

GOVERNMENT RESPONSE TO THE
SIXTH REPORT OF THE STANDING
SENATE COMMITTEE ON
AGRICULTURE AND FORESTRY
ENTITLED INNOVATION IN
AGRICULTURE: THE KEY TO FEEDING
A GROWING POPULATION

GOVERNMENT RESPONSE TO THE SIXTH REPORT OF THE STANDING SENATE COMMITTEE ON AGRICULTURE AND FORESTRY ENTITLED INNOVATION IN AGRICULTURE: THE KEY TO FEEDING A GROWING POPULATION

INTRODUCTION

The Government of Canada is pleased to respond to the Report of the Standing Senate Committee on Agriculture and Forestry (the Committee) entitled *Innovation in Agriculture: The Key to Feeding a Growing Population* (the Report).

The Government commends the members of the Committee, and the many witnesses who appeared before it, for their insight and commitment to understanding the challenges and opportunities of agricultural and agri-food innovation in Canada. The Government supports the positive approach and the constructive thoughts and ideas put forth by the Committee. The Report offers many valuable perspectives on agricultural and agri-food innovation that merit the attention of federal, provincial, and territorial governments, the private sector, and stakeholders.

The agriculture and agri-food sector plays a significant role in the Canadian economy, accounting for over \$106.3 billion in economic activity and providing employment to over 2.2 million Canadians in 2013. The Government recognizes the importance of advancing innovation to position the agriculture and agri-food sector for global competitiveness and future growth.

The Government of Canada is taking action to strengthen innovation in the agriculture and agri-food sector through the Growing Forward 2 (GF2) policy framework, which came into effect on April 1, 2013. Under GF2, federal and provincial governments are providing more than \$3 billion over five years for investments aiming to accelerate the pace of innovation, improve competitiveness in domestic and international markets, help the sector adapt to emerging global and domestic opportunities, and enhance business and entrepreneurial capacity.

Advancing innovation requires the engagement of a multitude of players and a mix of government and private sector investments. Through GF2 and other initiatives, governments can foster innovation by supporting industry leadership in the sector. A strong innovation culture, supported by a business-friendly investment climate, provides the necessary environment to enable industry-led innovation and increase the level of sustained private sector investment.

RECOMMENDATION 1

The Committee recommends that Agriculture and Agri-Food Canada, the Canadian Food Inspection Agency, and the Canadian Grain Commission complete the regulatory amendments of the *Seeds Act* to modernize the variety registration process.

The Government supports the recommendation to complete the regulatory amendments of the *Seeds Regulations* to modernize the variety registration system.

Since 2009, the Canadian Food Inspection Agency (CFIA) has consulted with sector stakeholders about transferring oilseed soybeans and all forage crop kinds from Part I to Part III of Schedule III of the *Seeds Regulations*. Based on these consultations and the rationale for change, amendments to the *Seeds Regulations* were published in the *Canada Gazette*, Part II on June 4, 2014. The new regulations are now in force.

With these regulatory amendments now in effect, the registration process of new oilseed soybean and forage crop varieties has been simplified. Specifically, pre-registration testing and merit assessments are no longer required for these crop kinds. All relevant safety assessments will continue. An application to register a new variety is only permitted after these safety assessments are complete and the variety is deemed safe for commercial production.

In addition, in keeping with efforts to increase innovation and productivity in Canadian agriculture, Agriculture and Agri-Food Canada (AAFC) engaged with crop production sector stakeholders in 2013 to review the variety registration system and its effects on the development and adoption of new crop varieties. This review was in keeping with AAFC's focus on innovation, competitiveness, market development, and regulatory modernization to generate economic growth across the entire agricultural sector. AAFC, the CFIA, and the Canadian Grain Commission are currently reviewing the results of this engagement with a view to informing the development of a streamlined and modernized variety system. Stakeholders from Canada's crop production sector will be notified in a timely manner of any changes that could have an impact on Canada's variety registration system.

RECOMMENDATION 2

The Committee recommends that Health Canada and the Canadian Food Inspection Agency make changes to the Safety Assessment Process for Plants with Novel Traits to centralize information and data collection, accelerate the review process, and improve predictable timeframes.

The Government supports the recommendation to centralize information and data collection, accelerate the review process, and improve predictable timeframes of the safety assessment process of novel foods, novel feeds from plant sources, and plants with novel traits (PNTs).

Health Canada (HC) and the Canadian Food Inspection Agency (CFIA) have an interdepartmental group, comprised of technical experts in pre-market safety assessments, to examine ways to improve the regulatory process for novel foods, novel feeds from plant sources, and PNTs. HC and the CFIA regularly engage with industry stakeholders. Stakeholders' priorities—including improvements to the efficiency, transparency and predictability of the regulatory process were taken into consideration when establishing the work plan of this interdepartmental group.

Two of the regulatory streamlining options that are being considered as part of the interdepartmental group's work plan include identifying potential duplication of assessment requirements and eliminating them, where possible, in order to reduce the level of work required by evaluators and applicants; and improving communication of data requirements to applicants, in order to shorten review turnaround times. To date, this group has completed a number of successful and highly valued projects for both industry stakeholders and the Government, such as organizing a workshop where regulators provided advice and best practices on optimizing the quality of regulatory submissions, and establishing standard operating procedures for industry stakeholder pre-submission consultations.

As part of Bill C-18, the Agricultural Growth Act, currently before Parliament, the Government has proposed several measures to partly fulfill this recommendation, including incorporation by reference. This tool may assist the CFIA in completing the approval of novel plant products on a more timely basis while upholding high Canadian standards.

RECOMMENDATION 3

The Committee recommends that Health Canada and the Canadian Food Inspection Agency strengthen the safe, predictable, and transparent system for commercialization of plants with novel traits for molecular farming.

