

GENE BANK GETS NEW HOME

Genetic treasures housed in one place

In locations spread across Wageningen campus, geneticists store the genetic material of plants and animals, which researchers and plant and animal breeders can then use. Now the collection is set to include more species and double in size. That means it is time for a new, dedicated building on campus.

TEXT HARM TEN NAPEL

For the past 40 years, the Centre for Genetic Resources, the Netherlands (CGN) has been tasked by the Dutch government with managing the genetic diversity of selected plants, trees, farm animals and aquatic species from the Netherlands and the rest of the world. Geneticists keep seeds, shoots, sperm and other genetic material in a mix of facilities – a freezer here, a lab there. The collection is not a museum. The gene bank shares the genetic material with plant and animal breeders so that they can develop better varieties or breeds, such as grains that withstand drought, vegetables that are resistant to mould, strong trees that produce a lot of wood, or resilient cattle.

WILD FOREBEARS

‘In the 1970s, developing countries followed Western countries in replacing their diverse mix of local varieties with new, popular plant varieties and animal breeds, often because the yields were higher,’ says Theo van Hintum, head of the crops department

at CGN. ‘As a result, the world was in danger of losing a lot of the genetic diversity that had in fact been used for developing these new varieties and breeds. That realization led to the first gene banks, aimed at preserving the genetic material of the local breeds and varieties and their wild forebears.’ Climate change, diseases, pests and declining biodiversity are still threats to the

‘We have the best lettuce collection in the world’

planet’s genetic diversity. Biologist Seppe de Mits of the CGN trees and shrubs department cites the example of ash dieback. ‘It has severely affected the ash tree population

in the Netherlands. That may have led to the loss of species variants with genes that make the tree more resilient to drought for instance.’ That is why De Mits and his colleagues are now collecting ash seeds and freezing them.

DIRECTLY AVAILABLE

CGN’s crop collection is ranked 15th in size in Europe, but Van Hintum says its impact is far greater than this modest ranking suggests. ‘That is because nearly all the seeds in the gene bank are directly available to plant breeders,’ he says. Not all gene banks are so accessible. ‘We have more than 23,000 varieties of farm crops in our collection, including 269 wild species, and the best lettuce collection in the world with some 2500 varieties,’ explains Van Hintum. ‘The spinach in the supermarket contains genetic material that CGN collected in Central Asia.’ Further growth is needed, though, to expand the available genetic diversity and bring the size of the collection more in line with the scale of Dutch plant breeding companies.



PHOTO SHUTTERSTOCK



PHOTO WUR



The Centre for Genetic Resources in the Netherlands (CGN) preserves seeds, shoots, sperm and other genetic material.

That is why CGN and the Dutch government have decided to double the size of the collection. In addition, the collection, currently dispersed across multiple locations, will be stored in a new building on campus. A central location will make it easier for the geneticists to collaborate. CGN will also offer more space for copies of other gene banks. These back-ups prevent the loss of the collected material in the event of a fire, natural disaster or war.

OYSTERS AND SEaweEDS

It is not only the crop department that will be expanding. Two years ago, the farm animal department started conserving aquatic species in addition to the genetic material for animals such as cattle, pigs, horses and chickens. ‘We decided to do this for species that are found naturally in the Netherlands and are grown commercially in aquaculture,’ says Annemieke Rattink, head of the animal collections. ‘So we ended up with mussels, oysters, seaweeds and various fish species, including the

eel.’ The geneticists are monitoring the genetic diversity of eel, oyster and mussel populations in the wild. ‘To safeguard that diversity, we collect sperm samples that we conserve in the gene bank.’ The trees and shrubs department is expanding its collection with a stock of frozen seeds. Previously, it only had a living gene bank – plots where specimens of rare and endangered species grow, such as the European white elm or the wild apple. That is risky, especially in view of diseases such as ash dieback. ‘But not all the seeds that we want to preserve can easily be frozen in this way,’ explains the biologist De Mits. ‘That is why we are experimenting with liquid nitrogen. We are getting help from our animal colleagues, who have more experience with this method. Such collaboration will be even easier once we are all working in the same location.’ ■

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SEARCH FOR FUNDS

The Dutch Ministry of Agriculture is CGN’s main client and most important source of funding. Plant and animal breeding companies also help finance the national gene bank. To enable the gene bank to achieve its goals, University Fund Wageningen and CGN are looking for additional philanthropic gifts, says fund director Lies Boelrijk. ‘A new, larger gene bank will let us make more of an impact in terms of food security and the preservation of biodiversity and our biocultural heritage,’ emphasizes Sipke Joost Hiemstra, the head of CGN. The aim is for the new gene bank to open in 2027.

For queries about donations:
lies.boelrijk@wur.nl

For questions about the gene bank:
sipkejoost.hiemstra@wur.nl