

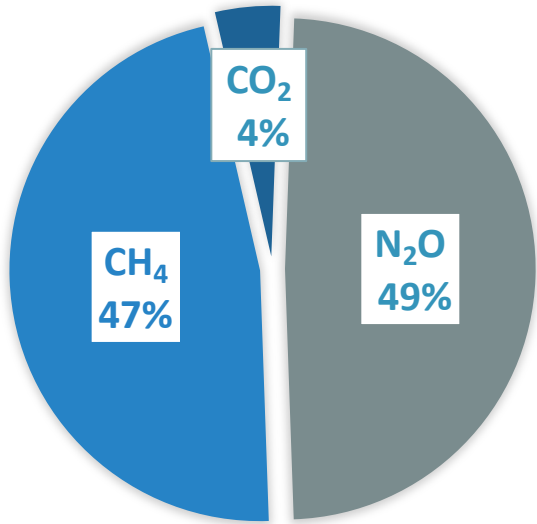


How does Soil Type, Crop Rotation Diversity and Climate Change affect Freeze-Thaw Nitrous Oxide Emissions?

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Coauthors: Claudia Wagner-Riddle, Shannon E Brown, Aaron Berg, Genevieve Ali

Agricultural Greenhouse Gas Emissions in Canada



Environment and Climate Change
Canada (ECCC), 2019



Post Harvest

- Nutrients available
- Soil temperatures decrease
- Microbial survival on water films



Freezing

- Carbon substrate released
- Ice seals surface
- Anaerobic conditions
- N₂O Build up



