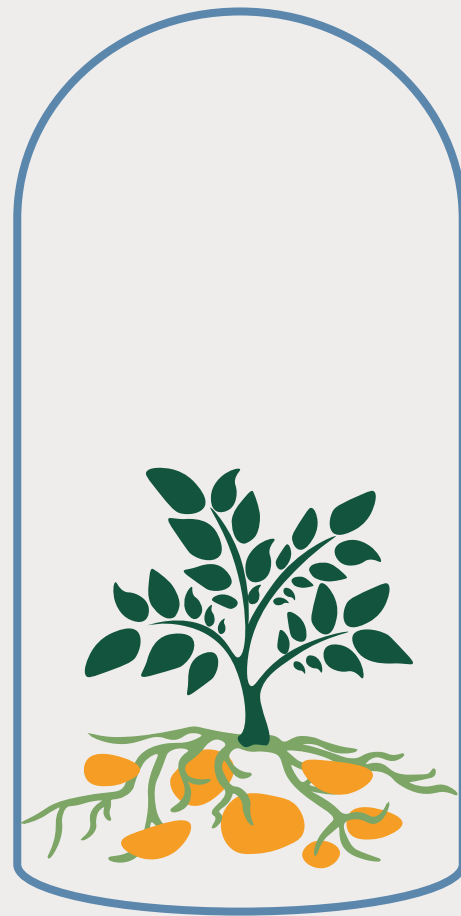


Pre-breeding

“Turning Ancient Grains into Tomorrow’s Harvests.”



Time



Initial state: Over time, climate change will potentially lead to a notable decrease in crop yields as the population expands.

“To tackle zero hunger, we must find ways to adapt crops while maintaining or increasing their yield.”



Root cause: The current agricultural landscape is dominated by elite varieties with little genetic diversity, so they are not resilient.

Solution: We need new crop varieties that are more nutritious, tolerant to drought or floods, and resistant to the new pests and diseases.



FUN FACT

Did you know?

Carrots were not originally orange. Pre-breeding magic turned them from yellow, white, and purple to the orange we know and eat today!



One solution is pre-breeding:

We cross the domesticated crops with their wild relatives or landraces to reincorporate native beneficial diversity in the modern elite varieties.



