

The Business of Plant Breeding

Market-led approaches to new variety design in Africa

Policy Implications

DEMAND-LED BREEDING



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Adopting a more demand-led approach to plant breeding to respond to market requirements has several policy implications. These need to be addressed by governments in many countries of Africa and are summarised below.

1 New crop varieties can drive sustainable economic development and agricultural transformation in Africa

Moving food and agriculture from low productivity in smallholder systems to more market-driven systems so that small scale producers can access markets is a high priority for many countries of Africa (Figure 1). Achieving this transformational change requires an enabling policy environment that encourages both public and private sector investments and public-private partnerships. It also requires the availability and adoption of new agricultural technologies as a basis for sustainable increases in productivity. Agricultural transformation also needs to address overarching issues such as biosecurity, climate change, the important role of women in food and agriculture and youth unemployment. Within this spectrum, a portfolio of new crop varieties that meets emerging market demands can be a driver of economic development and agricultural transformation in countries of Africa.

2 Making the business case for investing in plant breeding is critical for success

Decisions on investing in crop improvement as a potential driver of agricultural transformation should be made on the basis of a business case that demonstrates prospective benefits and beneficiaries and potential returns on investment. Plant breeding in publicly-funded research institutes should be viewed increasingly as an investment which generates a return on investment, as it is in the private sector, rather than as an R&D cost centre. Who benefits can be an issue if and when public sector investments lead to private sector benefits, without some cost and benefit sharing arrangements between the public and private sectors. As private sector investments in the food and agricultural sector increase, there is scope for more public-private partnerships in plant breeding in Africa. There is experience in the transition of public breeding to private sector varietal development in countries beyond Africa that may provide some insights here.

3 Designing successful new varieties requires foresight analysis and market research to understand future client needs

A demand-led, new variety design process requires better understanding of the needs of clients throughout the value chain, from producers through to consumers. Various clients will have different requirements in a new variety, hence a portfolio of varieties is likely to be required to meet the varied needs of farmers, consumers, processors, export markets, etc. rather than over-emphasis on a few individual varieties that address only yield and on-farm productivity constraints.

4 New variety design sets priorities and targets for market-demanded traits

The design process determines priorities amongst the many traits requested by producers, processors and consumers. A new variety design combines the most critical market-demanded traits with essential productivity traits that are scientifically and technically feasible using modern plant breeding methods (Figure 2).

5 Streamlining regulatory processes and making timely decisions on varietal release

Early engagement of plant breeders with national regulatory officials is essential to ensure that new varieties will meet regulatory requirements, especially if the new varieties contain innovative, consumer preference-based traits that are different from characteristics in current varieties (e.g. changes in colour, taste, and/or nutrient content). Timely decision-making on regulatory reviews and the varietal registration process is a comparative advantage to a country when transforming its agricultural sector.

Also, greater regional/sub-regional harmonization of regulatory systems and regional variety registration procedures would be a considerable advantage to all countries in ensuring the timely release of new varieties. It would also reduce the cost of regulation and strengthen the case for developing varieties that may be suitable for farmers and markets in several countries with similar agro-ecosystems. There are some regional regulatory approaches in operation in West Africa, through ECOWAS; however, sub-regional harmonisation is still under discussion in Eastern and Southern Africa.



