Access to plant genebanks may be changing. Will you be affected?
Proposed changes may affect sector access to plant genetic resources. For Canadian stakeholders, now is the time to weigh in.

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Overview

The diverse germplasm available from genebanks around the world is critical for plant breeding and conserving biodiversity. By having access to a multitude of different traits, breeders can create more resilient and higher-performing crops, especially as new pests emerge and growing conditions become ever more challenging.

Each genebank holds a variety of specimens important to agriculture; these are often referred to as plant genetic resources for food and agriculture (PGRFA).
In Canada, Agriculture and Agri-Food Canada (AAFC) manages three national genebanks that hold more than 120,000 accessions covering close to 1,000 species of PGRFA. These include cultivated species and crop wild relatives of cereals, pulses, oilseeds, forages and many other crops.

Many genebanks around the world conserve and share plant germplasm with Canadians and the international community for research, education, and plant breeding under an agreement known as the *International Treaty on Plant Genetic Resources for Food and Agriculture* (ITPGRFA). The treaty sets out terms for accessing and using PGRFA from genebanks that are part of the Canadian National Plant Germplasm System, as well as public genebanks in 150 other countries around the globe.

The current ITPGRFA terms for access to germplasm have been in place since 2008, but there may be changes in the future. This is a result of ongoing international negotiations for the Enhancement of the Multilateral System for Access and Benefit-sharing (EFMLS), scheduled to conclude by the end of 2025. Anticipated changes would include the cost of accessing and using PGRFA from genebanks – more on this later. Canadian PGRFA users and stakeholders are invited to share their thoughts and comments with this author in shaping Canada's position during ongoing international negotiations.

What is the ITPGRFA?

The ITPGRFA created a multilateral system for accessing plant genetic resources and sharing the monetary and non-monetary benefits arising from their use. This Multilateral System for Access and Benefit-sharing (MLS) became fully functional in 2008 and has two major features:

1. ***Global pooling of genetic resources***: 151 different ITPGRFA member countries manage and control access to germplasm of cultivated plants and crop wild relatives, with many as part of national and international genebanks. As of December 2021, this global pool of germplasm included 2.3 million genebank accessions from 76 ITPGRFA member countries and 15 international genebanks. Since 2008, 44 countries have provided access to 6.6 million samples to genebank clients in 185 countries for research, breeding, and education.

2. ***Raising funds to support projects***: When users have a commercial purpose and pay for materials accessed through the MLS, the funds are used to support projects in developing countries focused on the conservation and the sustainable use of cultivated plants and their crop wild relatives. These projects leverage plant genetic resources to find solutions for complex challenges relating to food and nutrition insecurity, biodiversity loss and climate change. This Benefit-sharing Fund is managed by the Food and Agriculture Organization of the United Nations (FAO) under supervision of the member countries of the ITPGRFA.

How does the ITPGRFA apply to Canadian genebanks?

In Canada, Agriculture and Agri-Food Canada (AAFC) operates three genebanks for PGRFA, which are part of the multilateral system of the ITPGRFA: (1) Plant Gene Resources of Canada in Saskatoon (Sask.) for seed germplasm; (2) the Canadian Clonal Genebank in Harrow (Ont.) for fruit germplasm; and (3) the Canadian Potato Gene Resources in Fredericton (N.B.) for potato germplasm. Together, they form the Canadian National Plant Germplasm System managed by AAFC.

The three Canadian national genebanks hold more than 120,000 accessions covering close to 1,000 botanical species important to food and agriculture. This includes cultivated species and crop wild relatives of oat, wheat, barley, pulses, oilseeds, forages and many other crops. About 70% of the germplasm holdings are cereals and wild relatives of barley, oat and wheat. An online database can be used to search through all germplasm holdings and make requests for samples. From 2002 to 2023, the Plant Gene Resources of Canada distributed more than 150,000 seed samples for research, breeding, and education to requesters in 71 countries (Figures 1, 2 and 3). Approximately 83% of the seed samples were shipped to Canadian clients. This highlights a considerable need and interest for plant genetic resources in Canada and around the world.

Germplasm requested from AAFC genebanks are shipped within Canada free of charge. However, foreign clients may need to pay for shipping by courier. Genebanks in other countries often charge a handling fee as well, but in principle, access to materials from the multilateral system is free of charge. Since 2008, all clients of the Canadian genebanks have been required to accept the Standard Material Transfer Agreement

(SMTA) of the ITPGRFA. Key terms of the current SMTA are:

- The germplasm is used solely for breeding, education, and training. Chemical, pharmaceutical, and other non-food/feed uses are not allowed.

