



Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada



Public Sector Ag Science Focus: the Canadian perspective

Presentation to: Food & Fuel - The Implications for Agricultural Research Policy

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Canada 



Key Messages

- **Canadian Agriculture**
 - At a juncture point of opportunity!

- **Science & Technology Environment**
 - Canada needs to focus on innovation and commercialization with government as a catalyst and enabler

- **Agriculture and Agri-Food Canada**
 - becoming a government S&T Leader in Excellence, Relevance, Accountability and Partnerships

- **New Models and Barriers**
 - Time for more formal integration with universities and industry
 - but ...we must overcome the barriers

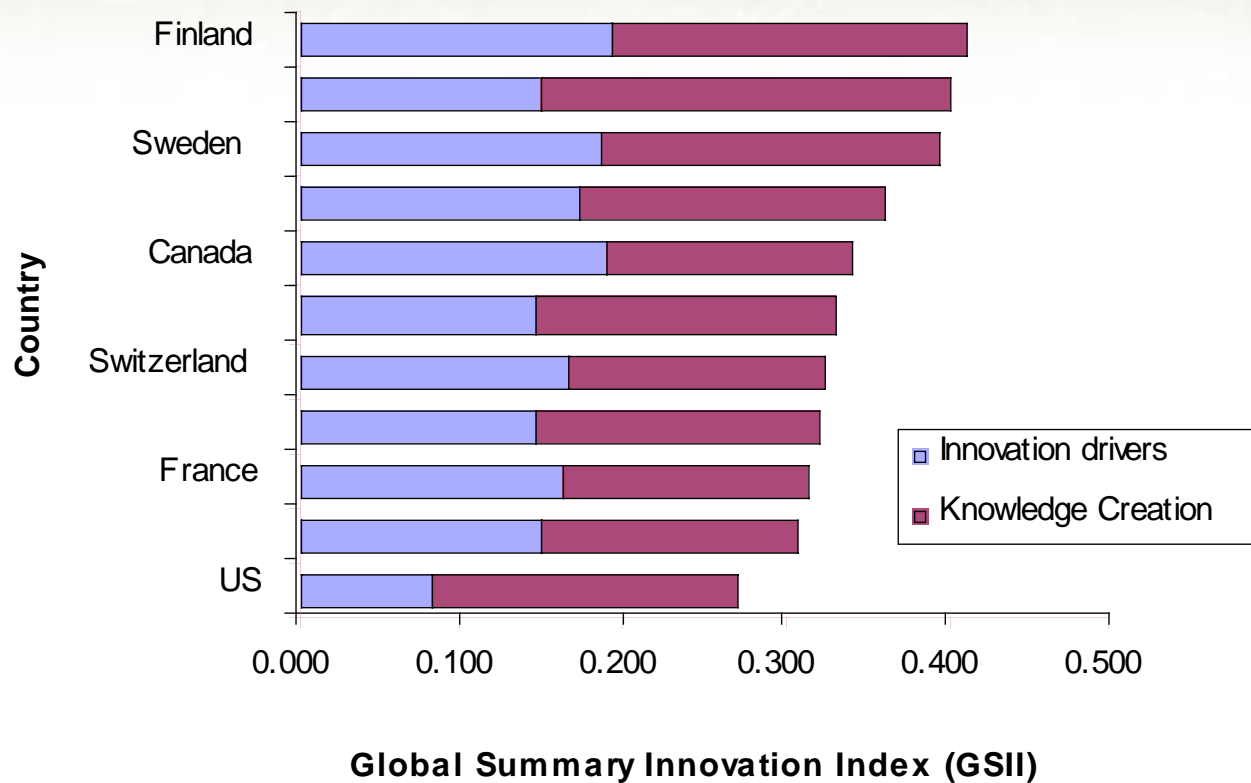
Canadian Agriculture – at a juncture point of opportunity!

- \$100B contribution to GDP i.e. 8% of GDP
- Paradigm shift – moving from commodity agriculture to differentiated, multi-functional agriculture (producing food, feed, fiber and fuel; biodiversity; environmental services, societal needs – health & wellness, rural development)
- Why? – new sciences (genomics, proteomics, etc), rise of renewable energy markets, environmental and food quality & safety concerns
- Paradigm shift is changing the commodity based institutions – CWB, CGC, etc.
- AGRICULTURE POISED TO BE A SOLUTION TO:
 - Health and Wellness
 - Environment
 - Energy, Biomaterials, Green Chemical, Bio-Products
 - Rural Development

