



# ANNUAL REPORT

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Highlights from a Year of Change





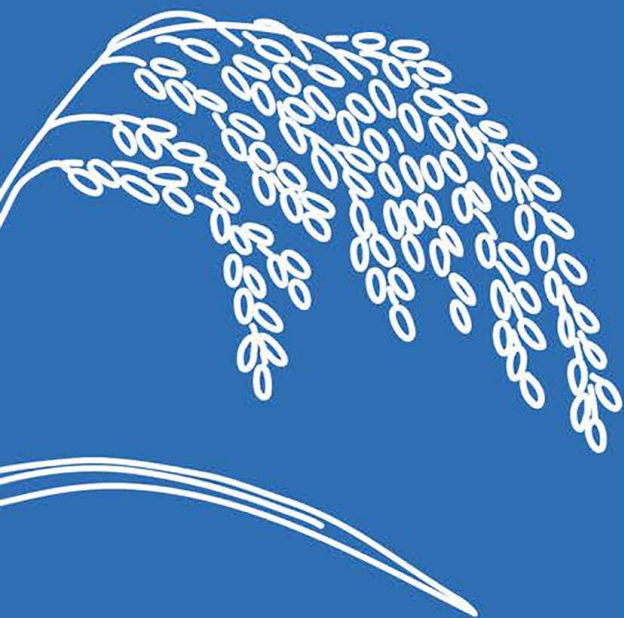
Stefan Schmitz,  
Executive Director

# Message from the Executive Director

In a year in which the global COVID-19 pandemic continued to constrain so many activities, I am deeply proud of all we have achieved. From the successful close of the CGIAR Genebank Platform and of the Crop Wild Relatives project to ramping up the Seeds for Resilience project, and the launch of BOLD (Biodiversity for Opportunities, Livelihoods and Development), a new 10-year initiative to strengthen the conservation and use of crop diversity with partner genebanks worldwide, there's a lot to be proud about.

Greater participation, stronger alliances and new partnerships: these give me hope that we can combat the dual crises of climate change and biodiversity loss and ensure that the foundation of our future food supply is secured forever. As we enter a new phase at the Crop Trust, I am humbled by the dedication and tenacity of our staff, partners and donors, without whom none of this would be possible, and I am deeply grateful.

*Stefan Schmitz, Executive Director, Crop Trust*



# Key Figures

## **DIVERSITY SUPPORTED:** USD 33 million in grants provided to fund conservation

*The Crop Trust and its partners conducted a wide variety of program activities in 2021, including the CGIAR Genebank Platform, the Crop Wild Relatives project, the Seeds for Resilience project, the new BOLD project and the development of global crop conservation strategies.*

## **THE FUTURE OF DIVERSITY SECURED:** USD 8 million contributed to the Crop Diversity Endowment Fund

*The total estimated value of the endowment fund amounted USD 339 million as of the end of 2021 as a result of contributions from USAID, the Government of New Zealand, the Government of Germany, the Government of India and Group Limagrain as well as continuing successful market performance.*

## **DIVERSITY RECORDED:** 3,532,430 records of genebank samples updated in Genesys

*As of December 2021, Genesys made publicly available data on 4,157,039 genebank samples to enable users worldwide to search for and request plant materials in order to conduct breeding and research.*

## **DIVERSITY CONSERVED:** As of December 2021, nearly 740,000 samples of seeds and plantlets were being conserved long-term by genebanks in the CGIAR Genebank Platform

*Performance targets introduced by the Crop Trust for the management of the long-term agreements have encouraged CGIAR genebanks to increase the proportion of their collections that are acceptably viable, disease-free and available for immediate distribution. As of 2021, 83% of the total number of samples are available, up from 66% in 2012.*





Durum wheat seed regeneration plots at ICARDA's Terbol station in Lebanon's Beqaa Valley.  
Photo: Michael Major/Crop Trust



Genebank of the International Rice Research Institute - IRRI

**DIVERSITY CREATED:** Five new varieties of durum wheat and one each of alfalfa and potato, all derived from crop wild relatives, were released to farmers

