New Brunswick Soil & Crop Improvement Association Inc.
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1. Project title and project number:

Developing a science-based grass-roots level tool for systematic field evaluation of soil health in New Brunswick.

2. Project leader and collaborators:

Sheng Li (FRDC), soil scientist, project science lead; Sheldon Hann (FRDC), researcher on GIS and land resources, project co-Lead; Ray Carmichael (NBSCIA), project management and farmers outreach; Fangzhou Zheng (NBSCIA/FRDC), data analysis and field work; Xiaoyuan Geng (ORDC), pedologists, digital soil mapping; Louis-Pierre Comeau, Ikechukwu Agomoh (FRDC) and Alex Koiter (Brandon U.), soil scientists, method development, soil sample collection and data analysis; Charles Karemangingo (DAAF), soil specialist, provincial databases; Cedric MacLeod (AANB-NB), Living Lab manager, farmers outreach; Sylvie Lavoie and Yulia Kupriyanovich (FRDC), AAFC technicians, technical support.

3. Specify period of time for which the interim report is being submitted:

April 1, 2024 to March 31, 2025

4. Project Objectives(s):

1) Develop a grass-roots level tool for Field Evaluation of Soil Health (FESH) in NB so that producers, land owners, other stakeholders and interested citizens can use it to track the changes of soil health over time, and to compare soil health status in a specific field to that on another field or the reference values at the local, regional or provincial levels.
2) Create a provincial database of FESH to provide reference soil health scores to guide land management in agricultural fields in NB.

5. Project Deliverable(s):

1) A manual describing the step-by-step procedure for the FESH model
2) An FESH reference database with local reference FESH scores for different regions in NB under different land uses
3) A website and a cell phone application for FESH
4) Workshops and field days for FESH training and demonstration
5) Fact sheets, workshop training materials and scientific publications on FESH

6. Summary of Progress:

This project is aimed at developing a grass-roots level tool for soil health evaluation in the field in NB. There are three components in this project. The first component is to develop a scoring system for the evaluation which includes the selection of soil properties as soil health indicators, standardizing methods used to determine the score for each indicator and the calculation procedure for the final score. The second component is to establish a database for those soil health indicators in NB. The last component is to develop a software or mobile app as an interface for collecting the data and presenting the results.

The whole project was planed for five years and this is the second year of the project. The team continued to test methods used to determine the score each selected soil health indicators in the FESH framework established last year. Once the method has been decided, trial runs were conducted to develop a Standard Operation Procedure (SOP) to provide step-by-step instructions for users to use the method in a field setting. This was done for all applicable soil health indicators. All these individual SOPs were combined to a SOP document for the FESH tool as a whole. The first draft of the SOP document is attached

to this report. For the second component, existing datasets and maps were collected and analyzed. A set of maps for each soil health indicator was produced. The list of the maps were attached to this report. This serves as the first draft version of reference database. A deck of slides was developed as a quick guide for the FESH tool methods and the available maps. The draft version of the file was also attached to this report.

For knowledge transfer, different aspects of the method developed under this project for using cell phone cameras to estimate soil organic carbon have been presented as an oral presentation in the 2024 North East Potato Technology Forum (NEPTF) and a poster presentation (attached to this report) in the International Union of Soil Science (IUSS) 2024 Congress.

7. Adjustments:

Due to the restriction on participation agreement, the Research Associate hired will not be able to continue with this project. To meet this challenge, the plan was changed to hire a graduate student to carry on the work as his or her thesis project. Research associate will be hired for a short period of time to tackle some specific tasks. To facilitate the supervision of the graduate student, the project applicant has been changed to Dr. Meng from UNB. No change has been made to the overall goal of the proposal or the budget.