Science & Technology Environment

- Canada does well on academics and knowledge creation

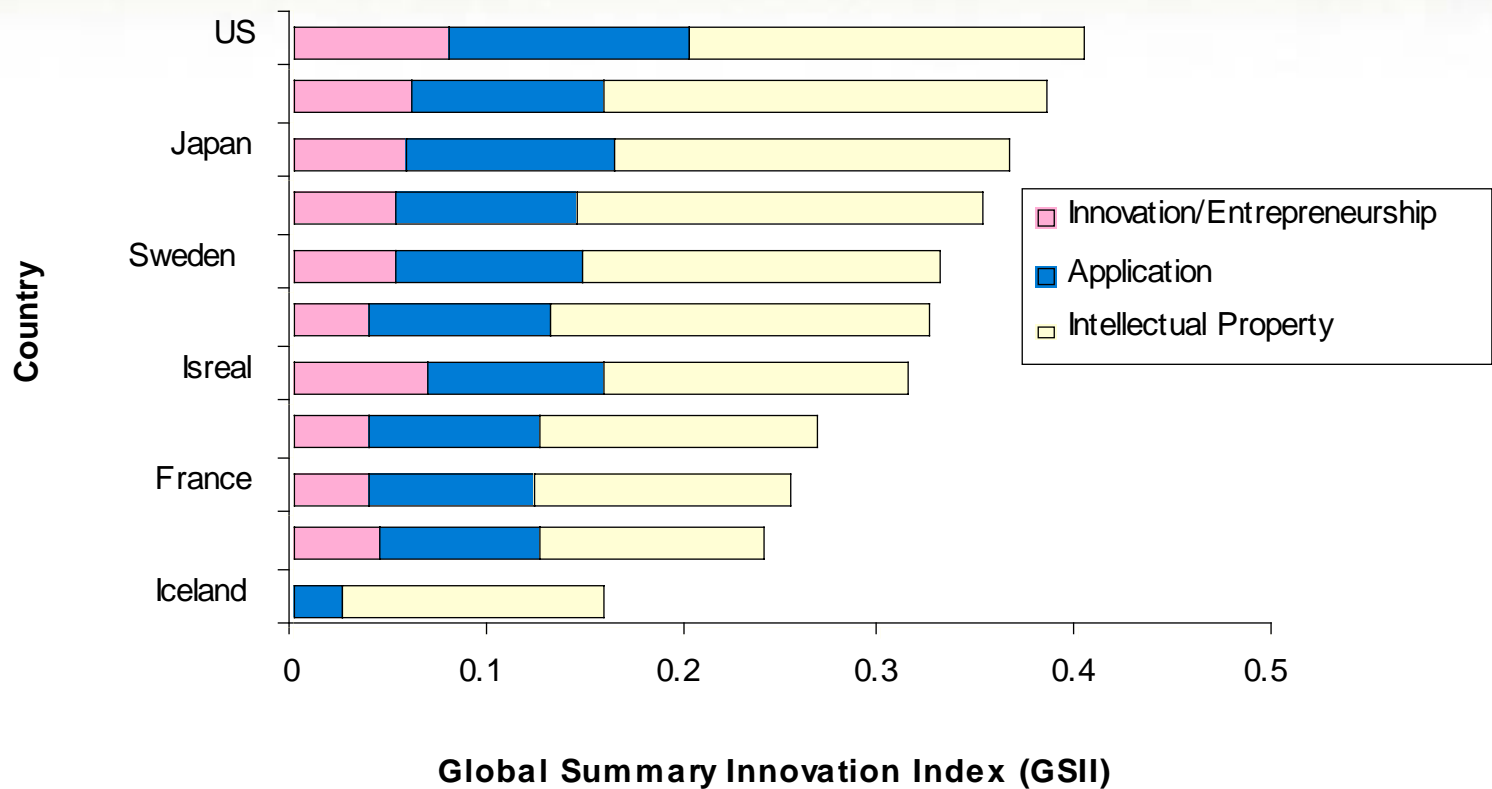
Innovation drivers & Knowledge creation



Science & Technology Environment

- Canada does not do well re: innovation and commercialization

Innovation/Entrepreneurship, Application and IP



Science & Technology Environment - Federal S&T Strategy – May 2007

- Advocates:
 - Principles of Excellence
 - Focus on Priorities
 - Foster Partnerships
 - Enhance Accountability

- Policy commitments to:
 - Entrepreneurial Advantage (business climate conducive to private sector innovation; strengthen public-private partnerships)
 - Knowledge Advantage (resources to priority areas Canada is good at – e.g. Natural resources & energy; health & life sciences, information & communications)
 - Government as an enabler and catalyst



