illustrate to producers the best combination of inputs for producing a high yielding and high quality faba bean crop. Treatments included 2 seeding rates (targeting 44 and 88 plants/ m²), 2 rates of seed placed fertilizer P (25 and 50 kg/ha P/ac), with and without foliar fungicides. All beans seeded had the appropriate seed treatment and inoculant.

In 2016, higher seeding rates increased plant densities in the trial but did not effect either disease levels in the crop or crop yield. The use of fungicides did reduce disease levels in the faba bean crop but the lower disease levels did not translate into increased faba bean yield. The only input that affected yield in 2016 was phosphorous. Crop yield responded well to increasing rates of seed placed phosphorus from 0 lbs P up to 50 lbs P regardless of the seeding rate or fungicide use. The high rates of seed applied phosphorous did not appear to have any negative effect on emergence or establishment.

This project was promoted during Crop Production Week in Saskatoon in January and will be locally at Cropportunities 2017 on March 14th in Swift Current (200+ expected participants). This project was promoted on a CKSW radio program called "Walk the Plots" which we broadcast in the summer on a weekly basis. As well this topic was brought to the attention of the group on the Annual Field Day on July 17th (100 participants) as well as a number of smaller individual tours. This topic will also be posted on our website.

