Written Submission for the Pre-Budget Consultations in Advance of the 2019 Budget

By: Kimberly Cornish of
Food Water Wellness Foundation and Pachaterrae

Recommendations

- **Recommendation 1:** That the government conduct an in-depth analysis of the status of Canada's soils to measure compaction, degradation, element composition, and other important qualifying factors as well as an analysis to quantify the economic benefit of soil carbon sequestration. To this end, broad scale in situ soil research should be funded and this research should utilize peer-reviewed soil organic carbon measurement protocol to correlate land use history, physical, chemical and biological properties with soil carbon levels and accrual. Research in the field would measure soil carbon in all types of agricultural land under a broad spectrum of management and would re-measure at a later date to determine the amount of CO2 sequestered in the soil. In addition to the benefits this research would have for contributing to our body of knowledge and potential future actions to address climate change, research of this nature would also provide farms with a specific carbon map of their land to be able to prioritize areas to work on improving. Carbon is the primary driver of soil fertility. Knowing how much soil organic carbon is stored in the ground and being able to monitor how management practices impact soil organic carbon is invaluable to producers and the long-term viability of their operations.

- **Recommendation 2:** That the government provide funding in the amount of $50,000,000 for the Canadian Agricultural Partnership Program to enable this soil organic carbon research through collaboration between Agriculture and Agri-Food Canada, Universities, Not-for-Profits and Private Companies.

- **Recommendation 3:** That the government establish a national carbon offsets framework, with the provinces, to include this learning and develop measurement protocols based on soil carbon sequestration to incentivize all farmer to be actively sequestering carbon and recognize those agricultural producers practicing who are already regenerative agriculture are providing Canada with climate mitigation and adaptation, ecological and food security services.

Body of Submission

While agriculture produces GHGs, the soils on which producers operate have a vast capacity to capture carbon and therefore reduce the overall GHG emissions of agriculture operations. By adopting an increasing number of beneficial management practices, producers can continue to improve the environmental performance and sustainability of the agriculture sector. Many of these practices are related to the management of soil and water resources.

Extreme climate events have a major impact on agriculture. Various regions of the country are being affected in different ways, some regions are experiencing longer periods of drought, while other areas are seeing more flooding. These events result in significant crop losses, which disrupt the viability and sustainability of farms. Climate change is having significant environmental and economic impacts on the agricultural sector. In short, climate change is compromising the global competitiveness of our producers and putting the livelihoods of many producers and the food security of average Canadians at risk. Through implementation of the recommendations above the Government can both provide the climate mitigation and adaptation tools necessary to allow producers to remain competitive internationally and maintain strong local food supplies.

Agricultural practices focused on soil health have the potential to increase soil organic carbon by as much as three gigatonnes (or 3 billion tonnes) per year globally. This corresponds to a 50 parts per million (ppm) reduction in atmospheric carbon dioxide by 2100. (Lal: 2010) As of January of this year, atmospheric CO2 is 407.98ppm up from 406.13ppm in January 2017. Scientists generally agree we need to get to 350 ppm or less to stabilize the climate.

Many of our conventional agricultural practices such as tillage and the application of inorganic fertilizers and biocides are harmful to soil because they are antagonistic to the soil food web biology present in healthy soil. (Bardgett (1999; Leake: 2004; Khan: 2007; Leigh 2009; Mulvaney: 2009; Czarnecki et al. 2013; Kimble et al. 2007). They also inhibit the ability of the soil to sequester carbon because the biology is critical to the sequestration process. Regenerative agriculture practices like carefully planned grazing, conservation cropping, intercropping, cover cropping, and conversion of degraded cropland to pasture nurture soil's natural ability to absorb CO2. Many of these practices keep the soil covered year round and also reduce erosion. (FAO:2017)

Healthy, carbon-rich soil can absorb and hold more moisture than carbon-depleted soil and thus can help mitigate extreme weather events like wildfires, droughts and floods. Promoting carbon storage in soil enhances biomass production, restores degraded soils, purifies surface and ground waters, and offsets emissions from fossil fuels use. (FAO:2017) Carbon acts as a sponge in soil and along with soil microbiological activity helps counter compaction and improve soil porosity even when heavy machinery is driven on top of it. Also, many of these practices increase biodiversity and habitat for species at risk. Improving soil quality by increasing soil organic carbon is essential for the retention and availability of macro and micronutrients. (Lal:2009)

Researching, incentivizing and building carbon rich soils also allows for a new commodity – soil sequestration carbon offsets - to be bought and sold via the global carbon market. The protocol incentives we are proposing for farmers will also providing the necessary social license for Canadian producers to ensure market access to countries that have made a commitment to the Paris Agreement along with Canada. Through this protocol initiative we can also coincidentally broaden Canadian access to many of the markets such as the EU and Japan that will not accept commodities that have herbicide and pesticide residues.

The federal government can play a critical role in increasing the competitiveness of Canadian agricultural producers and large emitting industry through establishing a carbon offsets framework that incentivizes all producers to sequester carbon on their land. This would be a game changer for Canada's agricultural producers currently facing narrowing profit margins and a win–win for all Canadians. Action is critical at this time to;

1. tackle climate change;

2. help farmers to improve their soil which will subsequently reduce costs and generate revenue through improved soil fertility and carbon offsets to alleviate pressure from tight margins;

3. create offsets that enable the sustainable development of Canadian industry while still complying with the emissions targets Canada has agreed to as part of the Paris Agreement.

The importance of protecting and preserving soil health is recognized by Alan Kruszel, Chair of the Soil Conservation Council of Canada, it is important to "promote the health of the soil in order to help us face up to climate change. He feels a "national study to reassess the cost and consequences of soil degradation in Canada, with an emphasis on greenhouse gas implications." (H of C - Kruszel:2018)

Tracy Misiewicz, Associate Director of Science Programs at The Organic Centre speaks of the interconnected benefits of building soil organic matter, which is comprised of 58% soil organic carbon.

"Soil organic matter has a positive impact on ... physical, chemical, and biological soil properties. It provides structural stability to the soil, reduces erosion, protects against soil compaction, and improves aeration, water infiltration, and soil water-holding capacity, all key characteristics that will be particularly important in times of drought or flooding. Soil organic matter also serves as a reserve for nutrients essential to plant growth, including nitrogen, phosphorus, and sulphur, and it makes up the base of the soil food web, providing a foundation for all soil life.(H of C - Misiewicz: 2018)

Sean Smukler, Assistant Professor, University of British Columbia, states that "... across Canada, it's possible that we could substantially increase our soil organic matter on the 20% of our agricultural lands that are currently considered moderately to severely degraded and are not currently sequestering carbon."(H of C - Smukler:2017)

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