

World food crops and the legal challenge



The fate of Europe's largest plant gene bank near St Petersburg is to be decided by a Russian court. But because 'we're all interdependent... is why this unfolding tragedy at Pavlovsk is a concern to people outside Russia as well', says s ananthanarayanan

THE Pavlovsk Experimental Station is a vast collection of worldwide crop diversity — apple trees from 35 countries, strawberry from 40, black currant from 30, plum and cherry plum from 12 and honeysuckle from Russia and Canada. The hundreds of hectares of fields at the station contain more than 5,000 varieties, including 1,000 of strawberries alone. Its crop collections are thought to possess a host of traits that could be crucial to maintaining productive fruit harvests in many parts of the world as climate change and a rising tide of disease, pests and drought weaken the varieties farmers are now growing.

The seed bank

This is a concept of storing seeds of different varieties, both to preserve those developed over millennia but now turning rare, and also as a safeguard against calamity, like disease or fire, that may destroy vital stock. The idea grew from the work of Nicolai Ivanovich Vavilov, Russian geneticist and botanist who is known for his work on the *centres of origin of cultivated plants*. In the course of his work, Vavilov organised expeditions and collected seeds from all over the world and, in 1926, set up the Pavlovsk repository near St Petersburg, now known as the Vavilov Institute of Plant Industry.

The preservation of seeds at Pavlovsk is achieved by a continuous replanting in well-differentiated beds in the hundreds of hectares. Many varieties of seeds need not be replanted as they can stay dormant for decades in a cool and dry environment, with little damage to their DNA.

They can, thus, remain viable and be stored in seed banks. Storage is improved by drying the seeds to ensure less moisture and keeping them in freezers. But still, DNA does degrade and, after some years, the seeds need to be planted and fresh ones preserved for a fresh round of storage. But there are varieties that cannot be preserved and must be continuously replanted to preserve the stock.

The seed bank, in fact, is a gene bank, in that the seed contains the specific genetic characteristics of the plant. All natural plant varieties have evolved over millennia of adaptation and represent intellectual property that is impossible to replicate. Hybrids and genetically engineered varieties all depend on basic, naturally evolved seed stock. A collection of thousands of varieties of important species is thus both a safeguard as well as a resource

for breeding and transplantation.

Temperature, moisture and atmospheric conditions are likely to change in all areas of the world in the coming decades due to global warming. Even if we were able to contain population, it is only rapid and widespread replacement of local varieties with other varieties that are adapted to the changed conditions that could keep food production going, even at current levels.

It is remarkable that Russian science a century ago realised the value of conserving biodiversity, mainly, at the time, to secure farm produce on which the empire depended. The concept has been replicated and there are now over 1,300 seed banks in the

below the freezing point of water and the seeds are protected by one-metre thick walls of steel-reinforced concrete to withstand catastrophes, including a nuclear war!

Threat at St Petersburg

Ironically, the first seed bank of them all, at St Petersburg, is now threatened with destruction to make room for constructing residential flats! As the city is expanding, the city fathers feel they need space more than they need berry and apple trees.

The institute scientists and the Global Crop Diversity Trust (an organisation working worldwide to preserve plant diversity) are now fighting a last ditch battle to save the second of the two plots being taken over. In December 2009, Russia's ministry of economic development handed two of the station's land sites over to the Russian



Scientists say many unique varieties may be lost.

be put on sale for property development. The decision about a second larger plot is to taken by the court on 11 August (tomorrow). The writing on the wall is that the builders will have this round, too,

THE Vavilov Institute of Plant Industry still maintains one of the world's largest collections of genetic material. It began as the Bureau of Applied Botany in 1894 and was reorganised in 1924 as the All-Union Research Institute of Applied Botany and New Crops and, in 1930, as the Research Institute of Plant Industry. NI Vavilov was the head of the Institute from 1921 to 1940. In 1968, the Institute was renamed after him in time for its 75th anniversary.

By 1940, Vavilov had accumulated some 200,000 plant seeds from the Soviet Union and abroad. Most of his genetic samples were seized by a

Checked history



Nicolai Ivanovich Vavilov.

German collecting command set up in 1943 and were transferred to the SS Institute for Plant Genetics, which had been established at the Lannach Castle near Graz, Austria. However, the command could only take samples stored within the territories occupied by the German army, mainly in the Ukraine and Crimea. The main gene bank in Leningrad (now St Petersburg) was not affected. The leader of the German command was Heinz Brucher, an SS officer who was also a plant genetics expert.

During the Siege of Leningrad in World War II, the Pavlovsk Station was isolated and had no access to food supplies. Twelve Russian scientists who were trapped starved to death, though they were surrounded

by seeds of rice, corn, peas and wheat, which could have saved them.

world. Modern installations include the Svalbard International Seed Vault inside a mountain tunnel in a frozen island in Norway. Permafrost keeps the vault

Housing Development Foundation. They appealed against the decision, but the court rule against them and a first plot, about a fifth of the station, will soon



The Pavlovsk Experimental Station outside St Petersburg.

and the trust has appealed to the Russian government. It is expected that the government may intervene.

"No country is self-reliant in terms of having the diversity it needs now and certainly will need in the future for breeding a variety of crops," says Cary Fowler, director of the trust. "Breeding is an ongoing activity because pests and diseases are always evolving and the climate is changing. We're always trying to make more productive, drought-tolerant and heat-resistant crops.

"This is the raw material for doing all of that — particularly with the changing climate. The biological resources conserved in one country could be very valuable to another country, another continent. We're all interdependent and that's why this unfolding tragedy at Pavlovsk is a concern to people outside Russia as well."

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