

# Stories of change

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## Healthier and more nutritious potatoes for food security in Colombia

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### Key messages

- Innovative partnerships between Canadian and Colombian researchers have generated specific solutions to problems faced by potato farmers in Colombia.
- Three new improved cultivars of yellow potatoes - with higher nutritional content, increased resistance to late blight disease, and greater yield - have been developed and delivered to 650 farmers.
- Public institutions and universities in Colombia have gained new skills and tools to promote food security in their country.

Colombia are low yielding and have high susceptibility to late blight disease. Additionally, researchers found that Nariño is Colombia's second most food insecure region, affecting up to 90% of households in rural areas (Del Castillo Matamoros *et al.*, 2014).

At the same time, Colombia does not have available disaggregated data on the nutritional status and dietary practices of its inhabitants. This impedes the implementation of differentiated public policies to improve food and nutritional security based on the characteristics of each community.

In this context, the Universidad Nacional de Colombia and McGill University, in collaboration with the University of New Brunswick and the International Potato Center (CIP), developed new potato cultivars with improved nutritional content, higher yields and superior agronomic qualities. Through a participatory selection process, researchers collaborated with native families of Nariño and participants in Farmer Field Schools (Escuelas de Campo de Agricultores - ECA), led by the local organization Fundelsurco. The project

### Context

The potato is one of the most important staple foods in the diet of the Colombian population, representing a significant source of low-cost calories for families. However, yellow potato varieties grown in the Nariño region in southern

complemented this process with nutritional and commercial research to explore the feasibility of using these new varieties extensively.

## Emerging outcomes

### New potato cultivars: improved nutrition and greater yield

Potato cultivars developed by the project contain up to 19% more iron and 17% more zinc, when compared to commercial varieties of yellow potato currently consumed in the country. Iron and zinc are found in foods of animal origin, but these are not always easily accessible. These new potato varieties have become a sustainable option to offset deficiencies in micronutrients.

In addition to improved nutritional content, these new varieties are twice as resistant to late blight disease and have shown higher yield when compared to commercial potato crops. As a result, they have the potential to increase farmer income by 18% (Figure 1). Seeds from the new varieties have already been distributed to 650 farmers for the next planting season.

### Increased awareness of women's roles in the family and the community

Enhancing food security not only requires improved agricultural products but also deep social changes. To respond to this need, the project fostered the establishment of *Espacios de encuentro* (meeting spaces) within the existing Farmer Field School programs. Through the research process, farmers - both women and men - improved their capacity for agricultural production and selected the best potato cultivars according to their agronomic conditions and culinary features. At the same time, the farmers had the opportunity to collectively reflect on the roles that men and women play in the family, recognizing existing differences and gaining understanding for enhanced gender equity.



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Feeding school children with new potato cultivars increases the levels of micronutrients in their diets

“ I have seen that this type of work (that of women in the home) is very hard. A man's work is dedicated to just one thing. We are here for the harvest, whereas the woman has to be dedicated to many things: to parenting, to caring for the animals, and attending to visitors who come to the house.

A participant from Carlosama, Santa Rosa ”

The meeting spaces have contributed to women's empowerment in the research communities. Women have gained confidence in expressing themselves and sharing their concerns with community members about issues that are important to them, such as domestic violence. Practitioners and farmers participating in the agricultural education activities also increased their awareness of the multiple roles that women play in family life and agricultural work.

In addition, research activities with women led to the recovery of ancestral recipes and culinary knowledge in seasoning food naturally rather than using artificial, high sodium condiments.

	Income	–	Costs	=	Profit
<b>Improved potato (Criolla Sua Pa)</b>	COL\$42,932		COL\$9,658		COL\$33,274
37.5 tons per hectare	↑ 12%		↓ 5%		↑ 18%
<b>Commercial potato (Criolla Guaneña)</b>	COL\$38,390		COL\$10,194		COL\$28,196
33.5 tons per hectare					

Figure 1: How much more can a farmer earn with the new potato cultivars?

## Public institutions and universities gained capacity to promote food security

The Colombian Institute for Family Welfare (Instituto Colombiano de Bienestar Familiar - ICBF), has taken the project's research findings on the nutritional status of the population in Nariño into account and, as a result, has given priority to rural communities in its policies and programs in this part of the country.

The ICBF used the data collection methodology developed by the project to construct the 2015 national nutritional status survey (Encuesta Nacional de la Situación Nutricional en Colombia). As a result, disaggregated and more accurate data will be available for other regions of the country. The ICBF also incorporated publications and materials developed by the project into its extension training programs. These included the manual *From the Garden to the Table (De la Huerta a la Mesa)*, which promotes healthy behavior and habits in carrying out daily household activities, and the manual *Knowledge and Flavours of the Andean Communities of Nariño (Saberes y Sabores de las Comunidades Andinas Nariñenses)* that highlights a variety of ancestral recipes recovered by the project.

Moreover, national entities and programs in Colombia such as the Ministry of Health, as well as the World Food Program (WFP), appointed project researchers to management positions in their organizations. This has allowed researchers to directly influence authorities such as the national committee on micronutrients (Comité Nacional de



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Farmers in Cuaical-Guachucal have harvested new potato cultivars

Micronutrientes), which coordinates policies for overcoming micro nutritional deficiencies in the Colombian population.

As a result, the potato improvement program (Programa de Mejoramiento de Papa) of the Universidad Nacional de Colombia now considers nutritional quality as one of the basic criteria in the development of new potato cultivars. This means that new varieties of potatoes in Colombia will not only have higher yield but will be more nutritious. To this end, information databases will be created containing the nutritional content and genetics of the different native Nariño potatoes. In the future, varieties may thereby be developed in a more time and cost-efficient manner.

The project has significantly strengthened the scientific capabilities of its researchers, and developed synergies between scientists from the three partner universities, as well as CIP, in the fields of natural and social sciences. Students at doctoral and masters levels have benefited from this research and learned how scientific knowledge can be applied to solve problems of food and nutritional insecurity in vulnerable communities.

This initiative also resulted in the launch of the first Master's Degree on Food and Nutritional Security in South America. This new master's program, to be taught at the Universidad Nacional de Colombia, is directed at decision-makers and public officials to increase their capacities on food security issues using a multidisciplinary approach.



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Women have achieved greater recognition within their families and communities

# Conclusion

This project is a concrete example of how a combination of scientific knowledge and the traditional practices of smallholder farmers can generate effective solutions to the problems of food insecurity in the short and medium term.

This work has contributed to improved food security through the development of new potato cultivars that are more resistant to late blight disease, require less fungicide and have higher nutritional value. Furthermore, project research shows that these improved cultivars have increased the income of farmers in Nariño, have high commercial potential and are well accepted by consumers. For these reasons, high quality seeds of these varieties have been handed over to the national program for certified seed (Programa Nacional de Semilla Certificada) and will thus reach producers in other regions of Colombia.

As a result of this research, national public institutions have given priority to the rural sector in their food security policies and programs. Project researchers will use these new opportunities to continue informing public policy in the future.

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Through participatory varietal selection, farmers have been able to select which new cultivars to grow

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