BACKGROUNDER

What are Cover Crops?

Cover crops are defined by the Ontario Cover Crop Strategy (https://gfo.ca/wp-content/uploads/2020/11/Ontario-Cover-Crop-Strategy.pdf) as plants seeded into agricultural fields, either within or outside of the regular growing season, with the primary purpose of improving or maintaining soil quality. They are non-commodity crops either inter-seeded into living crops or planted onto bare fields or crop stubble during fallow periods. They have been used for centuries to cover and protect the soil from water and wind erosion, add organic matter, reduce nutrient losses, improve soil fertility, reduce pest populations, reduce compaction, improve soil structure, and protect crops from rapid changes in temperature and moisture.

For this research project, we defined a cover crop as a crop that is planted primarily to provide soil health and other agronomic benefits that is not harvested as a major cash crop. Cover crops which are grazed as annual forage were counted as a cover crop in our definition.

Why Are Cover Crops Important?

Maintaining groundcover year-round provides greater protection for soil from water and wind erosion and provides food for soil microbes during periods when they may otherwise may have been left 'hungry'. Plants capture solar energy and fix carbon from the atmosphere that can be returned to the soil, building soil organic matter. This increase in soil organic matter alongside the presence of cover crop roots can assist in the building of stable soil aggregates and increase soil structure and water infiltration.

It is hypothesized that cover crops could play a role in increasing the profitability and resiliency of Ontario's farms by increasing yield, nutrient cycling, and water use efficiency. Cover crops may also play a role in nutrient management by reducing fertilizer costs when using legumes that fix nitrogen, or by growing cover crops that can scavenge excess nitrogen left in the soil after cash crop harvest which may otherwise be lost. Cover crops may also provide another management tool for weeds, insects, and diseases especially at a time of increasing resistance to current crop control products.

Who Responded and Where Were They From?

For this project, it was important to hear from farms that are currently growing cover crops as well as those that are not. A total of 520 farms that grew cover crops in 2020 took part in the project and reported growing 107, 900 acres of cover crops across almost every county and district in Ontario.

This project also heard from 211 farms from across Ontario that did not grow a cover crop in 2020 to better understand their reluctance and curiosity about cover crops. Of the farms that did not grow a cover crop in 2020, 52% had not grown a cover crop before but wanted to try in the future, 9% had never grown but did not want to try, and 39% had grown a cover crop in a previous year, but not in 2020.

What Benefits Have Farms Seen Growing Cover Crops?

Of the farms that responded and grew cover crops in 2020, the majority (91%) have observed benefits from growing cover crops with 68% of farms identifying that they have seen improved soil health, 59%

observing less erosion, and 57% seeing increased soil organic matter. More than three quarters of farms (77%) that responded and grew cover crops in 2020 reported observing benefits within three years of adopting cover crops.

What Challenges Have Farms Seen Growing Cover Crops?

Farms that grew cover crops in 2020 also identified common challenges that they faced while adopting cover crops. The most commonly observed challenges among farms that responded were related to poor cover crop establishment (30%), the late harvest of a cash crop preventing cover crop planting (27%), and the additional costs associated with growing a cover crop (25%).

What Are The Barriers to Adoption?

These farms identified that additional costs (41%), lack of equipment (36%), late harvests of cash crops preventing cover crop planting (29%), not knowing where to start (24%), and the shortness of the growing season (23%) as the most common challenges limiting cover crop adoption in Ontario.

What would enable cover crop use?

Farms that did not grow a cover crop in 2020 identified financial incentives as a potential method for enabling continued use of cover crops on their farm, with 53% identifying tax credits for planting cover crops, payments for storing carbon (43%), and payments from conservation programs (36%) would increase the likelihood for growing a cover crop in the future. Technical assistance (40%), greater access to information on cover crop agronomy (29%), more research specific to local areas (26%) and to soil types (20%), as well as local farm tours (16%) and the creation of local networks of cover croppers (11%) were identified as common methods to enable cover crop adoption among farms that did not grow a cover crop in 2020.

How to reference this report

Morrison, C.L., and Y. Lawley. 2021. 2020 Ontario Cover Crop Feedback Report, Department of Plant Science, University of Manitoba. https://gfo.ca/agronomy/soil-leadership/

Upcoming Webinar

All interested in cover cropping in Ontario are invited to attend a Webinar hosted by Grain Farmers of Ontario on December 14, 2021 at 8:30 a.m. (EDT). Register for this free event here.

About the Researchers

This project was designed, conducted and written by two researchers from the University of Manitoba who had previous expertise conducting a cover crop survey and creating a report for the Canadian Prairies. This 2020 Prairie Cover Crop Survey Report can be viewed here: https://umanitoba.ca/agricultural-food-sciences/sites/agricultural-food-sciences/files/2021-10/2020-prairie-cover-crop-survey-report.pdf

Callum Morrison is a graduate student at the University of Manitoba specializing in cover cropping on the Canadian Prairies and in Ontario through the Ontario Cover Crop Feedback. Callum has enjoyed connecting with farmers across 4 Canadian provinces for his research and learning about information

dissemination and extension in agriculture. Callum holds a BSc in Agricultural Science from Scotland's Rural College (SRUC) and a MSc in Sustainable Plant Health from the University of Edinburgh.

Dr. Yvonne Lawley is an assistant professor at the University of Manitoba. Her area of research is agronomy and cropping systems. Dr. Lawley's research has focused on several crops including soybeans, corn, and wheat and a range of management practices from residue management, strip tillage, to cover crops. Her research involves both small plot and on-farm field scale agronomy research. Dr. Lawley enjoys communicating the results of her research to a wide range of audiences including farmers, agronomists, scientist in a range of disciplines, and especially in the classrooms where she teaches at the University of Manitoba.

What Organizations are in the Ontario Cover Crop Steering Committee?

University of Guelph Ridgetown Campus, the Ontario Ministry of Agriculture and Rural Affairs (OMAFRA), and the Ontario Cover Crop Steering Committee organizations: Certified Crop Advisor Association (CCA), Conservation Ontario, Ecological Farmers Association of Ontario (EFAO), Grain Farmers of Ontario (GFO), Innovative Farmers Association of Ontario (IFAO), Ontario Agri-Business Association (OABA), Ontario Federation of Agriculture (OFA), Ontario Fruit and Vegetable Growers Association (OFVGA), Ontario Soil Network, Ontario Soil and Crop Improvement Association (OSCIA), Soils@Guelph.