The Government supports the recommendation to strengthen the safe, predictable, and transparent system for commercialization of plants with novel traits for molecular farming. The Canadian Food Inspection Agency (CFIA) and Agriculture and Agri-Food Canada (AAFC) are leading a pilot program that allows plant molecular farming (PMF) for the production of industrial products. Under the pilot program, plants are cultivated under confined field conditions, but commercial end uses are permitted, as well as cultivation on a larger scale than the existing confined research field trial program. The results of the pilot program will inform the potential development of a program for commercial production of PMF. The CFIA and AAFC are working with other Government of Canada experts to deliver the two-year pilot during the 2014 and 2015 growing seasons.

Concurrently in May 2014, Health Canada finalized a PMF guidance document, *Plant Molecular Farming Applications: Plant-Derived Biologic Drugs for Human Use*, which sets out data that manufacturers should submit to obtain approval for plant-derived biologic drugs in Canada. The document specifically addresses how preparing submissions for plant-derived biologic drugs would be different than for other biologic drugs. The document will give guidance to regulated parties respecting the interpretation of requirements of the *Food and Drugs Act* and the *Food and Drug Regulations* for this novel drug product line.

RECOMMENDATION 4

The Committee recommends that:

- **Health Canada, through all relevant stakeholders, including the provinces and territories, continue its ongoing research activities related to the efficacy of pesticides and their safety for humans, animals, and on the environment; and**
- **Health Canada take the necessary action to reduce the number of conditional registrations of pest control products.**

The Government supports the recommendation to continue ongoing research activities, noting that research related to the efficacy of pesticides and their safety for humans, animals, and on the environment is conducted by pesticide registrants, other government departments, academia, and provinces and territories. The Pest Management Regulatory Agency works with other parts of Health Canada, Agriculture and Agri-Food Canada, the Canadian Food Inspection Agency, Environment Canada, Fisheries and Oceans Canada, and Natural Resources Canada on prioritizing research needs to verify assumptions that can provide more realistic estimates for health and environmental risk assessments.

The Government supports the recommendation regarding the reduction of the number of conditional registrations of pest control products. Over the past five years, the Government has achieved a significant decrease in the number of new conditional registrations, and steps are being taken to ensure that the number of lengthy extensions, such as the ones referenced by the Committee, is reduced. All registration decisions, whether conditional or full, are based on rigorous scientific evaluation of health and environmental risks posed by pesticides. At no time is a conditional registration granted without an assessment that the risks are acceptable, meaning that the product meets current health and environmental safety standards. Granting conditional registration is only considered when confirmatory data is required. Conditional registrations may be extended to allow the manufacturer the time to generate the information and to allow regulators enough time to review the new information.

RECOMMENDATION 5

The Committee recommends that Health Canada, while maintaining Canada's high food safety standards, develop innovative procedures that reduce the time for the evaluation of technical and scientific data during the safety assessment of food additives, novel foods (including biotechnology-derived foods and foods bearing health claims, such as functional foods) and infant formula prior to their commercialization.

The Government supports the recommendation to develop innovative procedures that reduce the time for the evaluation of technical and scientific data during the safety assessment of food additives, novel foods and infant formula prior to their commercialization. The Government is committed to developing a more modern and sustainable regulatory environment that better protects and maintains the health and safety of Canadians, while fostering innovation, supporting competitiveness, enabling market access and attracting investment. Health Canada (HC) has outlined, under *The Regulatory Roadmap for Health Products and Food*, a multi-year plan to develop a more efficient and transparent regulatory framework for food.

The continuous review of HC's business processes is a critical component to the success of the Government of Canada's regulatory modernization efforts, including the streamlining of processes, removal of duplication, and investment in technology that supports submissions management and other aspects of our regulatory and scientific work. For example, HC and the Canadian Food Inspection Agency (CFIA) have established an interdepartmental group to examine ways to improve the regulatory process for novel foods, novel feeds, and plants with novel traits, including identifying potential duplication in assessment requirements and eliminating them, where possible, in order to reduce the level of work required by evaluators and applicants.

The Growing Forward Agricultural Regulatory Action Plan (2008-2013) included funding for and a Memorandum of Understanding between Agriculture and Agri-Food Canada (AAFC) and HC to increase capacity to address key regulatory issues in the areas of health claims, novel foods and food fortification. This resulted in new or revised policies and guidance that has led to better industry understanding of the system and how to navigate it and, subsequently, to improvements in the quality of submissions. This has also meant that, in general, less time has been needed to review and make decisions (i.e., quality of information provided resulted in less back and forth between regulators and petitioners), permitting industry to bring products to market more quickly.

Given the international nature of the food and health product industries and their increasingly complicated supply chains, drawing upon international partnering, best practices and new technological advances is critical. For example, HC actively participates in and contributes to the Codex Alimentarius Commission's standard setting program that allows Canada to leverage internationally-developed food safety standards and adapt them to the Canadian regulatory context. HC also leverages scientific advice given by various Food and Agriculture Organization (FAO) and World Health Organization (WHO) Risk Assessment Bodies, particularly, the Joint FAO/WHO Expert Committee on Food Additives and the Joint FAO/WHO Expert Meeting on Microbiological Risk Assessment in its assessment processes.

Implementation of the aforementioned *Regulatory Roadmap* will also support Canada's international activities, by indicating that regulatory amendments will be designed to allow for even greater levels of cooperation, including, common application filings, greater information sharing, joint reviews and other work sharing agreements, where appropriate, and when it is in the best interest of Canadians. Such measures will help to reduce the time required to complete Health Canada's food safety assessments.

In addition, AAFC, with participation from the CFIA and HC and members of the agri-food industry, have established a Regulatory Subcommittee (RSC) to the Value Chain Roundtable All Chairs Committee. The RSC has a two-year mandate during which they will examine cross-cutting regulatory issues that impact the agri-food sector and provide advice on ways to improve the regulatory system including areas such as submissions management, predictability and transparency, and scientific and regulatory decision-making processes which all contribute to the amount of time it takes before products requiring pre-market approval, such as food additives, novel foods and infant formula, can be commercialized.

