



Banking on Genetic Diversity

Seeds supporting smallholders to grow reliable healthy harvests.

Our ecosystem relies on biodiversity to flourish. Healthy and diverse plants contribute to healthy soils, and hence clean water and air. We are working toward a healthy planet supported by a regenerative, sustainable agricultural practices, which is the basis for growing food into the future. Yet, changing climate and steady population growth impose critical challenges. How then, can genetic resources assist in securing the richness of biodiversity while also providing smallholder farmers with new varieties of crops which can increase yield potential and are nutritious and resilient to the challenges of climate change?



Genetic resources of agricultural crops are helping to ensure that biodiversity is not lost. **Vegetables by Bayer** uses a variety of germplasm sources and works to develop innovative varieties including those that have the potential for resistance to diseases and are less susceptible to the challenges that climate change presents, such as low water conditions. As part of this, Bayer believes it is important to help maintain the biodiversity and help our planet by supporting institutions that are working to retain germplasm diversity and species that are gradually disappearing in nature. Protecting and increasing germplasm of *Brassica* species is a recent project we've been working on. And, interestingly, it will be able to help smallholder farmers, too.

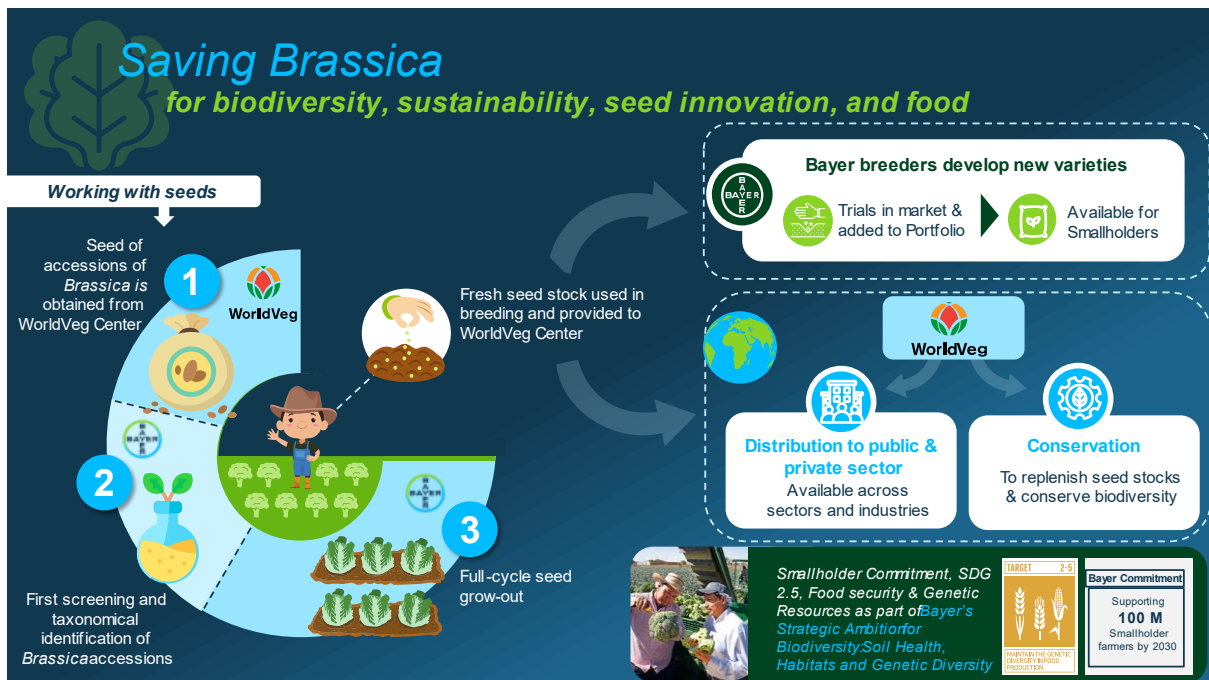
Working to collect & conserve

Vegetables by Bayer is working with a variety of renowned public research centers and gene banks including The World Vegetable Center ([WorldVeg Genebank](#)) to maintain and improve access to seed of agricultural crops and conserve wild relatives of cultivated crop species that are found indigenously in different regions of the world. The gene banks undertake collection missions for certain crops in untapped areas to conserve diversity of crop species before the species become rare or even extinct. This is becoming even more important as our climate changes. In addition, seed has a limited time for growth or viability, so it is critical to regularly regenerate seed in the public gene bank collections so that the seed is available for generations to come.

Bayer is working with several institutions to assist with regenerating and producing seed. Maintaining the seed and the genetic diversity is critical to developing new varieties that are more nutritious, taste good, resist pests and diseases, and are adapted to climate change in affected growing regions. It is also important for Bayer to continue to work with public gene banks and other institutions on the collection missions and seed maintenance since it is estimated that a quarter of the 1100 recognized vegetable species worldwide are not conserved in any gene bank.

Good for Biodiversity...