MOBILIZING
SCIENCE AND
TECHNOLOGY
to Canada's Advantage

2007

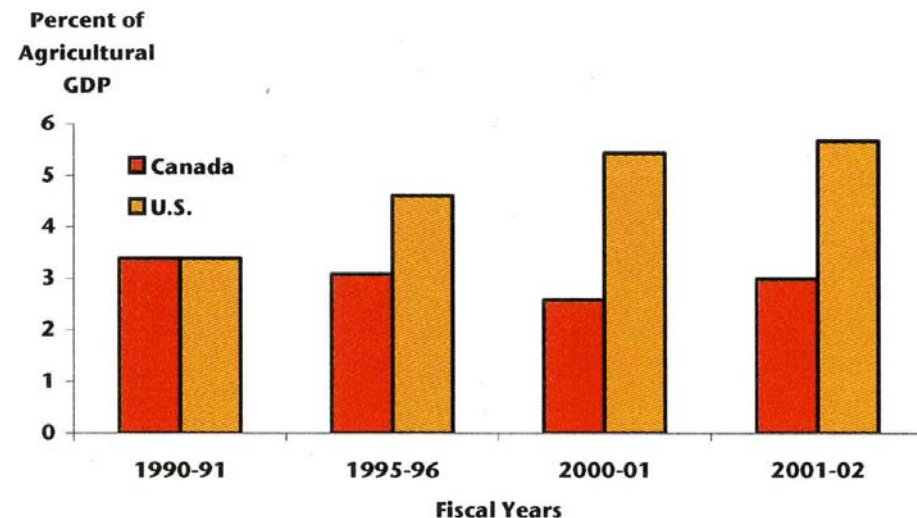
Canada

Science & Technology Environment

- Governments, universities, and the private sector

- Canadian R&D expenditures are concentrated in governments and universities
- Total spending on agricultural research in Canada is about \$700M
- Studies show that Canadian agricultural research expenditures return a 20:1 benefit to producers
- But universities have stopped doing applied research in the sector because of the priorities of granting councils.

Canadian and U.S. Public Research Expenditures on Agriculture, 1990/91 - 2001/02 Fiscal Years



Source: Statistics Canada, AAFC, USDA, U.S. Department of Commerce.

Note: The U.S. fiscal year runs from October 1 through to September 30 while the Canadian fiscal year runs from April 1 through to March 31.

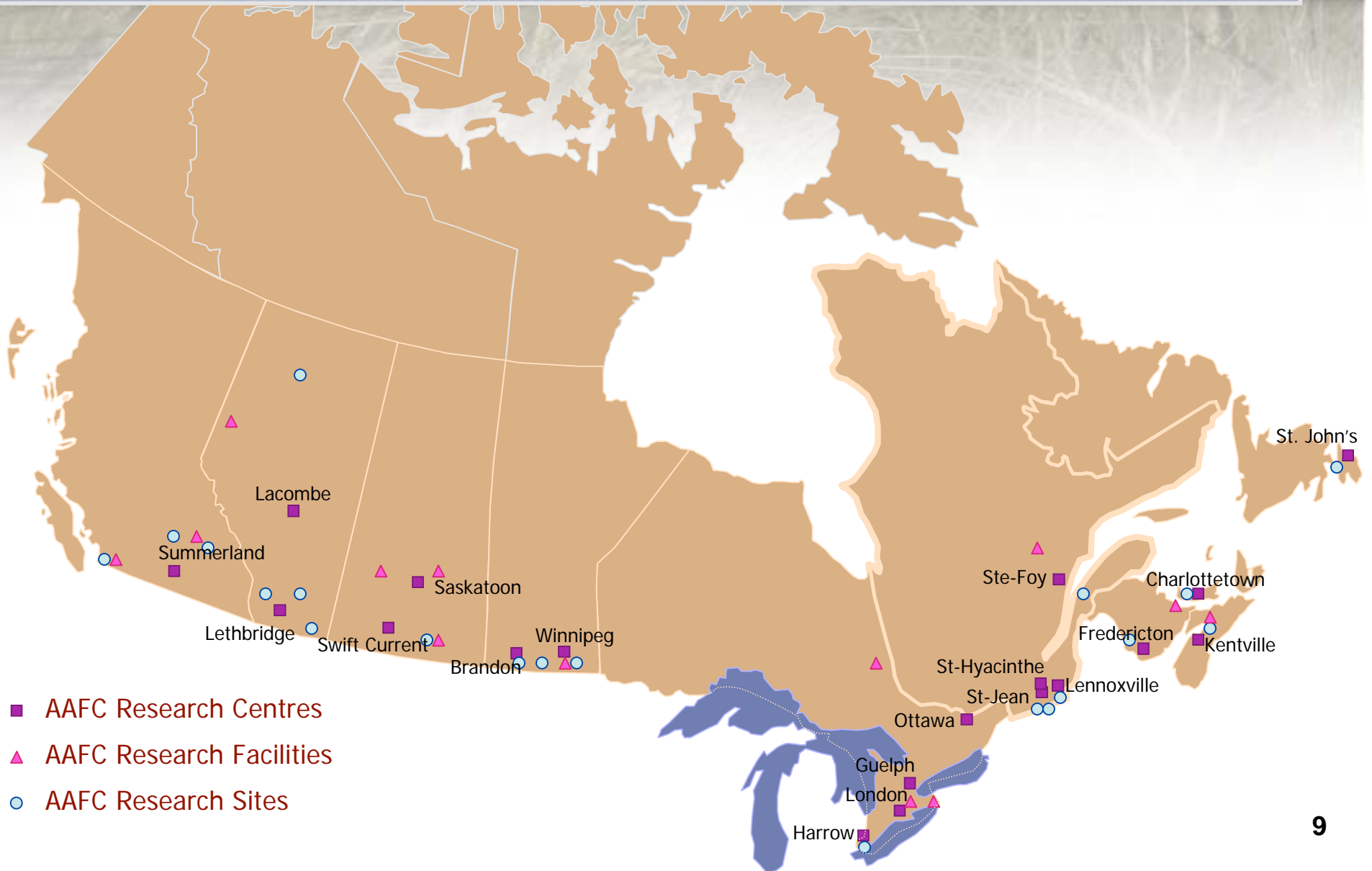
Agriculture and Agri-Food Canada (AAFC)

