

# Factsheet: Chickpea Flax Intercropping: Can flax stress chickpea to hasten seed set and maturity and/or act as a barrier to disease spread in chickpea?



## Objective:

The objective of this trial was to determine if intercropping chickpeas and flax improves yield performance and reduces disease incidence of the intercrop as compared to Desi and Kabuli chickpea and flax as monocrops.

## Methodology:

The trial was conducted at the AAFC Scott Research Farm in the 2014 and 2015 growing season. The experiment was set up as a randomized complete block design with four replicates and 10 treatments. The trial was unsuccessful in 2014, but was modified for 2015. The crop cultivars planted were Corinne & Alma and Bethune for chickpeas and flax, respectively. Both chickpea and flax were seeded directly into canola stubble. In 2015, no fertilizer was applied except in treatment 10 which received 60 kg/ha N side-band. Both chickpea varieties were seeded with the openers in the monocrops while flax was seeded side-band in the intercrops. Nodulator XL inoculant was applied to the chickpeas in-furrow at a rate of 3.3lbs/ac.

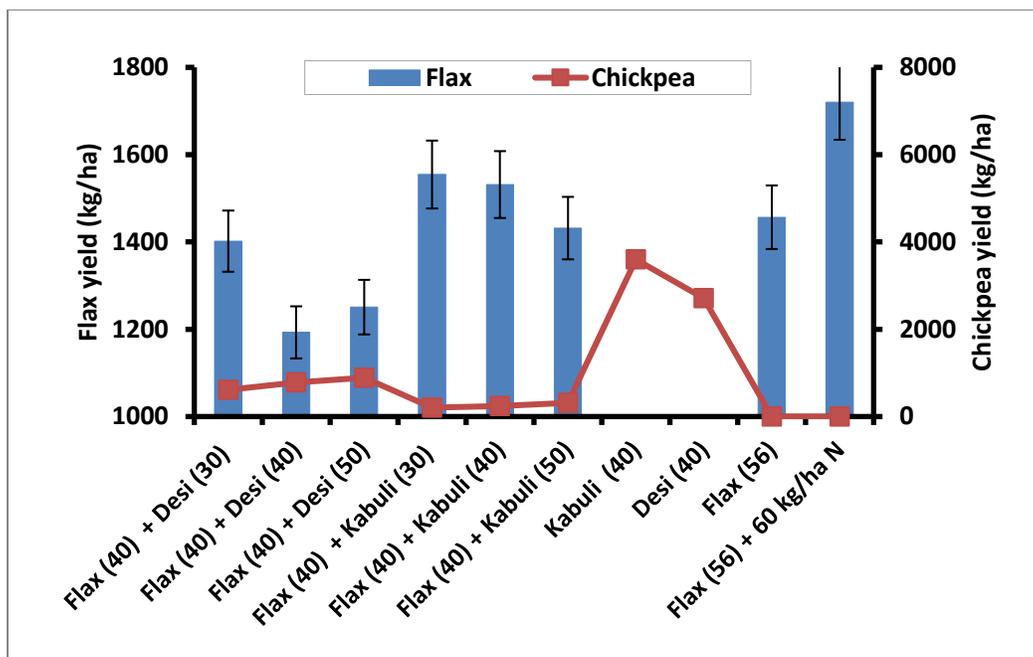
**Table 1:** Trial Treatment List for the 2014 and 2015 growing seasons

Trt#	2014	2015
1	Desi (30 seeds m <sup>-2</sup> ) + Flax (40 lbs ac <sup>-1</sup> ) Low N	Desi (30 seeds m <sup>-2</sup> ) + Flax (40 kg/ha)
2	Desi (40 seeds m <sup>-2</sup> ) + Flax (40 lbs ac <sup>-1</sup> ) Low N	Desi (40 seeds m <sup>-2</sup> ) + Flax (40 kg/ha)
3	Desi (50 seeds m <sup>-2</sup> ) + Flax (40 lbs ac <sup>-1</sup> ) Low N	Desi (50 seeds m <sup>-2</sup> ) + Flax (40 kg/ha)
4	Kabuli (30 seeds m <sup>-2</sup> ) + Flax (40 lbs ac <sup>-1</sup> ) Low N	Kabuli(30 seeds m <sup>-2</sup> ) + Flax (40 kg/ha)
5	Kabuli (40 seeds m <sup>-2</sup> ) + Flax (40 lbs ac <sup>-1</sup> ) Low N	Kabuli (40 seeds m <sup>-2</sup> ) + Flax (40 kg/ha)
6	Kabuli (50 seeds m <sup>-2</sup> ) + Flax (40 lbs ac <sup>-1</sup> ) Low N	Kabuli (50 seeds m <sup>-2</sup> ) + Flax (40 kg/ha)
7	Kabuli (40 seeds m <sup>-2</sup> ) No N	Kabuli (40 seeds m <sup>-2</sup> )
8	Desi (40 seeds m <sup>-2</sup> ) No N	Desi (40 seeds m <sup>-2</sup> )
9	Flax (60 lbs ac <sup>-1</sup> ) Low N (11.2 kg N ha <sup>-1</sup> )	Flax (56 kg/ha)
10	Flax (60 lbs ac <sup>-1</sup> ) High N (56.0 kg N ha <sup>-1</sup> )	Flax (56 kg/ha) + 60 kg/ha N

## Key Findings:

- There was a significant effect of treatment on both chickpea and flax yield
- There was a general trend of increasing yield by more than 100 % in the desi variety relative to the kabuli variety at all seeding rates in the intercropped.

- The superior yielding of desi in an intercrop may be because of better competition with companion crops.
- However, when in a monocrop setting, kabuli yielded 33 % higher than the desi. Flax yield in the monocrop setting was higher (18 %) for treatment with additional N relative with the treatment with no N. Flax yield was greatest when intercropped with kabuli compared to with desi.
- The increase in flax yield with kabuli may be attributed to its excellent potential to fix nitrogen, resulting in a high contribution of fixed N to the flax. Flax intercropped with desi resulted in a lower yield compared to with kabuli, because desi is a good nitrogen fixer but is less productive in adverse environmental conditions.
- Overall, flax yield was the greatest when grown alone with N applications. However, flax intercropped with kabuli resulted in similar yields but the added benefit of this intercrop is that, farmers may benefit from two profitable crops rather than a single crop.
- Based on this demonstration and due to the fact this is the first successful year, further studies are needed to be able to make recommendations to producers around NW SK



**Figure 1:** Treatment effects on flax (*columns*) and chickpea (*line*) yield (kg/ha) for the 2015 growing season at Scott. Treatment were considered significantly different according to Tukey’s Honestly Significant Difference (HSD) ( $P > 0.05$ ).