*During the final phase of the 11-year Crop Wild Relatives (CWR) project, more than 14,000 pre-bred lines of 19 crops incorporating useful traits from CWR were made available to plant breeders, researchers and farmers to help adapt agriculture to climate change.*

**DIVERSITY SAFELY BACKED UP:** 82,501 seed samples added to the Svalbard Global Seed Vault

*As of December 2021, the Svalbard Global Seed Vault safeguarded 1,125,419 seed samples from 89 genebanks and research institutions worldwide.*

**DIVERSITY SHARED:** 91 countries received 96,590 samples of seed and plantlets from genebanks in the CGIAR Genebank Platform

*The 11 CGIAR genebanks supported by the Genebank Platform coordinated by the Crop Trust, have distributed nearly 1 million samples of seeds and plantlets to 166 countries since 2012, when the Crop Trust started coordinating the program.*







Farmer Mariluz Cardena with CIP-Matilde potatoes.  
Photo: J. Huanai



Collecting mission for wild relatives of potato in the southern state of Rio Grande do Sul, close to Uruguay.  
Photo: Luis Salazar/Crop Trust

# Our Work

## Crop Wild Relatives Project Delivers Beyond Expectations

Having achieved or exceeded all its targets and objectives, the 11-year Crop Wild Relatives (CWR) project, funded by the Government of Norway, came to a close in 2021.

In the final years of the initiative, 19 pre-breeding projects in 43 countries worked to produce new breeding lines, the foundation for new climate-resilient crop varieties. By mid-2021, project partners had developed more than 14,000 breeding lines incorporating climate-resilient traits, with the materials and related data freely available to breeders and researchers around the world under the Plant Treaty.

In an unexpected achievement, several new crop varieties incorporating genes from wild relatives were publicly released to farmers during the project's duration. In 2021, a blight-resistant potato variety and a pest-resistant and salt-tolerant rice variety underwent final testing before release to farmers in Peru and Vietnam, respectively.

The CWR project engaged closely with partner genebank staff, researchers and farmers to build future capacity: over 12,000 people from 124 institutions in 71 countries participated in training programs on topics ranging from plant collecting to breeding to genebank and data management.

We celebrate the major achievements of the flagship project in a legacy video, an extensive donor report, and, to be launched in 2022, a new dedicated website.







Trevor Rowe (SARDI) measuring the plant height of alfalfa at the Waite Institute, Adelaide, South Australia.

Photo: Michael Major/Crop Trust

## Be BOLD

Biodiversity for Opportunities, Livelihoods and Development (BOLD), a major new 10-year project, funded generously with USD 58 million by the Government of Norway launched at the Global Citizen Live, Paris in September 2021.

New project builds on the successes and achievements of the CWR project to strengthen food and nutrition security worldwide. It focuses on advancement of pre-breeding and evaluation partnerships to further develop climate-resilient crops, improving farmers' access to crop diversity, and backing up vulnerable crop diversity collections in the Svalbard Global Seed Vault.

A call for grant proposals from collection holders in low- and middle-income countries to multiply and safeguard their crop diversity in the Svalbard Global Seed Vault launched in October 2021 and received an overwhelming response of 90 proposals. Applications are being reviewed and applicants will be notified in mid-2022.

# A fighting chance for food security in the face of climate change

**BOLD**  
Crop Wild Relatives



Norwegian University of Life Sciences



The International Treaty on Plant Genetic Resources for Food and Agriculture





Grasspea breeding at ICARDA's facilities at Marchouch Station, Morocco.  
Photo: Michael Major/Crop Trust



