

Impact of Cover Crops on Sweet Corn and Snap Beans.
2011 Research Report

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Introduction: Cover crops have the potential to improve soil health by minimizing erosion and nutrient losses (N and P) and increasing cropping system resiliency. Although many Ontario vegetable growers have been using cover crops for many years, there are still questions as to “what is the best cover crop to use before sweet corn or snap beans?”.

Objectives:

- To evaluate the impact of cover crops on processing sweet corn and snap bean yield and quality
- To determine if there is a difference between early- or late-planted cover crops

Methods:

LOCATION: Ridgetown Campus research plots

DESIGN: split-split-plot design (RCBD) Replications: 4

Plot width: 15 ft Plot length: 30 ft

PEST CONTROL was according to typical Ontario production practices.

ROTATION: Spring 2010 Cucumbers

Fall 2010 Two cover crop planting dates –Early (August 10th) and Late (September 8th)

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|-------------|---------------------------|--------------------------------|
| Cover crops | 1) no cover crop | 2) oat (seeding rate 72 lb/ac) |
| | 3) fall rye (120 lb/ac) | 4) oilseed radish (12 lb/ac) |
| | 5) forage pea (200 lb/ac) | 6) hairy vetch (25 lb/ac) |

Spring 2011 May 6 – Touchdown sprayed May 26 – Disked plots

N fertilizer rate: 40 lb N/ac for snap beans and 90 lb N/ac for sweet corn

June 2 – Cultivated plots June 6 – Planted

Snap beans (Festina) –harvested July 26th and 27th

Sweet corn (Obsession) –harvested Aug 18th and 24th

Table 1. Site characteristics at Ridgetown Campus in 2011.

Characteristic	Ridgetown 2011	
<i>Monthly rainfall:</i>	May	154.6 mm
	June	75.1 mm
	July	70.0 mm
	August	71.4 mm
<i>Soil characteristics:</i>	pH	5.8
	Soil texture	75:18:7 Sandy loam
	% OM	3.5
	CEC (cmol kg ⁻¹)	9.4
	P (ppm)	52
	K (ppm)	248
	Ca (ppm)	927
	Mg (ppm)	79

Results 2011:

YIELD:

- Cover crop planting date (early August or early September) did not impact snap bean or sweet corn crop growth the following year. Similar results were observed in machine-harvested cucumbers.
- Although there was no statistical difference among cover crop types, snap beans yield was numerically highest with oat followed by forage pea (Figure 1).
- Although there was no statistical difference among cover crop types, sweet corn yield was numerically highest with forage pea and vetch (Figure 2).

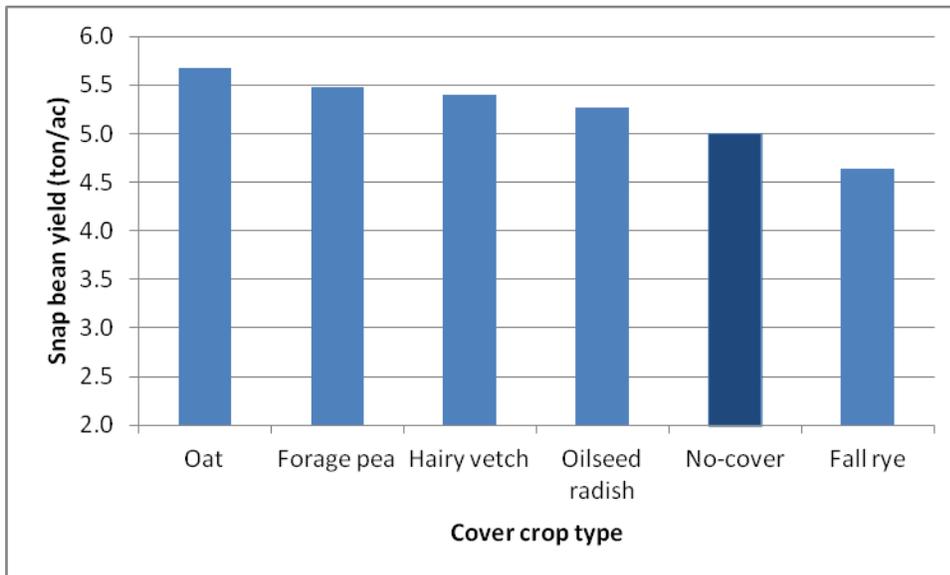


Figure 1. Effect of cover crop type on snap bean yield in 2011. (There were no statistical differences)

