



*Cooperative Program in Agricultural Research and Technology for the Northern Region*

*Programa Cooperativo en Investigación y Tecnología Agrícola para la Región Norte*

## PROCINORTE STRATEGIC PLAN 2015 – 2020

### Adopted by the Board of Directors, Costa Rica 2015

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## PURPOSE OF THE PROCINORTE STRATEGIC PLAN 2015-2020

The Cooperative Program in Agricultural Research and Technology for the Northern Region (PROCINORTE) was founded in 1998 by the Agriculture and Agri-Food Canada's Research Branch (now the Science and Technology Branch – AAFC-STB), the United States Department of Agriculture's Agricultural Research Service (USDA-ARS), the Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias (INIFAP) in Mexico, and the Inter-American Institute for Cooperation on Agriculture (IICA). These institutions agreed to cooperate on agricultural research and technology agendas of trilateral interest as specified in a Declaration in 1998.

PROCINORTE has a specific niche in the Northern Region, supporting agricultural trade through sound science and knowledge sharing on issues of regional relevance. The North America Free Trade Agreement (NAFTA) of January 1994 began a very significant level of economic integration and growth in trade in the region, influencing agricultural trade. As a result of the NAFTA, agricultural three-way trade in agricultural products between the three NAFTA partners exploded after 1993, almost doubling between 1993 and 2003. Canadian agrifood exports to the U.S. more than doubled during this period, while those to Mexico have more than tripled<sup>1</sup>. Similarly, US farm and food exports to its NAFTA partners more than doubled while Mexico also doubled exports of specialty crops to the USA and Canada<sup>2</sup>. The challenges, value, and issues of trilateral integration in agriculture have now reached unprecedented levels. This offers an opportunity for PROCINORTE to add great value to its member countries through the sharing of knowledge and science generated in the region's national research organizations.

This PROCINORTE Strategic Plan:

1. Focuses on priorities shared among Canada, Mexico and the United States.
2. Ensures that PROCINORTE continues its catalytic role in sharing knowledge between researchers and regulators from the member organizations.
3. Creates a platform to mobilize knowledge from the three principal scientific centers of excellence (AAFC-STB, USDA-ARS and INIFAP) to reach out to other countries in the hemisphere.
4. Contributes to the agricultural dialogue in the hemisphere through the appropriate science and technology bodies.

### *Vision*

The governments of Canada, Mexico, and the United States working together, in consensus, and through their national agricultural research institutions to address problems and support agriculture in the North American region using science, improved technology, and scientifically-based policy guidance.

### *Mission*

To mutually strengthen agriculture related governmental and stakeholder collaboration in research and in support of the development of science-based policies to: 1) enhance sector productivity and competitiveness; 2) improve food safety and plant and animal health, and 3) contribute to capacity building through cooperation in science and technology.

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<sup>1</sup> North American Free Trade Agreement, AAFC, 2007.

<sup>2</sup> Status of Agrifood Regulatory Coordination under the NAFTA, ECLAC. 2007.

## *Values*

1. Ensure an equal representation of all member countries
2. Share science for the benefit of all, and especially for farmers
3. Promote good stewardship of natural resources

## *Strategic Objectives*

1. Share knowledge on agreed priority themes by mobilizing public sector researchers and scientists, incorporating science relevant to regulation where appropriate
2. Strengthen mutually supportive regional networks in priority topics of relevance for agricultural trade
3. Contribute to the deliberations of regional/hemispheric agricultural science and technology bodies, in particular the Forum for the Americas on Agricultural Research and Technology Development (FORAGRO), the Global Forum on Agricultural Research (GFAR), the Global Conferences on Agricultural Research and Development (GCARD) and the G20 Meeting of Agricultural Chief Scientists (MACS)

## **THE WAY PROCINORTE WORKS**

PROCINORTE works to strengthen the culture of knowledge sharing between AAFC-STB, USDA-ARS, INIFAP and IICA to achieve the results required for the agricultural sector in its member countries.

The structure of PROCINORTE is simple, consisting of a Board of Directors (BOD), Task Forces (TF) and an Executive Secretariat (ES). The BOD is PROCINORTE's highest authority, comprised of senior officials from the member organizations who meet face-to-face once a year. Each member of the BOD is appointed by her/his government and continues until the government names a replacement. The President of the BOD is appointed by consensus among the BOD members for an initial appointment of two years, with a possible extension for a maximum of four years.