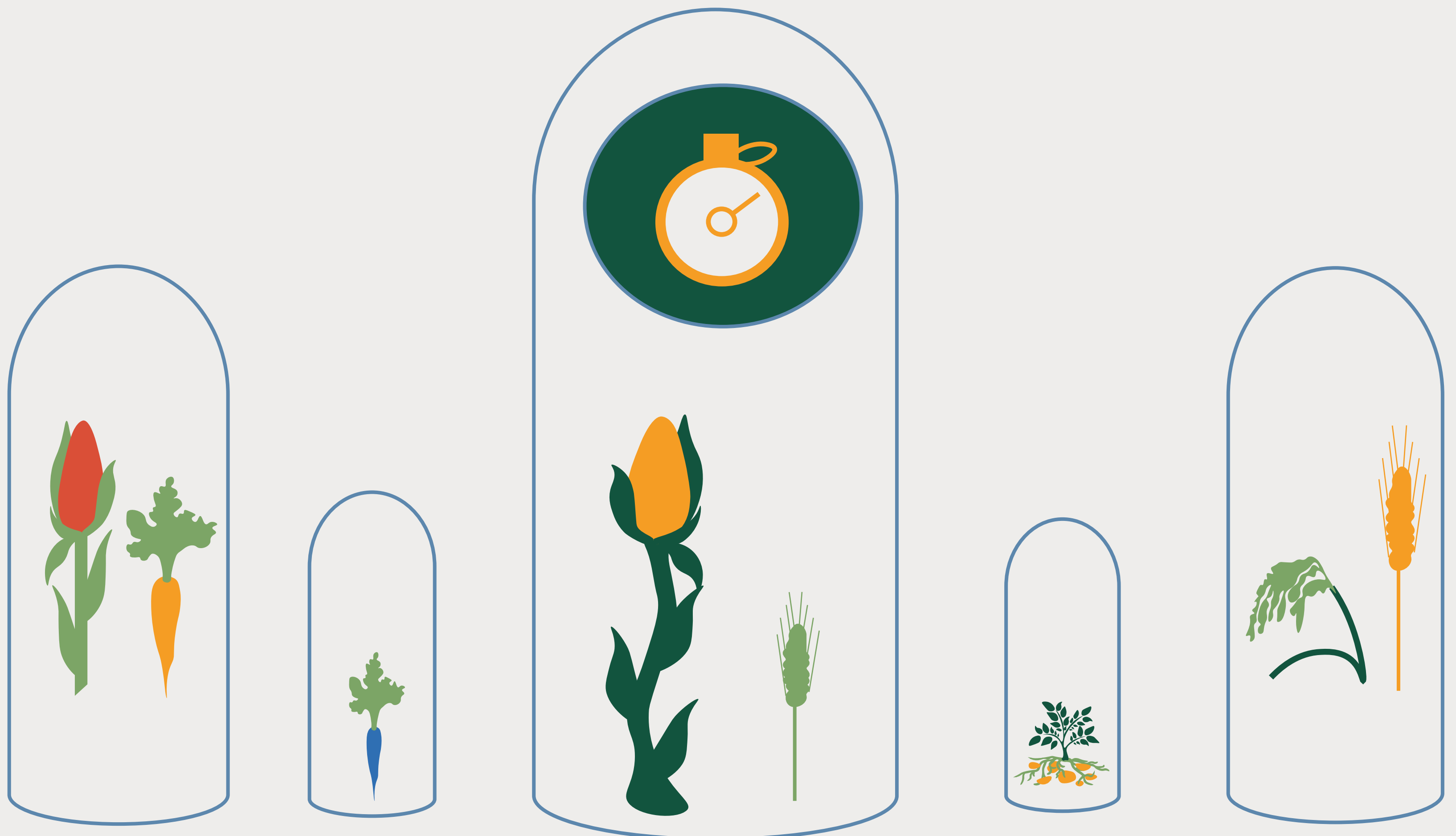
More resilient crop



Where and how do we get seeds for pre-breeding?

Seed banks

Seed banks are crucial for pre-breeding; they preserve crop diversity and make it available to breeders, farmers and researchers. Breeders can use the extensive diversity of wild relative seeds for the crosses with elite varieties.



It is like a plant remix

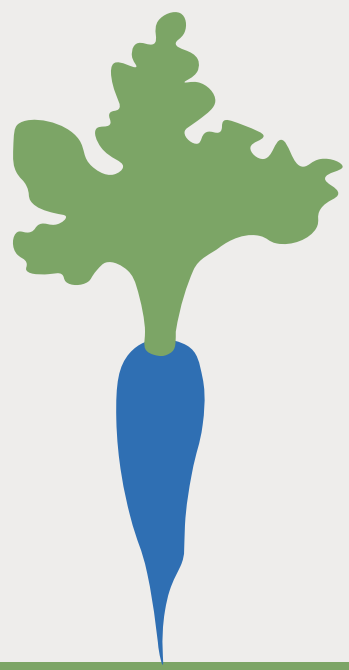
This is not a new magic solution. People have been breeding plants to improve them for a long time.

It is all about keeping the good traits—**like making sure the plants are strong, healthy, and tasty**—while giving them **new super-powers** for future needs. To make them as productive as the crop and as resistant as the wild relative.

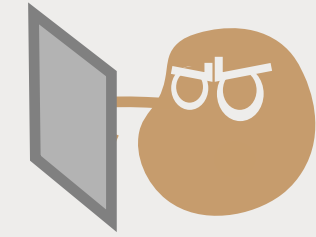


Some of the advantageous results are:

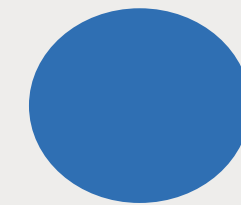
- Resilient plants that tolerate drought, heat, flood, or salinity.
- Shielded crops with resistance to diseases and pests.
- Nutrient-rich harvests with increased micronutrient content and better cooking quality.
- Enhances crop yield.



