

THE CAPI CONNECTION

Elise Bigley | Editor

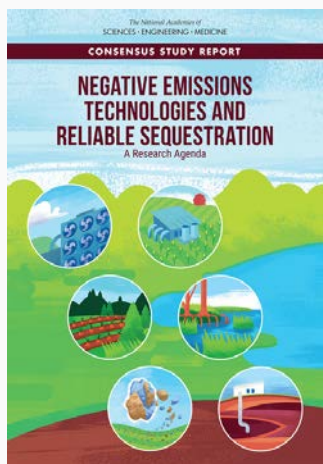
Soils: It's Complicated

Soil might seem like simple dirt to most, but it is anything but simple for Canada's food producers. It is foundational to putting food on tables in Canada and worldwide. Healthy soil can also boost production, fight climate change, promote biodiversity, and more. However, for soil to deliver on its full potential, farmers need to adopt a holistic approach that uses the right tools and techniques in the right place and at the right time.

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What We're Reading

A recent report by the National Academies of Sciences, Engineering, and Medicine titled Negative Emissions Technologies and Reliable Sequestration: A Research Agenda explores the relative costs and benefits and potential of various negative emission technologies (NETs), which take carbon out of the atmosphere and sequester it back into the earth. One of these technologies is of course related to terrestrial carbon removal and sequestration through soil carbon sinks. The others include coastal blue carbon, bioenergy with carbon capture and sequestration, direct air capture, carbon mineralization, and geologic sequestration.



The report argues there is a significant gap in research of these negative emission technologies (NETs). Based on their findings, the report concludes that research investment to improve existing NETs is needed. This will require reducing their costs and scaling up technologies through the launch of a substantial research initiative to advance NETs.

What's New at CAPI

Looking Ahead: Reflecting on 2021 and What Will Drive Ag Policy in 2022

Highlights Video



Agricultural Soils: The Link to Climate Change

Webinar Recording



Soils: It's Complicated

Soil might seem like simple dirt to most, but it is anything but simple for Canada's food producers. It is foundational to putting food on tables in Canada and worldwide. Healthy soil can also boost production, fight climate change, promote biodiversity, and more. However, for soil to deliver on its full potential, farmers need to adopt a holistic approach that uses the right tools and techniques in the right place and at the right time.

A recent Canadian Agri-Food Policy Institute (CAPI) [webinar](#) highlighted how soil is a complex, dynamic, organic ecosystem with huge variability across Canada. There is typically drier, sandier soil in the west and wetter soil with higher organic content in the east. However, soils can vary within a local region and can change significantly within a farm or even the same field.

This reality means that a farming practice that delivers the desired outcome in one field may not in another. For example, implementing cover crops, often touted as an important tool for sequestering carbon, may lead to increased carbon emissions in some situations. When soil was only relied upon to grow food, farmers could manage these variations at a farm or field level by using different tools including crop rotations, fertilizer rates, and drainage or irrigation.

Now, soil, and the farmers that steward it, are being asked to do more. The Federal Government is looking for soil to play an important role in meeting its ambitious climate targets by sequestering carbon and reducing emissions through reduced fertilizer use. At the same time, markets are telling farmers to grow more to feed the growing global population.

Farmers respond to these calls to action by investing in new technologies and changing their practices, but these things cost money, take effort, and may impact productivity. Farmers are looking for support from those that are asking them to do more, governments, processors and markets. That support needs to match the variability and complexity of soil itself. That can only be achieved through a renewed focus on working together, avoiding simplistic solutions, and making strategic investments within each actors areas of expertise.

Agriculture is a shared jurisdiction, which can lead governments to work in silos creating overlap and duplicated services. Funding on-farm investments appear to be fertile ground for governments to compete rather than collaborate.

Provinces have typically been responsible for on-farm programs, targeting support to the unique realities within their regions. This includes being responsible for Environmental Farm Plans and the programs that fund their implementation.

