Custodians of agricultural diversity

In the 1960s, the advent of intensive farming triggered an unprecedented rescue operation. The objective was to prevent the genetic resources of cultivated species and their wild relatives from being lost.

Cryopreservation of seeds.

Wild and hybrid millet, Niger.

The "green revolution" was active from the 1950s to the 1980s: improved plants, selected for their high yield, took over the fields. As reduced crop diversity sparked fears of an irreversible erosion of genetic resources, the FAO asked international organisations, including ORSTOM, to participate in sampling operations and develop collections, the purpose of which was to safeguard the genetic diversity of crops and their ability to evolve.

From 1966, researchers went on field trips to Ethiopia to sample wild forms of the Arabica coffee plant. From 1970 to 1990, rice species were collected in West Africa and Madagascar, while millet and sorghum surveys, cereals found in arid regions, were conducted in Sahelian countries. Other species (yam, cassava, cowpea, okra) were also surveyed.

Cereals produce seeds which can be perfectly preserved in cold storage rooms but must be regenerated every twenty to thirty years. For other species which do not produce seeds or with seeds which are difficult to preserve, alternative solutions were sought. This is why field collections were set up, biotechnologies (micropropagation, meristem culture) were developed, as was the liquid nitrogen storage technique (cryopreservation).

··· Seed collections act as a solution to the erosion of genetic diversity among cultivated plants ···

Coffee plant flowers, Côte d'Ivoire.

The emergence of molecular biology in the 1990s shed light on the organisation of diversity, giving rise to new management strategies. IRD researchers developed the "Core collection" principle, making it possible to dramatically reduce the number of duplicates.

In the early 2000s, genome sequencing options opened up new opportunities, notably with regard to adaptation to climate change. A genome comparison between millet sampled in 1973 and 2003 helped researchers identify a major gene involved in drought resistance. Studying the rice genome helps understand the genome of other cereals. Similarly, the sequencing of the Robusta coffee plant, an African species, enhances the understanding of the extraordinary diversity of Malagasy species.

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