



**Agricultural
Institute of Canada**

aic

**Institut
agricole du Canada**

**Brief to the House of Commons Standing
Committee on Environment and Sustainable Development**

**Clean Growth and Climate Change in Canada: Forestry, Agriculture
and Waste**

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About AIC

Founded in 1920, the Agricultural Institute of Canada (AIC) is a unifying voice for cross-sectoral research and innovation in Canada.

Our mandate is to advocate on behalf of agricultural research. This includes disseminating information, promoting careers in our sector and creating international linkages.

For nearly 100 years, AIC has responded to the needs of its members in service to the agricultural community, playing a central role as a source of credible information and comment for the Canadian agriculture and agri-food sector.

We are one of Canada's foremost advocates for agricultural research and innovation as well as an important tool to facilitate the dissemination of agricultural research and innovation to industry stakeholders.

The Agricultural Institute of Canada is rebranding. A change of name, to take place in 2019, is underway. The new name of the organization, to better reflect its nature and work, will be the "Agri-Food Innovation Council".



Recommendations

1. Support innovation – both at the development and adoption stages – of technologies that increase carbon capture and storage capabilities, including:
 - a. Incentivize early adoption by producers (for example, by offering tax breaks for use of certain technologies); and
 - b. Expanding rural broadband.
2. Collaborate with agricultural sector to address ongoing issues, including:
 - a. Support various sector-wide initiatives and promote and information sharing across sectors; and
 - b. Develop an agricultural-specific intellectual property strategy.
3. Adapting our urban environment through various means, including;
 - a. Carbon dioxide sponging techniques, other ways to use carbon dioxide efficiently.
4. Reinvestment of carbon tax revenue into green innovation that promotes:
 - a. Development and introduction of new sources of energy; and
 - b. Incentives for biofuel production.
5. Reduce administrative burden, including:
 - a. Greater collaboration between government departments (Environment and Climate Change Canada, Agriculture and Agri-Food Canada, Innovation, Science and Economic Development.)
 - b. Remove duplication and needless administrative burden – red tape.



Agriculture and Clean Growth

By some accounts, more than 10% of Canada's greenhouse gases are from traditional crop and livestock production. That percentage increases when emissions from farm equipment and the use of various types of fertilizers are considered.

The agricultural sector holds significant potential for the development and use of clean technologies and bio products.

Examples of Clean Growth and Technology in Agriculture

- Development of alternative proteins
 - Through the use of plant genomics and novel processing techniques, the nutrition and value of key crops will be increased.
 - This plant-based meat alternative is a growing market worldwide.
- Precision agriculture:
 - Uses technology (including GPS, satellites, UAVs, etc) to monitor crops in a variety of ways, and allows the farmer to respond accordingly (i.e. apply the right kind of fertilizer only where needed).
 - This makes farming more efficient, resulting in higher crop yields, while using less resources.
- Greenhouse horticulture:
 - Using robotics and automated technology, this indoor environment produces as much as 7 times higher yields, with greater consistency.
 - This relatively young sector is now worth \$2.5 billion, and exports nearly 70%.



Support for Innovation – Development and Adoption

Agricultural innovations and new technologies have the potential to revolutionize the way we produce and cultivate agriculture and agri-food products, as well as the products themselves.

We are already seeing products that:

- Utilize fewer resources;
- Emit less carbon;
- Have higher crop yields;
- Have more nutritional value;
- and more.

With targeted and strategic support, the impact of these innovations would be felt on a greater scale.

Government support and incentives – from the research stage to the adoption by end user – have the potential to increase the use of clean technologies while simultaneously reducing the environmental impact of the agricultural sector.

A prime opportunity for this is in the development of technologies to increase carbon capture and storage capabilities.

Taking strategic steps now, including encouraging collaboration between industry and academia and creating incentives for early adoption, will help ensure the effects are felt sooner, and on a larger scale. Of central importance is creating a favourable climate for the development and adoption of these new technologies (such as direct financial support, tax credits/write-offs, etc).

Academia plays an important role in the development of new technologies, and this needs to be recognized. These institutions train future generations that will help Canada remain a leader in clean technology development and innovation.