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However, the Federal Government announced \$200 million in funding for on-farm action in Budget 2021. Supporting only three solutions – nitrogen management, cover crops, and pasture management – and seeking new delivery partners across the country. The program is driven in part by a reality that some provinces cannot afford new investments or may not share the federal government's desire for ambitious climate action.

There needs to be a more collaborative approach. Federal-Provincial-Territorial governments are finalizing negotiations on their next five-year agriculture funding agreement. Governments should use the opportunity to make provincial governments responsible for on-farm programs while agreeing to a common set of ambitious objectives.

That does not mean there is not an essential space for federal funding.

First, the federal government should support more research, innovation, and knowledge transfer. The Living Labs Initiative is an excellent example of where the Federal Government should lead. Investments are increasing worldwide and Canada needs to do more if it wants to continue to be a world leader in the science of soil and the solutions required to deliver on its full potential.

Second, the Federal Government should lead the development of a national network to measure and monitor emissions from soils. Most of the data available today comes from a combination of models, testing, and remote sensing, but the variability of soil and the outcomes of different practices means that models may not capture the actual amount of carbon being sequestered.

Canada needs more investment in emissions measurement and monitoring, including test sites, remote-sensing, and new technologies. Better measuring emissions will allow farmers to be supported for actual results, rather than funding practices that may, or may not, deliver any.

Better data would also improve Canada's emissions reporting and facilitate a diverse suite of market-based solutions. Facilitating these tools, including carbon credits, inset protocols and conservation payments, facilitate other actors, such as investors, processors, and consumers, paying for their desired sustainability outcomes. The United States Department of Agriculture just announced a \$1 billion investment in a similar **initiative**.

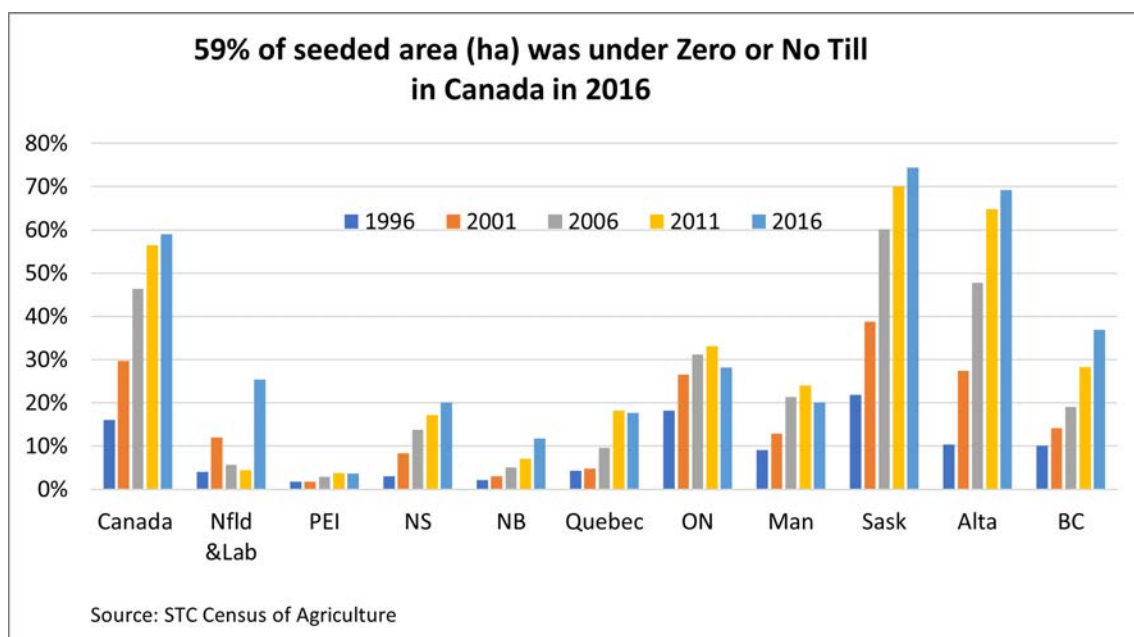
Governments may prefer simple solutions and low-hanging fruit, and politicians at all levels may want to fund on-farm action to be closer to voters. Still, these approaches may not deliver the comprehensive solutions that are needed. Soil is complicated, and getting soil to do all we need it to do is complicated, too.

