

Using compost instead of nitrogen as fertilizer in Canada can slow global warming

July 13 2022



Credit: Pixabay/CC0 Public Domain

A new study led from the University of Waterloo discovered greenhouse gas production is significantly less when biobased residues like compost replaces widely used nitrogen fertilizer during spring freeze-thaw events

in cold temperate regions.

"In cold temperate regions like Canada, spring freeze-thaw events contribute significantly to greenhouse gas production which further exacerbates climate change," said study lead Emmanuel Badewa, a Ph.D. student from Waterloo's School of Environment, Resources and Sustainability (SERS).

"The premise of our study is that biobased residues, which are generated as the natural by-product of our lives and economy, have the potential to reduce global warming thanks to our highly variable spring freeze-thaw cycle—in Canada and across the temperate world."

The research team from Waterloo and McGill University collected greenhouse gases—[carbon dioxide](#), methane, and nitrous oxide—during the spring from a [pilot study](#) at Elora, Ontario research station. The site was selected due to its three transient spring freeze-thaw phases—waterlogged, wet, and dry.

"There is incentive for farmers in cold temperate regions that rely solely on [nitrogen fertilizer](#) for crop production to adopt biobased residues from [food waste](#), biosolids from sewage sludges, digestate from plant materials," said Maren Oelbermann, a co-author from Waterloo. "Also, the value of biobased residues is better than ever for farmers now that there are severe fertilizer shortages globally."

The study offers proof that [climate change](#) mitigation can be achieved through carbon sequestration and soil improvement with the knock-on effect of creating jobs in the agricultural sector.

"As Canada takes steps toward a zero-waste future and aims to improve the circular bioeconomy, there is opportunity to utilize recycled organic waste from landfills as a sustainable alternative for farmers to boost their

produce," Badewa said.

The study was recently published in *Frontiers in Environmental Science*.

More information: Emmanuel A. Badewa et al, Spring Freeze–Thaw Stimulates Greenhouse Gas Emissions From Agricultural Soil, *Frontiers in Environmental Science* (2022). [DOI: 10.3389/fenvs.2022.909683](https://doi.org/10.3389/fenvs.2022.909683)

Provided by University of Waterloo

Citation: Using compost instead of nitrogen as fertilizer in Canada can slow global warming (2022, July 13) retrieved 20 June 2024 from <https://phys.org/news/2022-07-compost-nitrogen-fertilizer-canada-global.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.