SCALING UP THE PRODUCTION OF MORE NUTRITIOUS YELLOW POTATOES IN COLOMBIA

HEALTHIER AND HIGHER-YIELDING POTATOES NOW REACHING OVER 6.5 MILLION COLOMBIANS NAVIGATION TEASER

WHAT CANADIAN COLOMBIAN COLLABORATORS DISCOVERED:

- The development and commercial release of 3 yellow potato varieties that are highly nutritious, more resistant to fungal disease, and higher yielding with lower production costs
- Sustainable seed production businesses involving small-, medium-, and large-scale farmers
- Improved nutrition and health through home and communal gardens, and the recovery of ancestral foods
- Improved access to markets and income for farmers
- Assisted in the implementation of a nationwide program to supply micronutrient powders ("sprinkles") to mothers
- New Colombian regulations to produce high quality potato seed tuber production system

BY THE NUMBERS

- 16% of yellow production area in the country replaced by the new varieties, with the new potatoes available to over 6.5 million Colombian consumers; forecast to increase to 8.6 million Colombians in 2018
- New varieties have double the protein, and nearly 20% more iron and zinc than the current Criolla Colombia variety.
- 18% higher incomes for farmers growing the new potato varieties
- 40% increase in yields from new varieties; 335 tonnes of potatoes produced
- 297 tonnes of commercialized seeds produced
- 2,490 farmers (51% women) directly benefited from the project, and 1,571 (56% women) indirectly benefited
- 70% of participating households improved their nutrition and health, learning proper eating and nutrition habits, and recovery of ancestral food
- Established 7 groups of rural entrepreneurs (RENs) that work together to produce high quality potato seed that is sold to potato growers
- 16 Family Farming Community Schools (FFCS) were formed benefiting 763 farmers directly and 4,578 farmers indirectly across Nariño (53% of participants were women; 62% in leadership positions). 98% of participants adopted the new potato varieties in their farming activities.
- Developed and implemented 5 Community Action Plans in which communities and local institutions worked together to develop community initiatives, including a women's-only savings and credit fund managed by women, and a gastronomy entrepreneurial course to foster employment for young people.
- 286 individuals (181 women) received leadership training in food security and nutrition and food sovereignty (another 1,024 were indirect beneficiaries)
- 160 families through home gardens or communal gardens ("Shagras") grew more fruits and vegetables, learned about proper eating and nutrition habits, and use of ancestral food. This resulted in the Diet Diversity index, an indicator of adequate nutrient intake, increasing from 17% to 52%. At the same time, the number of households classified as food insecure decreased from 64% to 41%, while the number classified as food secure increased from 19% to 59%.

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THE IMPACT:

Building local capacity has been key to the project's sustainability. This includes a sustainable business model for the local production and availability of high-quality seeds that are increasing yields for farmers, creating new jobs, and improving the health of Colombian consumers, including smallholder farmers. Another strategic initiative, family farming schools, teach participants practical knowledge for growing the new varieties, as well as for growing fruits and vegetables, preparing food, hygiene, feeding practices, and guidance on gender issues. Leadership training and the development of Community Action Plans have empowered women in their communities, including new savings and credit mechanisms. New community groups called *SHAGRAS PARA LA VIDA* ("Home gardens for life") have recovered indigenous knowledge (e.g., more organic agriculture), as well as increased incomes, household consumption of fruits and vegetables, and dietary diversity.

THE CHALLENGE:

The potato is one of Colombia's most important staple foods and a significant source of low-cost calories for families. However, yellow potato varieties grown in southern Colombia's Nariño region are low-yielding and highly susceptible to late blight disease. As most families also own small farms (less than three hectares), planting high-yielding, disease-resistant varieties is vital to ensure enough harvest for both consumption and sale. To address these challenges, farmers, breeders and scientists collaborated on the development and selection of three new varieties of yellow potatoes (Criolla Ocarina, Criolla Sua Pa and Criolla Dorada) with higher nutritional content, increased resistance to late blight disease, and higher yields. The next step involved working with farmers of all sizes to make these new varieties available to millions of Colombian consumers, and alleviate malnutrition and food security, particularly for rural families.

TRANSLATING RESEARCH INTO ACTION

Delivering higher productivity and improved market access

- Three potato varieties were developed that have higher yields, contain more protein, iron and zinc, and are more resistant to blight than the most common variety cultivated.
- A sustainable seed supply system was developed without requiring external subsidies. The business model enables groups of rural entrepreneurs (RENs) to become specialists in the production of high-quality seeds. Short market chains ensure local seed producers can meet local needs while preventing the movement of pests and diseases from one location to another.
- Family farming schools have proven effective at translating proven research (seeds, sustainable practices) into improved productivity and incomes. Graduates have formed groups of home gardeners, putting into practice several of the lessons learned.
- The project's partnership with Agroidea, a private seed plant breeding and production company, accelerated the scale-up by producing elite and super elite potato seeds of the new varieties and selling directly to large-, small-, and medium-sized potato producers.

A multi-pronged approach to improve the health of mothers and children

- The project's *Shagras para la vida* strategy strengthened a communal ancestral relationship with the land and food production. This intergenerational community-based approach resulted in more fruits and vegetables being grown in new communal gardens and traditional family gardens, increased dietary diversity (especially among children), and the recovery of native plants and culturally appropriate meals. Some groups also grew trees and plants to reclaim land in the river basins above their communities to conserve soil and to ensure streams run throughout the year.

