

Researcher Profile: Breeding New Respect for Farmers in Cuba



Farmers and researchers discussing the results of a bean experiment in Batabanó, Havana province. (IDRC Photo: Ronnie Vernooy)

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Keane J. Shore

When Cuban agricultural scientist Humberto Ríos started looking for his doctoral thesis subject 15 years ago, he didn't realise that his pumpkin-breeding project would lead him to a new research model for his country.

But with help from a canny group of farmers, he independently gained his first inkling of participatory plant breeding. This is an approach where researchers work directly with farmers and testing frequently takes place on the farm, not under the controlled conditions of formal, experimental stations.

“I started without a real consciousness about the participatory approach,” says Ríos. “When the economy collapsed, I just moved from the [centralized] experimental station to work with farmers.”

He ended up learning as much as he was teaching to farmers and, in the process, proved the value of taking a participatory approach to research. Now coordinator of the participatory plant breeding program at Cuba's [*Instituto Nacional de Ciencias Agrícolas*](#) (INCA — National Institute of Agricultural Sciences), from 2000-2004 Ríos led a research project that used seed fairs (among other methods) to help farmers share and breed dozens of different varieties of plant strains. The research, which aimed to strengthen agricultural biodiversity in Cuba, was supported by the International Development Research Centre (IDRC). [See related case study: [Cuba](#)]

Economic collapse

When Ríos started working on his doctorate in the early 1990s the Soviet bloc had dissolved, the Berlin Wall had fallen, and Cuba's economy had collapsed. Without Soviet trade and assistance Cuba's export market dried up, the country's purchasing power was greatly reduced, and agricultural production was drastically affected.

Things were so tight for Ríos himself that he and several friends formed a band to earn extra money, playing in the streets of Havana in the evenings. Tips from tourists helped support his family while he studied for his doctorate. For a time he even flirted with the idea of full-time musicianship, but opted to stay with his studies.

“I realized I felt strongly about my field because of so much time spent studying,” Ríos says. “And I just continued because I felt some faith — I’m not religious, but I think some material faith — in the sense that it seemed it could be quite important to give this input to my society in Cuba.”

Facing a paradox

At the time Ríos was doing his research, plant breeding in Cuba relied on imported fertilizers, petroleum, and other agricultural inputs to improve yields. But as Cuba’s contact with the rest of the world was further constrained by an economic blockade, these inputs had become impossible to get.

Cuban plant breeders and farmers faced a seeming paradox — to try to grow more and better produce with fewer modern inputs. Ríos was assigned by the government to an experimental station to improve pumpkin varieties. Pumpkin is a popular vegetable in Cuba, but yields had gradually decreased to the extent that they disappeared from the market.

When Ríos arrived at the station he found there was no fertilizer for crops and no gasoline for the station’s tractor. So he sought out the farmers he was supposed to be helping and asked for their help instead.

It turned out to be a fruitful collaboration in more than the expected ways. The farmers planted several types of pumpkins. Then at harvest, when Ríos was trying to determine what breeding traits were best, the farmers gave him a pragmatic lesson in plant selection. It went against many things he’d learned in classical plant breeding.

A natural selection

His group of farmers liked plants with slightly diseased leaves and oddly shaped fruit. When Ríos asked why, they pointed out that the plants, although a little sickly, still produced a lot of deep-necked fruit. The flesh was bright coloured too, telling them that the vitamin content was better.

Only after he sat down to analyze the farmers’ choices did Ríos realize they’d chosen, as well, plants that produced large amounts of pollen, the better to pollinate other plants. Knowing he was on to something, he kept returning to farmers in the field to help him with the plant breeding he was doing as part of his PhD research.

“I had good people to work with — so friendly and intelligent,” says Ríos. “When the classical plant breeders were on top in Cuba, sometimes they accused farmers of doing a little bit of ‘voodoo’. But I cannot share this opinion because for me all of the farmers were quite clever.”

He’d had no idea other scientists around the world had formalized this approach of collaborating with farmers. It was only after he had been doing his own research for more than half a decade that Ríos stumbled upon the wider world of participatory plant breeding. In 1996 he travelled to a conference and attended a lecture by Salvatore Ceccarelli, a plant scientist with the [International Center for Agricultural Research in the Dry Areas \(ICARDA\)](#). Ceccarelli had years of experience using participatory methods in low-input breeding research in North Africa and the Middle East. [See related case study: [North Africa and the Middle East](#)]

“He was explaining the theory of why it is important to work with farmers and I realized, ‘Oh my goodness! This is my thesis!’,” says Ríos. “I started to gather literature and I was able to set up my degree thesis.” Ríos completed the first thesis in Cuba on plant breeding for low-input agriculture.

Organic farming

Since then, Ríos’s own research experience, coupled with continuing scarcities in Cuba’s farming economy, has made participatory plant breeding more and more important. Chemicals once kept Cuba’s agricultural system homogeneous and farmers grew only a handful of varieties. That’s no longer the case.

“Environmental differences now are increasing, because the lack of inputs has produced more differences between environments,” says Ríos. “Now we are more organic. Organic from the economic point of view is quite important, because we are producing more food now than we were before with agrochemicals.”

Ríos adds, he believes the results gained through participatory plant breeding have led to a shift in thinking in Cuba’s top-down society by showing other scientists the value of participatory research.

Breeding capacity

There’s been a social impact too, which is also important for Ríos. Many poorer farmers who had not benefited much from older high-input agriculture practices slowly found their knowledge and abilities were now valued.

In fact, results of the seed fairs Ríos and his research team have spearheaded have exceeded his expectations. At these fairs, farmers are invited to select varieties, developed through participatory plant breeding, most suitable for their environment. They take the seeds home where they continue to experiment with them.

“You can see it, for example, in one community where they had merely four varieties. Now they are managing over 100 varieties of beans, more than 100 varieties of rice, and more than 90 varieties of maize. It’s impressive — unbelievable, really.”

At first, he said, he wondered why farmers would want to maintain so many strains, even though many didn’t seem to look useful for them.

“One said, ‘Look, Humberto, you’re thinking the wrong way’,” says Ríos. “I asked why, and he said, ‘Because I have a family. Some of my kids are good and others bad, but they are my kids, so I have to keep them. It’s the same with varieties’.”

For Ríos, each carefully kept local plant variety has now come to represent another breeding option that didn’t exist in Cuba’s former, higher-input, less-diverse breeding culture. And varieties that languish in one microclimate can thrive for farmers that need new breeding traits in another. “Options mean knowledge,” he says. “If you don’t know your options, it’s very narrow, your view.”

Keane J. Shore is a freelance writer based in Ottawa.

For more information:

Humberto Ríos, Instituto Nacional de Ciencias Agrícolas (INCA), Gaveta Postal 1, San José de las Lajas, Havana, Cuba, CP 32700; Phone: +53 64 63867; Fax: +53-7-240942; Email: humberto@inca.edu.cu

Ronnie Vernooy, Team Member, Community-based Natural Resource Management, IDRC, PO Box 8500, Ottawa, Ontario, Canada K1G 3H9; Phone: (613) 236-6163, ext. 2229; Fax: (613) 567-7749; Email: rvernooy@idrc.ca