Scaling Success: Linking public breeding with private enterprise

Jacinta Majimbo proudly surveys her small plot of lush green and uniform bean plants. She pulls back the leaves to reveal an abundance of healthy pods.

"This is good seed," Jacinta says. "Before, I would only buy mixed seed from the local food market, and the yield was poor, maybe 5 kilograms. With this bean, KK8, I can expect to harvest up to 20 gorogoro (40 kilograms)." She's looking forward to a bumper harvest.

By way of demonstration, she points to a smaller plot of unhealthy looking beans with yellowing leaves and few pods. "I saw a bean at the market that was new to me, so I decided to experiment with it. You can see it is not good. I won't try it again."

For Jacinta, a farmer in western Kenya's Bungoma District, the advantages of harvesting an additional 35 kilograms of beans each season are obvious. "It provides more food, and I can sell some to pay school fees and other expenses," she says. "KK8 has made a big difference."

This large, red mottled bean resembling a popular local variety was released in 2008 by the Kenya Agriculture and Livestock Research Organisation (KALRO). KK8 is resistant to bean root rot, a disease that has devastated bean crops across East Africa. It also gives high yields, matures early, and then sheds its leaves, putting nutrients back into the soil and making the beans easier to harvest. In addition, the KALRO bean cooks quickly and tastes good.

But like many farmers, Jacinta had never heard of it or been able to benefit from it until 2 years ago. Then, a new public-private partnership, brokered by the Syngenta Foundation for Sustainable Agriculture (SFSA) and led by KALRO, started paying off by getting improved bean varieties into the hands of more farmers.

Bean seed bottleneck

As in many countries across sub-Saharan Africa, Kenya's breeding and seed systems for commercial crops, such as maize, are driven by the private sector. Companies ensure that quality seed is widely available through agro dealer networks. Beans, however, have been relatively neglected. While ranked as one of

Kenya's most important food crops, second only to maize, they haven't enjoyed the same success.

For beans, breeding, seed production and distribution have largely remained in the public domain. Until recently, KALRO was the only organization producing seed of KK8 and other improved varieties. Officials there worked with a small network of farmers trained as seed multipliers.

Reuben Otsyula is a bean breeder at KALRO's research station in Kakamega. Under his guidance, use of certified bean seed rose from 2% in 2008 to 5% in 2012 based on area planted. But despite the growing popularity of KK8 among KALRO-linked farmers, overall take-up remained slow.

A step-change was needed to deliver the variety to more farmers. "We knew we needed to involve the private sector," says Joyce Malinga, director of KALRO's Food Crops Research Institute. "Companies have the resources, land, and dealer networks needed to scale up seed production and distribution." The question was how to interest the private sector, given the prevailing assumption that farmers will never buy seed if it is not hybrid. Despite bean imports of 592 tons in 2013, many potential partners felt that there was no Kenyan market for bean seed.

"It's a chicken and egg situation," explains Ian Barker, head of agricultural partnerships at SFSA.

"The private sector needs to know there's a market in order to invest in seed production. But without seed or widespread awareness among farmers that improved varieties exist, there is no proof of a market."

An emerging market

The catalyst for change came from catastrophe. In 2012, farmers in western Kenya were dealt a devastating blow. Maize crops, on which many rely

as their primary source of income and food, were decimated by a new disease.

Among these farmers were hundreds of thousands of smallholders working with One Acre Fund. They had staked their harvest on paying back their loans of improved maize seed, inputs, and training, which had so successfully provided them with bumper harvests in previous seasons.

Fortunately, One Acre Fund's insurance kicked in. But recognizing the danger to incomes and food security of offering farmers a "one-crop" package, One Acre Fund quickly scaled up plans to diversify into other crops, such as beans, millet, and sorghum.

While One Acre Fund had already been testing different varieties of millet and sorghum, for beans they ran into a major hurdle: availability. "They were effectively waving a US$250,000 check in front of companies in exchange for quality bean seed," Ian Barker recalls, "but there was almost complete silence. Of Kenya's 35 active private seed companies, only three or four actually produced and sold bean seed, and not one could meet the demand. We wanted to bridge that gap and get the public and private sector to the table together."