TF are used as the mechanism for implementing the trilateral collaboration. Each research institution appoints one highly qualified scientist to each TF. These professionals are senior scientists typically responsible for national programs in their respective areas of expertise. Each is appointed by her/his government and serves until the government names a replacement. One among them is elected as TF leader and can be substituted by consensus in her/his temporary or permanent absence, with the same functions. The BOD can also decide to establish a TF once relevant themes are agreed upon by the three countries. Each year, the BOD reviews each TF and decides whether it should continue to operate.

In addition to appointing a senior official to the BOD, IICA provides in-kind support through having a senior-level staff member serve as the Executive Secretary. Currently, IICA dedicates a proportion of the time of a senior level innovation specialist based in Washington to coordinating PROCINORTE activities. Time and support of the three IICA representatives in the member countries, and the logistics support from the administrator of IICA in the US are also currently provided.

PROCINORTE's mandate is also to provide a solid mechanism for regional collaboration with other regions in LAC through outreach to the other PROCIS (PROCISUR, PROCITROPICOS and its equivalent in Central

America), PROMECAFE and other technical networks. In cases where the cooperation agendas of PROCINORTE and another collaborative mechanism are aligned, joint projects can be executed. Some areas of interest include the conservation and sustainable use of genetic resources, animal disease diagnosis and management, invasive pest species, biological control, and fruit post-harvest management and standards. PROCINORTE has built an extensive network of scientists and regulators with expertise in these topics who are willing to collaborate with their counterparts in the South.

Promoting research and innovation is crucial to IICA's mandate to support of its member countries, and while Canada and the US might not require technical assistance from IICA, this is an important function in Mexico. Thus, PROCINORTE is considered as a useful vehicle to contribute to IICA's hemispheric mandate not only in Mexico but also in the other LAC countries.

## THE PRIORITIES OF PROCINORTE

PROCINORTE works in the current following priority themes:

### *Genetic Resources*

The work of the genetic resources task force, called NORGEN, was initiated in 1999 as a focal point for genetic resources programs within the three nations and to facilitate exchange of information among them under the umbrella of PROCINORTE. Biodiversity International, as well as several other organizations, have also participated in various activities over the years. The current objectives of NORGEN are to (1) encourage the communication and collaboration among personnel involved in National Genetic Resource Systems, (2) identify training and educational needs, (3) integrate with other genetic resources networks in the Americas and around the world, (4) develop projects of interest to the three countries, (5) encourage reciprocal participation of national experts in each country's operational and advisory committees, (6) establish contact with other TF of PROCINORTE and (7) support the development of an Integrated Genetic Resources System in Mexico. NORGEN is recognized in the Hemisphere as a strong network that could support other countries through capacity building. NORGEN's strategic direction and potential role to contribute science and technology policy advice on genetic resources issues relevant for the three countries that need to be addressed. NORGEN can play a significant role for information and germplasm sharing among countries in light of the relevant international treaties, and the countries' common interests in research on specific topics related to genetic resources. The importance of access to genetic resources is emphasized, and Canada has encouraged the other two countries to ratify the International Treaty on Plant Genetic Resources for Food and Agriculture.

### *Animal Health*

The Animal Health Task Force (AHTF) was inactive for some time but has rapidly evolved to be one of the most dynamic networks of scientists and agricultural health regulators in North America focused on sharing knowledge about animal diseases and diagnostic methods, and contributing to policy formulation. The goal of the AHTF is to improve communication among the three countries concerning animal diseases and to work to harmonize diagnostics as much as possible. An annual regional seminar organized by this TF and supported by IICA has proven to be successful at sharing technology, knowledge and expertise on several

important animal diseases including avian and swine influenzas, bovine tuberculosis and bovine spongiform encephalopathy.