Figure 2

Trait Prioritization

Willingness to pay price premium

Opportunity to grow market share

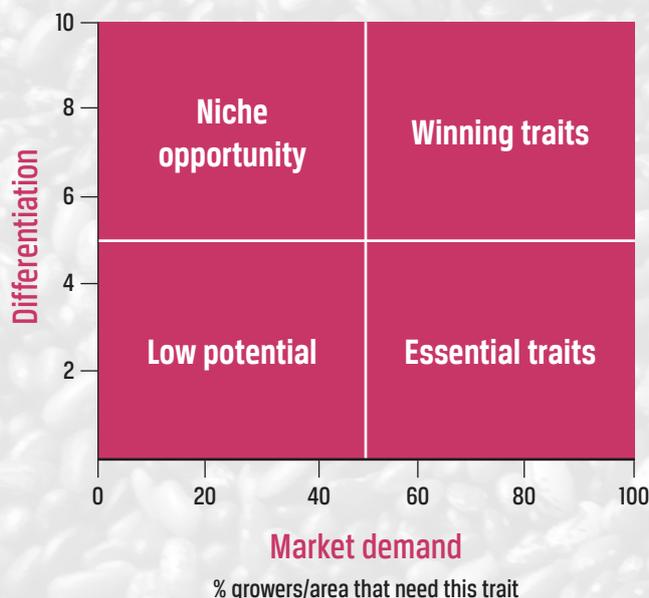
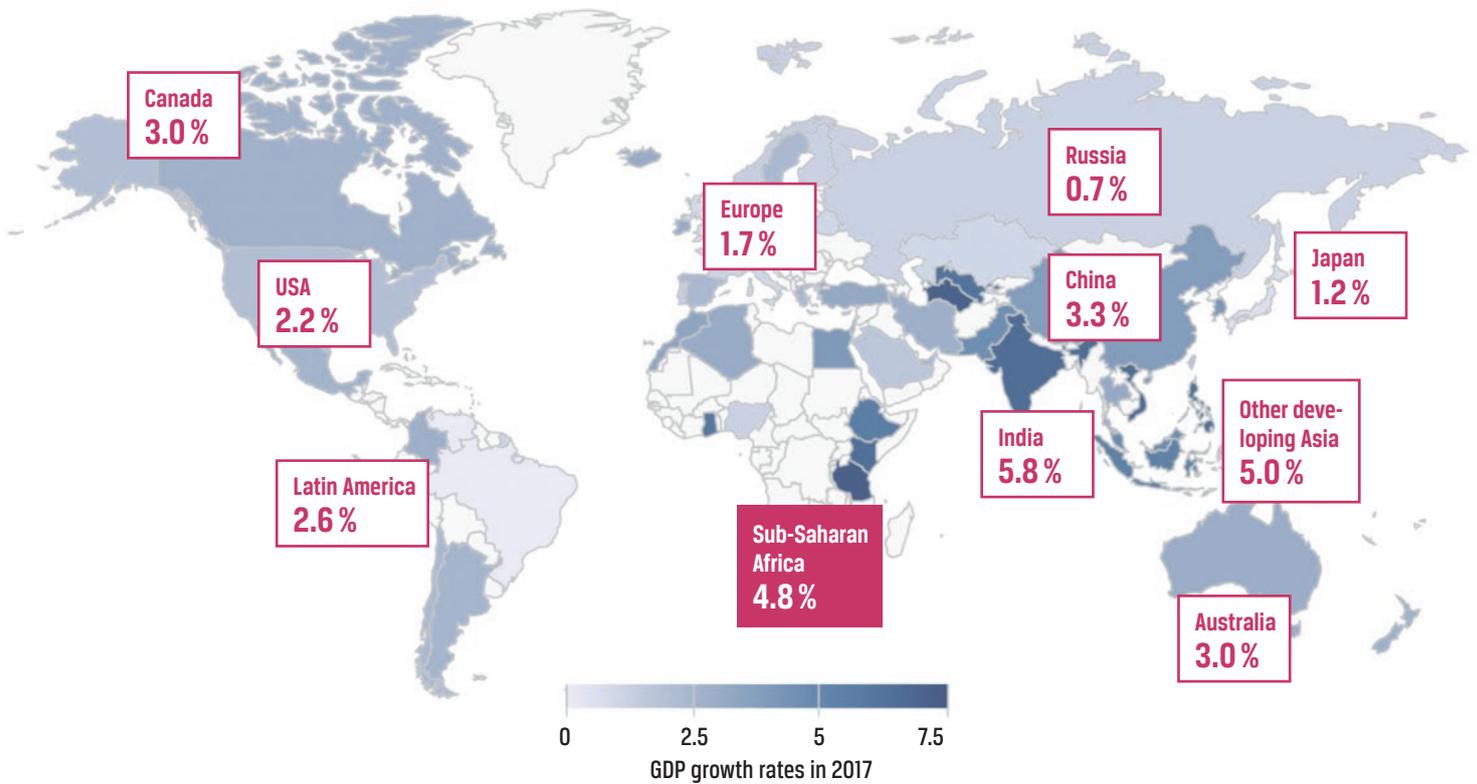


Figure 1

Gross Domestic Product Growth (2017–2021): Africa and Asia leading

Optimism in African agriculture exists ...



Source: The Conference Board Global Economic Outlook 2017

... through significant agricultural transformation

6 In-country seed system development is essential

Quality seed of new varieties needs to be available and affordable to small-scale farmers. This is challenging in most countries of Africa, since few countries have well-established and sustainable seed systems. Private sector engagement through local seed companies is the most effective way to ensure a sustainable seed system. However, seed companies obtain a return on their investment where they can sell sufficient quantities of seed or can sell seed in conjunction with other agricultural supplies. This seed supply model works for crops such as hybrid maize in countries where there is a large market for hybrid seeds. It is more difficult to develop a successful system of seed supply for other crops important for food and nutritional security and income, such as beans, cassava or sweet potato. Finding innovative remuneration models for private sector engagement is more challenging for these crops. Potential public-private partnerships need to be explored so that new seeds of publicly bred

varieties can reach millions more farmers and grow the market for home consumption, local and regional markets and potential export markets.

7 Measuring success by tracking new variety adoption in Africa

Accurately tracking the distribution, adoption and scaling up of new crop varieties across many countries, over several seasons and in multiple environments of Africa is a challenge. At present, this varietal tracking is largely based on seed sales, farmer surveys and/or expert opinion. New technologies to monitor varietal adoption should be considered during new variety development, such as: the inclusion of molecular markers within a variety to confirm its identity, or the use of drones to distribute new seeds to remote areas and monitor seed distribution. Demonstrating successful variety adoption provides confidence to public and private investors and builds the case for future investments in African crop improvement.





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