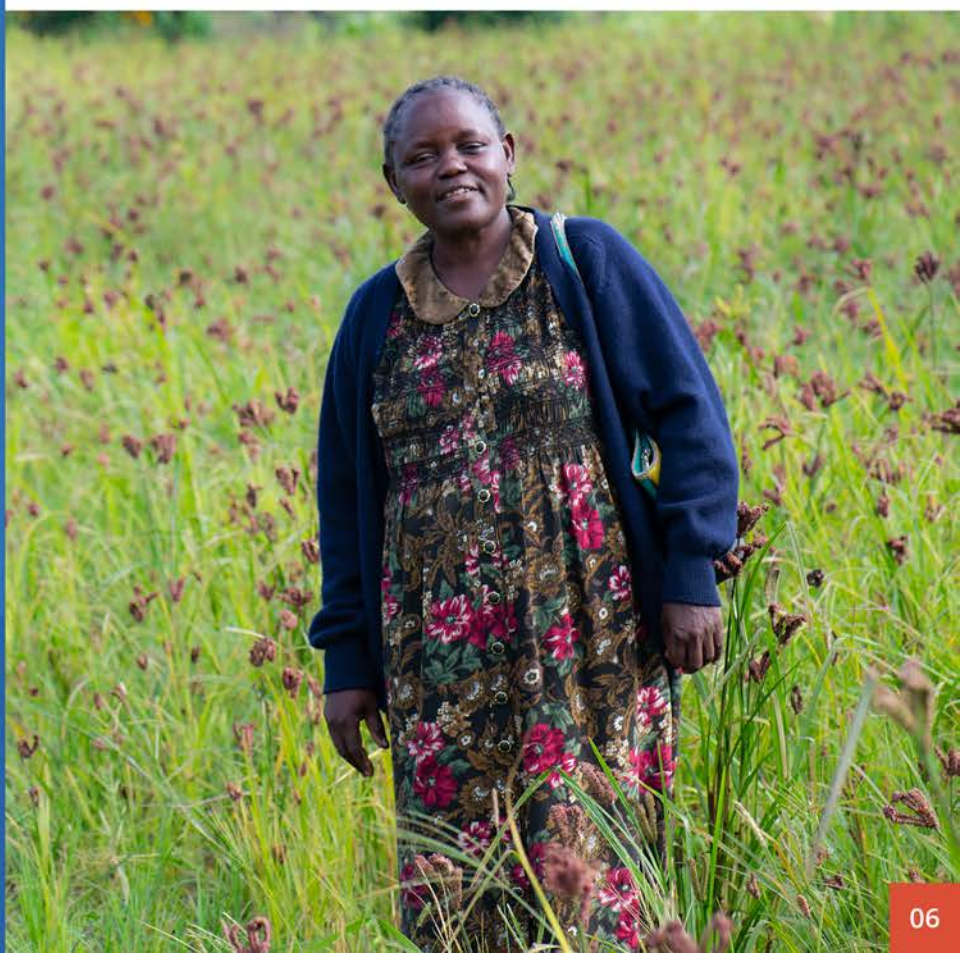
Farmer Margaret Kubende from Kakamega County in Western Kenya planted Finger Millet more than 20 years ago when all of her neighbor farmers planted maize.  
Photo: Michael Major/Crop Trust

## Breakthroughs in Breeding Grasspea and Finger Millet

The project, entitled 'Safeguarding Crop Diversity for Food Security: Pre-Breeding Complemented with Innovative Finance', and funded by the Templeton World Charity Foundation, Inc, made major strides toward developing more resilient varieties of grasspea and finger millet using diversity from CWR and traditional local varieties.

Project partners completed resequencing the genome of the core diversity collection of grasspea in 2021, and began to develop genetic markers to assist in targeted breeding. A new grasspea database and grasspea website will also serve as important resources for breeding.

Despite delays related to COVID-19, work on finger millet breeding in East Africa continued to progress well. Breeding lines, previously selected by partners in Ethiopia, Tanzania and Uganda, were multiplied. These are now being crossed with farmers' preferred varieties. Project partners are also beginning to genotype all available finger millet seed samples conserved in genebanks in East Africa, and a new finger millet database was recently released on the Germinate platform.







The cold storage and lab facilities for plant multiplications purposes at the offices of the International Center for Tropical Agriculture CIAT in Vietnam.