- a government leader in Excellence, Relevance, Accountability and Partnerships

- AAFC Research Branch – regional structure – 20 main sites – that supported development of commodity agriculture in Canada
- Last 20 years has evolved various partnerships and integration arrangement matching the paradigm shift in agriculture
- Last 2 years – push toward a new future
 - Stakeholder consultations
 - New S&I strategy – 7 Focused Priorities – positioning AGRICULTURE AS A SOLUTION TO HEALTH & ENERGY, ENVIRONMENT, RURAL DEVELOPMENT
 - Peer Review – establishment of EXCELLENCE
 - More formal partnerships – e.g. St Boniface, NRC-PEI
- Examples of what we do and what is the Public Role
 - Public good science, Public Safety & Security; Regulatory Related Activities
 - Fusarium, Collections

AAFC Research Branch

- 600 scientific and research professionals
- 19 research centres, 13 research farms, 20 other sites spread over 30,227 hectares of land

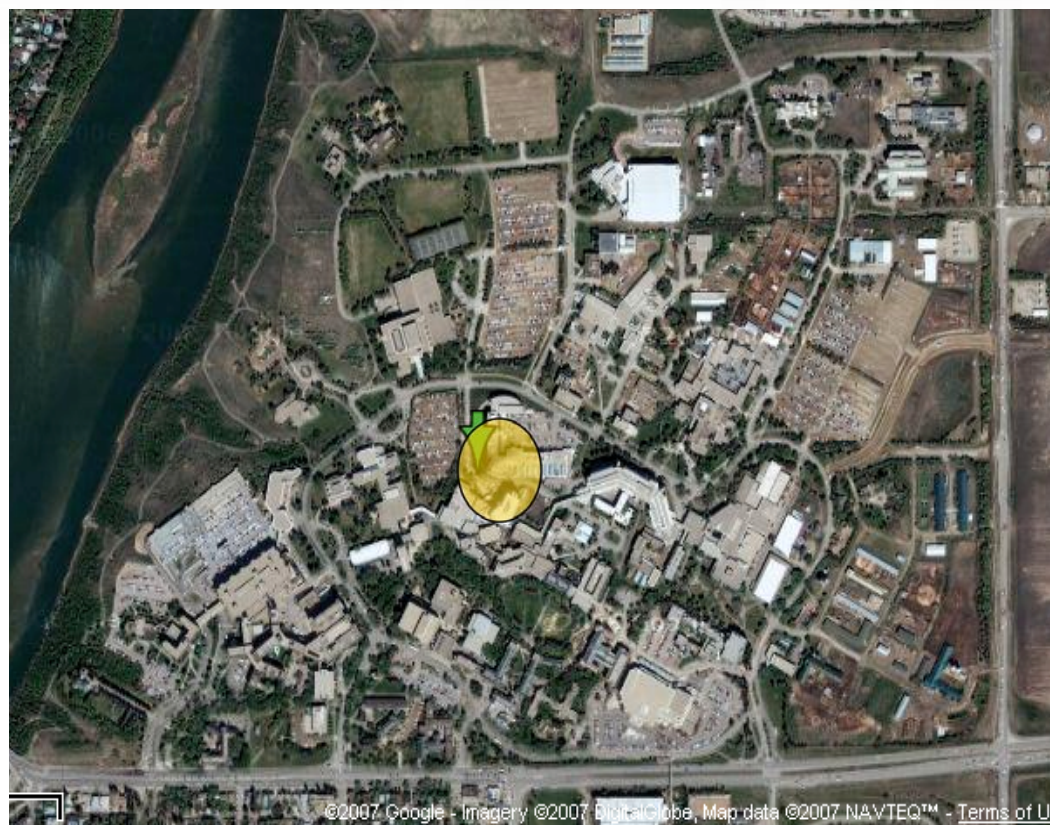


AAFC – Last 20 years have developed various integration arrangements as agriculture has evolved...

AAFC has adopted and adapted various models

- co-locations
- embedded staff in universities
- joint institutes (joint building, equipment and staff)
- arrangements with other government departments

**Saskatoon Research Center
200 AAFC staff on Campus of
the Univ of Saskatchewan**





AAFC - Last 2 years – push toward a new future...

