



CROP TRUST

SECURING OUR FOOD, FOREVER

COMPLETING A GLOBAL TASK

Conserving Crop Diversity, Forever

15 YEARS





The first 15 years of forever

In 2004, the genetic foundation of everything we eat rested on treacherous ground. Crop diversity – the raw material that breeders and farmers need to prepare for the challenges of the future – could be found in genebanks all over the world, but it was nowhere near as secure as its immense importance demanded.

Sometimes, accidents and disasters struck. Sometimes, quite simply, genebanks suffered budget cuts and couldn't pay their electricity bills. This could be catastrophic too: short lapses in the management of collections could lead to permanent loss of diversity. Unique adaptations – and options for the future – could die out forever.

Even the most important international genebanks worried about their future from budget to budget. And despite the critical need for new diversity for crop improvement efforts, it was seldom straightforward to put the immensely valuable material on genebank shelves to use. There was no single place to search for accession-level information across the scattered landscape of genebanks, and even if a breeder could locate material, much of it was not easily available for distribution.

But it wasn't all gloom and doom. At a conference organized by the UN Food and Agriculture Organization in 1996, 150 countries had launched a Global Plan of Action on crop diversity, eventually to form a major pillar of the landmark International Treaty on Plant Genetic Resources for Food and Agriculture ('the Plant Treaty'). The Plant Treaty brought the diversity of 64 food and forage crops, as well as a roster of international crop collections, into a multilateral system where this material will forever remain accessible to all who need it under agreed rules.

The Plant Treaty made history, and it brought attention to the question of exactly what "forever" means in crop conservation. A crop collection requires daily work, constant vigilance, and steady, reliable, predictable funding. There had been too many close calls at genebanks over the years. Something new was needed to fulfill the promise of conserving forever.

Something like the Crop Trust.

The Crop Trust was established in October 2004 with a mission to help build a global system of *ex situ* crop diversity conservation and use and fund it through an endowment that would make it a lasting reality. When the Governing Body of the Plant Treaty held its first meeting in 2006, it recognized the Crop Trust as an essential element of the Treaty's funding strategy.

Today, a USD 300 million Endowment Fund meets more and more of the needs of the world's most important genebanks, with a commitment to do so forever – at last, a long-term solution for a long-term challenge. Far more accessions are safely duplicated in a global system of genebanks around the world, and nearly a million are backed up in the Svalbard Global Seed Vault. A single online portal lets breeders search a majority of the world's collected crop diversity in seconds, and more accessions than ever are ready to be sent anywhere they are needed.

These are extraordinary changes to achieve in just 15 years. Together, they point the way to a global system that lies within reach and to what can be achieved in the next 15 years.

Crop Trust Timeline

2004

The Crop Trust is established as the world's only organization dedicated solely to conserving crop diversity in genebanks. Geoff Hawtin is appointed Interim Executive Director at its headquarters at the United Nations Food and Agriculture Organization in Rome, Italy.

2006

The Crop Trust signs with the International Rice Research Institute (IRRI) its first long-term grant to support an international crop collection. This guarantees funding of a proportion of the costs of the genebank's basic operations forever. Since then, the Crop Trust has entered into similar partnerships to support 20 other crop collections around the world.

2007

Cary Fowler becomes Crop Trust Executive Director. The Crop Trust launches the Global System Project in collaboration with the Bill & Melinda Gates Foundation, with complementary funding from the Grains Research and Development Corporation of Australia. The project aims to strengthen conservation efforts and secure at-risk crop diversity held in national collections in developing countries.

2008

The Svalbard Global Seed Vault opens as a partnership between the Ministry of Agriculture and Food of Norway, the Nordic Genetic Resource Center and the Crop Trust. By the end of the year, the Seed Vault holds 320,553 accessions – 75% of which are deposited with assistance from the Crop Trust. Time Magazine names the Seed Vault one of the best inventions of the year.

2010

The Crop Trust and CGIAR Consortium Office commission a costing study of the annual funds required to maintain all CGIAR collections and distribute their germplasm.