At around the same time that One Acre Fund recognized the need to offer different crops to its clients, Jonathan Mayer saw the need for seed companies to diversify. Jonathan is an entrepreneurial farmer and joint owner of Bubayi Products Ltd., a family-run seed business in Kenya's North Rift Region.

"I saw what disease was doing to maize. It was wiping out entire harvests. Farmers needed access to alternative crops that weren't available at their local agro dealer. There was – and still is – a big gap in the market for bean seed."

Bubayi had the necessary infrastructure, land, and skills needed for quality seed production. More important, and in contrast with other companies, they were also willing to take the risk and invest their own money. With a ready market of 167,000 potential One Acre Fund customers and a growing interest in bean seed, it was a risk worth taking.

Building a partnership

Keen to see more farmers growing his improved varieties, Reuben Otsyula joined Bubayi and One Acre Fund at the table, sharing breeder seed for testing and selection. All the partners needed to be sure they selected a marketable, high-yielding variety.

While Bubayi tested for yield and disease resistance, One Acre Fund tried out the new seeds in their nursery and with farmers on their own plots: They selected KK8.

The seeds, which are certified by the Kenya Plant Health Inspectorate Service (KEPHIS) to ensure quality, are proving popular. In 2013, Bubayi supplied 100 tons of KK8 seed to One Acre Fund. The following year demand among One Acre Fund clients grew by 8%. "Bubayi is producing very good seed," says Otsyula.

The model, which relies on farmers buying seed on credit as part of a financial package of inputs, demonstrates that farmers are willing to invest in bean seed. It also shows that the inputs are paying off – One Acre Fund doesn't provide seed to farmers unless the loan-repayment rate is high.

Similarly, despite the likelihood that a farmer will only purchase seed every 3 years, as beans can be re-sown from the previous season's harvest, Bubayi's investment shows that they see bean seed production as potentially profitable.

Addressing challenges

However, more needs to be done to ensure that public-private partnerships like this one thrive. As beans become commercialized, both opportunities and challenges will need to be addressed. SFSA has brought in an international law firm, Sidley Austin, to advise KALRO and other national research organizations on licensing issues.

For instance, if the private sector starts multiplying seed on behalf of the public sector, there is an opportunity to ensure that companies are obliged to target and benefit smallholders, for example, by writing a caveat into the license requiring that seed must also be sold in small packs that smallholders can afford.

There are also concerns surrounding the protection of public goods; the issue of collecting royalties on new varieties will need to be addressed. But partnerships like those between KALRO and Bubayi illustrate that demand is there – and rising.

Future growth

On his 335-hectare farm in Kitale, Jonathan Meyer points out one of Reuben Otsyula's newer bean varieties, CAL194, which is similar to KK8. "We're excited about this new variety," he says. "KK8 yields 34 pods per plant, on average, which is good for a bush bean. CAL194 yields about 94."

"At the moment," he adds, "we have the only certified seed of CAL194 in the country. We're producing breeder seed for KALRO. Theoretically, we should be able to start selling seed to farmers in September 2017. One Acre Fund is already interested."

According to Joyce Malinga, Bubayi should have no problem selling the new bean when it is ready, despite growing interest from other seed companies to get in on the action. The unmet demand for bean seed in Kenya together with future opportunities provide a big enough market to attract more private seed companies.

"The Ministry of Agriculture is pushing for Kenya to enter the Indian bean market. So, as we go into 2016, the demand for bean seed is set to rise," Joyce declares. "All the seed companies have a big opportunity to make money, which means more bean seed getting to farmers. If we can keep the market growing, in 10 years, this will be a major success story for bean seed systems."

Back in Bungoma, Jacinta leaves her house for choir practice, proudly wearing her One Acre Fund t-shirt and bag. "Farmers who aren't with One Acre Fund are asking us for our beans. They see we sell them for a higher price, and they want to join. I would definitely try new improved varieties. I know we can do even better than this."

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