Photo: Brent Stirton/Getty Images.

## CGIAR Genebank Platform

The CGIAR Genebank Platform came to an end in 2021 after a decade of intensive collaboration with CGIAR's 11 international genebanks. Even in its final year, the genebanks were initiating efforts to adapt advanced technologies for use in genebank management, including smart labeling to track accessions, high-throughput seed imaging and genetic markers to identify crop variety subgroups.

In 2021, CGIAR genebanks implemented action plans to address recommendations that had come out of the second phase of external review, which took place between 2018 and 2020. These included efforts to improve data and data management approaches, test dormancy breaking techniques in crop wild relatives, improve long-term conservation facilities, reduce redundancy in seed samples and streamline viability monitoring processes. Seed collections in at least two CGIAR Centers are due to reach performance targets by the end of 2021 and so will be eligible for long-term partnership agreements with the Crop Trust.

A monthly webinar series was launched to provoke open discussion on difficult topics, such as the impact of CRISPR technology on genebanks. The 2020 cohort of Genebank Impact Fellows continued work on case studies, to be published in an upcoming special issue of CABI Agriculture and Bioscience. CGIAR genebanks also began to trial the new GRIN-Global Community Edition software package, developed by the Crop Trust, in anticipation of adopting a single genebank data management system.

Despite the Platform's closure, the commitment of the Crop Trust to continue its close partnership with CGIAR and provide long-term funding and technical support to its genebanks remains steadfast.







The Ethiopian national seed collection is held by the Ethiopian Biodiversity Institute (EBI) in Addis Ababa.

Photo: Nora Castañeda-Álvarez/Crop Trust



African yam bean collection at International Institute of Tropical Agriculture in Nigeria.

Photo: Nora Castañeda-Álvarez/Crop Trust

## Strengthening Genebanks in Africa

Seeds for Resilience, the five-year project, funded by the German Federal Government's Federal Ministry for Economic Cooperation and Development (BMZ), through the German Development Bank (KfW) to strengthen national genebanks in five sub-Saharan African countries: Ethiopia, Ghana, Kenya, Nigeria and Zambia signed formal agreements with all five partner genebanks in 2021.

Early in the year, the genebanks developed Standards of Procedures (SOPs) for conservation and regeneration, and work is underway on SOPs for germplasm characterization. The project also moved ahead to procure vehicles, and laboratory and information technology equipment, for the partner genebanks.

Each partner also identified crops from their collections that are particularly important to farmers in vulnerable rural areas so that they can receive special support under the project.

For example, the National Plant Genetic Resources Centre (NPGRC) of Zambia selected beans, cassava, cowpea, sorghum and sweetpotato as target crops. In April 2021, a team from NPGRC collected sweetpotato samples from across the country to start rebuilding its collection of the crop, which had been lost to drought and underresourcing. Going forward, the project will support NPGRC to carry out field evaluations of the new collection with the help of local farmers and produce duplicate samples for back up in other institutions.







Vanilla: the well-known flavor is a product of a tropical orchid that grows green pods.

## Breathing New Life into Global Crop Conservation Strategies

Some of the world's most important crops are still not adequately safeguarded in genebanks. The Global Crop Conservation Strategies project, funded by the German Federal Ministry of Food and Agriculture (BMEL), brings together the latest information from experts and databases worldwide to plan and prioritize actions in support of the long-term conservation and availability of crop diversity.

Three new strategies (for cucurbits, temperate forages and vanilla) and one updated strategy (yams) were published in 2021. Four additional strategies (eggplant, groundnut, millets and sorghum) are set to be published in 2022. Data analysis also began for the brassica, citrus and vigna strategies.

The strategies will provide complete blueprints for policymakers and technical specialists to plan the conservation of these important crops for years to come.



Forages are not a single crop: they are thousands of species of grasses, legumes and trees. When not grazed by animals, farmers harvest them to feed livestock or sell at the market.