2011

The Crop Trust begins a 10-year project on conserving and using crop wild relatives for climate change adaptation, funded by the Government of Norway.

2012

The Crop Trust opens its new headquarters in Bonn, Germany. Together with CGIAR, it launches the five-year CGIAR Research Program for Managing and Sustaining Crop Collections (the Genebank CRP), taking on financial responsibility and oversight for 11 international genebanks, based on the results of the costing study.

2013

Marie Haga becomes Crop Trust Executive Director. The Crop Trust sets a target of raising USD 850 million for its Endowment Fund to finance a global system for the conservation of crop diversity, centered around key international, regional and national collections – and the Svalbard Global Seed Vault as the backup facility for the world's genebanks.

2015

Countries adopt the Sustainable Development Goals (SDGs), including Target 2.5 on safeguarding and sharing agrobiodiversity. The first-ever withdrawals are made from the Svalbard Global Seed Vault: retrievals of faba bean, wheat, barley, lentil, chickpea and other crops are made by the International Center for Agricultural Research in the Dry Areas (ICARDA) after its genebank in Aleppo, Syria is unable to function due to civil conflict.

2017

The six-year CGIAR Genebank Platform takes over as the successor to the Genebank CRP. The Food Forever Initiative is launched to raise awareness of efforts to achieve SDG Target 2.5.

2018

The Svalbard Global Seed Vault celebrates its 10th anniversary, and the Government of Norway announces plans to upgrade the facility. The Crop Trust agrees to fully fund the essential operations of the IRRI genebank forever. National partners in 25 countries finish collecting more than 4,600 crop wild relatives.

2019

The Crop Trust celebrates its 15th birthday. Entering a new era, it begins looking towards increased support to national crop collections. With support from the German Government, preparatory work with the aim of upgrading several national genebanks in sub-Saharan Africa begins.



Commitment with no end date

The Endowment Fund is the big idea that lets the Crop Trust do what it does. It stands behind the long-term funding agreements signed with 21 of the world's most important *ex situ* collections of crop diversity, as recognized by the Plant Treaty under its Article 15. As the Endowment has grown with contributions from donors of all sizes, along with a concessional loan from the Government of Germany of USD 57 million, the Crop Trust

has increased its commitments to provide dependable resources to keep these genetic resources safe and accessible forever under the terms of the Plant Treaty.

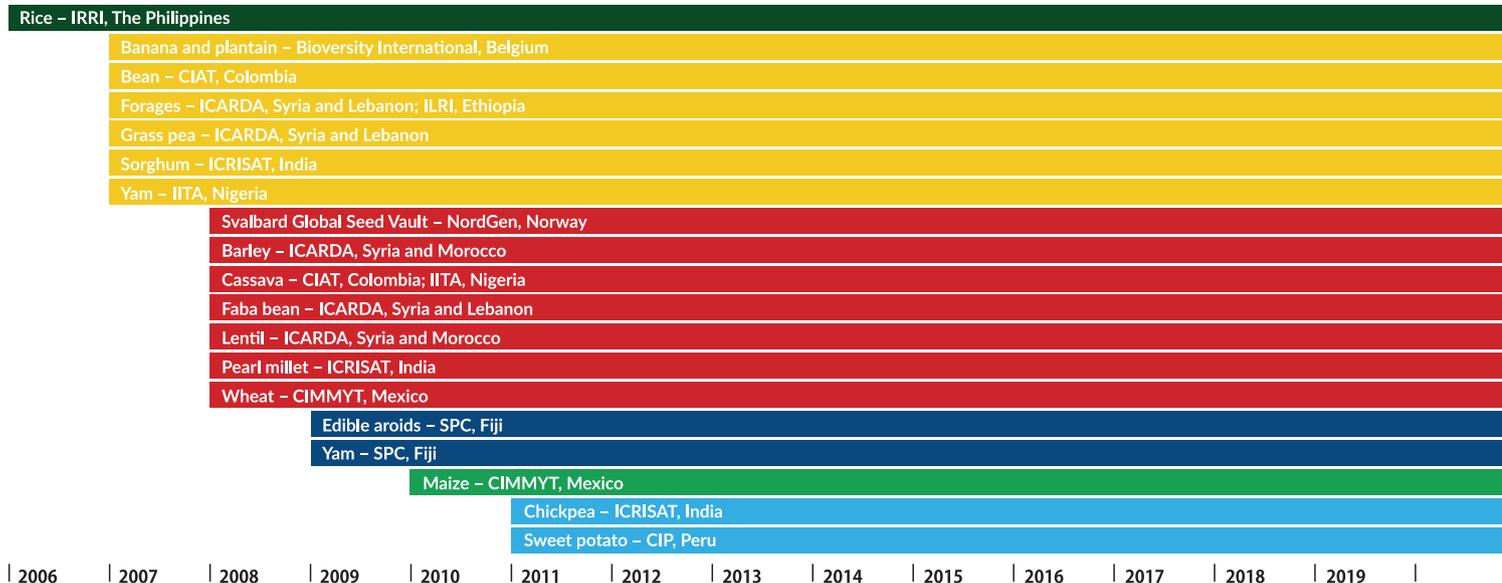
The Crop Trust is continually building the Endowment Fund to provide more of the assured funding that genebanks need to maintain their precious material in viable conditions and make it accessible to users. The effort reached a momentous point in