### ***Plant Health***

It has taken some time for the scientists in the three countries to agree on plant health issues of trilateral interest because of the differences in crop systems. In 2009, PROCINORTE scientists highlighted interest in pest control for greenhouse (protected) crops, including new invasive species. In 2012 the Plant Health Task Force (PHTF) agreed that invasive species would be the primary focus for this Task Force given their relevance for all three countries. The mission of this Task Force is to develop and share knowledge and technology to promote sustainable management of arthropod pests, diseases, nematodes, and weeds that negatively affect crop production in North America, as well as to prevent the introduction, establishment, and spread of invasive species affecting plant health. A network of scientists and regulators has been initiated through several training sessions focusing on invasive insect pests.

### ***Tree Fruits***

PROCINORTE's Tree Fruits TF was created in 2000 to improve research links between Mexico, Canada and the United States on issues related to the quality, safety and traceability of fruits. Its major goal is to serve as a mechanism to facilitate the exchange of experiences, information and training in the North American region by building linkages among public and private national level institutions, and the major research and technology transfer actors in the region, the hemisphere and the world. Since its establishment, the TF has been very active in conducting research supported by their own institutions while PROCINORTE has provided funding for the TF annual meeting, field evaluations and training for Mexican fruit producers.

### ***Outreach***

It is clear that the Task Forces are PROCINORTE's most important collaboration mechanism. Their role is increasingly viewed as a network of experts from the Northern countries who can contribute substantially to capacity development in the whole hemisphere. Several PROCINORTE activities have included participation of scientists from various Latin American countries, such as Chile, Argentina, Guatemala, Belize, Haiti and Bolivia.

## **PROCINORTE'S STRENGTHS**

During consultations carried out to identify mechanisms to improve the efficacy of PROCINORTE, four major strengths were repeatedly highlighted by members of the BOD and TFs.

1. Effectively fostering information exchange between the technical experts, scientists, and regulators in the three countries.
2. Substantially advancing trilateral networking and collaboration on areas of common interest.
3. Strength of constituent research organizations that generate science-based solutions to agricultural problems and the participation of regulators.
4. Actively facilitates understanding the diversity of issues and scientific priorities in the three countries.

## PROCINORTE'S ACHIEVEMENTS

A major achievement of PROCINORTE overall has been the formation of active networks of thematic specialists who share their knowledge at regional meetings and other means, strengthening capacity on specific topics of trilateral interest. The BOD can also decide to carry out seminars, conferences or special publications to address emerging issues for which establishment of a TF would not be appropriate.

A brief description of the accomplishments of each specific TF follows.

### *Genetic Resources*

The activities undertaken by NORGEN included developing capacity for establishing and strengthening an Integrated Genetic Resources System in Mexico. NORGEN has supported attendance of national experts (especially from Mexico) in other nations' annual plant genetic resource organizational and policy deliberative meetings. Some major accomplishments are:

- Collection of *Phaseolus vulgaris* germplasm and that of its wild relatives in the Mexican States of Guanajuato and Queretaro. Currently, this germplasm is kept at INIFAP's Centro Nacional de Recursos Genéticos (CNRG) in Jalisco, where it will be characterized. It is expected to be sent to researchers in Canada for further study.
- Training of more than 50 curators and researchers in the Germplasm Resources Information Network (GRIN-Global) by personnel from USDA-ARS and Bioversity International. As a result, Mexico began the implementation of the GRIN system in the collections of INIFAP as of 2012. Training has enabled genebank curators to actively enter, manage, and extract information from the complex relational database system GRIN-Global.
- Supported capacity building activities on *in vitro* propagation and cryopreservation of plant and microbe genetic resources utilizing the modern facilities of CNRG.
- Promoted strategies for *in situ* conservation of plant genetic resources, involving researchers from outside the Northern Region in field visits to Mexican farmers practicing *in situ* conservation. This has resulted in the strengthening of the networks of researchers on this topic and the enhancement of trilateral collaboration between the institutions.
- Led the formulation of the strategy "*The Americas: A Rational and Effective Conservation Strategy for Plant Genetic Resources*" (<http://www.croptrust.org/main/identifyingneed.php?itemid=512>), prepared for the Global Crop Diversity Trust in 2006. The document was a basis for a concerted strategy with participation of countries and networks of the PROCI system (NORGEN, REMERFI, REDARFIT, REGENSUR, TROPIGEN and CAPGERNET), as well as international research centers based in LAC.

### *Animal Health*

PROCINORTE has focused on training scientists and regulators on the state of the art diagnosis of animal diseases of importance, such as avian and swine influenza, bovine tuberculosis and bovine spongiform encephalopathy.

