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NEWS RELEASE
For immediate release

How are our agricultural soils doing?
Findings of a large-scale study on agricultural soil health in Quebec

Quebec City, June 7, 2023 – Commissioned by the Quebec Ministry of Agriculture, Fisheries and Food (MAPAQ), the Research and Development Institute for the Agri-environment (IRDA) has published the results of a five-year study on the health of Quebec's agricultural soils.

Important mandate to assess the health of Quebec's agricultural soils

Soil is the most precious and important resource for farmers. Unfortunately, good farmland is in increasingly short supply in Quebec, and it is subject to a number of pressures. Various stakeholders (agronomists, farmers, decision-makers and researchers) have had questions about the state of soil health for several years now, since the last inventory was carried out in 1990. That is why MAPAQ commissioned IRDA to carry out a large-scale study on the subject. The study was led by Marc-Olivier Gasser, a soil and water conservation researcher.

Background

The research project assessed soil health in Quebec's main soil regions and the parent materials from 2017 to 2019. The 71 most commonly cultivated soil series were studied at a total of 426 sites. The pedological, biological and physico-chemical characteristics of the soil were surveyed in cultivated fields and compared with those of undegraded soils in control sites. The fields were selected based on the 1990 inventory, so that changes in soil health over this period could be quantified. To carry out this large-scale inventory, IRDA relied on the contributions of nearly 400 farmers and 25 agri-environmental advisory clubs, who partnered in the study.

Findings presented in five reports

The findings of this study are presented in five reports available to the public on the IRDA website (click here to access the reports [AVAILABLE IN FRENCH ONLY]).

Highlights

Here are a few highlights (from the first and second reports) that could be useful in guiding future actions:

- The physical properties of cultivated soils and organic matter are more degraded in the southern regions of Quebec, on the Montreal plain and in Centre-du-Québec, where annual crops are more prevalent and intensive.
- Aeration and water flow are generally more limited in depth at the B horizon for clay, loam and some till soils.
- Soil structure and properties associated with organic matter in the soil are more often degraded in surface horizons when more intensive farming practices are in use, and in sandy to skeletal soils in particular.
- Compared to the 1990 inventory, there would be no increase in degradation in 2020. Soil in the southern regions is still more compacted or lacks aeration, as was the case in 1990, but soil in outlying regions appears to be less degraded today. The accumulation of P, Cu and Zn Mehlich-3 and, to a lesser extent, the reduction in soil organic matter, are still a concern.
- The intensity of farming practices associated with cropping systems, the intensity of tillage and compaction caused by increasingly heavy machinery are responsible for some of the problems observed at depth, such as aeration and water infiltration processes in heavier soils and water retention in lighter soils.

- Using perennial crops, such as grass crops, in crop rotation improves the organic matter content and its properties, as well as the physical condition of the soil.
- Intensive tillage, on the other hand, reduces the organic matter content in the surface horizon. Frequent inputs of organic fertilizers increase the content of organic matter, as do phosphorus and other nutrients linked to inputs of livestock manure.

These findings led to recommendations (presented in the third report) based on seven major conservation practices to be promoted to ensure soil health: using perennial plants and cover crops, reducing soil compaction and tillage, maintaining permanent soil cover, improving the management of farmyard manure, and reducing or avoiding the use of synthetic inputs.

About IRDA

IRDA is an agri-environmental research and development institute. The Institute's experts collaborate, question, explore and work with the agricultural community to ensure healthy, dynamic and high-yield agriculture. IRDA believes in a prosperous future that respects plant, animal and human health. That is why our teams are passionate about helping today's agricultural practices evolve. The Institute's mission is to foster agri-environment innovations that help shape the agricultural production of tomorrow.

Source:
Joannie Robitaille
Communications Officer
Research and Development Institute for the Agri-environment
418-643-2380, ext. 203 | joannie.robitaille@irda.qc.ca | www.irda.qc.ca