- The project assisted in the implementation of a nationwide program to supply micronutrient powders to mothers and schools. These fortified "sprinkles" can be added to a young child's food once every two days, providing most of the micronutrients they need. A clinical study involving 2,589 children under 5 showed found that children who had mild or moderate anemia at the start of the study in 2016 had no anemia when tested in 2017.
- A practical cooking course ("Saving the ancestral culture for the recovery of sovereignty and food and nutritional security in the territory") was offered in collaboration with a traditional chef and native from Nariño.

Building community leaders, including women and indigenous

- An agreement with Nariño's local mayors and the Department and Departmental Health Institute implemented Leadership Schools in Food Security and Nutrition and Food Sovereignty (ELIGESSAN) in 13 municipalities, including indigenous territories. The schools train community leaders who promote local production and consumption of healthy foods, and can influence policy and practice in their communities and municipalities.
- 87 students have participated to date in a Master's program in Food and Nutritional Security at the Department of Nutrition of the National University of Colombia
- A training school with public officials and indigenous authorities was developed in Guachucal municipality, strengthening local institutions.

WHAT'S NEXT?

The project reached an agreement with the National Fund for the Promotion of Potato Cultivation (*Fondo Nacional para el Fomento de la Papa*-FNFP) to continue scaling up RENs at the national level. The National University of Colombia team is documenting the models and promoting them within the ministry of agriculture and rural development, for possible inclusion in a national rural development policy.

LEARN MORE ABOUT THIS PROJECT:

Project abstract: https://www.idrc.ca/en/project/scaling-production-more-nutritious-yellow-potatoes-colombia-cifsrf-phase-2

Project website: http://www.papasmasnutritivas.unal.edu.co/

Research in action: https://www.idrc.ca/en/research-in-action/scaling-production-more-nutritious-yellow-potatoes-colombia

KEY OUTPUTS

BOOKS

Sabores y saberes de las comunidades andinas nariñenses : identidad gastronómica ancestral de cinco municipios de la zona andina del departamento de Nariño, Colombia. del Castillo Matamoros, Sara Eloísa; del Pilar Zea León, María; Suárez Higuera, Eliana Lorena. (2014) http://hdl.handle.net/10625/53673

Parrado-Barbosa, Alvaro & Mosquera-Vásquez, Teresa & Victoria Campo-Daza, María & Cuéllar-Gálvez, David. (2017*). Escuelas Comunitarias de Agricultura Familiar-ECAF. Una propuesta de formación integral para la transformación social. Guía Metodológica*. Universidad Nacional de Colombia. ISBN 978-958-783-474-1 https://www.researchgate.net/publication/326645600_Escuelas_Comunitarias_de_Agricultura_Familiar-ECAF_Una_propuesta_de_formacion_integral_para_la_transformacion_social_Guia_Metodologica

ACADEMIC PAPERS

Peña, Clara & Restrepo-Sánchez, Luz-Patricia & Kushalappa, Ajjamada & Rodríguez-Molano, Luis-Ernesto & Mosquera, Teresa & Narvaez-Cuenca, Carlos-Eduardo. (2015*). Nutritional contents of advanced breeding clones of Solanum tuberosum group Phureja.* LWT - Food Science and Technology. 62. 10.1016/j.lwt.2015.01.038.

Breeding differently: participatory selection and scaling-up innovations in Colombia Potato Research 2018 Teresa Mosquera Vásquez and David Cuéllar Gálvez Universidad Nacional de Colombia https://doi.org/10.1007/s11540-018-9389-9 IC36-1643402171-209589

Identification of Novel Associations of Candidate Genes with Resistance to Late Blight in Solanum tuberosum Group Phureja . Álvarez María F., Angarita Myrian, Delgado María C., García Celsa, Jiménez-Gomez José, Gebhardt Christiane, Mosquera Teresa. Frontiers in Plant Science. 2017. https://www.frontiersin.org/article/10.3389/fpls.2017.01040

Mosquera T, Alvarez MF, Jiménez-Gómez JM, Muktar MS, Paulo MJ, Steinemann S, et al. (2016) *Targeted and Untargeted Approaches Unravel Novel Candidate Genes and Diagnostic SNPs for Quantitative Resistance of the Potato (Solanum tuberosum L.) to Phytophthora infestans Causing the Late Blight Disease.* PLoS ONE 11(6): e0156254. doi:10.1371/journal.pone.0156254

POLICY PAPER

Equidad de género : una alternativa para la ruralidad colombiana. Olaya, Eucaris; Oriana Serna, Ambar; Mosquera Vásquez, Teresa. (2018) https://idl-bnc-idrc.dspacedirect.org/handle/10625/57341

VIDEO

More nutritious potatoes (Spanish with English subtitles) 2018 https://youtu.be/CPW-NwqkE2g

OTHER

Change story Shagras for life, from traditional home gardens to ancestral, agroecological and more nutritious shagras (2018) https://idl-bnc-idrc.dspacedirect.org/handle/10625/57339 In Spanish: https://idl-bnc-idrc.dspacedirect.org/handle/10625/57340

Country report: scaling up the production of more nutritious yellow potatoes in Colombia. Wiggins, Steve; Vargas Meza, Ricardo (2018-07) https://idl-bnc-idrc.dspacedirect.org/handle/10625/57263

View all related project outputs in the IDRC Digital Library

https://idl-bnc-idrc.dspacedirect.org/browse?type=project&value=108125

QUICK FACTS

Project location(s): Colombia
Institutions: McGill University (Canada); Universidad Nacional de Colombia (UNC) (Colombia)

Project duration: November 1, 2015—March 1, 2018
Project budget: CA$ 1,497,700
Project number: 108125

THE CANADIAN INTERNATIONAL FOOD SECURITY RESEARCH FUND IS JOINTLY FUNDED BY GLOBAL AFFAIRS CANADA AND THE INTERNATIONAL DEVELOPMENT RESEARCH CENTRE.