



SUBMISSION BY CANADA:

Sharm El-Sheikh online portal under the Sharm El-Sheikh joint work on implementation of climate action on agriculture and food security

Canada welcomes the opportunity to contribute to the Sharm El-Sheikh online portal under the Sharm El-Sheikh joint work on implementation of climate action on agriculture and food security. Canada would like to highlight two ongoing collaborative science and research initiatives and a national emissions-modelling tool. These initiatives support the development and adoption of climate smart agriculture practices. Canada highlights these partnerships and projects because they showcase research efforts that may serve as a foundation for engagement and collaboration with interested Parties and organizations. These initiatives are complementary to Canada's broader programs and policies that promote the adoption of sustainable agricultural practices, including those delivered under the [Sustainable Canadian Agricultural Partnership](#) and other climate-smart agriculture measures outlined in [Canada's Emissions Reduction Plan](#).

CANN₂ONET

The Canadian nitrous oxide network ([CANN₂ONET](#)) is a collaborative initiative that brings together leading experts from academia, industry, government, and producer organization across Canada. The network is focused on reducing nitrous oxide (N₂O) emissions from synthetic fertilizer use. These emissions not only contribute to a changing climate but also represent a significant cost to agriculture producers. Improving nitrogen use efficiency through the adoption of beneficial management practices (BMPs) and technologies can therefore both reduce emissions and strengthen producer profitability.

CANN₂ONET aims to:

(1) establish a national network of benchmark studies across Canada for whole-year measurements of N₂O emissions and soil processes; (2) develop and validate metrics to track emissions based on novel regional flux tower measurements, database development, and improved N₂O prediction models; and (3) develop a roadmap for N₂O emission reduction based on regional scaling-up of BMPs, including economic trade-offs and evidence from behavioral studies (i.e., adoption drivers and barriers).

Efficient Fertilizer Consortium

The [Government of Canada is a founding member of the Efficient Fertilizer Consortium](#) (EFC), an international public-private partnership created by the Foundation for Food & Agriculture Research. The EFC invests in research to help farmers use novel fertilizer practices and enhanced efficiency fertilizers more effectively to improve profitability and reduce nitrogen losses including as N₂O, a potent greenhouse gas (GHG).

As a founding member, Canada plays a key role in shaping EFC's strategic direction and research priorities. The Government of Canada also collaborates with other Canadian and international scientists, industry partners, and agricultural stakeholders to ensure that EFC-funded research is relevant and applicable to Canadian crop production. For example, Government of Canada scientists contributed to the

development of the Field Trial Guidelines; these guidelines will ensure consistent data collection across diverse climates, soil types, production systems, and management practices.

Holos

The [Holos™ model](#) is a Canadian National Greenhouse Gas Inventory (NIR)-based whole-farm model. The focus is on enhancing the environmental sustainability of Canadian farming by estimating changes to farm-level greenhouse gas emissions and soil carbon as a result of adopting various beneficial management practices. Model development and improvement rely on peer-reviewed Canadian science and follows Intergovernmental Panel on Climate Change (IPCC) guidelines for a country-specific approach. In addition, [the model is being developed open-source](#) and employs a co-development strategy with external developers with respect to interface design and long-term model development goals.

The free desktop-based software interface allows Canadian farmers to assess the greenhouse gas reduction and carbon sequestration of farm management changes. To increase ease-of-use, many built-in regionally representative default values are available if user-supplied data are missing. Increasingly, federal and provincial policy makers and program evaluators, the finance sector, and other external stakeholders leverage Holos to validate sustainability performance, inform risk management, and encourage the adoption of climate-smart practices.