Food and Agriculture Organization of the United Nations

The International Treaty ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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Submission by the Government of Belgium concerning a Global Cryo Backup Facility

Note by the Secretary

This document contains the submission by the Government of Belgium concerning the initiative for hosting a global cryo backup facility at the KU Leuven-Bioversity Genebank. It is being provided in the form and language in which it was received.
In August 2018, the Secretary issued a notification on this subject, which is available at the following URL: http://www.fao.org/plant-treaty/notifications/detail-events/en/c/1151265/.

A Global Cryo Backup Facility

Safeguarding crop diversity to nourish people now and in the future

Crop genetic diversity is vital to ensure our current and future food security. Without it, farmers cannot adapt to climatic change and make agriculture more productive, resilient and sustainable, and breeders cannot develop new and improved varieties. Yet this diversity is increasingly under threat. Once a crop variety is lost, whether through man-made or natural disasters, or through genetic erosion, it is lost forever. Indeed, one in five plant species is at risk of extinction[1].

This is why we need a global backup system for all our food crops. We are part of the way there. The Global Seed Vault, in Svalbard, Norway, has the largest backup collection of seeds originating from the majority of countries around the world.

But what about crops that are not conserved through seeds, like bananas, potatoes and cassava? For these crops, whose annual global production is estimated to be more than 1 billion tonnes and worth at least US$ 100 billion[2], there is no global backup collection.

These crops are currently mainly conserved as collections of field plants or small plantlets in test tubes – a relatively expensive and time-intensive conservation method in the long term. A minority is being cryopreserved. Cryopreservation is a method that allows the safe conservation of vegetatively propagated crops in the long term by storing plant material in liquid nitrogen (-196°C). The very low temperature stops all biological and physical processes, so the plant remains unaltered for thousands of years, but can be regenerated when necessary. Cryopreservation has been commonly used in medicine and the life sciences since the 1950s for the long-term conservation of biological materials.

In 2017, Bioversity International, the International Potato Center (CIP) and the Global Crop Diversity Trust commissioned a study, with financial support from Australia, Germany and Switzerland, to investigate the feasibility of establishing a global safety backup cryo facility for vegetatively-propagated crops, and crops with recalcitrant seeds. The study concluded that a major global initiative is urgently needed to accelerate the development and implementation of crop cryopreservation. This study also recommends that a safety back-up cryopreservation facility is set up to accommodate the estimated 5,000 to 10,000 accessions arising from current, ongoing cryopreservation activities at CGIAR and other Genebanks, with the capacity to grow over time as more material becomes available. The study outlined several criteria for selecting such a site.

One site already meets all the stated requirements for a global safety-backup cryo facility: the KU Leuven-hosted Bioversity International Genebank (KU Leuven-Bioversity Genebank) in Belgium.

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[1] See *The State of the World's Plants* (2016) Kew Gardens, UK at www.stateoftheworldsplants.com

[2] Estimate based on FAOSTAT 2012 (see also fig 1 for top producing countries)

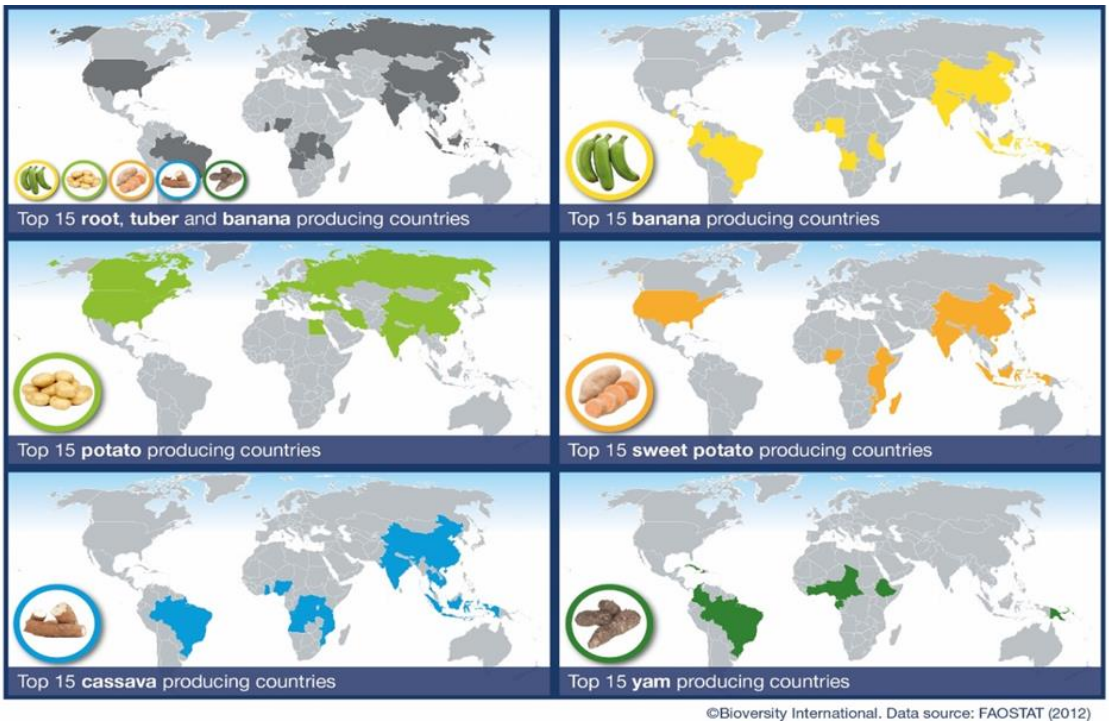

Fig. 1 – Major production centres of key vegetatively-propagated crops.

Thanks to the financial support from the Belgian Directorate-General Development Cooperation (DGD), the CGIAR Genebank Platform and the Global Crop Diversity Trust, and the in-kind donation of space and facilities from the University of Leuven, the KU Leuven-Bioversity Genebank can accommodate 5,000 to 10,000 accessions for at least the next 5 years. The site meets all infrastructure, technical and phytosanitary requirements for the facility and its operations articulated in the feasibility study. Over the past 30 years, the KU Leuven-Bioversity Genebank has developed strong expertise in cryopreservation and plant conservation for more than 40 species. They are already extensively using this method to back up the global collection of banana varieties under the provisions of the International Treaty on Plant Genetic Resources for Food and Agriculture: about 1,100 banana samples are stored in liquid nitrogen.

The Government of Belgium supports hosting the global safety backup cryo facility at the KUL-Bioversity International Genebank to safeguard cryopreserved plant materials from all facilities, within and outside of CGIAR, for future generations. The DGD has supported the banana genebank at KU-Leuven for over 30 years.

A global safety backup cryo facility would complete the global genetic resource conservation system, with active collections housed in CGIAR centres and national genebanks, safety backups for seeds in Svalbard, and for vegetatively propagated crops in Leuven. Belgium would be proud to play its role in the safeguarding our planet's future food security.

Left: Preparation of banana samples for cryopreservation. Right: Banana samples are plunged in liquid nitrogen at the International Transit Centre in Leuven. Credit: Bioversity International/N.Capozio