- The Science consultations in October-November 2005 with stakeholders addressed science directions, research priorities, and the role of government in meeting the changing needs of the sector
 - 11 Regional consultations – 300 representatives from producer organizations, processors, provincial and municipal governments
 - The first Agriculture Science & Innovation Symposium –120 senior officials from producer, processor, and other agri-industry organizations, as well as provincial, university, and other federal department representatives
 - Bilateral consultations – A series of approximately 40 with key stakeholders in addition to on-line consultations for all Canadians through AAFC's Science Consultations website

The Result: AAFC Science and Innovation Strategy - May 2006



*AAFC – May 2006 – Science & Innovation Strategy
- 7 long term national science priorities*

AAFC has identified seven national priorities

1. Enhancing **human health and wellness** through food and nutrition and innovative products
2. Enhancing the **quality of food and the safety of the food** system
3. Enhancing **security** and protection of the **food** supply
4. Enhancing **economic benefits** for all stakeholders
5. Enhancing **environmental performance** of the agricultural system
6. Understanding and **conserving** Canadian **bioresources**
7. Developing **new opportunities** for **agriculture** from bioresources



AAFC Science & Innovation Strategy - is well aligned with the Canadian S&T Strategy

- Focusing on Priorities
- Promoting World-Class Excellence – 2006-2007 Peer Review

AAFC reviewed all research projects via an external peer review process aimed at:

- assuring the best possible investment of public funds;
- ensuring scientific excellence through competition of ideas; and
- providing international caliber science.

AAFC was the first federal department to conduct a “zero-base” exercise: all scientists were asked to write new projects aligned with Department priorities.

Of 255 projects:

- 23 were stopped immediately
- 48 will be re-examined in 6 months
- 32 will be re-examined in 18 months

AAFC – Examples of what we do – the public role
- Science *in support of* regulation, public good and innovation

- Public good science – ***maintenance research re: threats – pests & diseases***
 - Winter wheat with resistance to *Fusarium* after the disease threatened the Ontario industry
 - Characterization, detection and transmission of Plum Pox virus, a disease with the potential to severely affect the fruit industry in Canada
- Public Safety and Security
 - Characterization and maintenance of fungal collections
- Regulatory-related research activities
 - Detection and transmission of potato viruses : a significant barrier to trade
 - Carbon cycling and sequestration : to document the carbon offsets provided by agriculture for GHG reduction
 - National collections and gene bank : to support CFIA's regulatory activities

National Production Constraints



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BE PREPARED

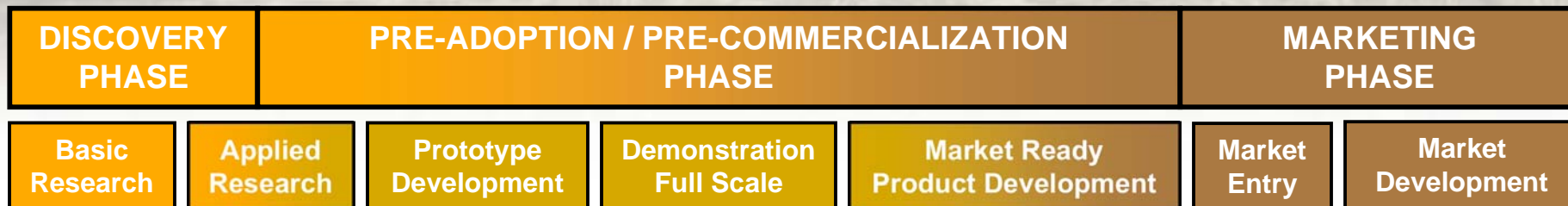


New Models and Barriers – AAFC is leading - Time for more formal integration BUT there are Barriers...

- Learning from the first Canadian Agriculture Policy Framework (APF)
- Innovation –Value – Chain approach
- Rebrand the AAFC – MII Program
- ABIP Fund model – mobilizing S&T capacity to get new things done -- \$145M fund had over \$1B in requests!
- National Innovation Coordinating Council (NICC)
 - Foresighting
 - Catalyst and adjustment role
- AAFC, Provinces, Universities, Industry – formal clusters
- Barriers to integration and new partnership models e.g.:
 - Use of G&Cs – Vote 1, Vote 10 monies
 - Regulatory Policies
 - Intellectual Property policy
 - Inter-Departmental working together

Lessons from Canada Agricultural Policy Framework (APF) – last 5 years.....Innovation needs a supporting continuum

INNOVATION CONTINUUM



- A systems approach is needed to stimulate innovation and accelerate the adoption/transformation of knowledge into market-ready products
- Changes are needed in the regulatory and intellectual property framework
- A patchwork of programming along the continuum, among departments and stakeholders, increases administrative burden and impedes effectiveness
- A pre-commercialization bottleneck exists from the lab bench to market entry
- We need to enhance focus on improving the business climate
- We need to start to implement a comprehensive national foresight and innovation coordination mechanism
- We need to explore alternative delivery models



***Since the APF was originally developed
the federal policy context has shifted...***

■ ***Advantage Canada***

- Focus is on industry competitiveness and economic growth achieved through innovation and productivity improvement. There is a strong focus on university-business science collaborations. The notion that excellence will be obtained through the competition of ideas is presented as a key theme.

