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# FOOD FOREVER

CLIMATE-PROOFING OUR FOOD FOR  
FUTURE GENERATIONS

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# WHITE PAPER

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Deep in the rural highlands of Madagascar, a family mills their rice in the traditional way by pounding. More than 90% of rice farming is in lower- and middle-income countries, where it is a foundation of food and nutrition security. ©Toby Smith/Reportage by Getty Images for the Crop Trust



## Why does crop diversity matter?



Rice terraces at different stages of maturity in a Betsileo village, Madagascar. The farmers sow a wide assortment of local types of rice at different times, employing irrigation to grow some in the dry season and waiting for the rainy season to plant others. This diversity is a source of efficiency, security, cultural identity and pride. ©Toby Smith/Reportage by Getty Images for the Crop Trust

More than 60% of the world's food supply depends on just three crops – wheat, maize and rice – all of which are vulnerable to biodiversity loss, the climate crisis and conflict.

Amid deeply challenging times at local, national and global levels, our reliance on such a narrow food supply is exposing the critical need to diversify our food system – for ourselves and for future generations – and identify actionable solutions to address these challenges.

Climate change is making it harder for farmers to grow enough food to feed not only their families, but also the rest of the world. Without adaptation, our global food system will be unable to cope.

Crop diversity – the variety of plants used in agriculture – is a prerequisite for future food and nutrition security. Only by safeguarding crop diversity in perpetuity, and making it available for use by researchers, plant breeders and farmers, can we adapt agriculture to the climate crisis, improve livelihoods and feed everyone adequately.

There are many crops beyond wheat, maize and rice that are often overlooked, neglected and even threatened with disappearance. These could enrich our menus, and provide a more varied and healthy diet. Some of these crops also require less water and other inputs, making them more economical to grow. New varieties are already being developed, using diversity conserved in genebanks, to be more resilient to the changing climate, with better heat and drought tolerance and improved resistance to pests and diseases.

## The solution is diverse

As climate change increases the risk of crop diseases, farmers need more robust crop varieties. The hardy wild cousins of cultivated crops can help with this. Crop wild relatives have evolved to withstand harsh conditions, such as extreme heat and drought, and through a process called pre-breeding, scientists can transfer these useful traits to cultivated varieties. It is a laborious process, but the results are worth it.



Field trials of two crop wild relative-derived potato varieties in farmers' fields near Huancayo, Peru.  
©Michael Major/Crop Trust

Potatoes are grown all around the world, and almost everywhere they are grown they are threatened by late blight, a wind-borne disease that can destroy a field of plants in a matter of weeks. Though this disease is widely controlled with agrochemicals, millions of farmers cannot afford or apply them as often as needed, resulting in about USD 14 billion in crop losses annually, primarily in developing countries.



Peruvian farmer Mariluz Cardenas holding CIP-Matilde tubers. ©J. Huanai/CIP

However, farmers in Peru have a new option for dealing with this devastating disease. A new potato variety called CIP-Matilde, developed by the International Potato Center (CIP) with support from the Crop Trust, is the product of a breeding effort that crossed wild potatoes with cultivated ones to produce commercially viable potatoes that can withstand late blight.

Grasspea is very nutritious and can withstand environmental extremes like droughts and floods that cause other crops to fail. Rich in iron, zinc and protein, this annual legume is used as livestock feed, a grain crop for humans and fertilizer for farming systems. It is a low-cost crop that can be simply thrown into a field and will still grow well – it does not require any fertilizer, nor much irrigation.

As climate change progresses, this multi-purpose crop will be increasingly important as livestock fodder and human food, however, some grasspea varieties also contain a neurotoxin that can cause paralysis if it is the only thing people eat. That is why breeders are using wild grasspea to create new varieties that will survive drought and heat without causing harm.

To adapt our food system to local conditions, taste preferences and the increasing challenges of climate change, we must use the diversity between and within crops. Only then will many countries be able to develop self-sufficient and productive agricultural systems and reduce dependency on food imports. Food security is increasingly becoming a security and geopolitical problem, and crop diversity is an important solution.

