

Agricultural Demonstration of Practices and Technologies (ADOPT)

FINAL REPORT

20130417

CHICKPEA FLAX INTERCROPPING

**Funded by: The Saskatchewan Ministry of Agriculture under the
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July 2015

Prepared by: Wheatland Conservation Area Inc. (WCA)

Wheatland Conservation Area Inc.
Swift Current, SK.

Chickpea Flax Intercropping.
Project #20130417

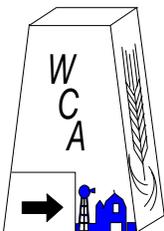
Start Date: April 1, 2014

End Date: Feb. 1, 2015

ADOPT 2014

Written by
Bryan Nybo and Don Sluth
Wheatland Conservation Area Inc.

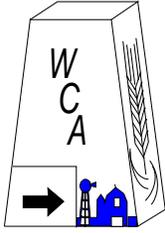
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Chickpea Flax Intercropping. 2014 Report

Project Objectives

The objective is to determine if flax can stress chickpeas enough to hasten seed set and maturity and/or act as a barrier to disease spread in chickpea. This demonstration compared desi and kabuli chickpea and flax as a monocrop to chickpea and flax as an intercrop.

Project Rationale

Chickpeas have been grown in the south west for many years with significant economic returns. Producers have avoided this crop in recent years due to strong disease pressure and delayed maturity. This project was done in Redvers with relatively good success, even though it was seeded late, there was excessive fall moisture, and Redvers is quite far out of the traditional chickpea area of adaptation. Even though the Swift Current area is well within the traditional chickpea growing area, there are still serious issues with maturity and disease control. Chickpea requires moisture stress and scarce nitrogen to stop vegetative growth. In an intercrop with flax, the chickpeas are competing late in the season for moisture and nitrogen. Chickpea and flax are not competitive crops on their own, so neither one tends to dominate early in the season. By demonstrating this practice successfully in the Swift Current area, chickpeas could make a resurgence and once again play a significant role in improving the producers bottom line.

Methods

This demonstration was seeded with the Fabro plot drill on May 21 into spring wheat stubble. Both Desi chickpea and Kabuli chickpea were intercropped with flax. The chickpea was intercrop at three seeding rates, 30, 40 and 50 plants/m². In addition to those 6 treatments, each chickpea cultivar was grown as a monocrop as well as two flax monocrop treatments, one at a low fertility level, similar to that used for all the chickpea treatments and one at a higher fertility level with 60 kg/ha of N applied. The intercrop flax was seeded at 40 lbs/acre while the monocrop flax was seeded at 60lb/acre. The chickpeas were seeded through the fertilizer shanks below and to the side of the flax. The following operations were done:

Crop: Alma Chickpea @ 30,40, and 50 plants/m²
 Common Desi Chickpea @ 30,40, and 50 plants/m²
 Sorrell Flax @ 40lb/ac (with intercrop) and 60 lb/ac (as a monocrop)

Plot Size: 18' long x 7' wide.
 Reps: 4 Reps
 Burnoff: 20-May Applied RT 540 @ .5 l/ac
 Pre-Emergent Herbicide: 20-May Applied Authority @ 118 ml/ac to entire trial
 Seeding: 21-May Fabro plot drill with atomjets (9 runs x 9" spacing)
 Seed Treatment: Applied Apron Maxx RTA @ 325 ml/100 kg on chickpea seed.