- Capacities were improved for the management of important animal diseases through "wet workshops" in which the researchers manipulated samples for molecular diagnosis, thus opening communication among specialists from the three countries. These workshops also aim at harmonizing diagnostics, particularly for influenza viruses. Collaboration on influenza among the three countries was important to assist in controlling the HPAI outbreak.

- The H7N3 highly pathogenic avian influenza (HPAI) outbreak of June 2012 in commercial layer poultry farms in Jalisco, Mexico, prompted this TF to engage in an effort to share knowledge about this disease and develop a plan for future interactions. Therefore scientists and regulators met with representatives from the private sector to discuss the disease and search for more effective ways of dealing with epizooties. A technical group for research and joint publication of results was established. A pre-proposal was written to support a surveillance workshop in Canada that will be submitted to the US Poultry and Egg Association for financial support.
- Two Bovine Spongiform Encephalopathy (BSE) wet workshops reinforced the capacities of scientists and regulators to diagnose this serious disease. The scientists learned the current techniques and immunohistochemistry procedures used in the Canadian Reference Laboratory certified by the World Organization for Animal Health (OIE). The participants shared experiences with national BSE testing from the three countries. Canada provides BSE proficiency panels which the US is already using and which Mexican participants expressed interest in obtaining.
- The re-emergence of bovine tuberculosis prompted the TF to dedicate efforts to train scientists and regulators on the new diagnostic assays for TB with increased speed, sensitivity and specificity. Experts from the research and regulatory governmental agencies in the three countries discussed the current status of TB diagnostics and are attempting to harmonize the assays used to diagnose this important zoonotic disease.

## ***Plant Health***

After examining the priorities on agricultural health of the three member countries, the TF members decided to focus on invasive species, especially those whose distribution is linked to climate change. The initial efforts of the TF focus on the Brown Marmorated Stink Bug (BMSB; *Halyomorpha halys*) which is widely distributed in the US and reported in Canada (Ontario), but not yet reported in Mexico.

- Developed a model for dispersion of BMSB for when it potentially arrives in Mexico. The model indicates that this pest could develop between 7 and 11 generations in a year –compared with only two in the US. Given the expected conditions in Mexico, it is expected that this pest will cause extensive damage to many crops of economic importance, many of key importance for food security such as maize and beans. Thus, the urgency to train researchers and regulators in the biology, epidemiology and management of this pest.
- PROCINORTE facilitated the participation of four Mexican scientists in the Brown Marmorated Stink Bug Working Group meeting in Maryland, where they learned about habits, epidemiology, damage, and control of BMSB. Two Mexican scientists conducted a review of the scelionid parasitoids of stink bugs found in Mexico, at the *Hymenoptera* collections in the Smithsonian Museum, the University of California, Berkeley and the California Academy of Sciences. The results were presented at international meetings.
- Assisted by their counterparts from PROCINORTE, Mexican scientists produced a leaflet in Spanish on the BMSB to be distributed among Mexican scientists, regulators, etc. alerting them about this potential pest.
- Facilitated knowledge sharing by supporting participation of Mexican scientists in the Brown Marmorated Stink Bug Working Group and the BMSB BioControl Identification Workshop in Bridgeton, N.J. In 2014, five Mexican researchers and regulators and one Canadian researcher were trained in data analysis of insect genomes for taxonomic purposes. Besides learning about state of the art tools, the scientists built a network in molecular taxonomy for insect pests of agricultural crops within the Northern Region. Supported one US and one Canadian scientists' participation in the Mexican Symposium of Biological Control held in November 2014, where they discussed the

impact of invasive species on agriculture in Mexico in light of the changes prompted by climate change and stressed the need to collaborate with entomologists and plant pathologists in Canada and the US.

### ***Tree Fruits***

Since its origins, this TF has been very active in conducting research. The members attend scientific meetings in which they present the results of joint collaboration, carry out field trips to evaluate genetic material, and jointly prepare publications (scientific papers, brochures, manuals, electronic publications, and others).