## A call to action

We have a window of opportunity to protect and make available the foundations of the world's agriculture, but it is closing, and we must act now.

This Crop Trust session will include global stakeholders from different sectors in lively debate in this solution-driven dialogue on how our food systems can adapt and sustainably supply enough healthy food for the rapidly growing world population. It is vital that we connect with others, share knowledge, build on experience, encourage innovation and identify actionable solutions.



There are many ways to use the cassava plant, and all of them take a bit of work. This farmer is peeling the fresh roots so they can be soaked and dried in the sun to increase their shelf life. ©Toby Smith/Reportage by Getty Image for the Crop Trust

If we do not take action to protect our planet's biodiversity, we will see greater biodiversity loss – and when biodiversity is lost, it is lost forever. Around 40 percent of plant species are facing extinction. That includes the wild relatives of key crops. This loss is massive, and irreversible. When we lose this biodiversity, we lose options, we lose solutions, we lose potential and we lose resilience.

What can the average person do to combat this loss? Consumer demand is an essential component driving farmer decisions to cultivate a broad range of crops. But most people are unaware of the potential impact of their food choices. Every time we eat, we have a choice as to which foods to consume, where to source them and which establishments to support. By demanding more diverse foods, we can help build the foundation for a nutritious and resilient food system.

## About the session organizer

The Global Crop Diversity Trust (Crop Trust) is a non-profit international organization dedicated to conserving and making crop diversity available for use globally, forever and for the benefit of everyone. Our work supports adaptation of our food systems to the climate crisis, ensures better nutrition and health, and provides the basis for sustainable agriculture. At the core of Crop Trust is an endowment fund dedicated to providing guaranteed financial support to genebanks worldwide. It supports the Svalbard Global Seed Vault, and coordinates large-scale projects worldwide to secure crop diversity and make it available for use. The Crop Trust is recognized as an essential component of the funding strategy of the [International Treaty on Plant Genetic Resources for Food and Agriculture](#).

Learn more at [www.croptrust.org](http://www.croptrust.org).

## Additional resources

### Handouts:

[The Climate Crisis and What Crop Diversity Has to Do With It](#)  
[Genebanks: An Introduction](#)  
[An Endowment for the Ages](#)

### Infographics:

[Saving Cucurbits](#)  
[Conserving Vanilla](#)

### Videos:

[Biodiversity for Resilience: We are diverse. We are resilient](#)  
[Biodiversity for Resilience: Farmers, Dedicated Stewards of Plant Diversity](#)  
[Biodiversity for Resilience: the Genebank, Ensuring Resilience](#)  
[Biodiversity for Resilience: Chefs, Advocates for Biodiversity](#)  
[Biodiversity for Resilience: A Food Secure World Starts with You](#)



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## GLOBAL LANDSCAPES FORUM

The Global Landscapes Forum (GLF) is the world's largest knowledge-led platform on integrated land use, dedicated to achieving the Sustainable Development Goals and Paris Climate Agreement. The Forum takes a holistic approach to create sustainable landscapes that are productive, prosperous, equitable and resilient and considers five cohesive themes of food and livelihoods, landscape restoration, rights, finance and measuring progress. It is led by the Center for International Forestry Research (CIFOR), in collaboration with its co-founders UNEP and the World Bank and Charter Members.

**Charter Members:** CIAT, CIFOR-ICRAF, CIRAD, Climate Focus, Conservation International, Crop Trust, Ecoagriculture Partners, The European Forest Institute, Evergreen Agriculture, FAO, FSC, GEF, GIZ, ICIMOD, IFOAM – Organics International, The International Livestock Research Institute, INBAR, IPMG, IUFRO, Rainforest Alliance, Rare, Rights and Resources Initiative, SAN, TMG-Think Tank for Sustainability, UNCCD, UNEP, Wageningen Centre for Development Innovation part of Wageningen Research, World Farmer Organization, World Bank Group, World Resources Institute, WWF International, Youth in Landscapes Initiative (YIL)

### Funding partners