RECOMMENDATION 6

The Committee recommends that:

- **the Canadian Food Inspection Agency continue to address disease control and prevention in its modernization of animal health regulations; and**
- **the Canadian Food Inspection Agency, together with the provinces, territories, and stakeholders, work on implementing a new national disease surveillance plan.**

The Government supports the recommendation to continue to address disease control and prevention in its modernization of animal health regulations. Disease control and prevention continue to be addressed as the Canadian Food Inspection Agency (CFIA) modernizes animal health regulations. The CFIA's approach to disease management is evolving to be more preventive in focus, and to better reflect that animal health is a shared responsibility between industry and government. The Integrated Agency Inspection Model, currently under consultation, would adopt this modernized inspection approach, the principles of which are based on prevention such as the requirement for industry to develop Preventive Control Plans to demonstrate regulatory compliance, and the implementation of risk-based inspection to prevent higher risks from being realized.

It is difficult to establish and maintain disease-free status for animals for an entire territory. The implementation of zoning benefits a country by enabling it to establish and maintain a subpopulation with a distinct health status within its territory. Changes have been made to the *Health of Animals Act* (January 2013), in keeping with international guidelines, making Ministerial declaration of Disease Control Zones more flexible and easier to administer. Efforts to prevent disease spread outside of control zones are intended to protect disease-free areas of Canada. To complement these enhanced authorities, an arrangement has been made, under the auspices of the Canada-United States Regulatory Cooperation Council, whereby both countries have stated their intent to recognize each other's zoning measures during highly contagious foreign animal disease outbreaks. Although foreign animal disease outbreaks are very rare in North America, this arrangement will ensure both countries are collectively protected from disease and bilateral trade can continue between areas shown to be free of disease. Recent changes to the *Health of Animals Regulations* (effective July 1, 2014) included identification and movement reporting requirements of pigs, which are in addition to previously existing requirements for cattle, bison and sheep. These amendments aim to further protect animal and public health.

Bill C-18, Agricultural Growth Act, introduced in December 9, 2013, and currently before Parliament, would provide authorities required for the amendment of the *Feed Regulations* to support a modernized process-based, preventive approach including preventive control plans and licensing. The Bill also contains proposed provisions that streamline processes and clarifies the scope and authorities in the regulation of veterinary biologics. These changes are intended to result in the timely availability of innovative veterinary vaccines for the control of animal diseases, including zoonoses (infectious diseases of animals transmissible to humans), while still providing appropriate regulatory oversight to safeguard the interests of Canadians.

The Government, represented by the CFIA, Agriculture and Agri-Food Canada and the Public Health Agency of Canada, each of which has members on the National Farmed Animal Health and Welfare Council (NFAHWC), also supports the creation of a national animal health surveillance system. The CFIA is fully engaged with the provinces, territories and industry stakeholders within the NFAHWC. Building on a strategic vision of collaboration and integration for a novel surveillance system, the NFAHWC is now leading a multi-jurisdictional, multi-sectoral dialogue to define its governance structure. Concrete steps towards this goal include identifying governance options and recommendations through a fall 2014 workshop of senior officials from federal, provincial and territorial agriculture and health departmental ministries, together with livestock and meat industry leaders, and following with a public report of the findings.

RECOMMENDATION 7

The Committee recommends that the Canadian Intellectual Property Office review the patent application process as well as evaluate the impact of renewing or extending the length of patent protection on the Canadian market.

The Government supports the recommendation to review the patent application process as well as evaluate the impact of extending the length of patent protection on the Canadian market. A patent framework that effectively supports innovation must focus on providing a benefit to applicants while serving the public interest.

The Canadian Intellectual Property Office (CIPO) will continue its concerted and productive efforts towards modernizing the Intellectual Property (IP) framework and reviewing the patent application process to further identify improvements and reduce red tape as part of its commitment to supporting the economic success of innovators and businesses. To this end, the Government tabled the Patent Law Treaty, which it intends to ratify in order to make the patent system more efficient for businesses and address concerns over procedural requirements that can contribute to inadvertent abandonment of patent rights.

The patent system is based on a fundamental bargain: exclusive use of the invention for twenty years in exchange of the full disclosure of the invention consistent with the requirements of the *Patent Act*. CIPO is the gatekeeper of this fundamental bargain, but the final arbiter remains the Federal Court.

The time it takes to obtain a patent varies greatly depending on a number of factors, some of which originate with the applicant and others from CIPO's internal processes. Notwithstanding these realities, CIPO is highly cognizant of the need for a modern IP framework that is internationally competitive, supports innovation, and enhances the commercial success of Canadian businesses. For this reason, CIPO continually evaluates its regulatory and administrative systems to ensure they serve businesses by: (1) reducing regulatory and procedural burdens; (2) streamlining procedures; and (3) improving alignment with Canada's major international trading partners.

CIPO is moving ahead into its third year of process modernization and investments in process and information-technology improvements to reduce waste and time lost in the application process. This includes setting targets to materially reduce turn-around times throughout the patent prosecution process as well as within the Patent Appeal Board. These efforts are yielding results: CIPO achieved its target of 43.2 months from application filing to a patent being granted in 2013–2014 with patents in the agricultural field taking an average of 42.9 months, a substantive reduction from the average of 50 months in 2010-2011. The goal for 2016-2017 is to further reduce this turn-around-time to 33 months, placing Canada at par with our trading partners. The Government remains committed to ensuring the administration of the IP regime is efficient and reflective of current business realities.