- Implemented several research projects of importance for the three countries such as (1) effect of post-harvest handling at the packing house on the shelf life of mango and avocado, (2) mechanized visual assessment of avocado and mango quality assessment, (3) a centralized database for the rapid integration of data with regard to quality and food safety in the mango and avocado supply chain, (4) development of anthracnose-resistant mango germplasm and (5) development of parameters to determine the quality of tropical/subtropical fruits.
- Currently carrying out four joint projects in topics relevant for the production and post-harvest treatment of several fruits of high market value.
- This TF has been very active training Mexican fruit producers and personnel at packing facilities on production and postharvest techniques to guarantee that the best practices are implemented and that the fruits are of market quality.
- The TF maintains an updated and comprehensive web site available in English, Spanish and French.

### **MAJOR CHALLENGES AND IDEAS TO OVERCOME THEM**

Overall, the PROCINORTE constituency agrees that there are three major challenges facing PROCINORTE: (1) consolidating its role as a mechanism for dialogue, (2) overcoming financial limitations and (3) internalization in the member organizations to increase national visibility. These need to be addressed to ensure that PROCINORTE continues to serve as a valuable mechanism for the three member countries, fulfilling its mandate, complementing IICA's mission, and contributing to sustainable agricultural development in the Hemisphere. The following points offer potential solutions to these limitations.

#### ***Challenge 1: Consolidate its role as a mechanism for dialogue***

1. Improve communication by using an appropriate information platform such as SharePoint for information exchange. It requires that one of the four member institutions agrees to manage the platform and that resources are allocated to carry out the task (i.e. a student/ intern /volunteer is allocated). A key condition for success is that PROCINORTE members provide content.
2. Distribute information about PROCINORTE's achievements at all possible opportunities including meetings, seminars and other events attended by BOD, TF and ES members.
3. Improve internal communications by carrying out quarterly teleconferences or videoconferences of each TF and bi-annual teleconferences or videoconferences with the BOD, to ensure follow-up on recommendations made at workshops, scientific meetings and training sessions. The ES would convene these meetings with enough anticipation to ensure the participation of the BOD and TF members, as well as circulate an agenda for discussion before the calls. The TF will provide technical inputs for the discussion. Following the meeting, the ES would circulate the agreements and follow up.

4. Strengthen institutional links with other PROCIs and thematic networks to identify opportunities to collaborate on issues of interest. For example, support could be sought from agribusiness, and partnerships with universities and other research centers could be established.
5. Promote participation of the member countries in FORAGRO and other relevant bodies through PROCINORTE.

### ***Challenge 2: Overcome financial limitations***

Building on core allocation from IICA, the member countries will endeavor to make PROCINORTE more financially sustainable by:

1. Building on the core allocation by IICA, the member countries will endeavour to work on making PROCINORTE financially sustainable.
2. Attracting and aligning additional funding in each country to optimize outcomes. Interact with potential stakeholders for each TF and broadly for PROCINORTE. Engage in dialogue with other agencies to gather feedback on issues of importance that might fall within PROCINORTE's mandate. BOD and ES could make presentations to key stakeholders and prospective supporters.
3. Preparing project proposals to present to national funding agencies in Canada, Mexico and the US that are interested in regional collaboration. The ES can lead the task assisted by BOD and TF.
4. Align PROCINORTE's agenda with the IICA's Northern Region agenda to provide another venue to present PROCINORTE's achievements and promote it as a mechanism for collaboration on research and science. This will also help leverage broader support from IICA Representatives in the Northern Region.

### ***Challenge 3: Internalization in the member organizations***

1. It is essential that the scientists and regulators working in the TF strive to include PROCINORTE's work in the annual work plans of their respective national institutions in order to obtain the proper support from their authorities to contribute to PROCINORTE more effectively.

## **THE WAY FORWARD**

It is in the interest of the member organizations to ensure the Strategic Plan 2015-2020, is an effective guide for ensuring that PROCINORTE contributes successfully to meeting the science and technology needs of the agricultural sector in the Northern Region.

Like the agriculture sector in the Northern Region it serves, this plan must continue to evolve to respond to the changing needs of its member countries. There might be emerging economic, environmental and social issues related to agriculture and trade in the Region that might require special attention and redirect the Plan.

PROCINORTE offers a mechanism for sharing knowledge among three centers of scientific excellence in agriculture in the Northern Region, with many advances in technical work valued by the member organizations.