Photo: Toby Smith/Getty Images



The diversity of pumpkin and squash at Norwich Meadows Farm, USA, is astounding and truly a sight to see.

Credit: Luis Salazar/Crop Trust



# Welcome to Svalbard Global Seed Vault's Seed Portal

At this page, you can search among the stored seed samples in the Seed Vault and the depositing institutions. You can also find information about terms and conditions for depositing seeds.

[Search the Seed Portal](#)

The new Seed portal database by Nordgen allows users to search for seeds held in the Vault.

## The Ultimate Back-up for Global Seed Diversity

Nearly 51,000 seed samples were added to the Svalbard Global Seed Vault in 2021 by 22 genebanks over the course of three openings (in February, June and October). This included two new depositors: the Genetic Resource Center, Latvia, and the Institute of Field and Vegetable Crops, Serbia.

The February deposit marked a notable first: with the depositor's agreement, newly deposited seeds were placed in the same box as the previous year's deposit to save space for future shipments. This is possible thanks to an update to the Seed Portal, the online database managed by the Nordic Genetic Resource Center (NordGen). NordGen staff also carried out a major update to the data in the Seed Portal in 2021, correcting errors and consolidating species synonyms to greatly improve data quality.

The Svalbard Global Seed Vault is managed through a tripartite partnership between NordGen, the Norwegian Ministry of Food and Agriculture (Norad) and the Crop Trust.