RECOMMENDATION 8

The Committee recommends that Agriculture and Agri-Food Canada and the Canadian Food Inspection Agency bring the *Plant Breeders' Rights Act (1990)* up to the standards of the 1991 Act of the International Convention for the Protection of New Varieties of Plants.

The Government supports the recommendation that the *Plant Breeders' Rights Act (1990)* be brought up to the standards of the 1991 Act of the International Convention for the Protection of New Varieties of Plants (UPOV 91).

Bill C-18, Agricultural Growth Act, introduced in December 9, 2013, and currently before Parliament, also includes the amendments to bring the *Plant Breeders' Rights Act (1990)* into conformity with UPOV 91. Strengthening the intellectual property rights for plant breeders will encourage investment in Canadian plant variety research and development, and motivate foreign breeders to release their varieties in Canada. This will give Canadian farmers more choice in accessing new and innovative plant varieties, helping them to remain competitive in the global marketplace.

RECOMMENDATION 9

The Committee recommends that Health Canada and Environment Canada strengthen regulations on nanomaterials to reflect the recommendations made by the Council of Canadian Academies in its 2008 report. The Committee recommends that changes to the regulations be made as soon as possible.

The Government acknowledges the recommendation to strengthen regulations on nanomaterials to reflect the findings of the Council of Canadian Academies in its 2008 report.

At the current time, the Government of Canada does not believe there is a need to amend existing or develop new regulations. Programs are able to use existing regulatory frameworks to provide effective oversight by adapting their human health and environmental risk assessment approaches to account for unique properties and behaviours associated with nanomaterials and their applications. This is consistent with the Organisation for Economic Cooperation and Development's (OECD) Council's recommendation that its Member countries apply existing international and national chemical regulatory frameworks to manage the risks associated with manufactured nanomaterials. The recommendation notes that these frameworks and other management systems may need to be adapted to take into account the specific properties of manufactured nanomaterials.

The Government continues to strengthen the regulatory oversight of industrial nanomaterials, within the existing Canadian legislative framework, through collaborative domestic and international efforts, such as the OECD Working Party on Manufactured Nanomaterials, the International Organization for Standardization Technical Committee 229 on Nanotechnology, and the Canada-United States Regulatory Cooperation Council (RCC) Nanotechnology Initiative. Developments in these fora, including work on nomenclature and categorization systems, physical, chemical and toxicological test methods and metrology standards, are applicable to the regulation and assessment of nanomaterials. Other critical activities include support for environmental, health and safety research on the effect of nanomaterials on human health and the environment, standardized approaches for the proper handling of nanomaterials, and the detection and characterization of nanomaterials released from food or food packaging.

The Government supports a wide range of regulatory programs including food, pest control product review programs and industrial nanomaterials. The Policy Statement on Health Canada's Working Definition for Nanomaterial, published in 2011, provides Health Canada programs, in particular, with a consistent approach across its diverse regulatory program areas to help identify regulated products and substances that may be or may contain nanomaterials. The Policy Statement also provides general guidance to regulatory programs on requesting more specific (or alternate) information from manufacturers, such as physical and chemical properties, and toxicological, eco-toxicological, metabolism and environmental fate data to further help identify and assess potential risks and benefits from nanomaterials. Although some data requirements and test methods will be more tailored to the properties of nanomaterials, this alternative information is not anticipated to increase the regulatory burden on industry.

Work under the RCC Nanotechnology Initiative includes the RCC Nanotechnology Policy Principles for Decision-Making Concerning Regulation and Oversight of Nanotechnology and Nanomaterials which are a set of principles that the Government of Canada developed to support innovation while ensuring regulatory oversight of nanomaterials is based on sound science and is protective of human health and the environment. The Government is committed to continuing its efforts to strengthen the necessary scientific tools and methodologies through collaborative domestic and international efforts.

RECOMMENDATION 10

The Committee recommends that the Government of Canada harmonize its regulations with those of its trading partners in key areas in the agriculture and agri-food sector without compromising health or the environment and that this become part of any new trade agreements.

The Government supports that Canada harmonize its regulations, where appropriate, with those of its trading partners in an effort to minimize non-tariff trade barriers while maintaining or improving levels of protection for health, safety and the environment. Since 2011, Health Canada, the Canadian Food Inspection Agency (CFIA), and Agriculture and Agri-Food Canada have been working in collaboration with their American counterparts under the Canada-United States Regulatory Cooperation Council (RCC) to better align regulatory approaches to protect health, safety and the environment while supporting growth, investment, innovation and market openness. Specific initiatives include a focus on improving alignment in the areas of food safety, animal and plant health, veterinary drugs, and crop protection products.

The Government has taken steps to allow for the adoption and use of modern tools and technologies, such as nanomaterials, by Canadians in an efficient and science-based manner based on available evidence internationally. On April 16, 2010, a Private Member's Motion put forward by Member of Parliament Bev Shipley was adopted that encourages departments and agencies to further consider and use scientific information from other countries in the Canadian regulatory approval process. Specifically the Motion states that "government should ensure that production management tools available to Canadian farmers are similar to those of other national jurisdictions by considering equivalent scientific research and agricultural regulatory approval processes by Health Canada, the Pest Management Regulatory Agency, and the CFIA."

Bill C-18, Agricultural Growth Act, which is currently before Parliament, will help Canadian farmers benefit from the latest scientific research from around the world; the bill also provides the CFIA with the authority to consider foreign reviews, data and analyses during the approval or registration of new agricultural products in Canada, allowing for a more effective approvals process.

At a multilateral level, the Government advocates for the development and adoption of science-based standards, guidelines and recommendations for trade in agricultural and agri-food products through its active participation in international standard-setting bodies such as Codex Alimentarius Commission, the International Plant Protection Convention, and the World Organisation for Animal Health. In addition, in other fora, such as the World Trade Organization (WTO), Canada encourages a rules and science based approach in the development, adoption and application of measures related to managing risks to human, animal or plant life or health.