2018 with the decision to permanently fund the entire operation of the world's largest rice collection, held by the International Rice Research Institute (IRRI) in the Philippines. The Crop Trust intends to emulate this achievement for other food crops in the years ahead.

Since 2004, over USD 35 million has been withdrawn from the Endowment Fund to support the CGIAR international crop collections.

APPROXIMATELY **USD 300 MILLION** IN THE ENDOWMENT FUND AS OF OCTOBER 2019

LONG-TERM AGREEMENTS TO FUND CROP COLLECTIONS FROM THE ENDOWMENT





How to save a crop

How many kinds of strawberries are there? Where are the world's largest collections of oats? What is the most efficient way to conserve a coconut variety?

It is not possible to ensure that a crop's diversity is secure without a great deal of knowledge: on how much diversity actually exists, where it is found, what threats it faces, what efforts are underway to protect it and what remains to be done.

The Global Plan of Action established a broad overview, but when the Crop Trust began, there was no single source of precise crop-by-crop knowledge. So one of the first

undertakings was to create such a source. The global crop conservation strategies are this and more: they are a solid scientific foundation for global efforts, and they lay out strategic action plans, from the most acute needs to the longest-term vision of a global system.

The Crop Trust worked with leading crop experts for several years to develop strategies for 22 crops, alongside eight regional strategies. There are crop strategies for the major staple cereals, with their hundreds of thousands of genebank accessions, and also for less-collected crops like breadfruit, finger millet, coconut and grasspea.

The exercise was a starting point for much of the Crop Trust's subsequent work, but it was more than just a preface. Updates and new strategies were always part of the plan, and these began in 2015. The

strategy for banana underwent a major update while new strategies were developed for coffee, tea, apple and tropical forages.

One effect of this strategic approach has been to draw attention to national genebanks. These conserve important crops that lack a large global collection, and they make vital diversity available to scientists and farmers both in their own countries and abroad. It is their place in global strategies that has informed the next big step: providing support forever to key national genebanks. Under the new project Seeds for Resilience, the Crop Trust began work in 2019 to upgrade five African national genebanks and prepare the way for long-term funding agreements.



2,116
PAGES OF
STRATEGIES
GUIDING
WORLDWIDE
CONSERVATION



A historic rescue mission, 2007–2013

While the Crop Trust set its sights on the long-term from day one, it was clear that some tasks could not wait. Around the world, genebanks held old material that was in danger of dying. Seeds sat in storage too long; field collections of crops that cannot effectively be conserved as seed stood unattended; and breeders needed to know what was in the collections before they could put them to use. This was clear from the Global Plan of Action, and from multiple global crop conservation strategies. Something needed to be done, and fast.

In 2007, the Crop Trust embarked on the largest rescue of crop collections ever attempted, under the banner of the Global System Project. In just five years, a vast network of partners achieved the regeneration of nearly 75,000 accessions from 246 collections that were in danger of being irretrievably lost.