Treatments 1 and 2 mono crop flax seeded @ 60 lb/ac down seed cone with fertilizer side banded. Treatment 1 (low N) received 40 lb/ac P (11-51-0); Treatment 2 (High Fertility) received 53 lb/ac N & 40 lbs of P/ac through blend 46-0-0 and 11-51-0

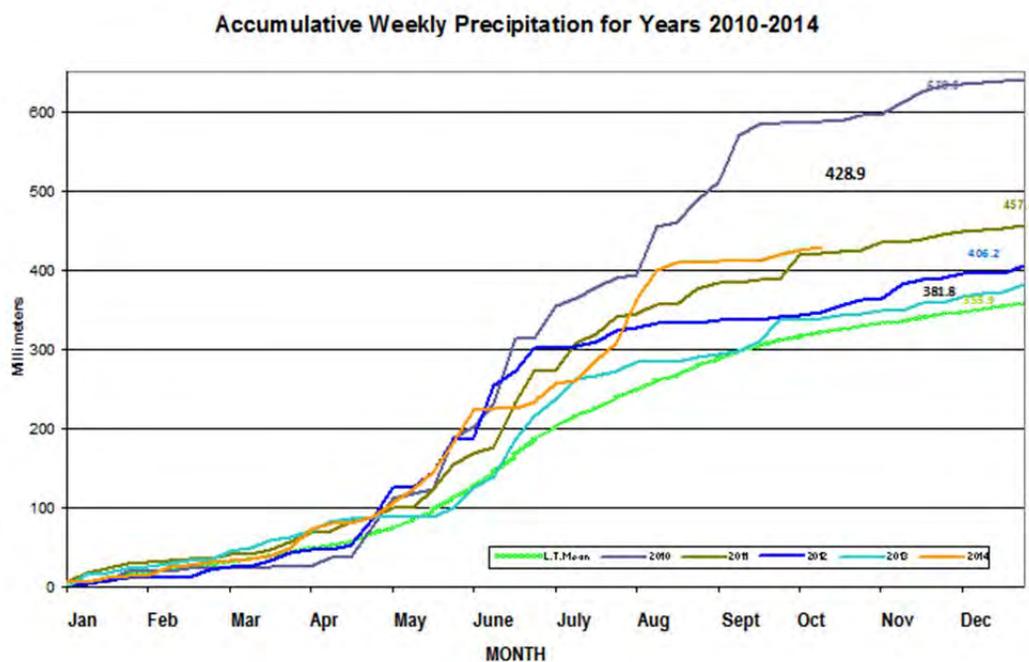
Intercrop Flax Treatments 5 to 10 were seeded @ 40 lb/ac and seeded through side band portion of opener. Intercrop fertility: 20 lb/ac of P coned with Chickpea and 20 lb/ac of P coned with flax (11-51-0)

Mono crop chickpea received 40 lb/ac of P (11-51-0) with seed. All chickpea received 5 lb/ac of granular inoculant applied with seed.

Incrop Spray: 02-Jun Applied Poast Ultra .19 l/ac + Merge adjuvant
 Fungicide: 21-Jul Applied Proline 480 @ 149 ml/ac + Agsurf @ .125% v/v on all plots
 Harvest: 07-Oct Harvested plots with plot combine. 7 rows x 9 inch row spacing

General Site Conditions

The site is situated 1 mile south of Swift Current. The soil is classified as a Swinton silty loam. For the most part in 2014, growing conditions were favorable for crop production. Overall yields were slightly above average with grain quality being variable. This was generally the case for area producers who experienced similar conditions resulting in similar yields.



Graph 1. Accumulated Precipitation.

