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Better cassava boosts food security

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Efforts to improve one of the world's most resilient staples — cassava — have paid off, with lasting and, in some instances, dramatic benefits. Plant breeding has increased this starchy root's nutritional value and resistance to disease, saving countless lives as a result.

IDRC has long recognized cassava as an important but neglected food crop. Drought tolerant and able to remain intact in dry soil until harvested months or even a year later, cassava is critical to the survival of more than 800 million of the world's poorest people. These producers and consumers depend on cassava, also known as manioc, for their daily sustenance.

In the mid-1970s, IDRC funded a university researcher and plant breeder, Nagib Nassar, who collected wild species of cassava, mostly in the northeastern part of Brazil. At the time, Nassar was part of a small minority of cassava scientists who valued wild species as a breeding tool. The wild relatives of cultivated cassava, he reasoned, were a rich source of new genes to improve the traits of the cultivated varieties.

"The living collection I established with the help of IDRC continues to this day to support my breeding work," explains Nassar, now 72 years old and Professor Emeritus at the University of Brasilia.

Higher protein content

Nassar was able to cross some high-protein wild species with cultivated varieties and produce hybrids with higher protein content. His success was an important step forward because, unlike staple grains such as rice and wheat, cassava contains very little protein.

"One of the biggest drawbacks of cassava, particularly as a drought and starvation food, is that it's basically carbohydrates without protein," explains Joachim Voss, a former IDRC program director and later director general of the International Center for Tropical Agriculture, headquartered in Colombia.

"Especially in West Africa. When there's a severe drought, people are eating cassava and cassava and cassava," Voss adds.

Resistance to disease

Nassar also used the wild species he collected to breed hybrids that are resistant to cassava mosaic disease, which is caused by a virus transmitted by whiteflies.

"My hybrids were then used by the International Institute of Tropical Agriculture [IITA in Nigeria] to develop the family of cultivars called MS. These have since been adopted and planted by millions of farmers in sub-Saharan Africa," recalls Nassar.

Without these cultivars, Nigeria, the world's leading cassava producer, would have suffered greatly from mosaic disease.

Farmers in Brazil's Federal District also cultivate some of Nassar's more nutritious and drought tolerant varieties and efforts are underway to distribute planting materials in Central Brazil.

Life-saving applications in Africa

Disease resistant cassava proved instrumental in saving lives in Uganda, where a highly virulent form of the cassava mosaic virus began devastating crops in the late 1980s. About 80% of the country's 500,000 hectares planted to cassava were affected. In the ensuing years, the sweeping epidemic caused severe food shortages and economic hardship in parts of the country. Several thousand people died of starvation.

With support from IDRC, a team of scientists led by the Ugandan government's Cassava Research Program at Namulonge launched a bold breeding program. They developed and disseminated new high-yielding varieties that were resistant to the Ugandan strain of the mosaic virus. A central element of the breeding strategy was to incorporate mosaic resistance from IITA's various cassava lines into the new Ugandan varieties.

The program was a major success. It improved national food security, restored economic balance to agricultural communities, and slowed the spread of the new mosaic strain to other cassava-producing countries of the region.

Collected over 35 years ago, Nassar's wild breeding stock continues to have a far reaching impact on food security.

> I am from Namulonge in Wakiso District, Uganda. In the 90s our local varieties were attacked by cassava mosaic and other pests to the extent that we were not reaping any crop from our gardens. I was chosen among the people to host a new cassava variety. Amazingly it did very well and even matured faster than our local variety. Now I have over five acres all planted with the new variety, which is not attacked by cassava mosaic and other pests. My income has improved. I used to live in a small grass-thatched house. Now I have a three-bedroom house which I built myself. All my children go to school. We also have enough food at home throughout the year because we store what we cannot consume for future use.
>
> — Nsamba Setyabula, Ugandan cassava farmer

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