CWWA INFORMATION SHEET
MARCH 2026

BENEFITS OF USING BIOSOLIDS

Humans make biosolids and we're never going to stop

When we flush our toilets, all that wastewater is collected at a municipal wastewater treatment plant. After most of the liquid is removed, "biosolids" are the nutrient and organic rich by-products which have been treated to meet specific Federal and Provincial standards and guidelines through engineering best practices that includes the reduction of pathogens, vector attraction and contaminants, and that are suitable for reuse as soil amendments. This definition of "biosolids" varies from one jurisdiction to another. See CWWA's biosolids page for more detail.

What are our options for biosolids?

Generally, there are just three things we can do with our biosolids:

- Landfill. We can truck our biosolids to landfill sites, but there are massive quantities of waste that would fill our landfill sites very quickly, generate greenhouse gases and waste valuable nutrients, like nitrogen and phosphorus, forever. Finding and opening new landfill sites is difficult from many perspectives – financial, political and environmental.

- Incineration. We can incinerate or burn our biosolids as fuel to create energy. However, incineration is very costly as it requires the trucking of biosolids and solid waste from a large catchment area, requires high temperatures to complete combustion thus requiring additional fossil fuels, generates greenhouse gasses and destroys the valuable nutrients and organic matter.

- Land Application. We can recognize the tremendous value of our biosolids and use them as nutrient-rich fertilizers on agricultural lands, enriching the soils, sequestering carbon and providing economic value to the farming community.

Feeding our crops

For Canadian farms to meet the demands of the agricultural industry, crops require a constant source of macronutrients, Nitrogen, Phosphorus and Potassium (N,P,K), and micronutrients to support plant growth. To ensure this supply is sustainable long term, maintaining and building soil health is crucial for the efficient use of these nutrients. A common source of plant macronutrients for farmers is to purchase commercial fertilizers – Canada is ranked as the 7th top consumer of N,P,K fertilizers in the world, utilizing over 4 million tonnes annually with a steady increase for the past 50 years. These fertilizers provide the required macronutrients but, unfortunately, do nothing to maintain or improve soil health because they do not provide organic matter. As a result, studies have revealed that Canada's agricultural land is experiencing a dramatic loss of soil organic matter which is an indicator of declining soil health.

Are there any other benefits to biosolids?

Healthy soils also play a significant role in fighting climate change. This air-to-soil cycling of carbon or carbon sequestration is a key strategy that has been identified by experts around the world as an effective solution to counter climate change. Healthy soils are able to store large amounts of carbon from the atmosphere and return them to the soil at a rate that is 3 times faster than trees.

Agricultural soils are among the planet's largest reservoirs of carbon and hold potential for expanded carbon sequestration, and thus provide a prospective way of mitigating the increasing atmospheric concentration of carbon dioxide. It is estimated that soils can sequester more than 10 % of the anthropogenic emissions of carbon dioxide. [1]

Is recycling biosolids safe?

Science-based regulations and best management practices for the land application of biosolids ensure protection of human health and the natural environment.

Checkout the CWWA Biosolids page on our website for examples and references to provincial regulations across Canada.

Returning organic matter back to soils

The concept of a Circular Economy is not a new idea and has been evolving since the 1970s. As early as 1976, Stahel and Reday [2] conceptualised a loop economy to describe strategies aiming at waste prevention and resource efficiency, among other things. However, before the concept acquired an official name and various definitions, many actions in tune with it have been happening for as long as can be remembered. Recycling animal manures on farmland is one such action, where a material that could be considered a waste is in fact recognized as a precious resource. Instead of the "take-make-waste" philosophy of a linear economic model, recycling follows a "loop" approach, where elements that were taken from the air (carbon and nitrogen) and soil (nitrogen, phosphorus and minerals) are returned to the soil.

(1) Food and Agriculture Organization of the United Nations (FAO). www.fao.org/soils-portal/soil-management/soil-carbon-sequestration/en/
(2) Stahel, W. R., & Reday-Mulvey, G. (1976). The potential for substituting manpower for energy: A report to the European Commission. Subsequently published as Jobs for tomorrow. New York: Vantage Press (1981).

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This information sheet was developed by the national Biosolids Committee of the Canadian Water and Wastewater Association (CWWA). CWWA is the national professional association for Canada's municipal water and wastewater sector, acting as national advocates and supporting our members with information