## ANNEX 1.

### PROCINORTE MEMBER ORGANIZATIONS

A brief description of the organizations that comprise PROCINORTE follows.

#### ***Agricultural Research Service (ARS/USDA)***

ARS is the USDA's chief scientific, in-house research agency. The agency conducts research to develop new scientific knowledge, transfer technology to the private sector to solve technical agricultural problems of broad scope and high national priority, and provide access to scientific information. This research covers a wide range of critical problems affecting American agriculture, ranging from animal and crop protection and production to human nutrition, food safety, and natural resources conservation. ARS employs over 7,000 employees and carries out approximately 800 research projects at over 90 laboratories throughout the Nation and in several foreign countries. The agency includes the National Arboretum and the National Agricultural Library, the Nation's major information resource on food, agriculture, and natural resource sciences.

#### ***Science and Technology Branch (STB)***

The Science and Technology Branch (STB) is part of the federal government Department of Agriculture and Agri-Food Canada. STB's science activities focus on the application of science to agri-based production systems to support an innovative and competitive sector. STB's approach is based on (1) partnerships with industry and academia, using the Branch's unique strengths - a national presence and problem-solving mission; (2) tailoring STB's approach to sector needs and capacity; and (3) supporting industry science priorities by providing access to internal resources and capacity, leveraged with the Branch's connections to universities and program funding for innovation. Program funding for agriculture is delivered primarily through the Department's federal-provincial-territorial policy and program framework, "Growing Forward 2" (GF2).

STB's work is aligned with three pillars that emphasize its role in supporting the sector's economic prosperity: (1) providing science that enhances the sector's resiliency; (2) fostering new areas of opportunity for the sector; and (3) supporting sector competitiveness.

To provide direction and to describe STB activities in a way that reflects how the sector is structured, the Branch has developed science strategies for forages and beef; cereals and pulses; oilseeds; horticulture; dairy, pork, poultry and other livestock; bioproducts; agri-food; agro-ecosystem productivity and health; and biodiversity and bioresources.

The strategies outline STB's objectives and focus areas for science activities funded internally, to complement funding provided to industry from innovation programming in GF2. Each strategy frames its specific areas of focus within cross-cutting strategic objectives, which represent the major scientific challenges facing 21st century agri-based production systems. This provides a framework for scientists to propose areas of work and to inform stakeholders of the role STB will play in relation to and in collaboration with others, including the provinces.

The strategies were informed by “sector maps” which outlined science capacity in Canada (academia, all levels of government, industry) to support the agricultural and agri-food sector, and engaged stakeholders including departmental staff and management, formal and informal discussions across government (federal, provincial, territorial), academia and the private sector.

### ***Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias (INIFAP)***

INIFAP, Mexico’s public research center, aims to contribute to sustainable rural development by generating scientific knowledge and innovation that responds to the demands of the agriculture sector. Taking into consideration the different types of producers and agro-ecological conditions, the Institute focuses on the needs and opportunities to develop agrifood chains. The objectives of INIFAP are to (1) plan and execute scientific research and technological development in the agriculture and forestry sectors; (2) promote knowledge and technology transfer; (3) participate in programs and projects for agricultural and forestry development, (4) disseminate the results of scientific research, and (5) provide technical assistance to producers. Current research priorities include: maize, beans, sugar cane, honey, dairy production, climate change, soil and water conservation, and agricultural value chains.

### ***Inter-American Institute for Cooperation on Agriculture (IICA)***

IICA is the specialized agency of the Inter-American System for the promotion of agriculture, and rural well-being, focusing on making agriculture competitive and sustainable in the Americas. IICA is governed by the Inter-American Board of Agriculture (IABA) comprised of its 34 member countries that meets biennially. IICA’s Medium Term Plan 2010-2020 highlights four strategic objectives: (1) improve the productivity and competitiveness of the agricultural sector, (2) strengthen agriculture’s contribution to the development of rural areas and the well-being of the rural population, (3) improve agriculture’s capacity to mitigate and adapt to climate change and make better use of natural resources, and (4) improve agriculture’s contribution to food security. To respond to the demands of its member countries and provide effective technical cooperation, IICA works through flagship projects, externally funded projects, rapid response actions and pre-investment initiatives.