- If a new cultivar is developed using any genebank material and there is monetary gain from the commercialization of this cultivar, a payment must be made to the Benefit-sharing Fund of the ITPGRFA. However, if there are no restrictions to others accessing the new cultivar for breeding or research purposes, then voluntary payments are encouraged (e.g., a cultivar protected under the *Plant Breeders' Rights Act* which permits the use of the protected cultivar for experimental and/or breeding purposes).

Access to plant genetic resources under the ITPGRFA has given rise to many new cultivars, most of them available without restrictions for further breeding or research.

Since the introduction of the SMTA in 2008, Canadian clients have requested and received more than 173,354 germplasm accessions from genebanks around the world. Of these accessions, 57% were provided by AAFC's three genebanks in Saskatoon, Harrow and Fredericton, while 43% were provided by genebanks in other ITPGRFA member countries. Canadian users have clearly made significant use of the ITPGRFA network and benefitted from both Canadian and international genebanks.

What is driving changes to the ITPGRFA?

In general, user payments to the Benefit-sharing Fund globally have been modest and fallen short of member countries' expectations.

For example, voluntary payments made to the Benefit-sharing Fund by Canadian users between 2008 and 2023 amounted to only $3,187 USD. In total, only 1.11% of the $35 million USD received and re-distributed by the Benefit-sharing Fund were due to obligatory or voluntary SMTA-based payments by users of genebank material. Meanwhile, 99% of the financial needs for projects supported by this fund were sourced from voluntary donations to the Benefit-sharing Fund by countries or organizations, with Norway as a major contributor who provided more than $11 million USD. Seeing this, ITPGRFA member countries agreed that it may be time to raise user costs generated through the SMTA.

Changes being considered

In 2013, ITPGRFA member countries established a working group to improve the MLS, putting forward suggested changes with two key objectives: (1) to create new avenues for user payments to the Benefit-sharing Fund; and (2) to expand the present list of 35 crops and 29 forage species to include more crops/species or to include all species that are plant genetic resources for food and agriculture.

The 151 ITPGRFA member countries which are represented in the working group are currently discussing proposals which may impact Canadian users. Examples of changes under consideration include:

- Creating a subscription option, where users make an annual payment based on profits made from selling products created using Multilateral System material or information associated with this material. This option may generate more sustained, reliable funding. Access to all Multilateral System material for breeding, research and education would be provided to subscribers without any additional costs, regardless of the restrictions that might be applied to a commercialized product.

- Making payments mandatory for creating and commercializing new cultivars. In other words, payments would also be applicable to cultivars protected by Plant Breeders' Rights in the future, even if they can be accessed without restriction for breeding research and education. So far, profits from their commercialization have been exempt from payments.

- Expanding the multilateral system to include many more species or even all plant genetic resources that can be used for food and agriculture. This would increase the scope of the multilateral system, as well as funds generated for the Benefit-sharing Fund. Many crops are presently not included under the ITPGRFA, e.g., crops important to Canada such as soy, flax, tomato, and many other vegetables.

- Reviewing current restrictions that only allow access to Multilateral System material for food and feed uses. Canada has consistently highlighted the potential benefits of expanding the scope of the multilateral system and its SMTA to include non-food/feed uses. This broader scope could include crops used for both food and biofuels, such as rapeseed/canola, camelina, and maize, as well as crops with combined purposes such as flax, which can be used for industrial applications (fiber, linoleum) and for food/feed.

- Using genomic data generated from PGRFA to generate financial profits, even without accessing physical specimens from a genebank. The term "Digital Sequence Information" (DSI) has been introduced as a placeholder for this type of data, though this term is not clearly defined. There is still the question of whether and how to address access and benefit-sharing issues for such data in the multilateral system. The complexity of the issue, along with very divergent views on what constitutes DSI, were key reasons that negotiations halted between 2019 and 2022.

- Reviewing payments timelines and rates for accessing and using genetic resources from the multilateral system.

These issues will impact Canadian researchers and breeders in both the public and private sectors. They are also relevant to Canadian genebanks as changes to SMTA

conditions may lead to more or higher payments and deter users from requesting genetic resources. The Canadian agricultural sector is currently facing challenges which rely on genetically diverse germplasm for solutions (e.g., climate change and enhanced resiliency). Canadian genebanks must ensure that they are well-positioned to support both national and international users in their ongoing work in breeding and agricultural sustainability.