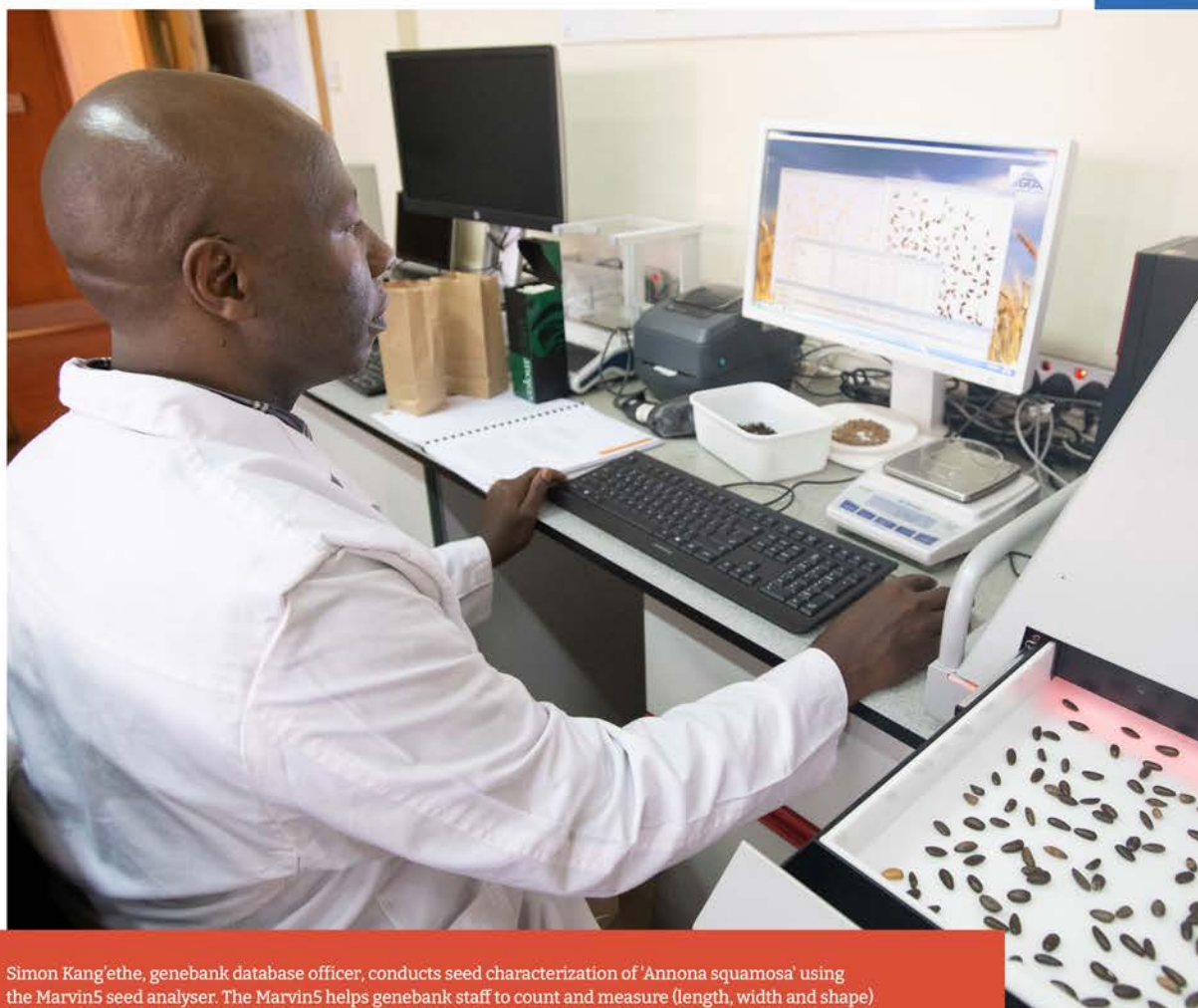


The Svalbard Global Seed Vault safeguards 1,125,419 million seed samples from around the world as of 2021.  
Credit: Svalbard Global Seed Vault/Riccardo Gangale



The Svalbard Global Seed Vault is the world's insurance against loss of crop diversity.  
Photo: Luis Salazar/Crop Trust





Simon Kang'ethe, genebank database officer, conducts seed characterization of 'Annona squamosa' using the Marvin5 seed analyser. The Marvin5 helps genebank staff to count and measure (length, width and shape) seeds quickly.

Photo: Michael Major/Crop Trust

## Data and Information: The Backbone of the Global Genebank System

Information is central to the effective conservation and use of plant genetic resources, whether managed at the level of the individual collection, using the likes of GRIN-Global, or at a global level, for example the Genesys platform. The Crop Trust's work on both systems made significant strides in 2021.

Six new national genebanks shared data on Genesys for the first time in 2021 [DENAREF (Ecuador), AgResearch (New Zealand), CNRA (Ivory Coast), NPGRC (Zambia), NARC (Nepal), and PGRI (Ghana)]. Meanwhile, existing data providers added or updated information for hundreds of thousands of records, representing samples of the diversity of globally important crops, such as cassava, rice, sorghum and coffee. The number of registered Genesys users also increased from 1,901 to 2,288.

As for managing individual collections' data, all CGIAR Research Centers began testing GRIN-Global Community Edition (GG-CE), a new evolution of GRIN-Global whose development is being coordinated by the Crop Trust, and that significantly advances the original system.





# Strengthening Ties, Old and New

## The Crop Trust and the Plant Treaty

The Crop Trust furthered its close collaboration with the International Treaty on Plant Genetic Resources for Food and Agriculture (the Plant Treaty) in 2021, starting with the co-organization of several international expert panels on pressing issues of the moment: fruit and vegetable genetic diversity and cryopreservation.

To further shared strategic communication aims, Plant Treaty Secretary Kent Nnadozie participated in the Crop Trust's session at the Global Landscapes Forum to celebrate the new BOLD project. Under the BOLD project, the Crop Trust, Plant Treaty, NordGen and Norad together launched a competitive grants scheme for crop diversity duplication in the Svalbard Global Seed Vault, among other activities.

As part of an ongoing initiative, the Plant Treaty Secretariat has also been helping to promote the global crop conservation strategies as a key tool for strengthening the global system of ex situ conservation.

Notably, 2021 also saw the joint launch by the Crop Trust and Plant Treaty of a new funding mechanism to support crop collections in crisis, detailed below.