Within the context of free trade agreement negotiations, the Government of Canada seeks to reaffirm its WTO rights and obligations in an effort to ensure that measures taken by other countries are no more trade-restrictive than necessary to protect human, animal or plant life or health or to fulfil a legitimate objective. Furthermore, improved regulatory cooperation through increased information exchange and the facilitation of discussion of issues related to unjustified non-tariff barriers is encouraged where appropriate.

RECOMMENDATION 11

The Committee recommends that:

- **Agriculture and Agri-Food Canada, set common strategic priorities for science and innovation that will be part of a long-term vision and integrated with sector objectives for profitability, sustainability, and competitiveness; and**
- **Agriculture and Agri-Food Canada ensure stakeholders are fully aware of the funding from all sources that are allocated to common strategic priorities.**

The Government supports the recommendation to set common strategic priorities for science and innovation. Agriculture and Agri-Food Canada (AAFC) employs a strong collaborative approach with stakeholders in developing its strategic direction and priorities to guide the department's science activities in support of the Canadian agriculture and agri-food sector. AAFC's strategic direction is informed by nine sector science strategies aligned to Canada's major commodity sectors, which provide a framework of priority areas for AAFC science investments. The set of strategies include a number of commodity based strategies for: forages and beef; cereals and pulses; oilseeds; horticulture; dairy, pork, poultry and other livestock; bioproducts; and agri-food, and also include two cross-cutting strategies for agro-ecosystem productivity and health; and biodiversity and bioresources. Each strategy identifies priority areas within a consistent set of four overarching science strategic objectives that correspond to the most important challenges and opportunities facing 21st century agri-based production: increasing agricultural productivity; enhancing environmental performance; improving attributes for food and non-food uses; and addressing threats to the value chain.

AAFC supports its long-term vision of a profitable, sustainable and competitive sector by identifying and working to fill gaps in these priority areas through close collaboration with the agriculture sector and the research community. Increasingly, AAFC employs multi-disciplinary forums such as the Value Chain Roundtables (VCRTs) to bring together the various players across government, academia, and the private sector to create a holistic approach to developing strategic direction for the various sectors. Finally, through the five-year agricultural policy framework, Growing Forward 2 (GF2), science and innovation programming is being driven by industry priorities.

AAFC is also committed to ensuring all stakeholders are made aware of funding opportunities available through our programs and uses a variety of means to do so, including direct interaction, ongoing collaboration, and joint fora with industry stakeholders and provincial-territorial governments. AAFC co-chairs a federal/provincial/territorial communications working group to coordinate activities around GF2 investment opportunities, including cost-shared programs. Along with actively engaging sector-specific VCRTs, AAFC facilitates an Agricultural Industry Communicators Network for an open channel of communication with industry stakeholders while our researchers network with private sector, academic and provincial/territorial partners to ensure that project partners are aware of ongoing funding opportunities.

AAFC employs traditional and new media to reach stakeholders including media releases, AAFC's internet site, social media, paid advertising, speeches, trade show exhibits, direct mail and other communications vehicles to raise awareness of available program funding that supports the strategic priorities of GF2. AAFC is committed to a vision of program and service excellence that supports the competitiveness and prosperity of the sector through the design and development of client-centered programs and services that fulfill clients' needs and expectations.

RECOMMENDATION 12

The Committee recommends that Agriculture and Agri-Food Canada, in cooperation with the provincial and territorial governments, continue and augment the funding of the AgriInnovation Program and renew the Canadian Agricultural Adaptation Program or develop a similar program so that farmers can continue to resolve issues specific to their region.

The Government supports this recommendation and has acted to continue and augment the funding of the AgriInnovation Program. The Government recognizes the importance of both innovation and the transfer of innovation to the farm level and all along the value chain. Growing Forward 2 (GF2) is the foundation for governments to collaborate on agricultural policy, programs and services until March 2018. Under GF2, the Government is making its key innovation investments through the federally-led AgriInnovation Program or through cost-shared programs (60:40 basis; between the federal government and participating provinces or territories) which are designed and delivered by the provinces and territories to ensure programs are tailored to meet regional needs. The \$2 billion investment made in cost-shared programs by the Government under GF2 represents a 50 percent increase over Growing Forward, the predecessor of GF2.

Knowledge transfer is a key component of the innovation agenda within GF2, and is supported federally within the AgriInnovation Program. This program has set aside funding for Agriculture and Agri-Food Canada (AAFC) to facilitate the transfer of innovative ideas, tools, and practices covering the full range of innovation efforts. Regionally relevant and commodity specific knowledge transfer approaches are informed by advice from industry users to ensure knowledge will be transferred according to local circumstances and needs to intended users, farms and firms, to enhance sector competitiveness, profitability, sustainability, and adaptability.

The Government has also augmented investments made under GF2's AgriInnovation Program with a renewed five-year 2014-2019 Canadian Agricultural Adaptation Program (CAAP). In May 2014, the Government, after a comprehensive review of the previous version of the program, including the consideration of AAFC's strong regional presence, announced the renewed CAAP with a focus on supporting national or sector-wide projects. Through CAAP, over \$50 million will be available for investments in industry-led projects that will help the sector seize opportunities, respond to emerging issues, investigate, and pilot approaches to confront new and ongoing challenges.

RECOMMENDATION 13

The Committee recommends that:

- **the Government of Canada encourage the use of second- and third-generation biofuels in conventional fuel; and**
- **the Government of Canada establish funding programs to support research into and the commercialization of second- and third-generation biofuels.**

The Government supports the recommendation to encourage the use of second and third-generation biofuels in conventional fuels by supporting research towards commercialization of new technologies for the production of second and third-generation biofuels through a number of agencies and programs.

