



Feed the Future Country Fact Sheet

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Farmers Fight Grain Loss With Purdue University Storage Solution



Faith Njoki/USAID

Julius Chirchir and his wife use hermetic bags on their farm in Trans Nzoia County, Kenya.

For farmers in Sub-Saharan Africa, a reusable storage bag can be the difference between making a living and struggling to make it to the next harvest. That's because improving food security is not just a matter of increasing food production: it's also a matter of ensuring farmers can safely and affordably manage their crops after harvest. Through Feed the Future, the U.S. Agency for International Development and Purdue University have collaborated to create a crop storage solution that's so effective, it's developed into an emerging market in Kenya.

Maize is Kenya's most important crop, and the country produces 2.9 to 3.4 million tons of it each year. Almost all families eat maize, and it provides feed for livestock. For many smallholder farmers, it is their only source of farm income.

Soon after harvest, smallholder maize farmers face one of their biggest challenges. Many experience huge losses because they lack suitable storage structures and proper knowledge to safely store their crops. Maize is often infected with pests or diseases like aflatoxin, a toxin produced by molds that develop when grains are stored improperly in humid climates and that can cause severe illness if consumed.

Postharvest losses are particularly severe in Kenya—up to 30 percent of total production—and drastically reduce the volume of maize available for consumption and trade. Lack of suitable storage also forces farmers to sell directly after harvest for a lower price because markets are flooded with grain.

Responding to these challenges, USAID and Purdue University pioneered maize farmers' use of an affordable postharvest technological solution: hermetic storage technology bags. The bags eliminate insects and molds by depleting oxygen levels and producing carbon dioxide within the storage unit, helping farmers keep grain marketable and consumable year-round.

Purdue's brand of these bags, known locally as PICS (Purdue Improved Crop Storage bags), were developed in West Africa

with Feed the Future support. At that time, PICS were designed for cowpea storage. Their use then expanded to millet, sorghum and maize in East Africa. PICS have proved to reduce losses by up to 90 percent in local trials across 22 counties. At about \$2.50 each, the reusable PICS bags are affordable, and farmers can recover the cost in one season.

Through Feed the Future training, demonstrations and media promotion, the word is spreading about PICS bags to farmers across the country and sales are rising exponentially. Since 2013, more than 1 million bags have been sold in Kenya—nearly 551,000 in 2016 alone. This is the equivalent of 90,000 megatons of storage capacity at a value of \$2.5 million. Partnerships with local businesses such as Bell Industries have further increased the availability and use of the bags. And for each PICS bag that Bell Industries sells, Purdue University gets a small royalty.

Moreover, the use of the bags is growing, and a number of new market entrants are providing farmers with even more options to choose from. Since the bag's introduction, four new companies have entered the market and are now producing and selling them. Today, in addition to PICS, there are Zero Fly, Agro-Z, Elite, and GrainPro-Super Grain bags, the latter of which are made by a U.S.-based company. All are high-quality products that are being purchased in the thousands by smallholder families and institutions across the country. In November 2016, all five businesses, USAID and the Government of Kenya participated in a national campaign to accelerate the adoption of the new technology.

Hermetic storage technologies offer a clear solution both on the farm and in the trade system. Beyond the effectiveness of the technology, the Feed the Future-Purdue University partnership succeeded in creating an emerging market for agricultural technology, providing local businesses with profitable opportunities and smallholder farmers with postharvest solutions that make sense for their yields and their pockets.