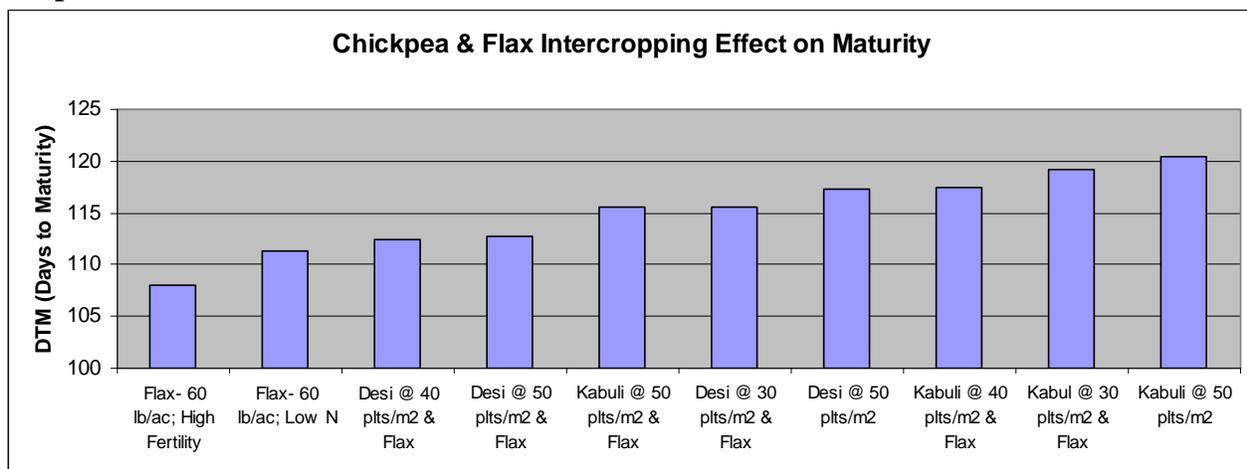
Results

Crop emergence, establishment, and crop development was excellent in this trial from seeding through to seed set as seen below and good data was collected for plant heights and maturity. Unfortunately, even though the trial was harvested, there was not enough of a harvest sample to generate any yield data. This was due to severe deer damage, despite the use of a scare cannon in a nearby sunflower trial. In a matter of a few days, after all adjacent trials were harvested and these were some of the only plots left in the field, deer moved in and literally striped the plant clean.



The main focus of this trial was to determine if a flax intercrop would speed up and shorten the days to maturity of the accompanying chickpea crop. Maturity data collected indicate that this may indeed be the case (Graph 2.). For example, the Kabuli chickpea seeded as a monocrop matured in 121 days, whereas, the same Kabuli seeded at the same 50 plants per square meter intercropped with flax matures in 115 days. This improved maturity by 6 days. This was also the case for the Desi chickpea, however to a lesser extent. The Desi chickpea seeded as a monocrop matured in 117.25 days, whereas, the same Desi seeded at the same 50 plants per square meter intercropped with flax matures in 112.75 days. This improved maturity by 4.5 days. In general, lowering the seeding rate of chickpea portion of the intercrop mix extended the days to maturity, to the point where the Kabuli seeded at the low rate (30 plants per square meter) intercropped with flax saw little maturity advantage and actually came close to the Kabuli seeded as a monocrop.

Graph 2.



This project will be promoted at the Agri-ARM Information Day during Crop Production Week in Saskatoon on January 15 and locally at Cropportunities 2015 on March 17 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.

Conclusions

The main focus of this trial was to determine if a flax intercrop would speed up and shorten the days to maturity of the accompanying chickpea crop. Maturity data collected indicate that this may indeed be the case, shortening days to maturity of Kabuli type chickpeas by 6 days and Desi type chickpeas by 4.5 days. Unfortunately yield data was unavailable.

Acknowledgements

The Ministry of Agriculture was acknowledged 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.

Summary

Chickpeas have been grown in the south west for many years with significant economic returns. Producers have avoided this crop in recent years due to strong disease pressure and delayed maturity. The objective is to determine if flax can stress chickpeas enough to hasten seed set and maturity and/or act as a barrier to disease spread in chickpea. This demonstration compared desi and kabuli chickpea and flax as a monocrop to chickpea and flax as an intercrop.

Both Desi chickpea and Kabuli chickpea were intercropped with flax. The chickpea was intercrop at three seeding rates, 30, 40 and 50 plants/m². In addition to those 6 treatments, each chickpea cultivar was grown as a monocrop as well as two flax monocrop treatments, one at a low fertility level, similar to that used for all the chickpea treatments and one at a higher fertility level with 60 kg/ha of N applied. The intercrop flax was seeded at 40 lbs/acre while the monocrop flax was seeded at 60lb/acre. The chickpeas were seeded through the fertilizer shanks below and to the side of the flax.

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