Canada supports a diversified mix of energy sources and recognizes that emerging renewable sources of energy can make an important contribution to that energy mix. Since 2006, Canada has invested more than \$10 billion to build a more sustainable environment through investments in green infrastructure, energy efficiency, clean energy technologies, and the production of cleaner fuels.

The Government has introduced several targeted programs that support research towards commercialization of advanced biofuels including:

- the AgriInnovation Program under Growing Forward 2 with \$468 million for industry-led agricultural research that can include the development of crops and technologies for use in advanced biofuels and other industrial bioproducts;
- the NextGen Biofuels FundTM through Sustainable Development Technology Canada (SDTC) created in 2007 to provide support for first-of their-kind large scale demonstration facilities is making \$275 million available for second and third-generation biofuels;
- \$325 million, announced as part of Economic Action Plan 2013, for SDTC's Sustainable Development Tech FundTM to support development and demonstration projects including second and third-generation biofuels;

- Natural Sciences and Engineering Research Council support to postsecondary research for topics including food, agriculture, and biofuels through its suite of programs, including the Networks of Centres of Excellence, which are large-scale, academic-led virtual research centres that bring together multi-disciplinary partners from academia, industry, government and not-for-profit organizations (e.g., BioFuelNet, awarded approximately \$25 million over 5 years to undertake research in advanced biofuels);
- Genome Canada support of large-scale genomics research in key economic and strategic sectors, including agriculture, energy, and the environment. Examples include two large-scale research projects specifically related to biofuels, for a total investment of \$12.8 million;
- Natural Resources Canada's support for biofuels research through programs such as the Program of Energy Research and Development, the ecoENERGY Innovation Initiative, the Transformative Technologies Program, and the Forest Innovation Program. In addition, Natural Resources Canada works with Environment Canada to collaborate with the United States on biofuels research through the Clean Energy Dialogue;
- there have also been investment related to an aviation biofuel initiative funded by the National Research Council of Canada, several industry partners, the Green Aviation Research and Development Network (which awarded approximately \$25 million over nine years through the federal government's business-led Networks of Centres of Excellence program, created in 2007) and under the Government of Canada's Clean Transportation Initiatives; and
- the National Research Council's first flagship program for next-generation biofuels projects, the Algal Carbon Conversion Program, is an initiative that will provide Canadian industry with a cost competitive, value generating solution to divert CO₂ emissions into algal biomass. This biomass can then be processed into biofuels and other marketable products. This initiative represents an opportunity to address the environmental, energy and economic issues associated with industrial emissions by exploring how CO₂ emissions can be sustainably and profitably converted by algae into valuable products.

The Government believes these early investments in the advanced biofuels industry will enable more lucrative and diversified opportunities for biomass producers in the broader bioeconomy while leading to reduced greenhouse gas emissions.

RECOMMENDATION 14

The Committee recommends that the Government of Canada enhance the Scientific Research and Experimental Development Program to reflect the needs of the agriculture and agri-food sector and related sectors.

The Government acknowledges the Committee's recommendation to enhance the Scientific Research and Experimental Development Program to reflect the needs of the agriculture and agri-food sector and related sectors. The Scientific Research and Experimental Development (SR&ED) tax incentive program is already one of the most generous systems in the industrialized world for supporting business research and development (R&D). It is the single largest federal program supporting business R&D in Canada, providing more than \$3.3 billion in tax assistance in 2013. The SR&ED program includes special provisions to support farm-related R&D. Businesses in the farming industry are able to earn SR&ED tax credits on contributions made to agricultural organizations that fund eligible R&D. This facilitates access to the SR&ED program for farmers by allowing them to pool their efforts to conduct R&D while minimizing the compliance burden.

RECOMMENDATION 15

The Committee recommends that:

- **the Government of Canada facilitate researchers' access to suitable agricultural research facilities and equipment by means of existing funding and infrastructure programs;**
- **the Government of Canada earmark funds to develop long-term data-sharing tools when providing financial support to research projects; and**
- **the Government of Canada reinstate agri-food as a priority research area for the Natural Sciences and Engineering Research Council of Canada and the National Research Council Canada.**

The Government supports the recommendation to facilitate researchers' access to suitable agricultural research facilities and equipment by means of existing funding and infrastructure programs. The Government also supports the recommendation to earmark funds to develop long-term data-sharing tools when providing financial support to research projects. The Government acknowledges the recommendation and recognizes the importance of research and innovation in the agri-food sector.

In terms of the Canadian agriculture, agri-food and agri-based products sector, the Government of Canada's key program is the AgriInnovation Program, a five-year initiative, ending March 31, 2018 delivered by Agriculture and Agri-Food Canada (AAFC).

Within this program is the Industry-led Research and Development Stream where industry submits proposals for pre-commercialization research, development and knowledge transfer projects leading to innovative agriculture, agri-food and agri-based practices, processes and products. An applicant may apply for contribution agreement funding to support research that they may have secured through a private entity, such as a university, and/or they may apply seeking support in the form of collaborative assistance given by AAFC research scientists and experts for knowledge transfer. In undertaking an approved project, the recipient may acquire the services and equipment that they need to undertake the research activities related to the goals of the project, including access to federal research facilities and infrastructure to pursue the targeted objectives of the proposed research.

AAFC will continue to be a major driver in agricultural research and development, and the Government will invest in its facilities accordingly to best serve Canada's research priorities and interests of researchers, however as one of many research providers, AAFC will continue to leverage federal investments through collaborations.

Leveraging of investments and collaboration are achieved through the AgriInnovation Program's industry-led Research and Development stream under two types of projects.

The Agri-Science Clusters initiative supports national, industry-led initiatives that support components of a sector's applied science plan. These clusters assemble and coordinate a critical mass of scientific expertise comprised of interdisciplinary representatives and non-profit organizations. Application intake for agri-science clusters concluded on February 1, 2013.