This was the Crop Trust's most urgent and complex activity in its first decade. It meant partnering with genebanks in 86 institutes in 78 developing and transition countries,

who undertook the work of planting seeds and cuttings to see if they would still grow.

When this was successful, they could record important data on the plants as they matured, and return fresh material to their genebanks. They could also send duplicate accessions to international genebanks and the Svalbard Global Seed Vault as a backup against any future loss.

As its name suggests, the Global System Project was essential groundwork for the effective and efficient global system that lay ahead. By bringing so many genebanks together in one initiative, it drew attention to the needs they share – particularly the needs to better document collections and make that data available to users. These needs were addressed during and after the project as the Crop Trust helped to roll out powerful new information systems: the genebank data management package GRIN-Global and the first version of the Genesys online catalog.

74,410

ACCESSIONS SAVED
FROM THE THREAT OF
PERMANENT LOSS





The Seed Vault: underground icon

It does not pay to take chances with the foundations of agriculture. Safety duplication of crop collections should be normal practice and has always been a Crop Trust maxim. This led to the decision to create an ultimate backup for seed collections. It would become the largest collection of crop diversity ever assembled in one place – and that place would be a remote island above the Arctic Circle.

The Svalbard Global Seed Vault first opened its doors in February 2008 and is operated under a

three-party agreement between the Norwegian Government, NordGen and the Crop Trust. It is built to stand the test of time, with the capacity to hold 4.5 million seed samples and the stable conditions to keep them at low temperatures even without external power. It became a media phenomenon and remains an icon of long-term thinking for an uncertain future. For the Crop Trust, it is both a symbol of shared international commitment to conservation and a practical keystone of the global system.

Several times every year since 2008, the Seed Vault has opened its doors to welcome boxes of seeds from genebanks all over the world. The 76 depositors maintain sole ownership of the seeds they send to Svalbard. These remain safe deep in the rock and permafrost as a long-term insurance policy against

962,186
TYPES OF SEED CURRENTLY
BACKED UP IN THE
SEED VAULT

anything the future may bring to the genebanks, to farmers, and to the global food system as a whole.

Eleven years on, the Seed Vault safeguards backups of roughly half of the crop varieties held in all of the world's seed banks. More than a million varieties have been deposited – and some have already been temporarily withdrawn as a dire need arose.

These withdrawals were made by the International Center for Agricultural Research in the Dry Areas (ICARDA) in 2015 and 2017, when its globally unique genebank near Aleppo, Syria became inaccessible due to conflict. The Crop Trust and NordGen helped ICARDA retrieve more than 90,000 accessions of wheat, lentils, chickpeas and other dryland crops from the Seed Vault. This allowed ICARDA to re-establish its operations in Lebanon and Morocco, proving, much sooner than anyone expected, or hoped, that the Seed Vault is an insurance policy the world of crop conservation really needs.





80% OF CGIAR ACCESSIONS IMMEDIATELY
AVAILABLE FOR INTERNATIONAL DISTRIBUTION

The backbone of the global system

The 11 genebanks managed by CGIAR Centres contain more than 750,000 accessions of humanity's most important food crops. They hold these collections in trust for the world under Article 15 of the Plant Treaty, and they distribute almost 100,000 samples every year to breeders, farmers and other genebanks. In short, they form the backbone of the global system that the Crop Trust is helping to build.

After establishing long-term funding agreements covering part of their costs with most of these genebanks, in 2010 the Crop Trust took on a bigger role. Under the

five-year CGIAR Research Program for Managing and Sustaining Crop Collections, it accepted responsibility for supporting all core operations of the 11 genebanks and ensuring that they follow the highest standards. This brought the genebanks to a new level of operation, and they were enthusiastic about taking the partnership further in 2016, when it evolved into the CGIAR Genebank Platform.

Agreement of basic performance targets (on accession availability, safety duplication, documentation, and quality management) is driving significant improvements. Expert technical reviews and funding have enabled the genebanks to step up operations, efficiency and capacity. Several Centres have co-invested, built new infrastructure, and piloted new technologies, like automated seed sorting and germination testing.