Challenges:



- Crosses can be hard to make, and sometimes they require technological intervention.
- They are time-consuming, it can take 10-20 years from the seed bank to a newly released variety!
- And so, it is costly and challenging.



Key terms:

Modern Elite Varieties: They are pure lines = one genotype only; high input is needed and high yields will be obtained in good years but entire crop failure is possible in bad years.



Landraces: mixtures of several genotypes = in the same field we have early and late flowering, short and tall plants; resistant and non-resistant plants to a particular disease. The yield is generally lower than for elite line.



Crop Wild Relatives: These are the wild cousins of the plants we grow on farms. They have unique abilities to deal with pests, diseases, and changes in the weather.



BOLD (Biodiversity for Opportunities, Livelihoods, and Development) project: The Crop Trust's BOLD Project focuses on pre-breeding seven food and forage crops we heavily rely on.

BOLD's pre-breeding component aims to make new crop diversity available for crop improvement. BOLD builds on the achievements of the Crop Wild Relatives Project, which has already shown promising results in creating superior breeding lines with improved traits.



FARMERS

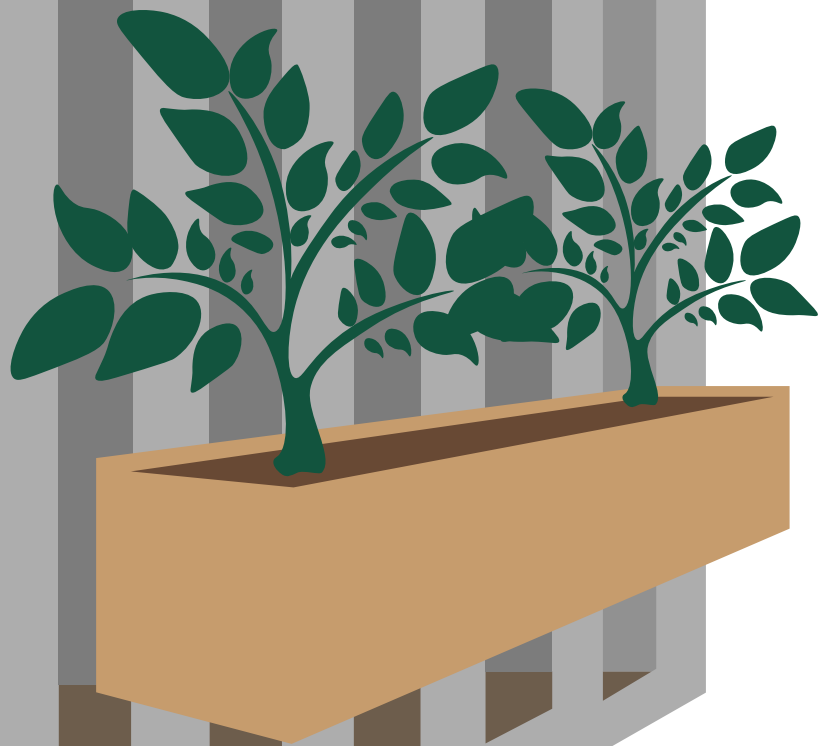
In BOLD, farmers play a crucial role in pre-breeding by closely working with the plant breeders to ensure the new varieties fulfill their needs. In the BOLD pre-breeding rice project in Vietnam, they have been involved in selecting desired properties and evaluating the products. Hence, providing crucial direction and feedback to the plant breeders.



And if you are thinking, "What can I do to help?"

It's incredible how even the small choices you make can lead to big changes.

- You can support crop diversity by choosing different kinds of fruits and veggies when you shop from local farmers.
- Try growing some plants on your balcony!!!.



Every little action counts.
So go ahead,
BE BOLD in your choices.

Together, we can make a difference and
create a better future for our food.



Learn more about the BOLD Project at
<https://bold.croptrust.org/>.