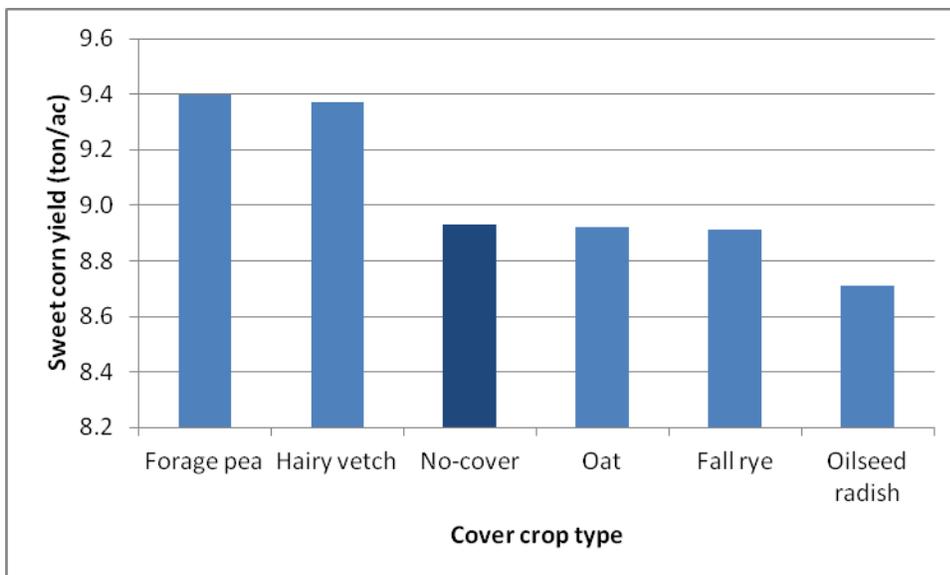


Figure 2. Effect of cover crop type on processing sweet corn yield in 2011. (There were no statistical differences)

COVER CROP FALL GROWTH:

- In general, early-planted cover crops had higher aboveground biomass and N content than late-planted cover crops. But in the following year, cover crop planting date did not impact snap bean or sweet yield. Therefore, growers do not have to modify which cover crop they plant based on when the cover crop is planted (Table 2).
- Generally, the cover crop %N concentration was higher in the late-planted compared to early-planted cover crops. With three months of growth by November, many of the early-planted cover crops were in a reproductive stage of development.

Table 2. Effect of cover crop type and planting date on aboveground biomass weights and nitrogen content in November 2010.

Cover crop type	Cover crop planting date	Dry weight (lb/ac)	N	
			concentration (%)	N content (lb N/ac)
Hairy Vetch	Early - 10 th Aug	3240 bc	3.84 abc	124 a
Forage pea	Early	4390ab	2.82 cd	119 a
Oats	Early	5970 a	1.77 d	100a
Oilseed radish	Early	2990 bcd	1.73 d	51.7 bc
Fall rye	Early	1640 cde	1.75 d	27.4 c
Oilseed radish	Late - 8 th Sept	2390 cde	3.31 abc	82.1 ab
Forage pea	Late	1260 e	3.95 ab	49.9 bc
Fall rye	Late	1500 cde	2.78 cd	43.9 bc
Oats	Late	1280 e	3.08 bc	38.8 bc
Hairy Vetch	Late	830 e	4.23 a	30.4 c

^a Different letters in each column indicates a statistical difference.

Recommendations: Based on one year, it appears that legumes should be planted before sweet corn and oats before snap beans. Matching funding from OMAFRA will support research on assessing soil quality, economics, and pest pressure but results are not available now. This study will be repeated in 2012 with sweet corn and snap beans rotated.

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