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*The face and voice of soil conservation in Canada
Le visage et la voix de la conservation des sols au Canada*

Recruit soil (and organic matter) to tackle climate change

By Susan Antler and Glenn Munroe

A couple of unsung heroes are waiting in the wings to help us tackle climate change. Soil leads this dynamic duo, but it has a very important and powerful partner — organic amendments such as those produced by composting and anaerobic digestion facilities across Canada.

Context and support for this claim can be found in an important new report, *Recruiting Soil to Tackle Climate Change: A Roadmap for Canada*, which identifies the enormous opportunity that soil represents for combatting the climate crisis.

Written and published jointly by the Soil Conservation Council of Canada (SCCC) and the Compost Council of Canada (CCC), with support from the Metcalf Foundation, this timely report identifies an enormous opportunity. Canada's soils — about 71 million hectares of managed agricultural and urban soils — have the potential to absorb and hold enough carbon to completely offset agriculture's greenhouse gas emissions footprint, currently estimated at 73 megatonnes (Mt) annually!

What adds to the excitement of this focus on soil to sequester carbon is the reality that a range of important co-benefits will also be delivered, including increased fertility, cleaner water and enhanced biodiversity. For our farmers, it will also create greater resiliency and profitability.

The roadmap was more than two years in development, with input from soil health researchers and practitioners from across Canada. It describes the latest science on how carbon is sequestered in soil, identifies the principles and practices that make sequestration happen, outlines the most important challenges to effecting change, and recommends key actions for the country's decision-makers to consider. If widely adopted, these principles, practices and policy measures could rally soil managers to reinforce our soils, such that they increase their carbon content and retain it long into the future.

Central to the report is five fundamental principles. These are: minimizing soil disturbance; maintaining live roots in the ground for as much of

the year as possible; keeping the ground covered; optimizing diversity; and optimizing inputs. The latter principle includes important initiatives such as the 4Rs of fertilizer use, integrated pest management (IPM) as well as adding organic matter (e.g., crop residues, manures, compost) to the soil. All have a common objective — to protect and enhance the community of beneficial soil organisms known as the soil food web.

Of all the organic amendments, compost has the most unique role to play in helping the soil food web do its job. Not only does compost provide energy and nutrition for the members of the underground community but it also significantly boosts microbial diversity. Diversity is crucial for building SOC. In a diverse soil food web, there is always a set of microbes ready to go, no matter what the environmental conditions, from too dry to too wet, from very cold to very hot. As a result, compost's "inoculation effect" boosts the SOC-building capacity of other beneficial practices such as reduced tillage and cover crops.

Moreover, as shown in the Compost Council's multi-year agricultural research using Compost Quality Alliance (CQA) compost produced from the source-separated residential organics recycling program in Brandon, Manitoba, the nutritional value of the food crops grown in compost is dramatically improved. Better soil health delivers better crop health, which in turn delivers better human health.

Understanding all this is beyond motivating for any of us who believe that unavoidable food waste, leaf & yard trimmings and other organic residuals should be recycled and transformed into soil-destined products such as digestate and, ultimately, compost.

The benefits to society are enormous. Massive landfill diversion means significant methane emission reductions, improved and reduced leachate management and

local economic gains. The latter include increased farmland profitability through productivity gains and reduced inputs, better soil health, improved plant yields and nutrient advantages and enhanced water quality and conservation, with the ultimate social good being the very real delivery of climate stability.

The Intergovernmental Panel on Climate Change (IPCC) has issued a "now or never" call to action in its recent report *Climate Change 2022: Impacts, Adaptation and Vulnerability*, stating that "Human-induced climate change is causing dangerous and widespread disruption in nature and affecting the lives of billions of people around the world."

The severe downside consequences of inaction are enormous. IPCC chair Hoesung Lee states "It (the report) shows that climate change is a grave and mounting threat to our wellbeing and a healthy planet. Our actions today will shape how people adapt and nature responds to increasing climate risks."

We can all help address this threat when we understand that soil and compost, working together to tackle climate change, can deliver a true "hit it out of the ballpark" grand-slam home run.

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