Canada is fortunate to have a strong entrepreneurial spirit throughout our agricultural research sector. Private companies – such as Ag West Bio, etc – are making great strides. Fostering greater collaboration between government, private corporations, and academia, would go a long way to ensuring that the full impacts of these innovations are felt.

While cost is almost always an obstacle when investing in a new technology, other obstacles exist, including lack of access to broadband internet. Without these building blocks, many producers are less likely to invest in cleaner technologies.

The Auditor General of Canada's fall reports painted a disappointing picture of the state of connectivity in rural and remote regions. It is our hope that the recommendations in the report will encourage the government to take concrete steps to make positive changes.

In 2018, the federal government has created the Federal-Provincial-Territorial Connectivity Committee and launched a national digital and data strategy consultation. We encourage the government to move forward from the consultation stage to the implementation stage.



The federal government has taken steps in the right direction, including the Agricultural Clean Technology Program, and more recently, allowing specific clean energy equipment to be eligible for a tax write-off.

We hope to see these initiatives expanded in the future. These measures will help to encourage the adoption of clean technologies at the producer level.

Collaborating with Agricultural Sector on Ongoing Issues

Advancements in clean technology affect our environment as a whole, and many opportunities exist to share information, research and ideas and to help further development and application.

This presents an opportunity for government leadership. By encouraging and nurturing cross-sectoral collaboration we can help find solutions to ongoing issues. Supporting sector-wide initiatives, such as facilitating meetings between representatives from the agri-food research and innovation sector and various funding agencies, will help ensure that the full impact of ongoing research can be felt sector wide.

As an example, AIC will be hosting an Agri-Food Innovation Summit next spring to promote collaboration between sectors. Representatives from various superclusters and others in the industry will gather to discuss how their research plans and paths forward intersect and overlap. Participants will also share developments, and discuss how discoveries in one sector (i.e. artificial intelligence) can positively impact another (i.e. agriculture). We hope the government will consider supporting events like this.

In the same vein, a comprehensive and industry specific agricultural intellectual property strategy would help support the advancement of technologies in a more timely way. This would increase the speed at which technologies are applied (from research to application level) and allow them to be marketed in a more efficient manner.

Adapting the Urban Environment

Canada is a world leader in many ways, however, when it comes to the environmental efficiency of our built environment we are lagging behind. If steps are taken today and leadership shown, we can convert our built environment into carbon sequestration hubs and generate revenue while reducing carbon dioxide.

As an example, the Netherlands has a carbon dioxide sponging system in major urban centres. It feeds carbon dioxide to greenhouses or agricultural fields that converts it to biomass. Ultimately reducing carbon dioxide and potentially increasing crop yields.

This could be easily duplicated in parts of Canada, with the right support. Individual municipalities could expunge carbon dioxide and enrich the soil or other natural carbon sink.



Carbon Tax Revenue

The 2016 Pan-Canadian Framework on Clean Growth and Climate Change sets the stage for what carbon pricing will look like. It also identifies areas where further action is needed to help meet Canada's emissions targets, including in our agricultural sector.

In the year that followed, 2017, the federal and provincial ministers of agriculture committed to addressing priority areas as well as accelerating science, research and innovation in select areas.

We believe this is a step in the right direction, but would like to see some further leadership from the federal government as it relates to the use of the carbon tax revenue.

Recognizing the impact that clean technology and agriculture have on our environment as a whole, AIC recommends that a portion of the carbon tax revenues be specifically earmarked for green innovations. These green innovations could focus on the introduction of new sources of energy (through a circular economy) and incentives for the production of biofuel.

Reduce Administrative Burden, Streamline

Our sector is fortunate to have many opportunities within the government to turn to for support, however, for emerging entrepreneurs and innovators, this can be confusing.

Greater collaboration between government departments that support clean technology development and deployment would help ensure that funds are invested strategically and with a whole-of-government approach.

Additionally, removal of excessive administrative burdens (red tape) would allow for clean technologies to move through the innovation continuum more expediently.



Canada's Agricultural Research and Innovation at a Glance

Canada's Agricultural Research and Innovation at a Glance

Our agriculture and agri-food system plays a critical role in Canada's economy.



