

HOW TO PUT A VALUE ON COVER CROPPING

PROVIDING SYSTEMS-LEVEL BENEFITS

Cover crops are growing in popularity in Ontario¹. They have many agronomic benefits and provide many ecosystem services (see side bar). Nevertheless, not all the economic values of these many benefits have been quantified yet. It's a challenge for researchers to put a dollar value on soil not-lost, yield not lost due to compaction damage or drought stress, habitat provided, etc.

LEARN TO SEE THE VALUE

At the farm level, Gordon Alblas, can see the value of cover cropping in his approach to weed control and in how his farm near St. George, ON, can handle the weather.

On weed control:

“ When I plant a rye cover crop, it's like, pick your weed. When rye is growing, it's suppressing all the other weeds, and then you only have one species to take care of in the spring. And it's one you know you can control and is not resistant to sprays.” | Alblas

On riding-out the weather:

“ Growing forage cover crops help us get through seasonal weather patterns. Over the winter, it protects the ground from being lost. In the spring, the ground is too wet to be doing anything else anyways, but then we can harvest it as forage in May before planting our high moisture grain corn, silage corn, or soybeans. It's tight, but we make it work. Then, in the summer, if it's a dry year and the pasture's dried up, the cattle graze in the cover crop that went in after wheat harvest.” | Alblas

¹ Study lead by Grain Farmers of Ontario finds Ontario farmers are leaders in cover crop adoption: <https://gfo.ca/news-releases/study-finds-ontario-farmers-are-leaders-in-cover-crop-adoption/>



Gordon & Andrea Alblas and family run a 60-cow dairy with a small flock of sheep and 230 acres. They grow feed (forage and grain for the livestock) with the extra sold as cash crop.

Cover crops can:

- Prevent wind and water erosion
- Fight weeds and compaction
- Improve water conservation and quality
- Provide wildlife habitat and pest control
- (Re)cycle nutrients
- Improve soil structure
- Provide back-up forage
- Add soil carbon and feed the soil biology

WHAT'S THE BOTTOM LINE?

There is an upfront cost to cover cropping. Seed needs to be purchased, planted (broadcast or direct drilled), and either terminated mechanically or by herbicide. These costs need to be weighed against the benefits, which sometimes take some time to be realized.

A report for the Greenbelt Foundation used available field data to estimate net returns in a corn and soybean rotation that used a winter cover crop mixture of 50% legume and 50% cereal rye. They used data that showed corn and soybean yield increased over time, that using a legume mix can also provide a 40 – 80 lb nitrogen credit and that there were less weeds, providing a \$13-\$33/ac value for weed control (Table 1).

The scenario depicted in Table 1 shows how cost recovery took about 5 years. It is notable that in a scenario when the value of the nitrogen credit rose (due to the cost of N-fertilizer inputs doubling to the price of \$1/lb N) the economic returns were positive after the first year. Also note that costs of cover cropping can vary. Ontario farmers reported² in 2020 costs of cover cropping were mostly in the range of \$16 - \$20 per acre, with some free of cost, and others \$70+.

Table 1 | Difference in mean rotation net returns (\$/acre) from consecutive cover cropping in a corn-soybean rotation, assuming a \$30/acre value for the nitrogen credit (60 lb N/acre when N is \$0.50*/lb N) from the cover crop mixture (50% legume, 50% cereal), a yield increase over time of 0.5 to 3% in corn and 2 to 5% in soybeans, and a savings in weed control of \$22.75/acre. Note that positive values represent income and negative values represent costs/expenses.

	Year 1		Year 3		Year 5	
	corn	soy	corn	soy	corn	soy
Yield Change %	0.5	2	2	3.5	3	5
Revenue Change \$/ac	4.15	13.60	15.00	22.70	24.95	32.45
Added Costs (\$/ac)	-57.40	-57.40	-57.40	-57.40	-57.40	-57.40
Nitrogen Credit (\$/ac)	30.00	0.00	30.00	0.00	30.00	0.00
Weed Control (\$/ac)	-22.75	-22.75	-22.75	-22.75	-22.75	-22.75
Crop Net Return (\$/ac)	-0.50	-21.05	10.35	-11.95	20.30	-2.20
Mean Rotation Net Return (\$/ac)	-10.78		-0.80		9.05	

*NOTE: Mean rotation net return is POSITIVE in the FIRST YEAR when the cost of N-fertilizer is \$1/lb N instead of \$0.50/lb N as above.

² Morrison and Lawley (2020): <https://gfo.ca/wp-content/uploads/2021/12/Ontario-Report-V12-Dec-1st-For-PDF-conversion-for-publishing.pdf>



Turnip and rye cover crop planted after wheat harvest. This can be a valuable source of pasture for grazing when the pasture biomass is limited by a dry summer.

Pro Tips:

Plan for the “less-than-best-case-scenario” and focus on the things you can control.

Think ahead. Anticipate and plan for how cover cropping may impact your tillage systems, planting and termination scheduling, nitrogen management and pest control.

Cost-share programs. Take advantage of them to help off-set the cost of buying seed or bumps along the way.

Reduce N fertilizer rates if including pricier legumes in a cover crop seed mix or consider using a non-legume cereal rye with a smaller price tag.

Build from local knowledge. Find and learn from local growers or professionals who have experience in cover cropping. It's never too late to learn:

“All this cover cropping – we didn’t grow covers 5 years ago. We didn’t really know about it then”. | Alblas

Keep records. This will help you track the impact of your management.

This factsheet is a summary of key findings from the report, Towards a Business Case for Soil Health. Soil health practices considered in the report and this Factsheet Series are: reduced tillage, cover crops, crop rotation, manure amendments, rotational grazing and various 4R nutrient practices. The report estimated that Ontario farm net returns would increase by approximately \$14.6 million dollars per year if an additional 10% of the agricultural land in Ontario were to be managed to support soil health. The numbers come from peer-reviewed, Ontario-based research and the analysis is based on financially-representative, farm-level budgeting techniques for Southern Ontario. Estimates are conservative and do not represent profits possible with experienced management.

Additional resources:

Towards a Business Case for Soil Health: A Synthesis of Current Knowledge on the Economics of Soil Health Practices in Ontario. 2022. The Greenbelt Foundation. www.greenbelt.ca/business_case_soil_health

For all OMAFRA's Best Management Practices Resources, including Winter Cover Crops, Cover Crops and Manure Applications, Inter-seeding Cover Crops, and Soil Health in Ontario, go to: bmpbooks.com

Ontario Cover Crop Decision Tool. Midwest Cover Crops Council. <https://soilsatguelph.ca/resource/cover-crop-decision-tool/>

Possible funding programs to support equipment modifications, purchase, new practices, etc., consult:

- Your local Conversation Authority
- OMAFRA Programs
- Ontario Soil and Crop Improvement Association, or your local Soil and Crop Group