

## Irrigation effects on Canola production

**Project Duration** - 2018

### Objectives

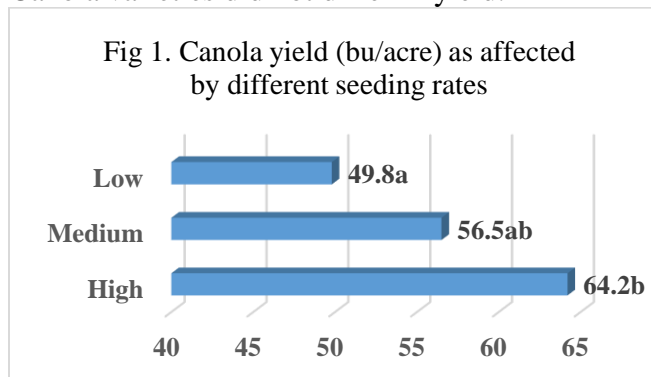
The current study was designed with the objective to determine if canola variety agronomic attributes (maturity and height) and seeding rate have any effect on canola yield and performance under excess moisture conditions. Three canola varieties and three seeding rate combinations were evaluated under irrigation and ideal growing (on tile drainage land) conditions.

### Collaborators

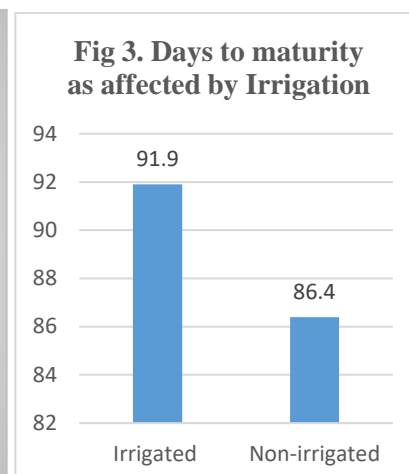
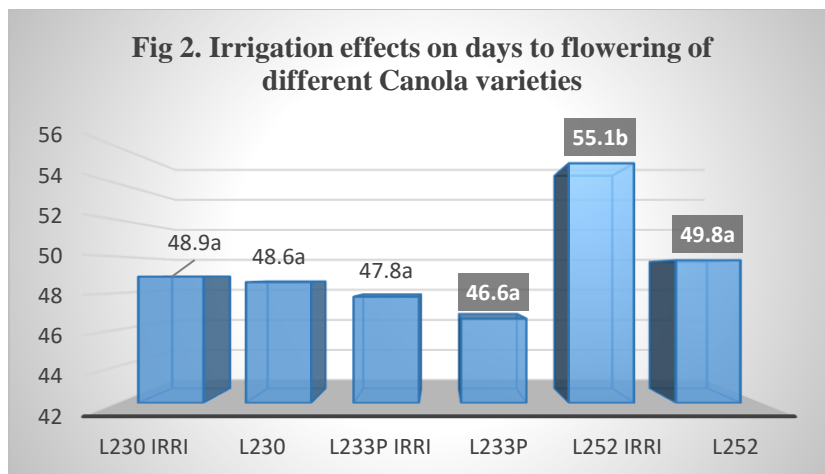
Bifrost Agricultural Sustainability Initiative Cooperative (BASIC)  
Bayer Crop Science

