BIOFORTIFICATION IN LATIN AMERICA AND THE CARIBBEAN REGION

BIOFORTIFICAÇÃO NA AMERICA LATINA E CARIBE

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RESUMO - O objetivo deste trabalho é descrever o que foi alcançado em termos de biofortificação na América Latina e no Caribe (ALC). O Projeto HarvestPlus, continuando com as atividades iniciadas pelo AgroSalud, trabalha para melhorar o conteúdo nutricional de culturas como arroz, milho, feijão, mandioca e batata-doce, que são a base da dieta de muitos latino-americanos. O projeto também pretende avaliar o impacto nutricional, econômico e colocar sementes biofortificados nas mãos dos agricultores, favorecendo o desenvolvimento de novos produtos alimentícios. Como resultado deste trabalho, entre 2007 e 2015, 29 variedades foram liberadas na ALC.
Palavras-chave: impacto econômico, biofortificação, conteúdo nutricional.

ABSTRACT - The aim of this paper is to describe what has been achieved in terms of biofortification in the Latin American and Caribbean (LAC) region. Continuing the work initiated by AgroSalud, the HarvestPlus Project has been working to improve the nutritional content of crops such as rice, maize, bean, cassava, and sweet potato, which are the base of many Latin Americans' diet. It also seeks to evaluate their nutritional and economic impact and place biofortified seeds in farmers' hands, thereby fostering the development of food products. As a result of this work, between 2007 and 2015, 29 varieties were released in LAC.
Keywords: economic impact, biofortification, nutritional content.

INTRODUCTION

In 2005, a consortium of institutions called AgroSalud was created for the purpose of improving nutritional food security in LAC by means of the consumption of the useful production of biofortified crops. It worked in 14 countries of LAC and was financed mainly by the Canadian International Development Agency (CIDA). When financing for AgroSalud ended in 2010, HarvestPlus, which was already working in Asia and Africa with the same focus and goal, decided to continue with the work in LAC starting in 2012, serving the poorest communities of the region. This made it possible to expand the biofortification of crops in various Latin American countries and to align the projects with those which are proposed in Sub-Saharan Africa and in South Asia. The aim of this paper is to describe the past and current situation of biofortification in LAC.

METHOD

Continuing the work initiated by AgroSalud, HarvestPlus has been working to improve the nutritional content of crops such as rice, maize, bean, cassava, and sweet potato, which are the base of many Latin Americans' diet. It also seeks to evaluate their nutritional and economic impact through experimental and quasi-experimental methods and place biofortified seeds in farmers' hands using different models (ex. seed banks), thereby fostering the development of food products. As a result of this work, between 2007 and 2015, 29 varieties were released in LAC (NUTTI& GONZALEZ, 2015). Countries such as Nicaragua, Panama, and Cuba have made biofortification part of their national food and micronutrient security agenda. In 2012, stage II was initiated, and some countries were prioritized based on their micronutrient deficiencies and their consumption of these crops. Guatemala and Nicaragua are progressing in evaluating and multiplying promising varieties; Honduras, El Salvador and Belize will likely join in 2015 when biofortification workshops will be held.

RESULTS AND DISCUSSION

In Guatemala, 74,268 pounds of seed of maize variety QPM ICTA_Maya, as well as 4,879 pounds of seed of Super Chiva, a bean variety with high iron content, have been delivered across the whole country benefiting more than 13 thousand producers in the first case and more than one thousand in the latter (Table 1). A consumer acceptance study of this variety (Super Chiva) in the northwest part of the country showed marginally positive acceptance compared to the traditional variety (Table 2). A management committee was also established with the participation of public sector institutions, and of national and international NGOs.