In 2021, the Crop Trust gave a hand to a Philippine genebank (NPGRL), still struggling from the 2006 Typhoon Xangsane. Here is the drying setup of maize seeds with installed dehumidifying equipment at NPGRL.  
Photo: NPGRL

## Relief for Genebanks in Crisis: The Emergency Reserve

As we have unfortunately witnessed over the last years, genebanks are far from invulnerable to external crises. Natural disasters, war, political disruptions, pest and disease outbreaks, equipment failure and, most recently, the challenges caused by the global pandemic, can cause catastrophic loss of the invaluable resources they conserve.

In June 2021, the Crop Trust and the Plant Treaty launched the world's first formal mechanism to provide financial support to genebanks under imminent threat. The Emergency Reserve enables rapid funding when there is an urgent risk to unique crop diversity collections that fall under the Plant Treaty framework.

The Government of Norway, through the BOLD project, is one of the first donors to have stepped forward to fund the Emergency Reserve.







Marco Wopereis, World Vegetable Center Director General and Stefan Schmitz, Executive Director of the Crop Trust signing a Memorandum of Understanding.

Photo: Luis Salazar/Crop Trust.

## Joining Efforts with WorldVeg

Vegetable diversity received a boost in September 2021, when the Crop Trust and the World Vegetable Center (WorldVeg) signed a memorandum of understanding (MoU) to strengthen cooperation. The MoU emphasizes joint fundraising to establish more sustainable financing for the WorldVeg collections and taking steps to support the safeguarding of threatened vegetable crops worldwide, especially in sub-Saharan Africa.

In collaboration with other global experts, authors from the Crop Trust and WorldVeg released a 10-year rescue plan in the run-up to the United Nations Food Systems Summit: Safeguarding and Using Fruit and Vegetable Biodiversity. The milestone agreement came during the UN International Year of Fruits and Vegetables, and hopefully marks the start of an ambitious effort to use vegetable diversity for better nutrition and incomes.

## The United Nations Food Systems Summit (UNFSS)

The Crop Trust played a leading role (together with the Alliance of Bioversity International and CIAT) in developing the Agrobiodiversity Working Group and co-led the Agrobiodiversity Cluster together with Johns Hopkins University in preparation for UNFSS. The Crop Trust put forward a “game-changing solution” for scaling up financial resources to support *ex situ* conservation. It also produced a technical brief, Crop Diversity, its Conservation and Use for Better Food Systems: The Crop Trust Perspective, and collaborated on a second brief on fruits and vegetables, as mentioned above.

The UN Food Systems Summit included over 51,000 people from 193 countries, all ready to tackle global hunger, climate change and biodiversity loss for true food systems transformation.

Photo: UNFSS





# Communicating our Global Impact

## Digital-first Strategy Reaches New Audiences



Since implementing a new digital-first strategy, the Crop Trust's communications efforts are yielding major impacts, with significant increase in audience reach on all channels.

Working closely with our partners, over the course of the year achievements included:

- Our key digital events were watched over **140,000** times, reaching a truly global audience, compared to **500** attending in-person events
- Video views increased from an average of **60** to more than **3,500**
- Blog readership increased from **100** views to more than **3,000**
- Facebook reach grew from **30,000** to **630,000**
- Instagram reach climbed from **11,000** to **490,000**
- Overall growth in followers across all social media channels of over **65%**

And these numbers continue to grow. Multi-year projects came to an end with outreach campaigns that included events, blogs, opinion pieces, media attention, social campaigns and more. The Food Forever Initiative closed in July 2021 by exploring the power and potential of crop diversity with a session at the Global Landscapes Forum (GLF) Africa conference.

At the same event, Stefan Schmitz joined high-profile speakers such as Éliane Ubalijoro, Crop Trust Executive Board member, and Agnes Kalibata, President of the Alliance for a Green Revolution in Africa (AGRA) to highlight the importance of African genebanks in ensuring food security.

Outreach to celebrate the achievements of the Crop Wild Relatives project included a legacy video and multimedia campaign celebrating a new crop wild relative-derived potato, CIP-Matilde – that gained over 300 media mentions – and an event at the GLF Climate conference which ran alongside COP26 in Glasgow.