Thawing

- Soil temperatures increase
- Release of N₂O
- Denitrification intensifies

Sand Loam



Conventional



Average Winter



Silt Loam



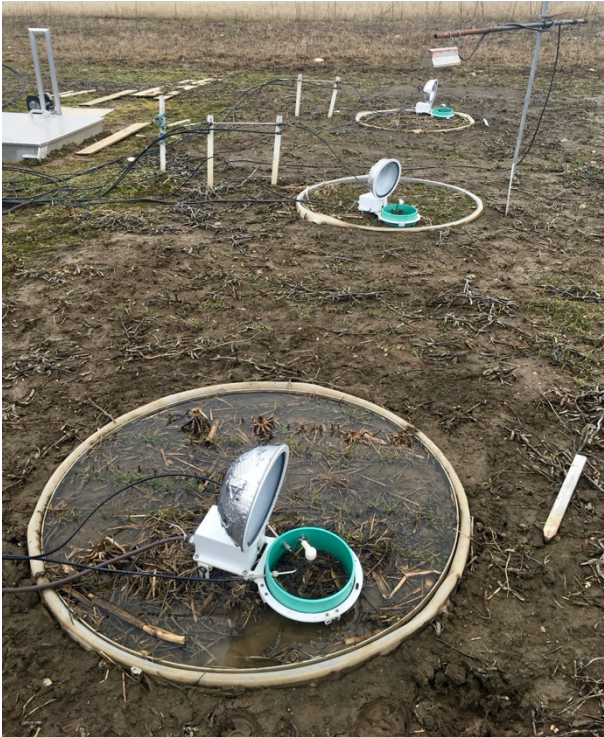
Diversified



Warmer Winter



Elora Research Station Lysimeter Facility



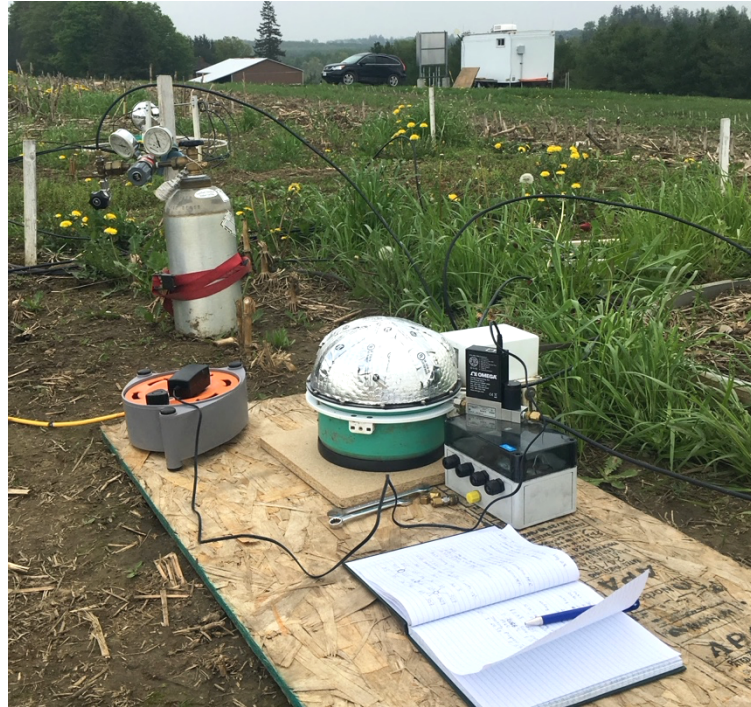
↑ Photos by Sean Jordan



↑ Photo by UBC Micromet Group