### Results

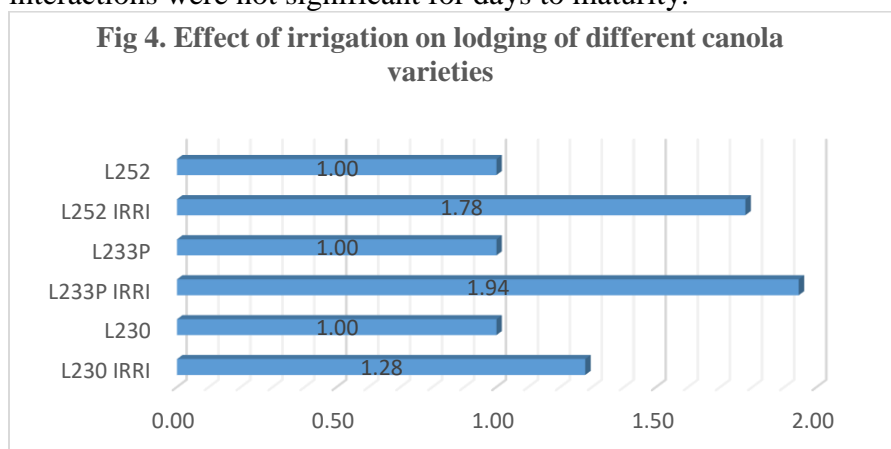
It was not possible to compare yield between irrigated and non-irrigated canola plots as a rainstorm towards end August resulted in huge shattering losses in non-irrigated canola plots. However, canola seeding rate had significant effect on yield (Figure 1) in irrigated canola plots and higher seeding rate resulted in greater yield as compared to low seeding rate ( $p=0.044$ ). Canola varieties did not differ in yield.



Irrigation had no effect on plant height at maturity when data were combined over varieties and seeding rates. Irrigation delayed days to flowering in canola variety L252 ( $p<0.0001$ , LSD – 2.36), when the data were pooled for seeding rates (Figure 2). This effect due to irrigation was not recorded in other two varieties.



Irrigation also increased number of days to maturity ( $p < 0.0001$ ,  $LSD = 2.76$ ), when data were combined over varieties and seeding rates (Fig 3). Irrigation-variety or irrigation-seeding rate interactions were not significant for days to maturity.



Irrigation also exhibited significant effect on lodging of canola varieties L252 and L233P (Figure 4), although it did not affect variety L230 ( $p = 0.009$ ,  $LSD = 0.52$ ).

### Project findings

Irrigation treatment had effects on canola growth, but its effect on yield was not determined because of rainstorm damage in non-irrigated plots.

The summer during 2018 was exceptionally drier at Arborg site and the site only got almost 70% of the normal rainfall during active canola growing period. A total of 16.5 inches of simulated rainfall (started at 3-4 leaf stage) did not show any adverse effect on canola productivity and the yield ranged from 34-76 bu/acre in different plots. Irrigated canola plots took greater number of days to mature, when compared with non-irrigated canola plots. Irrigation exhibited significant effect on lodging of canola varieties L252 and L233P.

It was not possible to simulate excess moisture conditions because of drier year. It is recommended to repeat this study to simulate excessive moisture stress.

## **Background/References/Additional Resources**

Canola is quite susceptible to water logging and shows a yield reduction if exposed to excess moisture in the earlier phase of crop growth. Wet soils cause an oxygen deficiency, which reduces root respiration and growth (Canola Council of Canada). With wet conditions, roots may be shallow and not able to access nutrients once the soils begin to dry. A few days in waterlogged soil can be enough to kill canola plants, and yield loss is certain — although as canola plants age, they tend to be more resilient.

## **Materials & Methods**

*Experimental Design* – Replicated block design

*Treatments* – Canola grown in Irrigated and Non-irrigated set ups. Irrigated plots got 16.5” simulated rainfall during June 14 – Aug 10 in addition to natural rainfall.

*Varieties* – L230, L 252, L233P

*Seeding rate treatments* -

- a. Low seeding rate – target population 6 plants/ft<sup>2</sup> (75% survival)
- b. Medium seeding rate – target population 9 plants/ft<sup>2</sup> (75% survival)
- c. High seeding rate – target population 12 plants/ft<sup>2</sup> (75% survival)

*Plot size* – 7.1 m<sup>2</sup>

*Data collected* – plant population, plant height at maturity, days to flower, days to maturity, lodging, yield

### ***Agronomic information***

*Stubble, soil type* – Fallow, Heavy clay

*Fertilizer applied* – P 25 lbs/acre at the time of seeding.

Pre-plant broadcasting of 100 lbs/acre of actual N

Pesticides applied – Sprayed Liberty @ 1 L/acre on June 4.

Decis @45 ml/acre on June 25 (for flea beetles)

Decis @45 ml/acre on August 19 (for flea beetles)

*Seeding/Harvesting date* – May 22/Sep 6