Table 1. Number of beneficiaries of improved varieties in Guatemala

Institution (delivery)	Super Chiva	QPM ICTA Maya
MAGA	1.020	12.286
IICA	22	454
Semilla Nueva	0	265
TOTAL	**1.042**	**13.005**

Source: Author's

Table 2: Mean economic rating of bean varieties (northwest Guatemala)

Variety	Average WTP± S.D.(Quetzals)
Super Chiva	
HIB (T1)	4.83±0.71
HIB (T2)	4.96±0.83
HIB (T3)	4.89±0.76
Traditional Variety	
Traditional (T1)	4.70±0.72
Traditional (T2)	4.67±0.74
Traditional (T3)	4.67±0.71

Source: Perez, Oparinde, Birol, Gonzalez (author) and Zeller

In Nicaragua, at least 20 promising rice genotypes have been identified as having good production and agronomic traits and good potential under irrigated and/or rainfed conditions, besides being tolerant to pyricularia. Seed of bean variety INTA Ferroso y Nutritivo with higher iron content will be multiplied. A sensory evaluation of INTA Ferroso (which has 32% more iron and 6% more zinc) vs. the conventional variety INTA Cincuenteño was conducted. No significant differences were found between the acceptability and preference of these two varieties. A field manual for Sensory Evaluation of Biofortified Crops came out which describes, step by step, the methodology used to perform sensory evaluation during the data collection phase.

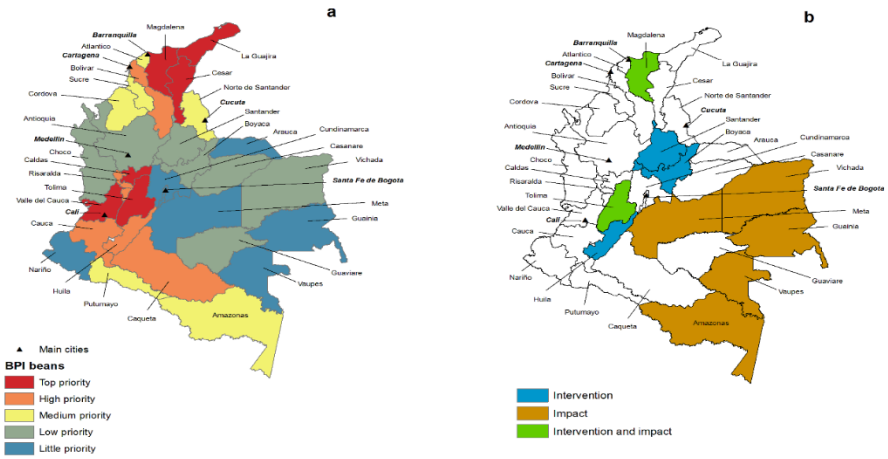
In Panama, the National Biofortification Program (AgroNutre), funded by the country itself, has introduced new maize varieties with higher zinc and beta-carotene content, as well as rice varieties with higher zinc content. It also has advanced bean lines with high iron content, such as NUA24 and NUA27. A partnership was established with FAO to write two recipe books and promote sweet potato production and consumption. A diagnostic of current production conditions and consumption of these crops is being carried out in an area of the country populated by native Indians

In Haiti, a biofortification activity planning workshop was carried out. Bean and cassava materials were sent to Haiti to be evaluated in the country's experiment stations, and a strategic alliance with the AKOSSA project was established, for the collection of national data in order to develop a work plan during 2015.

In Colombia, field trials of Andean and Mesoamerican bean varieties that may potentially be released in 2015 have been conducted. A Priorization Index of Subregional Interventions with Biofortification was established in Colombia (ex. BPI Beans-Iron see Figure 1), and processed

products (mixtures) based on biofortified crops (maize, cassava, bean, and rice) were developed in partnership with the private sector.

Figure 1. Bean-Iron/Colombia BPI



Source: Funes, Gonzalez, Perez and Zeller

In Bolivia, rice varieties with higher zinc content were evaluated for potential release in 2015–2016. Tests were conducted to determine the impact that soil zinc content has on a variety. In addition, 900 farmer surveys were carried out to find out which varieties they grow, their rice grain preferences and the crop's limitations.

The government of Belize presented interest in testing biofortified crops such as cassava, sweet potato and beans, in order to develop a sustainable strategy for food security in the country. During 2015, materials of these crops will be sent for evaluation.

CONCLUSION

Great efforts have been made over the past three years to obtain the described results, however there is a lot of more work that needs to be done to achieve our final goals.

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