How do we measure N_2O Emissions?



Simple Rotation



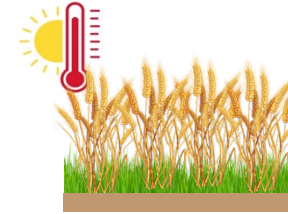
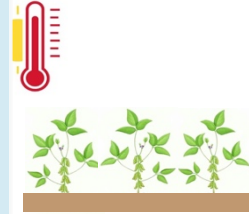
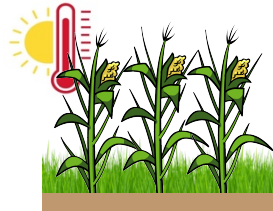
Data Presented



Diverse Rotation



Diverse Rotation +
Winter Warming
Treatment



3 Years

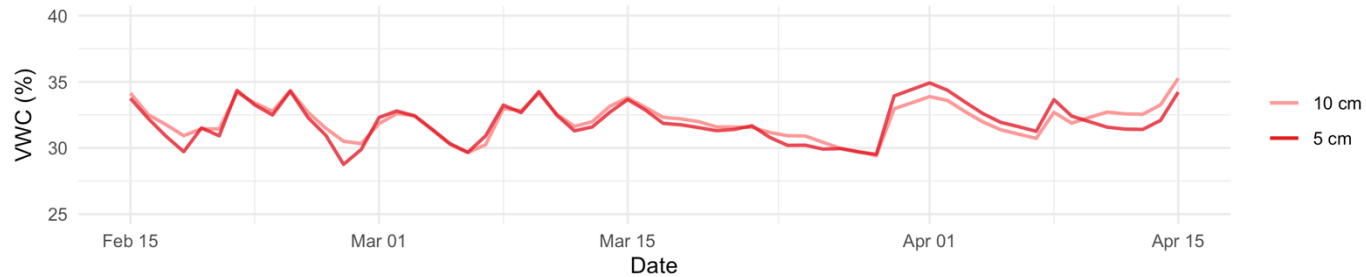
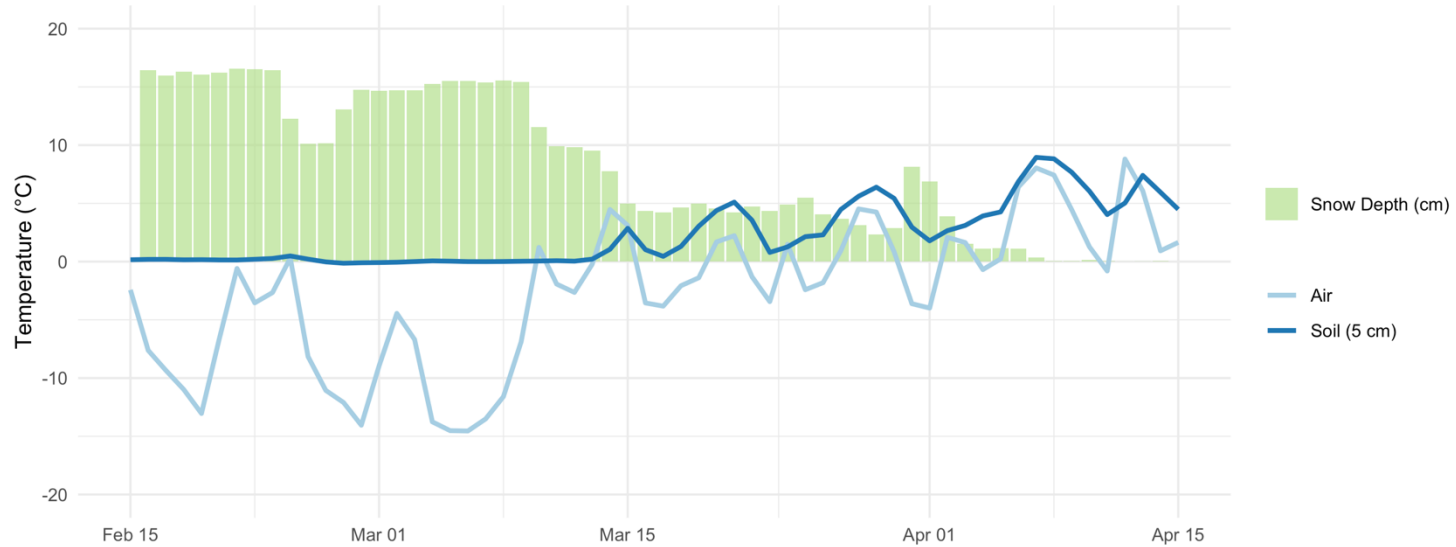
Control



