Impact of previous crop on soybean and canola yield (1527)

Principal Investigator:
Dr. Brian Jenks, NDSU, brian.jenks@ndsu.edu

Co-Principal Investigators:
Dr. Nancy Ehlke, Univ. of MN, ehlke001@umn.edu
Dr. Mike Ostlie, NDSU-Carrington, mike.ostlie@ndsu.edu
Dr. Jasper Teboh, NDSU-Carrington, jasper.teboh@ndsu.edu
Bryan Hanson, NDSU-Langdon, bryan.k.hanson@ndsu.edu
Eric Eriksmoen, NDSU-Minot, eric.eriksmoen@ndsu.edu

Research Objectives:
1: Determine if soybean yield is greater following canola than wheat
2: Determine if canola yield is greater following soybean than wheat

These objectives are to be accomplished using a 3-year crop sequence to evaluate soybean and canola production grown back-to-back. Crops were grown as shown in Table 1 below. Soybean and canola were planted in 2015 to evaluate the impact of the previous crop.

Table 1. Planned crop sequence to evaluate effect of previous crop on soybean and canola yield.

Treatment	2013	2014	2015
1	Wheat	Wheat	Soybean
2	Wheat	Canola	Soybean
3	Wheat	Wheat	Canola
4	Wheat	Soybean	Canola

This study is being repeated by planting wheat in 2014 followed by wheat, canola, or soybean in 2015 (see Table 2 below). Soybean and canola will be planted in 2016.

Table 2. Repeat of planned crop sequence in Table 1.

Treatment	2014	2015	2016
1	Wheat	Wheat	Soybean
2	Wheat	Canola	Soybean
3	Wheat	Wheat	Canola
4	Wheat	Soybean	Canola

Benefit to ND Soybean Farmers:
Some research and farmer experience indicate that soybeans grow just as well on canola ground as on wheat ground. This study is designed to test that theory in the northern plains where soybean and canola are commonly grown. If the hypothesis is true, then the main benefit would be potentially higher soybean yields following a profitable canola crop.

Research challenges:
Our research went as planned in 2015 with the exception of the plot in MN where the landowner inadvertently harvested through the research plots before the researchers had harvested. Thus no yield data are available from MN.

Research Results:

Below are the 2013-2015 results for soybean grown on wheat (W-W-S) compared to soybean grown on canola ground (W-C-S).

Minot

Rotation	Density	Height	Yield	Test wt	Oil
	sq ft	cm	bu/A	lb/bu	---%---
W-W-S	**4.5 a**	**22.9 a**	**32.7 a**	**58.2 a**	**15.9 a**
W-C-S	**5.1 a**	**20.9 a**	**32.8 a**	**58.3 a**	**16.2 a**

Langdon

Rotation	Density	Height	Yield	Test wt	Oil
	sq ft	cm	bu/A	lb/bu	---%---
W-W-S	**5.3 a**	**38.3 a**	**39.5 a**	**57.3 a**	**15.9 a**
W-C-S	**6.3 a**	**37.2 a**	**41.1 a**	**57.0 b**	**16.1 a**

Carrington

Rotation	Density	Height	Yield	Test wt	Oil
	sq ft	cm	bu/A	lb/bu	---%---
W-W-S	**5.0 a**	**66.4 a**	**34.9 a**	**58.0 a**	**xx.x a**
W-C-S	**4.7 a**	**58.5 b**	**33.5 a**	**58.2 a**	**xx.x a**

There was no significant difference in yield at any location between soybean grown on wheat ground compared to soybean grown on canola ground. Generally, there were no differences in crop density, height, test weight, and oil content. At Carrington, soybean height was greater for soybean grown on wheat, but there was no difference in height at Minot and Langdon.

Below are the 2013-2015 results for canola grown on wheat (W-W-C) compared to canola grown on soybean ground (W-S-C).

Minot

Rotation	Density	Height	Yield	Test wt	Oil
	sq ft	cm	lb/A	lb/bu	---%---
W-W-C	**10.7 a**	**72.0 a**	**2005 a**	**51.5 a**	**40.4 a**
W-S-C	**9.1 a**	**72.8 a**	**2213 a**	**51.7 a**	**39.4 b**

Langdon

Rotation	Density	Height	Yield	Test wt	Oil
	sq ft	cm	lb/A	lb/bu	---%---
W-W-C	**12.4 a**	**56.7 a**	**3335 a**	**51.9 a**	**49.3 a**
W-S-C	**11.6 a**	**56.2 a**	**3330 a**	**52.1 a**	**48.4 a**

Carrington

Rotation	Density	Height	Yield	Test wt	Oil
	sq ft	cm	lb/A	lb/bu	---%---
W-W-C	**11.1 a**	**104 a**	**2150 a**	**52.0 a**	**43.1 a**
W-S-C	**12.6 a**	**105 a**	**1976 a**	**52.2 a**	**43.1 a**

There was essentially no significant difference at any location for the variables measured. Canola yield, test weight, height, density, and oil were similar whether canola was grown on wheat ground or soybean ground.