Panelists at GLF Climate session "Into the Wild: Climate Resilient Crops for a Drier, Hotter World" reflect on Crop Wild Relatives project impact.







Norwegian Minister of International Development Dag-Inge Ulstein launches the BOLD project on stage at Global Citizen Live: Paris.

As some projects ended, new ones launched. Former Norwegian Minister of International Development, Dag Inge Ulstein, announced the BOLD project at Global Citizen Live in Paris. We celebrated the launch with a social media campaign followed by a high-profile event at GLF Climate to announce the BOLD Emergency Reserve, where the incoming Norwegian Minister of International Development, Anne Beathe Tvinningreim, gave a lightning talk.

Executive Director Stefan Schmitz's keynote speech at the conference, which celebrated BOLD, had the highest number of views at the event (more than 110,000).

In addition, a major initiative began in 2021 to refresh the branding of the Crop Trust. This includes a new Crop Trust institutional website and dedicated news hub that will consolidate and replace a number of previously separate websites. The website and refreshed corporate identity will roll out in Q2 of 2022, alongside a new mini-site dedicated to the achievement of the Crop Wild Relatives Project, and the first all-digital Annual Report.

A legacy video celebrated the CWR project achievements and the hard work and dedication of its partners.







Sunflower pre-breeding at National Agricultural Technology Institute (INTA) in Argentina.  
Photo: Luis Salazar/Crop Trust

## South Korea and Norway to lead the Donors' Council

In October 2021, the Republic of Korea, represented by Taek-Ryoun Kwon, Director General of the Technology Cooperation Bureau, Rural Development Administration, was formally elected as the new Chair of the Donors' Council. Norway was elected as the new Vice-Chair, and is represented by Daniel van Gilst, Senior Agricultural Advisor at the Norwegian Agency for Development Cooperation.

We welcome both and look forward to fruitful meetings in 2022 guided by their wealth of knowledge and expertise.



IRRI staff perform a quality check on seeds of a rice variety that they are preparing for conservation in the institute's genebank in Los Baños, the Philippines.

Photo: Brent Stirton/Getty Images



The flood plains around Ambatondrazaka, Madagascar, have been a rice granary for centuries. The island is now recognized as one of the world's two major secondary centers of rice diversity.

Photo: Toby Smith/Getty Images



## Same Mission, New Leadership & Expertise



*"In my decade and a half as a member of the Crop Trust Executive Board, most recently as its chair, I have been privileged to witness first-hand some of its most impactful achievements. It has been an honor and great pleasure to be a part of the Crop Trust's exciting journey. I shall continue to do all I can to promote and support the work of the Crop Trust and its many partners across the world."*

**– Sir Peter Crane FRS, Outgoing Chair,  
Crop Trust Executive Board**

## New Executive Board Chair, Catherine Bertini

After contributing to the Crop Trust Executive Board for 14 years, first as a valued member and then as Chair, Sir Peter Crane stepped down in December 2021, making way for Catherine Bertini. Catherine Bertini was awarded the 2003 World Food Prize Laureate for her transformational leadership at the World Food Program, which she led for 10 years. A noted advocate for women and girls, Catherine Bertini was appointed to senior positions by three UN Secretaries-General and five US Presidents. She also serves as Chair of the board of the Global Alliance for Improved Nutrition (GAIN) and is on the board of the Global Food Banking Network.

We welcome Catherine wholeheartedly to the Crop Trust and look forward to her guidance and expertise in supporting the organization in this new phase.



*"I am delighted to be appointed as chair of the Crop Trust's executive board and look forward to playing an active role in advancing and supporting the Crop Trust's mission to underpin the long-term future of the global food supply. In the face of the climate crisis, it is clearer than ever that the Crop Trust's unique mandate has never been more relevant or important."*

**– Catherine Bertini, Incoming Chair,  
Crop Trust Executive Board**





# Securing our food, forever







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