Have your say: Invitation to comment

AAFC is representing Canada in negotiating changes to the multilateral system and invites feedback from all Canadian stakeholders that may be affected. The next working group meeting will be held from September 16th to 19th, 2024, at the FAO headquarters in Rome, Italy.

Please send comments or questions to Axel Diederichsen, Canadian National Focal Point to the ITPGRFA (axel.diederichsen@agr.gc.ca). In particular, we are seeking feedback on payment obligations for the use of plant genetic resources and the relevance of non-food, non-feed uses of germplasm obtained from genebanks.

Further Reading

The Multilateral System for Access and Benefit-sharing of the International Treaty on Plant Genetic Resources for Food and Agriculture

Assembled background documents for the Open Ended Working Group for the Enhancement of the Multilateral System for Access and Benefit-sharing

The formal meeting report from the 11th meeting of the OEWG-EFMLS April 15-18, 2024

A summary report of the 11th meeting of the OEWG-EFMLS and visual impressions of the meeting are provided by the IISD Earth Negotiations Bulletin

The Benefit-sharing Fund: 2022–2023 report

Report on the implementation of the MLS and on the Availability of Material in the Multilateral System:

Figures

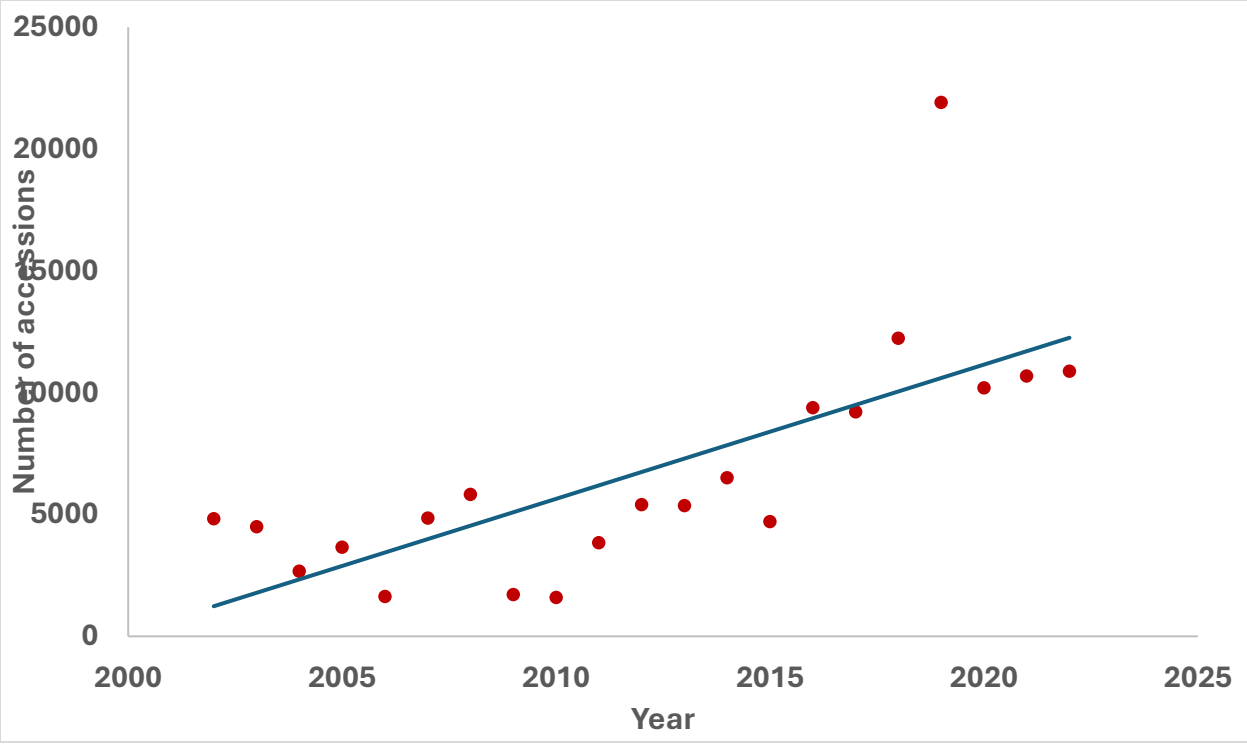

Figure 1. Germplasm shipments annually by Plant Gene Resources of Canada from 2002 to 2023: Total: 150,378 accessions shipped; ca. 6800 accessions annually; Clients served in 71 countries.

Figure 2. Preparing a shipment of pea samples from Plant Gene Resources of Canada.

Figure 3. Seed shipment from PGRC with associated documents: The Standard Material Transfer Agreement and a Phytosanitary Certificate.