2.3
million jobs

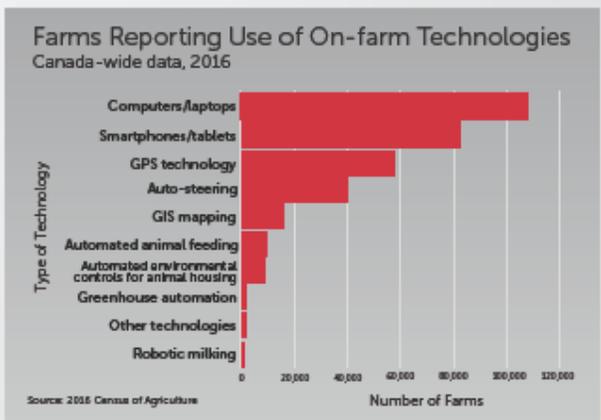
\$56 billion in
export sales



5th largest global exporter of
agri-food products

6.6%
GDP

Agricultural innovation has the potential to be a key engine of economic growth and job creation, strengthening our competitive position internationally.



48% Canadian farms adopted agricultural innovations in **2013**

Source: AAFC

Why do agricultural research and innovation matter?

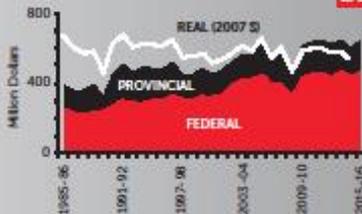
Growth in the sector relies on agricultural innovation to drive productivity gains and provide a basis for building a more globally competitive and sustainable economy.



Canada's Agricultural Research at a Glance

Public Agriculture R&D Spending Provincial & Federal (AAFC Estimates) Primary Agriculture & Food Processing

\$649 million
2015-16



Investment

Scientific Production

6,878
academic
papers
published
2014

8th place in
scientific
production of
agricultural
research
worldwide

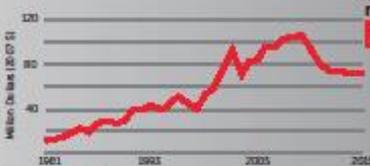
Sources: Science-Metric, Statistic Canada
*Includes Agronomy, Agricultural Engineering, Irrigation, Weed and Pest Control, Agroforestry, Agricultural Economics & Policy, Plant Sciences, and Land Resource & Soil Science



29,937 students enrolled
in agricultural programs
2014-15

Private Agriculture R&D Spending Primary Agriculture

\$73¹
million
2015

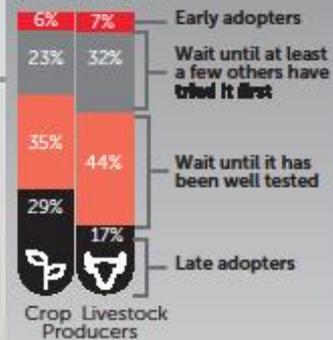


48% Canadian
farms
adopted
agricultural
innovations in
2013

Source: AAFC

Farm-Level Adoption

Speed of adoption



Agricultural innovations are more likely to be adopted by **large farms** with revenues of over one million dollars.
Source: AAFC

Actors



Why does agricultural research matter?