In 2017, the CGIAR germplasm health units and a plant genetic resources policy module joined the genebanks in the Platform and took on its quality management approaches. Communities of Practice on seed longevity and clonal crop conservation have been set up across the Centres to ensure that genebanks with less experience benefit from those with more and to develop joint research projects on common problems.

The Platform has also provided an opportunity to assess the diversity in collections in more detail than ever. Using expert inputs, crop "diversity trees" have been developed and linked to a geographical gap analysis to highlight where landrace diversity is missing from the international collections. This is also revealing the likely proportion of individual crop genebanks that are conserved *ex situ*.

With its coordinating role, the Crop Trust is doing far more than just funding the backbone of the global system. It is bringing the most important international collections together as a community.





Crop wild relatives and the secrets of climate adaptation

Around the world, many farmers are facing climatic conditions they have never encountered before. This is bad news: even the rich diversity found in crops has its limits when faced with extreme conditions. The process of domestication means that crops are generally less adaptable than wild plants, which evolve outside the comfort of the agricultural field, surviving drought, flooding, high temperatures and poor soils. But what if some of that wild diversity were brought onto the farm?

The use of wild diversity in breeding has still only scratched the surface – and now wild species themselves are under threat from the spread and intensity of human activities. In 2011, therefore, the Crop Trust took the lead in the broadest effort ever to collect, conserve and use crop wild relatives. Again, this was something that was called for by the Global Plan of Action and numerous global crop conservation strategies.

It all began with a map. The Crop Trust and the International Center for Tropical Agriculture (CIAT) drew on all available knowledge about the wild relatives currently in collections and the environments where they are likely to grow. The resulting gap analysis revealed the hotspots where collectors should look first – and look right away, before the plants disappeared.

By the end of 2018, national partners in 26 countries had done just that. They brought into their genebanks more than 4,600 samples of the wild relatives of eggplants, barley, chickpeas, bananas and 22 other crops, from locations as remote as the deep rainforest and as accessible as the side of a highway.

The Millennium Seed Bank at Kew, which helped implement the collecting work, has received the majority of these samples for safety duplication, and they will be shared

4,644
NEW EXAMPLES OF
WILD DIVERSITY IN
BREEDERS' TOOLKITS

and conserved throughout the global system under the terms of the Plant Treaty.

Some crop wild relatives are already being used in pre-breeding projects for 19 crops: more than 100 partners in 48 countries are doing the complex and time-consuming work of finding the most beneficial traits and transferring them, one painstaking step at a time, into domesticated varieties. Through this work, characteristics that will help prepare crops for the climates of the future are already making their way into breeders' hands. Soon, they will be in the hands of farmers too.





The explosive potential of genebank data

The Crop Trust was born at a time when less than 13% of the world's population had internet access, and in far too many genebanks the sole information management system was a logbook. Things have changed in the intervening 15 years. A lot.

It was always clear that part of the Crop Trust's task would be to harness the emerging power of data.

Within genebanks, it has participated in the development and deployment of GRIN-Global, an advanced data management package which was initially released at the end of 2011 and is gradually taking over from the old patchwork of paper, spreadsheets and last-generation software. GRIN-Global empowers genebanks of all shapes and sizes to document and manage their collections so nothing falls through the cracks. GRIN-Global is currently used by twelve genebanks globally: four in the CGIAR and eight in national programs. Twenty-eight other genebanks are evaluating or are in the process of implementing GRIN-Global as their

primary genebank management system, with help from a growing community of users and training workshops.

Outside of genebanks, users of genetic resources also depend on data to find what they need. Genesys, the Crop Trust's answer to the needs of genebank users, was launched in 2008. In a decade, it grew into a public portal of genebank material in over 450 collections across CGIAR, ECPGR, USDA, EMBRAPA, SPGRC and a number of other data providers. It provides instant access, through a single search, to more than four million accession records – probably the majority of genebank material in existence. This is a dream come true for policy makers, breeders, researchers, and even farmers, whether they are searching for a lost variety or need an overview of where diversity can be found in the global system. Genesys is a key element of the Global Information System being put in place by the Plant Treaty, which will go beyond genebanks to cover all plant genetic resources.

