

Keeping weevils at bay with metal silos

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In Kenya, and particularly Eastern Kenya, weevils have been singled out as the major causes of post harvest grain losses. Poor storage facilities including substandard storage pesticides have aggravated the attack and losses.

Traditional cribs and gunny bags, the most common storage facilities can not guarantee protection against the larger grain borer that causes over 30 per cent of the losses, sometimes wiping out the entire harvests during severe infestations. They are not even effective against the common weevil that accounts for 10-20 per cent post harvest losses in the area.

However, a new technology is proving effective in protecting harvested grains from attack not only from these deadly weevils, but also from other insects and pests. Metal silos are airtight. It therefore minimizes oxygen inside killing any weevils or pests that may be inside. It also completely locks out any insect or pest that may want to invade the grains inside.

Metal silos are not only guaranteeing full protection against the destructive pests, they are promising to be the ultimate weapon for improving food security for small-scale farmers in eastern Kenya.

Aware of its potential, the Catholic Relief Services (CRS) initiated the Metal Silo Promotion Project in July 2005. The Project's main objective is to reduce post harvest on-farm grain storage losses in Machakos, Kitui, Mwingi, Kirinyaga, Murang'a districts. It is implemented by the Catholic Dioceses of Machakos, Murang'a and Kitui in collaboration with the Ministry of Agriculture and Kenya Agricultural Research Institute. It is co-funded by MATF (FARM-Africa) with funds from the Kilimo Trust, and CRS private funds.



METAL SILO TECHNOLOGY:
A visitor to the MATF stand admires a 6-bag metal silo on display. Prices of different silo sizes are also indicated.

Apart from causing losses, pests in stored grain are also linked to aflatoxin poisoning like the severe ones experienced in 2004 and 2005 in some parts of these districts.

Challenges

But while metal silo is a simple and effective grain storage technology, there are several challenges that require both innovation and creativity if poor farmers are to benefit from it.

One of the biggest challenges is the initial high cost of the Silo that varies according to capacity - from Ksh 3,000 for a one-bag capacity silo to Ksh 17,000 for a 20-bag capacity.

However, considering that the silos can be used for over 50 years, with minimum or no maintenance costs, they are much cheaper than the conventional storage technologies that cost Kshs 200 to 3,040 per season. The silos can also protect the grain in storage for a much longer period of time than the four months under the conventional storage systems.

One of the strategies CRS employed to ensure that needy farmers acquire the silos was to set up a revolving fund from where the farmers could borrow to buy the silos. The revolving fund was designed such that a farmer only raises 40 per cent down payment to qualify for 60 per cent loan.

But as the project learnt, establishing a revolving loan scheme is not enough. Farmers need to be sensitized on the loaning process if the scheme is to succeed. Alternatively groups should be selected on basis of exposure to Microfinance services.

Having sensitized the community on the effectiveness of the silos – through trainings, participatory evaluations and demonstrations - the project trained artisans on fabrication, use and maintenance of metal silo so that the silos are locally available to the farmers. This was accompanied with entrepreneur or business skills development for the artisans so that they fabricate and sell metal silos as a business.

Considering that the artisans may not be able to have adequate funds to fabricate the silos, the project advanced them 60 per cent of the cost of fabricating the silos, the balance to met by the farmer on completion and collection of silos.

While the dissemination approaches were very effective in promoting the metal silo in areas of intervention, there is still room for improvement that could increase the impact or adoption of the technology in the area.

For instance, it was felt that participatory evaluations should coincide with frequency of grain withdrawals by farmers. Selection of artisans should also be based on level of interest and scale of business.

While credit scheme or revolving fund enabled poor farmers access the technology, the 40 per cent down payment is very high and needed to be reduced. The period of repayment should also be increased to at least one year. The initial cost is still very high even with the credit scheme.

That the metal silo technology is feasible and effective is not in doubt. However to speed up adoption, it is also important to widen the target group from just individual farmers to include groups with grain storage enterprises.

Technology Dissemination

In supporting technology dissemination efforts, MATF facilitated the participation of the CRS at the 2007 Nairobi International trade fair. At the MATF pavilion, one representative of the CRS was at hand to explain and demonstrate the technology to keen show visitors, many of them practicing farmers from districts around Nairobi. Mr. Ephan's King'oo, a consultant with CRS had brought to the show ground three different sizes of the metal silos for demonstration purposes.

The smallest silo had a capacity of one (90 kgs) bag of grains, followed by a larger one with a capacity of 3 bags, and the largest had a capacity of 6 bags.

Mr. King'oo showed tent visitors the technology, demonstrating how the silos were constructed and sealed, and finally how the grain was prepared before being put into the silos for preservation. Ephans demonstrated to keen farmers the crucial steps required for the technology to work well.

“The most important thing to check before starting on the storage is the moisture content of the grains,” he enthusiastically explained.

After the grains have been harvested, they are usually laid out in the sun to dry before the actual storage begins. A farmer needs to confirm that the grains are completely dry before storing them in the metal silos.



METAL SILO TECHNOLOGY:
Mr. Ephan's King'oo (right) explains the “bottle test” method of checking grain moisture content to a keen show visitor.

“There is a simple method of checking this moisture content using a soda bottle,”

Ephans explains. “Just put a few grains in the bottle together with a fair amount of salt. Mix the contents of the bottle thoroughly for a few minutes and leave for a while.

If the salt particles are left sticking on the glass walls, it shows that they’ve absorbed some moisture from the grains. This is an indication that the grains are not yet dry, so further drying is required. If the salt particles do not stick to the glass walls, it’s an indication that the grains are now ready for storage in the metal silos.

After the grains have been put into the metal silo, Ephans demonstrated the last crucial step for the technology to work well. The container cover must be placed tightly onto the silo’s top then sealed with rubber tubing. This ensures that the silo will remain airtight for years to come and that no pests or insects can get into the container.

Quite a number of farmers were visibly impressed by the technology. Many were keen on purchasing the silos and Ephans gave them contacts of local suppliers from Kitui.

Local artisans in Kitui and Machakos were constructing the silos after training by the project implementers. However, one show visitor could not wait to get in touch with the suppliers. He purchased the 90 kilogramme metal silo from Ephans on the last day of the show.

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METAL SILO TECHNOLOGY:
Mr. Ephans King'oo pours grain into a metal silo after verifying its moisture content.