Tyler McCann, Managing Director

One Great Graphic

Soil Health and No-till Practices Across Canada

Soil health is essential for improving crop yields, sequestering carbon and improving the environmental impact of agriculture in Canada, including for climate change mitigation and long term sustainability. One of the most transformational innovations contributing to improved soil health in Canada has been the adoption of no-till over the past 30 years. No-till is a system where mechanical tillage of the soil is avoided and seeding and fertilizing is done with as little soil disturbance as possible. [1] Between 1996 and 2016, Canadian crop area under no-till increased from 16% to 59%.



No-till is not suitable for all crop and soil conditions. Given the diversity of soil types, climate and crops grown across the country, no-till adoption varied by province. Saskatchewan and Alberta saw the highest rates of adoption as Prairie soil types, moisture levels and crops such as canola and pulses benefited from no-till, with seeded area under no-till rising to 73% and 70% respectively by 2016 from 20% and 10% in 1996. On the other hand, in Eastern Canada which is characterized by wetter soils, warmer climate and different crops and soil types, adoption rates were much lower, ranging from 4% in PEI to 28% in Ontario in 2016. As a result of no-till, soil carbon in soils has increased on the Prairies in particular, helping Canada offset greenhouse gas emissions from agriculture over this period.

[1] Boame, A.K., "Zero Tillage: A Greener Way for Canadian Farms", in Statistics Canada: VISTA on the Agri-Food Industry and the Farm Community, Catalogue no. 21-004-XIE, November 2005. Accessed here: [Microsoft Word - 1105-21-004-XIE.doc \(statcan.gc.ca\)](#).

CAPI in the News



Et si l'agriculture était une des solutions à la politique des Affaires mondiales du Canada: entrevue avec Tyler McCann



Missing the market

Farmers like the Thatchers are succeeding, but what happened to the promise that industry would make us a world leader value-adding?

The logo for 'FINANCIAL POST' features the text in a white, serif font, centered within a solid blue rectangular background.

Canadian farmers face volatility as war in Ukraine creates swings in global market for grains, oilseeds



La référence en nouvelles technologies agricoles au Québec

Le conflit Russie-Ukraine est un enjeu pour le secteur agricole



Better Space Data To Reduce Canada's Agricultural Environmental Impact

Partnership Opportunities at CAPI

Your commitment is vital. The risks have never been greater and the opportunities never bigger. Now is a pivotal moment for the agri-food system to lead as an essential solution provider for the economy, environment and global food security. But creative policy changes are critical.

Investing in the Environment

New technologies and tools are changing the way today's farmers operate. However, there can be a cost to adopting new technologies or changing the way food is produced that can prevent farmers from increasing their contributions to the fight against climate change and protecting biodiversity. These new technologies and practices can positively impact the environment, but that only happens if farmers adopt them.



This project aims to determine what public and private policies can be used to rapidly increase the implementation of new tools, and the adoption of beneficial management practices to maximize environmental and social outcomes.

This project is funded in part by the RBC Foundation. We are actively seeking private and foundation partners to advance this project and the agri-food system.

Support CAPI

You can make a difference! Become a partner or supporter of our work through the Canadian Agri-Food Foundation, a registered charity. Your commitment is vital as it is urgent to intensify our efforts as agriculture and agri-food can be essential solution providers for the economy, environment, health, food and global security but creative policy changes are essential. Click [**here**](#) to learn more.

CAPI acknowledges the overall support of its many partners particularly Agriculture and Agri-Food Canada.

Canada