

The Improved Seed Storage Project

Overview of Briefs and Case Studies

Seed is the foundation for the production of cereals and grain legumes that underpins farm family food security and income across Africa and Asia. Throughout Africa, in particular, farmers themselves produce an estimated 80–100% of the seed of both local and improved varieties. A recognition of the centrality of farmer-managed seed suggests that research and development practitioners need to support this important system and seed source. Farmers typically produce seed and grain in the same field, although there can be wide variation between crops and cropping systems. Methods for seed selection also vary, as seed might be selected in the field or after harvest, or from stored grain only at the time of planting.

The importance of storing seed in a smallholder context

There are many advantages for farmers in being able to store their own seed. Using seed from their own stores means that: a) farmers can sow varieties whose quality and management requirements they know well; b) they can access seed without having to lay out cash (in contrast to spending for seed purchased from agro-dealers and local markets); and c) their stored seed is always available on time and just nearby. Unfortunately, farmers often struggle to prevent losses in stored seed that may impede their ability to maintain quality seeds for upcoming plantings. Among other constraints, stored seed may be attacked by insects and pests; or it may lose its ability to germinate, perhaps due to high temperature or too much moisture.

Investing in good seed storage, that is, investing in efforts to help farmers save their seed “at the front end” (preventatively), should be seen as a strategic investment. Particularly with vulnerable farmers and in high stress regions, better seed storage options may mean less need for emergency assistance when

times get tough “at the back end,” when drought or flood or other stresses mean that multiple sowings, or more seed overall, might be needed to ensure that farmers can adequately sow their fields.

On-Farm Seed Storage Project overview

Recognizing the need for more critical thinking on seed storage options for smallholder farmers, the United States Office of Foreign Disaster Assistance (OFDA), supported a series of grants from 2009–2013 examining diverse seed storage methods across six countries and diverse crops (Table 1). All country case studies are available separately (see reference section). A learning workshop was also held in April 2013 in Bujumbura, Burundi to document and socialize lessons learned across the varied initiatives (CRS 2013).

In terms of general findings, field programs indicated some advances in reduction of seed storage loss, improved seed quality (viability and vigor) and ultimately yield. As examples, in Mozambique, farmers’ combined use of 1.5 liter bottles, ash, and cooler box technology allowed for stabilized temperature



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and resulted in reported germination rate increases of 50–90% for maize (as fluctuations negatively impact germination). In Afghanistan, ventilation of traditional pit storage, rigorously combined with improved plant selection in the field and better seed handling practices (separating seed from tubers destined for consumption), cut potato storage losses down from 30% to 5% and resulted in marked yield increases, from 12 to 16 metric tons per hectare.

Table 1. Summary of seed storage interventions tested in OFDA-funded On-Farm Seed Storage Project: 2009–2013

| Country | Crop | Technology tested | Implementing partner |
|--------------|--|---|--------------------------|
| Afghanistan | Potatoes | Ventilate underground pits; improved seed handling practices (separating tubers destined for seed and consumption) | Catholic Relief Services |
| Burundi | Beans (with farmers also extending to maize) | Various hermetic storage products containers PICS*, GrainPro bags, Food oil cans, clay pots | Catholic Relief Services |
| Burkina Faso | Cowpea and rice | Various hermetic products, the main one being PICS sacks (multi-layer, made of 2 polyethylene bags), also plastic bottles and painted clay pots | Catholic Relief Services |
| Ethiopia | Maize, sorghum and groundnuts | Below- ground storage pits | Mercy Corps |
| Ethiopia | Maize | Modification of above-ground granaries and below-ground storage pits | Goal |
| Mozambique | Maize | Storage in 1.5 liter bottles, with ash and cooler box of clay/bamboo | Aga Khan Foundation |
| Timor-Leste | Maize | Metal drums | Mercy Corps |

* *Purdue Improved Crop Storage*

Seed storage briefs

These storage briefs aim to synthesize some of the technical lessons from field experience in testing and encouraging adoption of seed storage technology. Brief no. 1 focuses on seed quality and the principles of seed storage technology. Brief no. 2 takes a closer look specifically at hermetic seed storage. Brief no. 3 provides an overview analysis of the economics and promotion of improved seed storage options.

These briefs are intended to be practical guides for field managers and implementers who have to make concrete decisions around seed storage programs. They should help practitioners design better on-farm seed storage proposals in consultation with farmers, implement activities which better meet farmers' needs, and monitor and evaluate their activities more effectively. Each brief concludes with a reference section for further reading to encourage an ongoing learning process.

References

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Case study documents

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