■ ***Budget 2007***

- Continues the messaging from Advantage Canada. Government investment in universities through Granting Councils is increased only modestly. Granting Councils are essentially the means by which excellence through competition of ideas will be achieved. Innovation supported by a focus on entrepreneurship, knowledge development and management and enhancing HQP is a key thrust.

■ ***Federal Laboratory Infrastructure Project***

- Treasury Board is leading a multi-department review of federal laboratory infrastructure. It is apparent that significant reinvestment is required and this project is attempting to determine the current condition of federal laboratory capacity in the context of government science priorities.

■ ***Federal S&T Strategy***

- Promoting world class excellence
- Focusing on priorities
- Encouraging partnerships

Rebrand the AAFC Matching Investment Initiative Program..

The Matching Investment Initiative (MII) program is being rejuvenated to enhance its effectiveness and flexibility and improve its delivery. Rebranding and rejuvenating the MII will:

- Enhance innovation capacities across the value chain
- Introduce a new funding formula to cater to a wider variety of industry needs
- Build long-term AAFC-industry relationships
- Simplify agreements will be put in place
- Welcome applications throughout the year

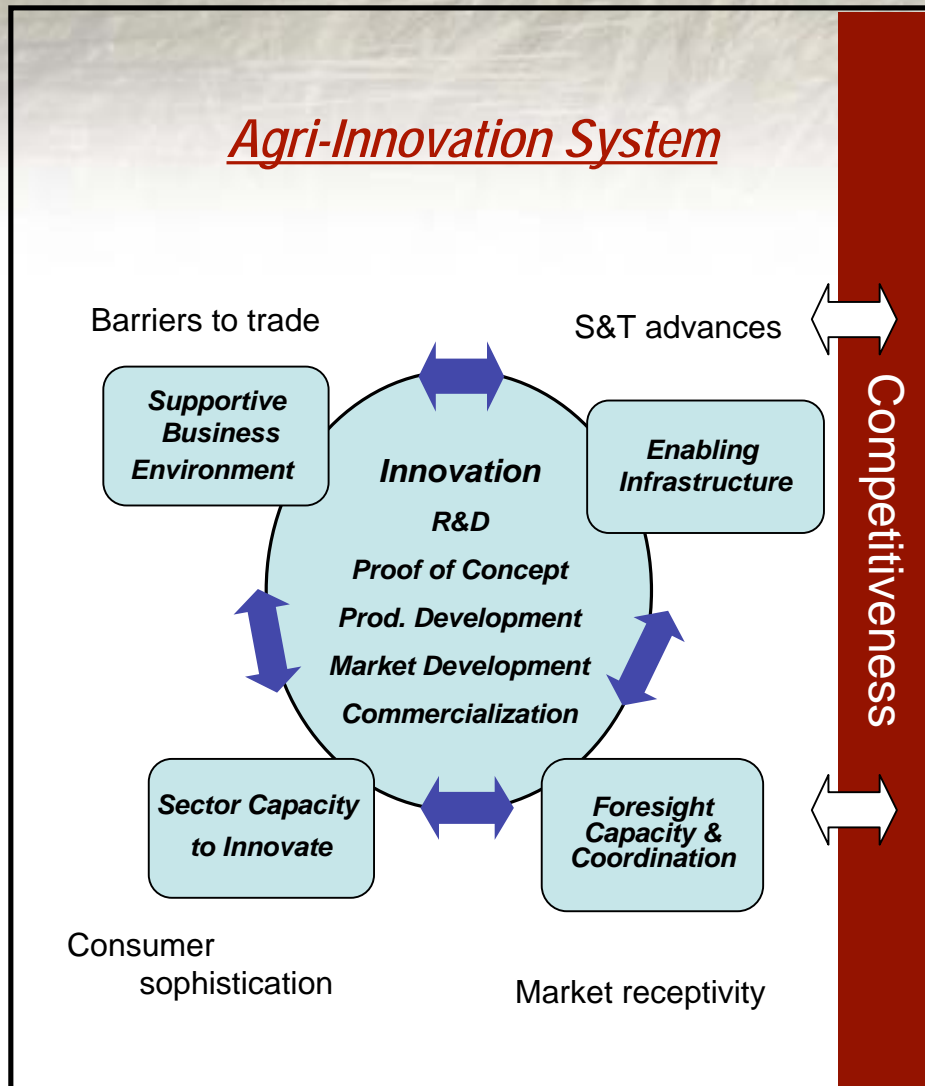
The MII program has been a success. For the period 1994-2002