The latest example of how **Vegetables by Bayer** supports the global effort to secure food is our seed regeneration work with WorldVeg Center for a unique collection of *Brassica* crops (the family of vegetables that includes nutritious and versatile mealtime favorites broccoli, cauliflower, cabbage, kale and pak choi). WorldVeg Center maintains a collection of *Brassica* crops, which was collected in South-East Asia at the end of the 20th century (<https://avrdc.org/seed/improved-lines/leafy-brassic/>). The collection contains more than 1500 accessions of different varieties and types that are not believed to be present in any other gene bank collection and may no longer be found in the wild. Bayer is providing resources and expertise to assist WorldVeg Center in increasing the amount of seed so as to conserve this important *Brassica* material. Our work will start with phenotypic screening of the plantlets to help WorldVeg Center identify the different species and types in their collection. Afterwards, new seed will be produced and returned to WorldVeg Center for maintenance and distribution.

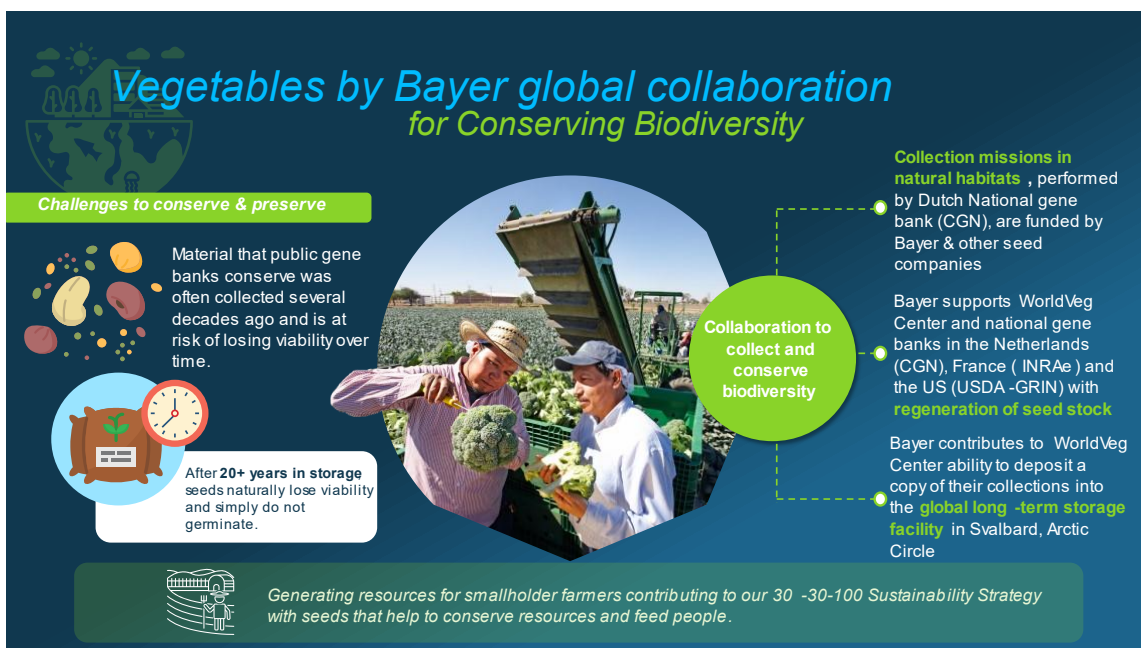


Health for All. Hunger for None.

#Infographic (1): The effort to increase, conserve and utilize genetic resources entails multiple steps. Bayer provides resources and expertise to assist WorldVeg Center in replenishing the seed stock of the important *Brassica* material conserved in WorldVeg Genebank. Newly increased seed is provided back to WorldVeg Center for distribution to users in public or private sector, as well as for further conservation. At the same time, *Brassica* breeders at Bayer use the germplasm for breeding and development of new varieties which will be accessible to smallholder farmers.

More food, less crisis – for smallholders too

The increased seed will be available to breeders, including those at Bayer, to use in the breeding programs in accordance with the distribution terms of WorldVeg Center. The ability to access this important and unique material will help create new *Brassica* varieties for growers and consumers. Since it is likely that the material will include traits and characteristics specific or beneficial to growing in Asia, the varieties will be of significant benefit to growers in that region, including smallholder farmers. The new varieties will help smallholder farmers to secure their yield potential and provide food for their families and local communities. Overall, these improved *Brassica* varieties can help reduce the vulnerabilities the smallholder farmers face in growing food with the challenges of shifting climates.



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#Infographic (2): The approach we're taking with WorldVeg Center is working well in collaborating with others, too. The Dutch National Gene bank (CGN) continues to conduct collection missions "in the wild" for specific species. Bayer supports these collection missions along with other seed companies. Bayer has also helped with seed stock regeneration for several gene banks including CGN, French national gene bank (INRAe), US gene banks system (USDA-GRIN), and now WorldVeg Center. With the latest project, we are scaling up the annual numbers of seed increases for gene banks considerably, in part to bolster our Vegetable Seeds Smallholder segment strategy and 100M Sustainability Commitment.

Genetic Resources represent a core pillar of our [Bayer Strategic Ambition for Biodiversity](#). By ensuring that we conserve natural resources, such as water, and retain healthy soil, we can continue to invest in what the planet needs to provide mankind with food for generations to come. Genetic resources are part of this holistic approach towards food security, mitigating the consequences of climate change and contributing to our 30-30-100 Sustainability Strategy – also helping to keep Bayer at the top of the [Access to Seed Index](#).



About the author:

Jasmina Muminovic heads the global Genetic Resources, at Veg R&D Sustainable Business Practices. Together with her team, Jen Green and Ruud Goossens, Jasmina is passionate about innovations that continue to support smallholders with reliable, nutritious harvests while contributing to biodiversity conservation and a healthier planet.