Sweetpotato improvement

The dramatic return on CIP's investment in sweetpotato improvement and virus control has set the stage for this crop to contribute more than ever to food security and equitable economic development in marginal areas across the developing world.

This nutritious food crop, grown mostly by low-income farmers, contributes to the diet and income of some 600 million people in the developing world, which accounts for 98 percent of the crop's global production. Not only does sweetpotato provide a staple food for the poor, but it is also rapidly becoming an important source of raw material for animal feeds, starch, and starch-derived industrial products.

Another dividend for farmers who use improved sweetpotato varieties is that it is proving to be an extremely effective approach to boosting food production without the excessive use of chemical inputs. As a result, researchers are helping to ensure that this valuable crop fulfills its enormous potential in combating food shortage, malnutrition, and poverty. Genetic improvement has led to the release of 21 sweetpotato varieties in targeted countries since the project started in 1996. In one example of the success of CIP's approach to improving sweetpotato, the application of virus cleanup techniques undertaken in two provinces in China in 1998 has generated net benefits of US$550 million.

Goals. This project aims at improving human health and income generation through the development and adoption of new sweetpotato varieties with enhanced postharvest characteristics, and the application of virus cleanup techniques for production of healthy planting material in low-input subsistence farming systems.

Output. CIP researchers will utilize the diverse reservoir of sweetpotato genetic materials held at CIP's state-of-the-art genebank in order to generate:

- enhanced sweetpotatoes with desirable quality attributes for table use, feed, processing, or resistance/tolerance to major biotic and abiotic stresses, readily accessible by national agricultural research system (NARS) breeders

- **new varieties with enhanced dry matter yield, beta-carotene content, and other desirable postharvest characteristics adaptable to low-input subsistence farming systems**
- **detection technology for major virus diseases, and virus eradication protocols applicable in developing countries**
- **new tools and knowledge that facilitate genetic improvement and seed production of sweetpotato**
- **strengthened capacity for sweetpotato improvement and healthy seed production in NARS**

IMPACT. CIP researchers identify the following among the benefits that will be derived from CIP's Sweetpotato Improvement and Virus Control Project:

- **increased sweetpotato productivity, ranging from 15 to 40 percent**
- **potential sweetpotato growth area expansion**
- **enhanced sustainability of sweetpotato-based production systems through adoption of varieties with better quality and adaptability to marginal environments**
- **greater availability of healthy planting material**
- **improved nutrition status by the adoption of new varieties with high dry matter and beta-carotene content**
- **higher profits for the rural poor through marketing**
- **diversified use of sweetpotato**
- **increased status of small-scale farmers, particularly women, working in sweetpotato-based cropping, livestock, and food systems**

The nature of this interdisciplinary project will link it closely to CIP's sweetpotato germplasm conservation and postharvest utilization projects.

THE PROMISE OF SWEETPOTATO. Sweetpotato may be one of the best hopes for African children whose health—and lives—are threatened by lack of vitamin A. Vitamin A deficiency is one of Africa's leading causes of early childhood death and is a major risk factor for pregnant and lactating women.

With this in mind CIP, together with about 40 international and local partners, has launched a project known as VITAA (Vitamin A for Africa) that aims to replace the white-fleshed sweetpotatoes presently grown by farmers in Africa with orange-fleshed, beta-carotene-rich sweetpotatoes.

Beta-carotene is used by the human body to produce vitamin A. The idea behind VITAA is that the new sweetpotatoes, "hand-picked" for traits acceptable to African palates (i.e. high dry matter content and less sweet flavor) and for their good yields and high beta-carotene content, will provide farmers and consumers numerous nutritional and economic benefits.

This innovative project is believed to be the first food-based approach to be used in the fight against vitamin A deficiency. Studies suggest that 50 million African women and children could benefit from the new orange-fleshed varieties.

A Ugandan woman crushes peeled sweetpotato roots for sun drying. The dried, crushed chunks, called *inginyo*, are later processed and consumed.

For more information, please contact Dapeng Zhang, CIP Project 5 Leader, Apartado 1558, Lima 12, Peru, or at d.zhang@cgiar.org. Information and other contact points are also available on our website: www.cipotato.org

The International Potato Center (CIP) seeks to reduce poverty and achieve food security on a sustained basis in developing countries through scientific research and related activities on potato, sweetpotato and other root and tuber crops, and on the improved management of natural resources in the Andes and other mountain areas
www.cipotato.org

CIP is one of 16 food and environmental research organizations known as the Future Harvest Centers. The centers, located around the world, conduct research in partnership with farmers, scientists, and policymakers to help alleviate poverty and increase food security while protecting the natural resource base. The Future Harvest Centers are principally funded through the 58 countries, private foundations, and regional and international organizations that make up the Consultative Group on International Agricultural Research (CGIAR)
www.futureharvest.org • www.cgiar.org