

Cover Crop Research and the Bottom Line

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Winter wheat provides "niche" for cover crop opportunity

- In a corn/soybean/winter wheat rotation winter wheat rotation often perceived as contributing the least to profitability...but perhaps it is equal or more
- Longterm trials at Elora Research Station and Ridgetown Campus demonstrate that addition of winter wheat provides
 - Increase of yield and yield stability of corn and soybean
 - Reduction of corn N requirement
 - Net return from wheat straw
 - An opportunity for cover crop and associated benefits





What cover crop to grow in "niche" provided by winter wheat?

- Substantial data set demonstrating that N benefit of cover crop to subsequent corn crop observed for red clover and not for other cover crops
- Substantial data demonstrating rotation benefit of red clover to subsequent crops... less data for other crops

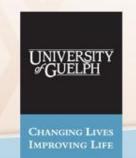


Table 2. Analysis of maximum economic rates of nitrogen, yield gains and profits associated with red clover inter-seeded to winter wheat under different tillage systems and maize and nitrogen prices.

Cover crop

No red closuer

Maize price 1

 Mg^{-1}

N cost

\$ Kg⁻¹

Tillage

system

MERN²

Kg N ha⁻¹

1/12

MEY³

Mg ha⁻¹

0454

Gross return 4

1202

\$ ha⁻¹

Profit

S	Plant Agriculture
1	

			No red clover	1293				
	150		Red clover	79	9886	1382		
	150	1	Difference,	**	**	**		
			Rotational effect (%)		4.57%		89	
			No red clover	129	9338	822		
			Red clover	74	9841	888		
	100	1	Difference	**	**	**		
renti			Rotational effect (%)	**	5.38%		66	
al —	150		No red clover	129	9338	1234		
ge		1.5	Red clover	74	9841	1352		
	150		Difference	**	**	**	118	
_			Rotational effect (%)	**	5.38%			
			No red clover	107	9068	772		
	100	1.5	Red clover	63	9713	863		
			Difference	Difference		**	00	
			Rotational effect (%)		7.11%		90	

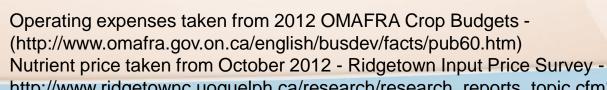
ar from the Ontario Nitrogen Database project [79–124]. ' Maize price after drying, handling and marketing; 2 Maximum Economic Rate of Nitrogen (MERN) calculated using quadratic-plateau functions; 3 Maximum Economic Yield (MEY) at MERN; 4 Gross return based on nitrogen cost and maize yield at MERN with clover establishment cost estimated at \$40 ha⁻¹; ns: non significant;

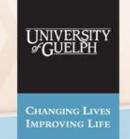
Gaudin et al, 2013. Agron. ** significant at p < 0.01.



Estimated gross margin of C/S rotation

	Corn	Soy
Yield (bu/ac)	175	50
\$/bu	5.25	12.00
Gross Revenue (\$/ac)	918.75	600.00
Operating Expenses (\$/ac)	477.00	231.00
Gross Margin (\$/ac)	441.75	369.00







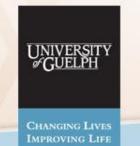
Estimated gross margin of C/S/W rotation - No red clover

	Corn	Soy	Wheat	Straw Value		
Yield (bu/ac)	175	50	80	Straw yield 2500 lbs		lbs
\$/bu	5.25	12.00	7.00	Straw value in winrow	0.04	\$/Ib
Gross Revenue (\$/ac)	918.75	600.00	560.00	Nutrient removal	0.007	\$/Ib
Operating Expenses (\$/ac)	477.00	231.00	274.00	Net straw value	0.033	\$/Ib
Gross Margin (\$/ac)	441.75	369.00	286.00			
Adj Gross Margin (\$/ac)	487.69	417.00	368.50	Red cover N credit		
GM Diff (\$/ac)	45.94	48.00	82.50	Ncorn N rate reduction	75	lbs/ac
True Gross Margin (\$/ac)	441.75	369.00	462.44	Nitrogen cost	0.5	\$/lb
				Red clover success rate	0.00	
Adjustments						
Rotation Adjustment (%)	5	8	0			
Straw Revenue (\$/ac)			82.50			
Red Clover (adj for stand success) (%)	0	0	0			
Red clover N Adj (adj for stand success) (\$/ac)	0.00					
Double crop revenue - oat/pea			Bonus			

Operating expenses taken from 2012 OMAFRA Crop Budgets - (http://www.omafra.gov.on.ca/english/busdev/facts/pub60.htm)

Nutrient price taken from October 2012 - Ridgetown Input Price Survey -

http://www.ridgetownc.uoguelph.ca/research/research_reports_topic.cfm?ref=FARM_INPUT_PRICES





Estimated gross margin of C/S/W rotation - Red clover

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True Gross Margin (\$/ac)	441.75	369.00	575.88	Nitrogen cost	0.5	\$/lb
				Red clover success rate	1.00	
Adjustments						
Rotation Adjustment (%)	5	8	0			
Straw Revenue (\$/ac)			82.50			
Red Clover (adj for stand success) (%)	5	5	0			
Red clover N Adj (adj for stand success) (\$/ac)	37.50					

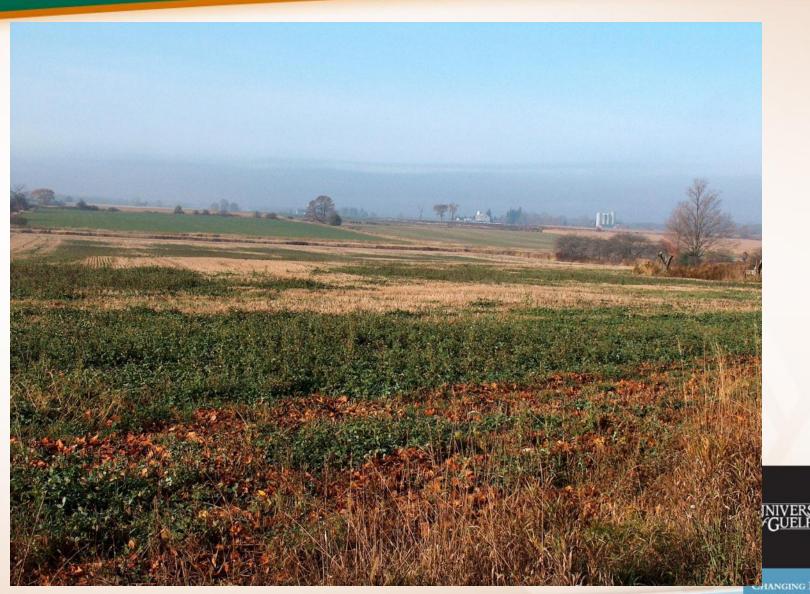
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