Agriculture and climate change: how Quebec producers are innovating to find solutions



Agriculture is one of the sectors most strongly affected by climate change. As elsewhere, producers in Quebec are already feeling the effects: more frequent droughts, heavy and unpredictable rain, soil erosion, dwindling biodiversity, etc. All of these are challenges that farmers must prepare for while continuing to provide quality food and keep their businesses profitable.

But did you know that agriculture and forestry can also be part of the solution when it comes to fighting climate change? Read on for a portrait of an industry that is adapting by working with experts to become more resilient.

On the ground with producers

Since its first forays into the agri-environmental sphere, the Union des producteurs agricoles (UPA) has spearheaded numerous projects across Quebec to give farms resources, training, and guidance in adopting agri-environmental practices.

The UPA currently has two major projects under way on Quebec farms: Agrisolutions climat, which aims to reduce greenhouse gas emissions and build resilience in farm businesses, and Laboratoire vivant – Racines d'avenir, which uses research to support innovation in real-life farming conditions. These complementary

initiatives both reflect a deep conviction: solutions exist, and they are built through the collaboration of farmers, researchers, advisors, and citizens.

Laboratoire vivant – Racines d'avenir: innovation through co-development



Since 2018, two programs based on the living labs approach, funded by Agriculture and Agri-Food Canada (AAFC) and led by the UPA, have given Quebec producers the chance to directly participate in research that is usually exclusive to scientists.

Laboratoire vivant – Racines d'avenir, which launched in 2023 and will continue until 2028, brings together farmers, scientists, and other partners to develop, discuss, test, and evaluate innovative agricultural technologies and practices in real-life production conditions. The aim of these initiatives is to accelerate the adoption of sustainable solutions on farms to combat climate change; it promises to generate key knowledge for producers in a number of specialties.

How does it work?

All throughout the innovation cycle, the needs and interests of producers are identified. Other experts (advisors, scientists) take part in the discussions to refine needs, share knowledge, and determine what approaches to take to develop innovations: this process is known as co-development.

Experimenting in the field

Next, the ideas are investigated through experimentation and study (e.g., trials on farms or research stations) with research teams. After this, the group evaluates the results. Finally, with the help of everyone's comments and ideas, the process is adjusted by starting the cycle again and making refinements throughout.

The "living lab" approach enables producers to play their part in the innovation process by sharing their ideas and implementing co-development and experimentation activities, which evolve with the results that emerge as the project advances.

Five innovation cells

Laboratoire vivant – Racines d'avenir is made up of five innovation cells. The purpose of each is to co-develop or refine farming practices to lower GHG emissions and sequester carbon on farmland.

1. Soil management and fertilization
2. Ruminant feed and forage crop management
3. Manure management
4. Reappropriation of knowledge and ecological restoration of sweetgrass
5. Agroforestry and watercourse development

A total of 70 producers, spread out across most regions of Quebec, participate in the different cells. Not all producers take part in all project activities, while some are involved in testing more than one practice. For example, the soil management and fertilization cell is made up of 30 producers.

Valuable government assistance

None of this work would be possible without financial assistance from AAFC. Thanks to this support, Quebec producers have the chance to enrich their knowledge and adopt new practices to help them face the challenges of climate change with greater resilience.

All knowledge and skills gained from the living lab project will be shared with other producers and other stakeholders in the agriculture sector. Everybody wins!

Agrisolutions climat

Agrisolutions climat is another project initiated by the UPA. It is funded by AAFC's On-Farm Climate Action Fund and run by the Conseil pour le développement de l'agriculture du Québec (CDAQ). Since the launch of its first season in 2022, this project has supported Quebec farm operations in adopting practices to help reduce GHG emissions.

Agrisolutions climat has three components:

1. Nitrogen management through fertilizer optimization

2. Cover cropping to protect soil over the winter and add nutrients to the following crop (in partnership with the Producteurs de grains du Québec

3. Fighting climate change with the on-farm diagnostic tool

What makes this project different is its customized approach: each farm receives coaching tailored to its individual situation, thus ensuring that any changes made are viable over the long term. Producers also receive financial support to adopt new practices, which helps them handle the financial risks associated with making changes.

Through the support of diverse partners, Agrisolutions climat helps:

- Significantly increase the adoption of best practices in all regions of Quebec
- Improve nitrogen management in different production sectors through practices aimed at reducing the total amount of mineral fertilizer used, replacing mineral fertilizers with alternatives or introducing new beneficial practices, and gaining useful practical knowledge
- Producers plant cover crops on their land by providing appropriate and adapted support
- Give many farmers the chance to conduct the **Agriclimate** diagnosis to fight climate change and target the most appropriate actions for their businesses

A shared vision: balancing planet, profit, and people

Underlying both Agrisolutions climat and Laboratoire vivant – Racines d'avenir is the desire to show that sustainable farming is not just possible but also beneficial for society as a whole.

This is truly a virtuous circle in which innovation and cooperation benefit all. Clearly, land does so much more than feed discussions at the UPA! It is fertile terrain for innovation, research, and projects that bring hope for the future.

Looking forward

The agriculture sector is not backing down in the face of climate change: it is innovating, adapting, and proposing solutions. Through Agrisolutions climat and Laboratoire vivant – Racines d'avenir, the UPA is showing that productivity, profitability, and care for the environment can all go together.

These projects go well beyond simple technical initiatives: they are the embodiment of a vision for the future in which producers, researchers, and citizens work together to build a sustainable agriculture sector, for the benefit of all.

To find out more and hear inspiring stories from participating farms, visit the UPA's **agri-environmental projects** section.