In addition to Agri-Science Cluster initiatives, more targeted and focused initiatives are supported under the Agri-Science Project initiative which supports moving innovative products from pre-commercialization stages towards commercialization. The majority of these initiatives require a degree of interdisciplinary collaboration and interested stakeholders have three application deadlines each year for Agri-Science Projects on February 1, June 1 and October 1. The Agri-Science Project will continue to be supported until all assigned funds and other resources have been allocated to approve agri-science projects.

The Government has also earmarked funds to develop long-term data sharing tools and research support, such as the launch of its Open Government strategy in March 2011. To support this initiative, the Treasury Board of Canada Secretariat (TBS) has developed a data clearinghouse website to promote government sharing of information with the public. AAFC has made over 1,700 datasets available through the clearinghouse site (data.gc.ca) and preliminary tools and processes are being put in place to increase AAFC's contributions over time.

In addition to the Open Government initiative, a TBS-approved project is underway to complete the Federal Geospatial Platform which will promote the sharing of geospatial data, infrastructure, and software between federal departments. This initiative will also make data available to the public through the public clearinghouse website.

From 2005-10, Natural Sciences and Engineering Research Council of Canada (NSERC)'s Strategic Projects Program funded research in seven targeted areas, one of which related to agriculture and bioproducts. In 2010-11, NSERC revised the target areas for this program to align with the priorities identified in the Government's Science and Technology Strategy, as follows:

- Environmental Science and Technologies
- Information and Communications Technologies
- Manufacturing
- Natural Resources and Energy

Agriculture and food-related research are linked to all four target areas and therefore research related to food and agriculture is funded under these target areas (e.g., food related projects are funded under "Manufacturing", biofuel related projects are funded under "Natural Resources and Energy", agriculture related projects are funded under virtually all of the areas).

NSERC is currently undertaking analysis on research needs and investments, including in the area of agriculture, and will be developing and implementing sector outreach strategies intended to stimulate and increase research partnerships between industry and academia.

The National Research Council (NRC)'s current agriculture and agri-food-related initiatives are selected for their potential to deliver benefits to Canada and Canadian industry and they are engineered for high impact. They are also national in both scope and scale and incorporate research activities across the country.

The NRC works directly with small and large Canadian companies to sustainably transform Canada's bio-based resources into value-added products. For example, NRC works with firms that are realizing technological advances with aquatic and crop resources destined for natural health products, foods and beverages, fibers, bioenergy, bioremediation, bio-based chemicals and other bioproduct areas.

Examples of recently launched NRC programs that support Canada's agriculture and agri-food sectors include the "Canadian Wheat Improvement Program," the "Natural Health Products Program, and the "Industrial Biomaterials Program."

In the October 2013 Speech from the Throne, the Government committed to updating the federal S&T Strategy and soon after launched a public consultation to support the updating process. Reviewing the identified research priorities and areas of focus is being considered under this exercise. As announced in Budget 2014, the Government intends to release an updated Science, Technology and Innovation Strategy later this year.

RECOMMENDATION 16

The Committee recommends that the Government of Canada set policies which enhance the access of small and medium-sized enterprises (SMEs) to venture capital in order to better meet the needs of SMEs in the agriculture and agri-food sector.

The Government supports the recommendation to enhance access to venture capital for innovative companies in the agriculture and agri-food sector.

Farm Credit Canada (FCC) began investing venture capital in innovative agriculture and agri-food companies in 2001. In 2006, the management of venture capital investments was moved outside of FCC with the creation of Avrio Ventures, an independent venture fund manager. FCC has taken a lead role in capital committed to Avrio funds, the Business Development Bank of Canada (BDC), and Export Development Canada have also participated. Since 2002, the Avrio team has invested in more than 40 companies with operations ranging from crop inputs and food production through to value-added processes such as fermentation and synthetic biology. Avrio Ventures is only one component of the Government of Canada's wider commitment to investing venture capital in innovative companies across several technology sectors.

- The BDC is a major venture capital investor with \$1 billion under management. It invests directly in technology companies, and also makes investments in privately managed venture capital funds. The BDC's portfolio includes investments in the agriculture and agri-food sector.
- Through the Venture Capital Action Plan, the Government of Canada is investing in the creation of funds of funds. The first investment contributed to the first close of the Northleaf Venture Catalyst Fund in January 2014. A subsequent close of this fund was announced in August 2014. Work is on-going to establish up to three more funds of funds in the coming months. These new funds of funds will increase venture capital available to firms across many sectors, which may also include the agriculture and agri-food sector.
- *Economic Action Plan 2014* announced the creation of the Immigrant Investor Venture Capital Fund pilot to support long-term venture capital investments in Canada, including the agriculture and agri-food sector.

Agriculture and Agri-Food Canada does not directly invest in venture capital, but supports innovation and SME's access to venture capital in several ways. In 2008, Growing Forward created the Agri-Investment Symposia, now privately managed as the Agri-Investment Forum, which is a semi-annual match-making conference between SME's and venture capitalists.

RECOMMENDATION 17

The Committee recommends that Agriculture and Agri-Food Canada strengthen vertical and interdisciplinary collaboration by fostering communication with consumers, academia, and federal departments and agencies interested in agricultural and agri-food issues.

The Government supports the recommendation to strengthen vertical and interdisciplinary collaboration by fostering communication with consumers, academia, and federal departments and agencies interested in agricultural and agri-food issues.

In addition to the existence of Agriculture and Agri-Food Canada's (AAFC) robust federal, provincial and territorial consultation process whereby government officials identify and discuss issues that impact the sector, extensive public consultations with sector stakeholders (such as those undertaken in the development of the agricultural policy framework, Growing Forward 2 (GF2), that were held across Canada with representation from the general public, academia, industry, and other levels of government) are regularly held with key collaborators including venture capital providers, and the non-profit sector which all contribute to priority-setting with the objective of addressing key sector issues related to competitiveness, innovation and sustainability. AAFC participates in discussions with partners that also strengthen its ability to foster communication with consumers, academia, and federal departments and agencies such as the Canadian Food Inspection Agency's healthy and safe food forums. The forums bring together approximately 250 stakeholders from all different sectors to discuss proposed approaches to regulations and Agency Transformation.

