



Resilient Nutritious Sweetpotato

View from the field: Challenges in international agriculture

Today's world is a hungry place. Some 870 million are undernourished; the number of those who suffer from "hidden hunger," or micronutrient deficiency, is pushing two billion. Undernutrition has actually increased in poor countries in both Asia and in many African countries, where the number of underweight children has almost doubled since 1980. In developing countries, the effects of hunger and malnutrition on the rural poor can be devastating. Vitamin A deficiency (VAD) is one of the most pernicious forms of undernourishment: it can limit growth, weaken immunity, lead to blindness, and increase mortality. Globally, 163 million children younger than 5 years suffer from VAD: 65 million in Sub-Saharan Africa and roughly 49 million in Asia.

The vast majority of the world's poor live in rural areas; their nutritional security depends upon productivity of their land, crops, and available agricultural technologies. Agriculture throughout Asia and Africa has not kept pace with the changing needs for more nutritious food. Only recently have national agricultural policies begun to look at nutrition as a primary goal, and agricultural research systems in many countries need to take this concern into account and be better connected to global science and to delivery systems that can reach the rural poor. New challenges are raising the bar further. Climatic changes threaten agricultural productivity, and global food price fluctuations increase the vulnerability of both rural and urban poor. Smallholder farmers urgently need agricultural technologies that can help them produce nutritious and marketable food and take advantage of economic opportunities from growing demand for food among expanding and urbanizing populations. Which crops and technologies will be most effective in achieving this transformation, and what are the best ways to enable millions of smallholder farmers to access and use them?



Transforming livelihoods with sweetpotato

CIP is a recognized global leader in the development and dissemination of biofortified, vitamin A-rich orange-flesh sweetpotato (OFSP). From our early R&D work with the crop we are now responding to increasing global demand for OFSP through a phased scaling-up program in Africa, Asia, and Haiti. Biofortification, which increases micronutrient content in sweetpotato or other crops through conventional breeding, sustainably builds micronutrient supply into the regular, daily food production and consumption patterns. This eliminates the need for continuous investments in the delivery of nutrition supplements. Over the next 10 years the program will focus on locations where malnutrition is prevalent and where sweetpotato has an inherent agronomic advantage as a short-cycle crop that requires few inputs and can produce comparatively high yields even under marginal conditions. This program will coordinate closely with the CGIAR Research Programs (CRP) in which CIP participates, particularly with Roots, Tubers and Bananas (RTB).

Better nutrition

OFSP, when coupled with nutrition education at the community level, provides vitamin A cost-effectively and at high levels of bioavailability to vulnerable populations, especially women and young children. In many environments, OFSP production from 500 m² can provide enough vitamin A for a family of five. It is a good source of energy, a number of B vitamins, and vitamins C and K. These are vital benefits for the majority of people affected by VAD who live in rural areas where conventional VAD interventions such as supplementation and food fortification are less effective. Building on a strong evidence base of the efficacy of OFSP and using tested and effective delivery systems, CIP is developing linkages with other biofortification and diet diversification efforts as well as with wider nutrition and education programs to realize the full nutrition potential of OFSP at large scale. Our global and regional breeding programs, particularly in Africa, will continue to generate improved vitamin A-rich OFSP varieties to support this effort, which will be complemented by interventions oriented to improve the availability of quality planting material

and sustainable crop intensification. Our progress on further biofortification of sweetpotato to increase iron and zinc levels will produce varieties with these traits in the coming years.

More income to women

OFSP's contributions to the livelihoods of the poor go beyond the crop's health and nutritional benefits. In most African countries, sweetpotato is almost exclusively a woman's crop and it can add significantly to women's income where market linkages are established. CIP has been working with women farmers and traders to expand these income opportunities and break into larger and more competitive urban markets with fresh OFSP roots. Demand among food processing companies to include OFSP and other sweetpotato as a major ingredient in a number of products is also increasing, both as a cost-effective wheat substitute and to capture a market premium for more nutritious products. In Africa, CIP works with large private sector food processors as well as with fresh roots traders to develop new value chains for OFSP and link women farmers to these opportunities. In Asia, these markets are well established and

rapidly diversifying. We are working with women farmers to strengthen their access to sweetpotato varieties and technologies that make them more competitive in highly dynamic market chains.

A new level of partnership

For sweetpotato to play its full role in the fight against malnutrition and poverty, it needs to become everybody's agenda. Working with diverse stakeholders including communities and donors, CIP is catalyzing action among a broad coalition of partners that is driving investment and implementation in key areas of R&D. Such innovative partnerships are central to our success. In the Sweetpotato Action for Security and Health in Africa project, for example, we have coordinated and sped up nutrition-focused sweetpotato breeding programs across Africa and pioneered collaboration with health centers and food processing for effective delivery and targeting of vulnerable households. Similar activities and coalitions are underway with the Horticulture Project in Bangladesh. Our partnership with the CIP-China Center for Asia and the Pacific will play a pivotal role in strengthening

capacity for sweetpotato—particularly in value chains—by linking pertinent Chinese experiences to demand in Asian and African target countries. All OFSP scaling-up projects will include specific capacity-building and technology exchange components that will fully use CIP's global reach to link up national and regional expertise. Through CGIAR Research Program platforms, synergies with related research in other crops and on agricultural systems allow us to accelerate our progress, further strengthen our partnerships, and achieve wider impacts.

Tapping the potential

Over the next 10 years scaling-up efforts will focus on resilient, nutritious OFSP varieties that are adapted to the local environment, perform well, and meet consumer taste preferences. Our OFSP programs should reach at least 15 million resource-poor households in Africa, Asia, and Haiti by enabling them to improve the quality of their diet by 20% and raise their crop income by 15%. These efforts should increase

production and intake of vitamin A-rich OFSP and future biofortified sweetpotato varieties, diversify use of sweetpotato, and expand gender-equitable market chains. This target includes at least 2.5 million households as direct beneficiaries in intervention areas and at least 12.5 million as indirect beneficiaries reached through follow-on dissemination by farmers, extension agents, and other stakeholders. To reach these numbers, we need active, ongoing engagement with our partners, support and buy-in of the full spectrum of our stakeholders and donors.

The CGIAR Research Program on Roots, Tubers and Bananas is an essential platform for this strategic objective.

To learn more about Resilient Nutritious Sweetpotato go to <http://cipotato.org/resilient-nutritious-sweetpotato/>



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