But that's not all. The Crop Trust also arranges for experts to visit national and regional genebanks to assess IT needs, and it offers grants and technical support to upgrade systems or develop new ones. It weaves information systems into every project, from the urgent support of the Global System Project to the advances undertaken by the Genebank Platform and Crop Wild Relatives Project. The result is a unified vision for managing and sharing data in the global system.

4,000,000+
ACCESSIONS
DISCOVERABLE
RIGHT NOW IN
GENESYS



Speaking out for diversity

The Crop Trust has always been a voice for crop diversity in general and genebanks in particular. Communications and advocacy have been a constant and necessary part of its mission over the years, from the exuberant media interest around the Svalbard Global Seed Vault, to engaging stories of collecting crop wild relatives in every corner of the world, to campaigns like #CropsInColor, which documents diverse farming and foodways through photography.

Through their participation in formulating the Sustainable Development Goals (SDGs), agreed in 2015, the Crop Trust and its partners helped teach the whole international development community to speak the language of crop conservation. Goal 2, aiming for zero hunger, brought

with it a crystal-clear recognition of how this ambition rested on a base of precious crop diversity. In its Target 2.5, it calls on all countries to safeguard and share the genetic diversity of crops and livestock by 2020.

This target set one of the closest end dates seen anywhere in the SDGs and demanded a sweeping, broad-based response. The Food Forever Initiative was born. This global advocacy partnership has brought together politicians, farmers, chefs, entrepreneurs and many other voices to call for changes in the way people conserve, grow, sell, consume and value crop diversity.

The Food Forever Initiative is chaired by Mercedes Aráoz, Vice President of Peru, and a strong advocate for biodiversity. It

maintains close ties with some of the key stakeholders of SDG Target 2.5, including the UN Food and Agriculture Organization and the Convention on Biological Diversity. It raises awareness of the work going on around the world to safeguard agricultural diversity – and it rallies support not just around genebanks, but also dinner tables.

The Initiative's flagship Food Forever Experience, of which there have been six so far, opens up the conversation even more, inviting people everywhere to imagine the future of food. Working with innovative chefs to showcase cuisine using surprising ingredients that participants might not have seen before, the Food Forever Experience plants the seed for important conversations about a more diverse, sustainable and exciting food future for all.



SDG TARGET 2.5:
SAFEGUARD AND SHARE
DIVERSITY BY 2020



Join us in completing the task

At the Crop Trust, we know crop diversity holds answers to serious problems in the food system. We also know that diversity is under threat but that it can be saved. In just 15 years, we have made enormous progress toward safeguarding the diversity of the world's most important food crops – so we have no doubt that it can be done. We *will* complete our global task.

The time and resources this task will take are finite, well understood, and within reach. We are well on our way to meeting the Endowment Fund target that will keep the international genebanks operating forever.

At the same time, we are embarking on a new era of support to national collections. Under our newest initiative, Seeds for Resilience, we have opened a window in the Endowment Fund to provide long-term support to national genebanks that promise to be entry points for developing climate-resilient crops. In the coming years we will help five African genebanks step up to fulfil this vital role.

These and our other efforts – to advance how genebanks work, how they share material, how they add missing unique diversity, how they manage data, and how they protect their collections from the unexpected – can all be completed in the years ahead.

What will it take? What's required to get the rest of the way to the vision of a true global system? One that will fulfil the potential of the Plant Treaty and secure the foundations of food for good? The answer is simple: we need support from all who are prepared to take action.

We need people in every country to speak to their governments, urging them to contribute to the Endowment Fund and support international action for a shared resource that no country can do without, and no country has enough of. We need foundations, private companies and individuals to join us in imagining an effective, efficient global system for safeguarding the basis of our food, and, most importantly, making it a reality.



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For more information on ways to get involved in the future of crop diversity, please visit

croptrust.org/take-action,

or write to

info@croptrust.org or

media@croptrust.org.