View from the field: Challenges in international agriculture

Asia today faces a tremendous food security challenge to feed its 4.3 billion people. Many Asian countries are also some of the lowest lying and most vulnerable to the extremes of climate change. Over-intensification from monocropping, including poor irrigation practices, has compromised the quality of arable land. Frequent droughts and flooding have increased salinity, degrading soil quality further. Population growth over the next few decades will continue to be concentrated in cities, and precious farmland will increasingly be lost to roads and buildings. Asian economies and farming systems are inextricably bound to a small number of cereals, as are Asian diets: more than 500 million of the absolute poor depend on rice. Rice, wheat, and other grains are traded internationally and are subject to market fluctuations, which have caused the price of food to spike dramatically in recent years.

Poor populations also continue to experience nutrition vulnerability due to low levels of diet diversification with limited micronutrient content and the relatively low economic value of cereals. Asia has the highest concentration of poverty worldwide, and high malnutrition rates among women and children under five are responsible for high levels of infant and maternal morbidity and mortality. Economic and social exclusion, largely due to gender, caste, and ethnic discrimination, intensifies the problems of poverty and malnutrition. Strategies to address food and nutrition insecurity here are urgently needed.
Transforming livelihoods with early-maturing potato

Several Asian countries are already diversifying their farming systems while making the intensification of existing systems more sustainable. This is helping to increase economic and nutritional value and ease the strain of food price inflation. Early-maturing agile potato varieties, particularly a 70- to 90-day potato resistant to heat and viruses and with good processing quality, are a profitable and nutritious complement to low-income cereals in sub-tropical lowlands and highlands of South China, North Vietnam, Bangladesh, India, and the plains of Nepal and East Pakistan. In Central Asia, the crop offers a valid alternative to fallow between two consecutive wheat crops, thus creating huge opportunities for potato cultivation. It can be adapted to a wide range of cropping systems in subtropical, temperate, and highland environments to help low-income consumers cushion the impact of food price inflation and achieve higher incomes from on-farm and added-value options. These potato varieties provide flexible planting and harvesting times without putting undue pressure on dwindling land and water resources.

Stronger alliances and partnerships to enrich and sustain impact

CIP’s program to promote early-maturing potato aims to improve systems productivity and farm incomes of at least seven million households throughout the region. Good quality seed or resilient varieties are in short supply in Asia and greatly limit potato production in the region. To overcome this serious bottleneck we will work with local, regional, and national partnerships to develop elite, tropically adapted bred populations and candidate potato varieties with short growing seasons of 70–80 days in subtropical climates and 90–100 days in temperate ones. CIP and its partners will make available necessary early-maturing varieties with traits for resistance to biotic and abiotic stress, including those required by the market and processing industry, as well as those preferred for home consumption. We will help our partners build capacity and scale up the use of research products for accelerated breeding, improved seed delivery, diversification of value chains, and ecological management practices—especially more efficient use of
precious water resources. Collaborative research on the early-maturing potato will explore sustainable cultivation practices and the environmental impact of introducing the potato on cereal-based cropping systems of Asia. This program will coordinate closely with the CGIAR Research Programs (CRP) in which CIP participates, particularly with Roots, Tubers and Bananas (RTB).

We will establish strategic alliances for going to scale and assess their efficacy and return on investment. Trade-off analysis in terms of labor, nutrients, water, and other input use will be measured to assess the beneficial impact of potato-related interventions on the four key elements of food security: food availability, accessibility, utilization, and vulnerability. Agricultural research institutes, universities, and government and nongovernmental organizations are essential to the development and adaptation of technologies and practices to the needs of smallholder farmers, especially poor and female agricultural workers. Studies of value chains and networking with their key actors will help us to identify gaps, bottlenecks, and opportunities. We will cultivate private–public partnership chains for contract farming and buy-back mechanisms to enhance processing of potatoes and ensure income of farmers and buffer years of overproduction. There are opportunities to develop and deliver intensive training to farmers who need greater awareness and skills of processing requirements through improved technology options that support agricultural diversification and strengthened rural institutions engaged in market value chains.

Tapping the potential

Tolerant to high temperatures and resistant to major virus diseases, the resilient, competitive potato varieties, together with appropriate crop and system management practices, can be incorporated into diverse cropping systems of subtropical lowland, highland, and temperate regions. Their specific postharvest qualities will address current producers’ and market needs as well as food security for vulnerable households. They can bring new areas under potato cultivation in cereal-based systems and increase overall food productivity. Our interdisciplinary approach to research
for development will contribute to the analysis and design of ecologically intensive, sustainable agricultural production systems involving potato in Asia. Integrative solutions will be a priority for the region as it braces itself for the anticipated rise in global population, the growing prospect of major shocks from climate change, and the impacts on society and natural resources from ongoing urbanization and rural dislocation. The CGIAR Research Program on Roots, Tubers and Bananas is an essential platform for the agile potato. It will make an important contribution to other CGIAR research programs, such as Dryland Systems, Humidtropics, Water, Land and Ecosystems, and Climate Change Agriculture and Food Security.

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To learn more about Agile Potato go to http://cipotato.org/agile-potato-for-asia/