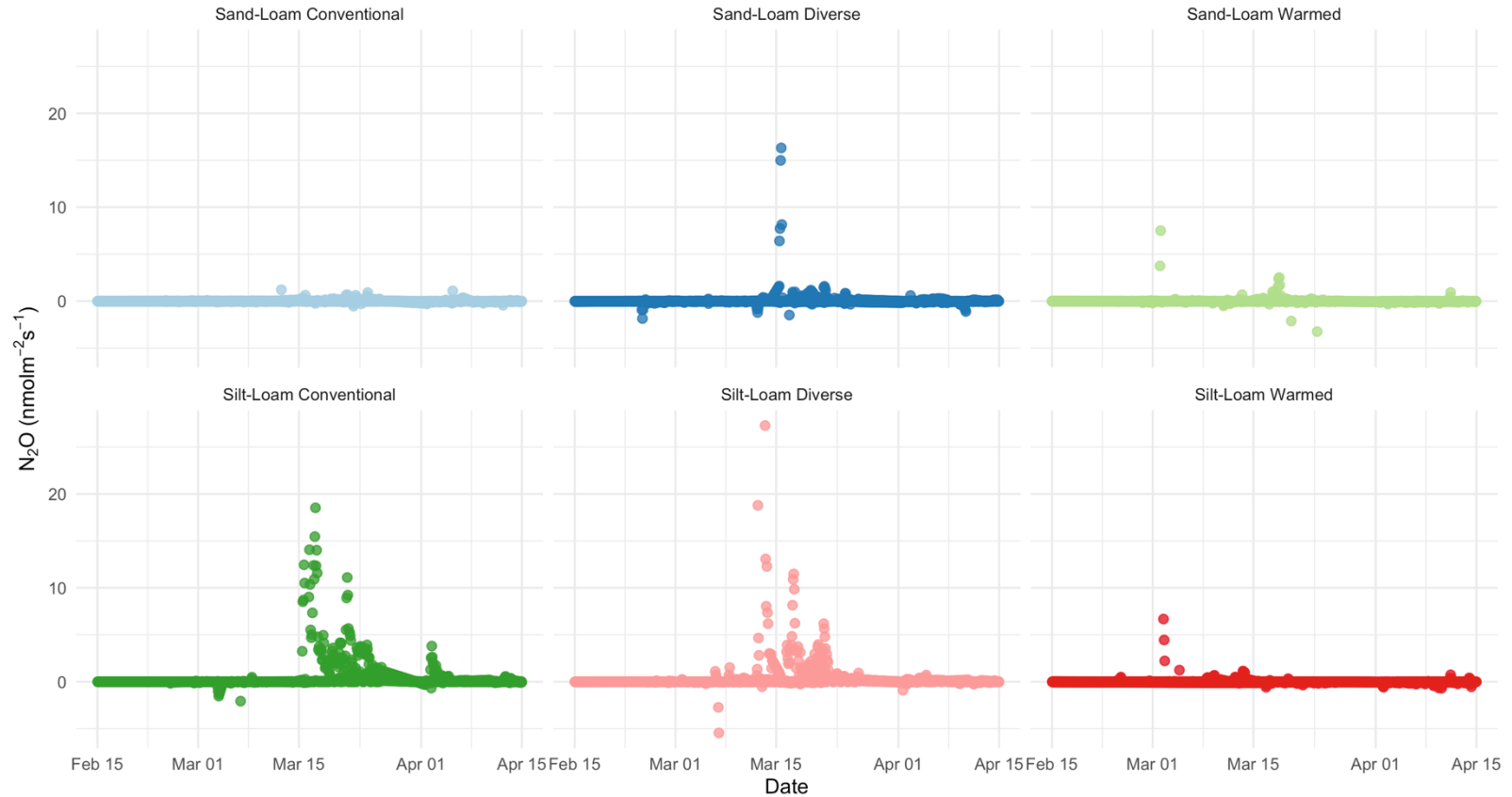
Heated



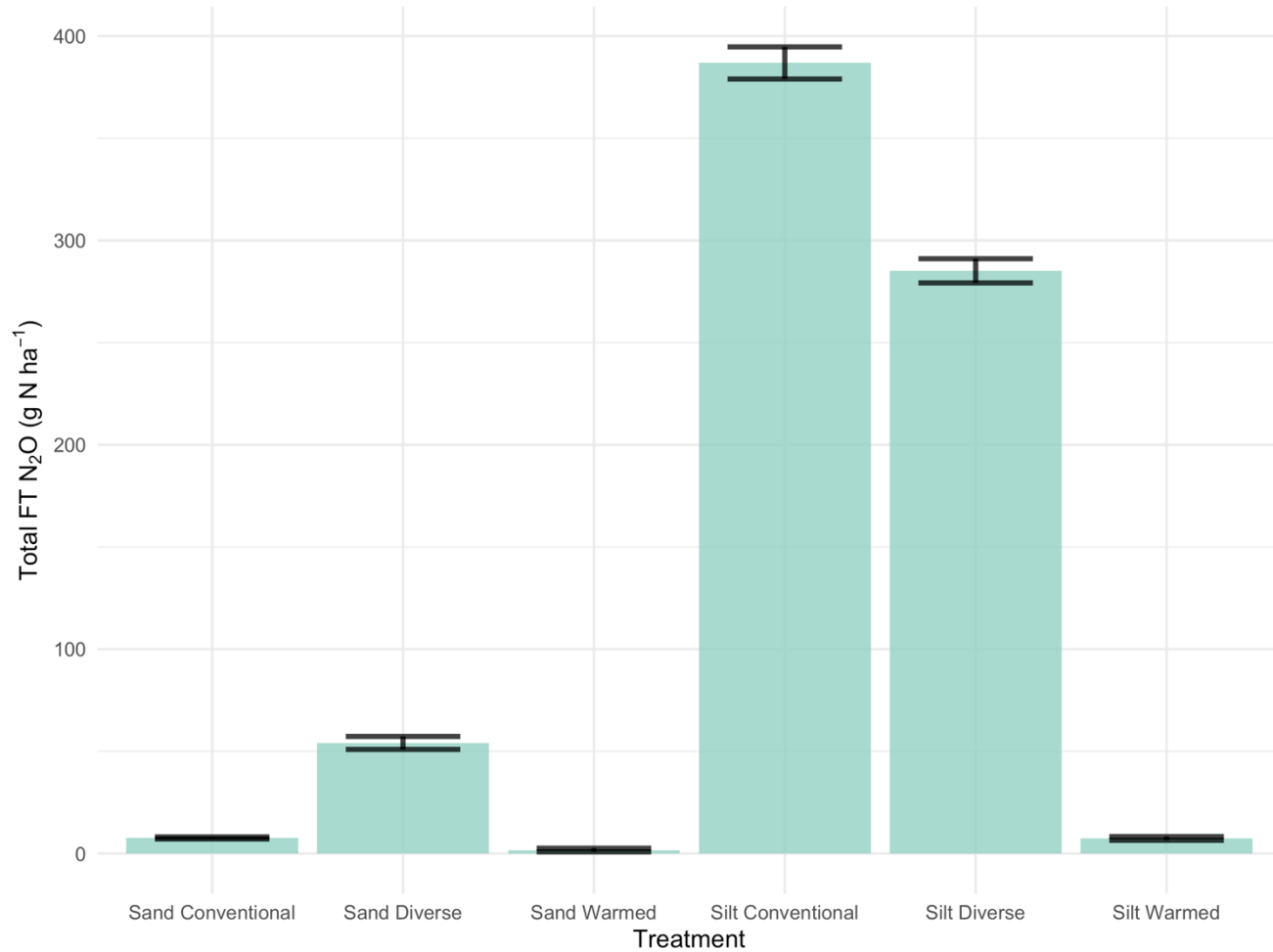
2019 Spring Environmental Conditions



2019 Spring Emissions



Total Emissions over 2019 FT Period





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Thank You!



Ontario