- MII funded **3000 projects** involving **1400 industry groups** between 1994 and 2002
- MII leveraged **\$235 million AAFC direct cash investment** with matching industry cash and in-kind investment (50:50)
- **Net economic benefits** from MII funded research have been estimated to be at least **\$2.2 billion**

AAFC – \$145M ABIP Program – Funding new BioEconomy networks

- AAFC announced the Agricultural Bioproducts Innovation Program (ABIP).
 - ABIP is a \$145 million program designed to support research networks and encourage the development of clusters for the advancement of a sustainable and profitable Canadian bioeconomy.
 - It is the first major injection of new research funds in several years.
 - As the Science and Innovation Strategy indicated, these new research efforts will put an increased emphasis on research partnerships that will allow for the creation of the best research teams in Canada.
 - Close to 1 Billion \$ of funding requests were received.
 - Cereals Bio-refineries 16 proposals / Cellulose Bio-refineries – 3 proposals
 - APF S&I related - Flax 2015, Novalait, Potato Innovation Network, Pulse, Triticale, Soy 20/20 related projects were submitted
 - Other Commodity Projects – Apples, Eggs
 - Micro-organism (Process/Feed stocks) / Fertilizer/Inoculants: 3 proposals
 - General Economy/Environment Support: - 5 Proposals; Manure: 1 proposal; Deadstock - SRM: 2 Proposals
 - Nutraceuticals: 8 Proposals / Plant Bio-actives: 6 Proposals
 - Bio-Fibres: 3 Proposals; Building/Construction: 2 Proposals
 - Bio-Oils: 1 proposal ; Green Chemicals: 1 proposal
 - Harvest Process: 1 proposal

For the Next Generation, an integrated policy direction is proposed with four key themes



- **Foresight Capacity and Coordination:** To identify emerging challenges and opportunities for the long term competitiveness of the sector and mobilize its capacity to address key issues
- **Enabling Infrastructure:** To enable a foundation that accelerates the flow of new ideas to the marketplace
- **Supportive Business Environment:** To promote a climate that fosters innovation
- **Sector Capacity to Innovate:** To foster strategic planning, entrepreneurial leadership, and knowledge needed to succeed



Integrated programming that emphasizes coordination along the innovation continuum

These four themes work together to identify opportunities for the sector, to develop these opportunities,...

■ **Foresight Capacity and Coordination – to identify the opportunities**

- Establish a **National Innovation Coordination Council** with a foresight process and associated fora to address priority issues

■ **Enabling Infrastructure – to develop the opportunities**

- Develop centres of excellence to optimize collective public-private investment in, and mobilize capacity to address, national and regional sector priorities
 - Technology and Innovation Partnership centres would combine national and regional strengths and leverage federal-provincial investments with academic and private partners. Technology and Innovation Partnership centres would focus on development and demonstration of applications that can be readily transferred to stakeholders.
 - Federal support would catalyze the development of Research Clusters and networks in areas outside of, but complementary to, traditional agricultural activities.
- Bolster capacity to identify and use global science, technology and market intelligence
 - Technological scanning for international market, trade and scientific opportunities would be linked to scientific and societal foresight. Develop scanning capacity for innovation, assess the potential value to Canada and develop country strategies that will deepen our domestic capacity to exploit knowledge and trade opportunities.
- Enhance pre-commercialization services and associated broker capacity within the sector to assist in the commercialization of products
- Develop an AAFC innovation-industry liaison function to facilitate connections
 - A national network of Technology and Innovation Partnership Centres would leverage discoveries in one area to create products and services in widely diverse areas beyond where the original discoverer has expertise.

... to accelerate the necessary investment, and finally, to enable the sector to act to realize these opportunities

