



## **Organic Soil Health Indicators Project Report**

### **Background**

Soil is a universal asset shared by all agricultural producers; and, productive soils are fundamental to the success of any farm business. Historically soil performance has largely been characterised by established physical and chemical metrics (soil type, aggregate stability, pH, mineral composition, water holding capacity, etc.). More recently, additional metrics based upon specific biological indicators have been introduced to characterise performance based on overall soil “health “. One such methodology, which has regional comparability is the Cornell Soil Health Test developed in New York State.

### **Overview**

This project proposed to undertake a comprehensive suite of soil analyses under the current defined protocols of the Cornell Soil Health Test (CSHT), using samples collected from a number of organic farms across the province. These samples were also analysed using established chemical, physical and biological methodologies at the PEI Analytical Laboratories and AAFC Mills Lab in Charlottetown as well as the Dal Ac Burton Lab in Truro, NS.

Results of the analyses contributed as well to a larger provincial soil quality monitoring survey and comprehensive collection of soil data.

### **Objective**

The objective of this work was to verify and calibrate over a defined period of time the accuracy of the CSHT under local conditions, and further to determine if the current protocol requires amendment to ensure efficacy on Prince Edward Island; and, will also serve to establish and quantify baseline soil health levels on organic farms across the province.

In addition, using the on farm comparative sampling methodology, another significant objective (specifically for the participating farmers) was to use the soil test results to compare soil health indicators in different areas of the farm as well as to crudely correlate test results with soil management practices

Longer term objectives are to develop a regionally specific suite of soil health indicators and to develop associated on-farm management practices which will result in improved soil health and performance characteristics.



### **Activities and Results**

Samples were collected from 16 participating organic farms across PEI during the 2 week period of October 13-28, 2017 (inclusive) using the CHST sampling technique. Penetrometer (compaction indicator) measures were also conducted as part of the protocol at 6", 12" and 18" depths. Sampling was undertaken during periods when the soil was known to be water saturated. Sampling while soil temperatures were cooler was intended to ensure measurable soil biological activity.

On each farm samples, were collected from 2 fields (or areas on the farm) which were observed to have performed differently, i.e. one field was more productive than the other. Productivity was defined by the participating producers and ranged from yield performance to incidence of soil borne diseases, weed pressure, and field crop and forage quality. Thirty-two (32) aggregate samples were collected in total. Samples were divided into 3 sub-samples and were submitted for analyses to each of the aforementioned testing facilities.

Sampling sites were located in: Bonshaw, Brookfield, Cable Head, Dundas, Ebenezer, Freetown, French River, Glencoe, Harrington, Heatherdale, Milton, Murray River, Oyster Bed Bridge, Souris, Stratford, Warren Grove, Waterside and Winsloe. Farms were variable in size and production, ranging from 12 – 1700 acres and producing field crops (grains, oilseeds, potatoes, cole crops, carrots) forages, vegetables, livestock and orchard crops.

Once samples had been collected they were dried and prepared for shipment to Cornell. Samples were sent to Cornell in mid December, 2016 and final analyses were complete by February 21, 2017. Triplicate samples were analysed in Charlottetown for typical soil chemistry and physical measures. Those analyses were complete by mid-December, 2016.

Producers will meet individually and/or in small groups with PEIDAF and local AAFC staff to review and interpret the soil test results. Soil management practices/ experience will be shared, compared and discussed. This format will also be carried on to the PEI COPC Annual Soils Workshop in March, 2017 with the addition of external theoretical and practical expertise.

Results of this process will be shared with PEI COPC members.

### **Impact**

Improvements in soil health and resultant increases in performance should ultimately lead increases in farm profitability. Having an ability to accurately measure and better understand the impact of specific management practices on soil health can potentially lead to improvements in environmental and economic performance on farms.