



Seed Potato for Africa

View from the field: Challenges in international agriculture

At first glance, the problem might be hard to spot. The broad, fertile highlands of East, Central, West, and Southern Africa are blessed with a temperate climate and generally dependable rains. These are ideal growing conditions for potato, a well-established, nutritious crop with high market demand. But look closer and the challenges appear in sharp relief. Rising populations and growing cities are shrinking landholdings, pressuring small-scale farmers to increase farm incomes in order to offset the loss in acreage. For this region's six million smallholder potato farmers, potato is one of the few choices for cash crops on farms as small as half a hectare. Troubling is that many farmers are trying to meet the growing demand for potato by expanding the areas under production rather than tackling productivity constraints. This is costly and inefficient. Yields range from 6 to 10 t/ha, far below attainable yields of 25–35 t/ha and the 2010 global average of 17.4 t/ha. Moreover, farmers' knowledge of good agronomic practices, which could boost potato yields and marketability, is uneven.

The single major bottleneck to increasing productivity is farmers' limited access to quality seed potato of suitable and more nutrition varieties and biofortified with micronutrients. Farmers in this broad area of Africa tend to grow potatoes in very close rotations or even, in some cases, continual mono-cropping. As a result, diseases accumulate in crops and soils, yields decline, and farmers are left with less to sell. Another problem is that seed sourced from markets or farmer's own fields is also prone to diseases, which can build up and spread in farmer-saved seed stocks and the seed system in general. Farmers often are unaware of how to select quality seed or use good agricultural practices; many have limited capacity for storing healthy potato. Seed certification standards exist but are difficult to implement in practice. Many national policies do not recognize alternative approaches and more practical quality standards, such as Quality Declared Planting Material, or efforts to maintain quality seed in farmers' own fields. Access to quality seed is limited further. Policy advocacy at national levels for more practical quality standards is sorely needed.

Transforming livelihoods with potato

For more than 40 years, breeding for adaptive and disease-resistant traits has been a defining pursuit at CIP, which has an inventory of advanced materials with demanded traits available. These traits include resistance to diverse diseases such as late blight and various viruses, drought and heat tolerance, and high levels of iron and zinc. However, having good varieties is not enough when the supply of planting material is limited, or when conventional multiplication usually takes several generations to produce high-quality seed. Ineffective seed dissemination schemes further delay seed's timely availability. Farmers' inability to access quality seed of potato varieties with desired traits undermines all investments and innovations in breeding for new varieties.

Accelerating the multiplication of high-quality seed and increasing its supply to smallholder potato farmers have been critical to breaking the seed bottleneck. The centerpiece of this effort is the three-generation (3G) seed multiplication strategy that can reduce the number of specialized multiplications from the conventional

five generations to just three. A three-year pilot project implemented by CIP and its national partners pioneered the 3G approach and supported the development of rapid multiplication techniques (RMTs) in Kenya, Rwanda, and Uganda. More than 15,000 smallholder growers also gained knowledge and skills on potato production technologies and best practices, and saw average yields increase by 20%. Results from similar projects in other African potato-growing countries reveal that decentralized multiplication, on-farm seed maintenance, and capacity building can improve farmers' access to quality seed.

A new level of partnership

An efficient seed system will ease the seed potato bottleneck by accelerating much-needed access to and adoption of varieties with in-demand traits. But seed systems, if they are to be sustainable, need further private sector engagement, which includes creating entrepreneurial opportunities for young and female farmers. Part of the success of the 3G approach came from targeted, strategic private-public partnerships

all along the seed value chain. This has spurred increased investment by the private sector in seed potato production as it responds to high demand for seed. And although 3G initiatives have since expanded into Angola, Ethiopia, Malawi, Mozambique, and Tanzania with promising results, private sector involvement is still lagging. Africa's overall improved investment climate and e-commerce offer attractive opportunities in a stronger seed potato value chain that continues to mature.

CIP's traditional partners are essential for adaptive research on and implementation of RMTs for in-vitro, minituber, and field generation seed categories. They play a critical role in building persuasive business models around socioeconomic and cost-benefit analyses and willingness-to-pay studies. To continue to attract critical private sector investment, we need to understand current and shifting user preferences and demands along potato value chains to address changing food habits. We will promote activities to increase the use of seed and ware potato through identifying, adapting, implementing, and documenting effective methodologies to raise awareness of the value of potato, quality seed, and

improved varieties. Similarly, adaptive research into technologies for on-farm seed quality management, integrated crop management, and postharvest storage for seed and ware potato producers will revolve around national agricultural research systems and advanced research institutions.

Tapping the potential

CIP's 10-year goals are ambitious but realistic. In close collaboration with a wide set of partners, CIP has pledged to improve the livelihoods of at least 600,000 smallholder households in potato-growing regions of Africa by the use of high-quality seed of robust, market-preferred and biofortified varieties. We expect farmers to increase potato yields to 15 t/ha and incomes of at least US \$800/ha per season. Multiplier effects will benefit an additional three million households. The initiative will exploit the crop's largely untapped potential, creating entrepreneurial opportunities for all levels along the seed value chain, with a special focus on women and youth farmers. The approach includes testing and implementing of methodologies

to generate innovations on large-scale production and use of quality seed, as well as on effective linkages among value chain actors, paying special attention to private companies. We will identify, document, and promote replicable and scalable methodologies to reach new areas and users with suitable varieties. This program will coordinate closely with the CGIAR Research Programs (CRP) in which CIP participates, particularly with Roots, Tubers and Bananas (RTB).

The CGIAR Research Program on Roots, Tubers and Bananas is an essential platform for Seed Potato for Africa.

To learn more about Seed Potato for Africa go to <http://cipotato.org/seed-potato-for-africa/>



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