As a member of the federal Integration Board (IB), AAFC is engaged with other federal science-based departments and agencies (SBDAs) in a continuous dialogue on key issues which impact the federal science community. Under the IB, AAFC is co-leading an examination of current models of collaboration employed by SBDAs with the objective of creating a tool to assist in developing and undertaking appropriate models to achieve specific outcomes with a variety of external partners. AAFC is also working to promote the adoption of common standards in publication and knowledge management that are consistent with the Open Government initiative. The use of expert panels also contributes to addressing key sector issues. For example, in developing the federal-provincial-territorial agricultural policy framework GF2, an expert panel of stakeholders (including academia and industry) was created to provide advice on priority setting. Also within GF2, under the AgriInnovation Program, Canadian Agri-Science Clusters are a model of collaboration that mobilizes and coordinates a critical mass of national scientific and technical resources to establish research and development clusters that support sector priorities and objectives for enhanced profitability and competitiveness. Agri-Science Clusters are industry-led initiatives comprised of interdisciplinary representatives, including those representing non-profit organizations and end-use consumer interests that address national sector initiatives along commodity lines.

Similarly, but utilizing a more targeted approach than Agri-Science Clusters, the AgriInnovation Program also supports Agri-Science Projects which are industry-led research efforts to address national and/or regional local opportunities and challenges. These projects are led by sector organizations or by companies attempting to move innovative products from the pre-commercialization stage towards commercialization. A majority of these projects require a degree of interdisciplinary collaboration.

In 2014, the Minister of Agriculture and Agri-Food received the final report from the Agri-Innovators Committee. The Committee was comprised of a number of sector innovators and charged to provide advice on how to advance innovation within the sector. During the course of their deliberations, committee members heard from a wide variety of experts from a number of disciplines from industry, academia, and other federal departments.

Canada's national Value Chain Roundtable (VCRT)'s approach in the agricultural sector is distinctive from other business-to-business value chain models. VCRTs are sector-specific and are comprised of all segments of the industry, federal and provincial governments (including regulatory bodies), academia, independent experts and certification bodies, and obtain the consumer perspective from small, medium and large retail members of the value chain and organizations such as the Retail Council of Canada. VCRTs rely on partnerships between value-chain interests from across Canada and senior officials from provincial and federal government departments responsible for regulating and supporting Canada's beef, food processing, grains, horticulture, organic, pork, pulse industry, seafood, seeds, sheep, and special crops sub-sector value-chains.

RECOMMENDATION 18

The Committee recommends that the Government of Canada continue its work on the Codex Alimentarius Commission in order to better harmonize pesticide maximum residue limits and thereby promote the elimination of sanitary and phytosanitary barriers.

The Government supports the recommendation to continue its work at the Codex Alimentarius Commission on the development of Codex maximum residue levels (MRLs), with which countries can harmonize with the objective of reducing sanitary and phytosanitary barriers.

Health Canada (HC) is actively involved in ongoing MRL initiatives both in Canada and internationally, with support to Agriculture and Agri-Food Canada and in consultation with stakeholders. These activities include participation in the Food and Agriculture Organization/World Health Organization Joint Meeting of Pesticide Review; and serving as Head of Delegation to the Codex Committee on Pesticide Residues. Through these activities, HC coordinates and promotes Canadian objectives in setting international standards (i.e., Codex MRLs).

In addition, HC has undertaken the analysis of novel, scientific methodologies designed to further streamline the data requirements required to establish MRLs. These ongoing projects should also assist in further aligning MRLs for major and minor uses of pesticides to minimise trade barriers for agricultural commodities in global trade.

RECOMMENDATION 19

The Committee recommends that Agriculture and Agri-Food Canada improve the strategic market information available to sector stakeholders in order to effectively meet their needs.

The Government supports the recommendation that Agriculture and Agri-Food Canada (AAFC) improve the availability of strategic market information for sector stakeholders in order to effectively meet their needs. AAFC has been delivering market information since 1905 and regularly adjusts its program to meet industry needs.

AAFC recognizes that timely, accurate, and unbiased market information is critical to sector stakeholders in order to effectively make business decisions. The Government has made strategic investments in housing and reporting market information to ensure it is securely stored and disseminated in a timely and accessible manner whether through reporting directly to clients, web updates or portals.

For example, AAFC's internet site provides the dairy, poultry, and red meat sectors with single window access to a range of supply and demand data including inventory, imports, fabrication, stocks, consumption, exports and prices. Opportunities in domestic and foreign markets are also reported, including information about re-opening, maintaining and expanding market access. Current strategic intelligence information on food policy and regulatory issues is also available to equip Canadian producers and food processors with the resources they require to make informed decisions on the development and marketing of innovative products, processes, and technologies, and to effectively navigate the regulatory environment in a timely manner is also available.

To ensure that market information programs continually adapt to changing client needs, AAFC undertakes a series of outreach efforts which include AAFC's eleven Value Chain Roundtables and other advisory committees. These approaches bring together key industry leaders from across the value chain, including input suppliers, producers, processors, food service industries, retailers, traders and associations, and federal and provincial government policy makers, to share information, identify emerging market information needs, and cooperatively discuss how best to meet these needs.

The Government also recognizes the importance of adopting a collaborative approach with other provincial governments to advance market research priorities, and has created fora for interaction with the industry to assure better federal-provincial coordination. These initiatives further strengthen the capacity of the sector to maintain current markets and enter new foreign markets through a suite of activities, programs or information contributing to the leadership, and strategic direction of the sector.