Funding Trends in Agriculture R&D

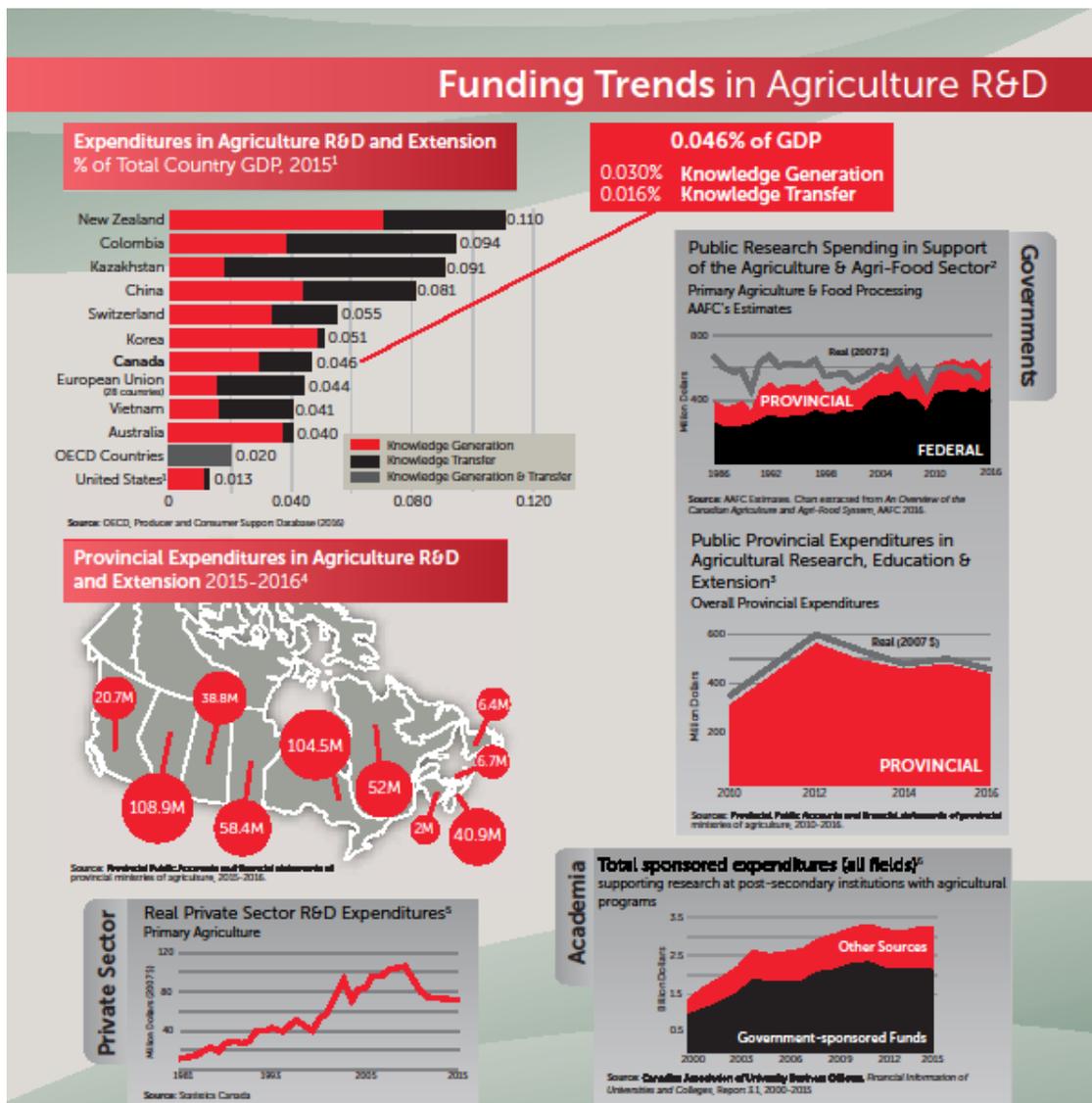


Image B.4. Funding Trends in Agriculture R&D

- 1 Agricultural knowledge generation includes budgetary expenditure to finance agricultural research (institutes, grants) and gene banks. Agricultural knowledge transfer includes agricultural education and generic training and extension services provided to farmers. The U.S.A. ranked 18th among 33 countries and the European Union.
- 2 AAFC Estimates. Federal research values correspond to operating, capital and program expenditures.
- 3 AIC Estimates. Sources for provincial expenditures: Provincial Public Accounts and financial statements of provincial ministries of agriculture, 2010-2016. Real values (2007 \$) based on StatCan Price Indexes.
- 4 For a more detailed description of the data and sources used in this map, see the References section at the end of this report.
- 5 Data includes all R&D expenditures (intramural) made by private industry regardless of whether the sources of funds were self-financing but does not include investments from the agricultural input sector.
- 6 Post-secondary institutions with agricultural programs included in this chart are members of the Canadian Faculties of Agriculture and Veterinary Medicine. Government-sponsored funds include federal, provincial, municipal, intra-provincial and foreign governments. Other sources of funding include donations, non-government grants and contracts, investment, sale of services and products, and miscellaneous. None of the listed institutions allocated resources from tuition and other fees towards research.



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