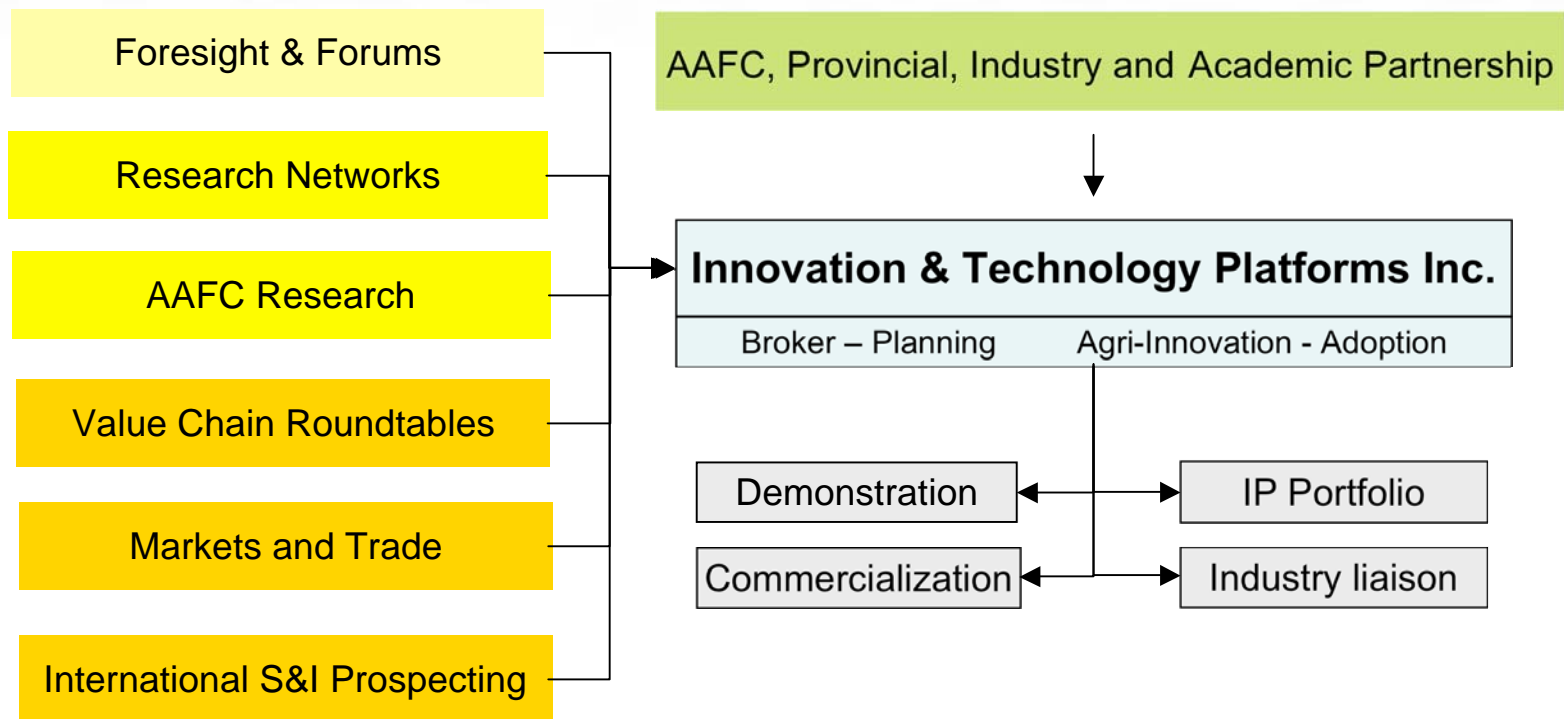
■ **Supportive Business Environment – to accelerate investment in opportunities**

- Foster a transparent, timely and cutting-edge science-based regulatory system
 - Federally-catalyzed Research Clusters would develop the basis for science-based regulatory processes.
 - Technology and Innovation Partnership centres would have the mandate to support SMEs in meeting regulatory requirements.
- Ensure a globally competitive approach to intellectual property management
 - Explore new models of IP portfolio management to maximize competitive outcomes.
- Develop a policy framework for advancing the bioeconomy

■ **Sector Capacity to Innovate – to realize the opportunities**

- Enhance the capacity of leaders to champion new ideas and develop value chain strategies for market opportunities
- Ensure the sector has the right skills to support innovation and enable it to compete in the knowledge economy
- Establish an independent forum to foster dialogue with Canadians on emerging technologies
- Position the sector as a “sector of opportunity” to better attract new graduates, experienced entrepreneurs, and investors to opportunities within the sector

Time for more formal integration
- Alternate delivery models – new partnerships and clusters



Examples of Canadian Research Clusters





But there are...Barriers to overcome..

- Use of Federal Grants and Contributions
 - Vote 1 and vote 10 monies available to government researchers
- Regulatory policies
- Intellectual property policies
- Inter-Departmental barriers
- Institutional changes
- HR aspects - employment groups, benefits, pensions, unions
- Provincial and Regional barriers



Vision – Canadian Agriculture in 20 years

- Prosperous Farms & Vibrant Rural Communities
- New Value-Added and Industrial Bio-Product Opportunities
 - Transition from “COMMODITIES” to “DIFFERENTIATED PRODUCTS”
- A “Suite” of New Industrial and Value-Added Crops and Livestock
 - Flax oils & biofibres, CLA Beef, Biorefineries – Triticale, Mustards, Canola, Bio-Pharma crops
- Rural processing plants linked to the above “suite” of crops will create jobs, revitalize rural communities, and move farmers up the value chain
- Targeted, world-leading innovation systems will support the transition from primary reliance on commodities to increased emphasis on the development of first-of-their-kind agri-based products and processes that better meet the needs of global consumers.

Summary

- **Canadian Agriculture**

- At a juncture point of opportunity!

- **Science & Technology Environment**

- Canada needs to focus on innovation and commercialization with government as a catalyst and enabler

- **Agriculture and Agri-Food Canada**

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