

Doing things differently: Technical and institutional options for Post-Harvest Innovation (projects R7034, R8179 & R8460)

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Technology transfer context

Conventional approaches to technology transfer within small-scale farming systems have generally failed.

Recent approaches to scaling-up technologies – products and processes – point to its dependence on the activities and interactions of a diversity of key players and organisations, and place emphasis on ‘doing things differently’ to overcome institutional constraints.

‘Institutions’ here refer to the “mechanisms, rules and customs by which people and organisations interact with each other (i.e. the rules of the game)”

These ideas correspond with our experience. Promotion of an initially technology-oriented project – use of diatomaceous earths – has been expedited by the early and progressive enlistment of a diverse range of players (e.g. farmers, extension staff, regulators, policy advisors, private sector players, trainers, communicators etc). Engagement was built around local capacity-building, and the concept has since been formalised in the Post-Harvest Innovation Learning Alliance (PHILA).



Meeting storage needs

Farmers throughout sub-Saharan Africa suffer serious losses to stored produce due to insect damage. Such losses threaten household food security and force early sales at lower prices.

In 1998 trials were initiated in Zimbabwe (R7034) to explore whether inert dusts (known as diatomaceous earths [DEs]) might be used as grain protectants under small-scale storage conditions, and provide an alternative to conventional synthetic pesticides. Trials confirmed that imported DEs, Protect-It and Dryacide, were effective grain protectants for small-scale on-farm storage for periods up to ten months.

What are diatomaceous earths?

Diatomaceous earths are soft whitish powders formed from the fossils of aquatic planktons. After processing – mining, grinding and drying – these can be mixed with grain to kill insect pests. When DEs come into contact with insects they absorb the wax from the cuticle causing them to lose water, dehydrate, and die.

DEs have extremely low toxicity to mammals and are safe to mix with food. Industrial uses include: filtration agents to clarify fruit juices, beers and wine; fillers in paints and plastics; and as coating agents in fertilisers. In addition to imported commercial DEs, there is potential for exploiting local deposits in Tanzania, Zimbabwe and the region.

Following the successful trials in Zimbabwe further work to evaluate DEs was undertaken in Tanzania (2002–2005; R8179), where the devastating insect pest, the larger grain borer (*Prostephanus truncatus*), imported from Central America in the 1980s, was widespread.

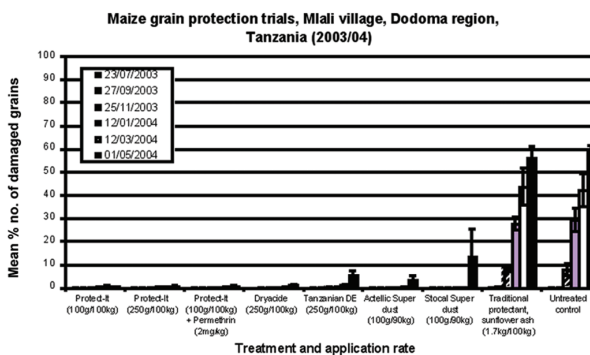
Farmers in Tanzania were demanding options for improved grain protection. Local treatments such as ash and plant materials were often ineffective. Use of synthetic pesticides was faltering due to poor compliance with application recommendations, while unscrupulous traders were selling fake/expired products. Non-treatment was not an option as grain becomes heavily damaged.

Trials were set up in Shinyanga, Dodoma and Manyara regions to test and compare the efficacy of different grain protectants (including DEs from African deposits). Comparative trials were run for three consecutive 10-month storage seasons, using maize, sorghum and beans.

Technical and farmer-focused findings

The graph shows how effective DEs are in protecting grain, performing as well as the synthetic protectants. The private sector is now using this data to secure the registration of DEs in Tanzania and Zimbabwe, before making them available to farmers.

The team also explored the diverse circumstances and post-harvest needs of different households. This research reveals that quantities of grain to be stored and sold, and treatment practices, differed enormously between households in the same locations. Confirmation of the diversity of the rural client-base highlights the importance for service providers to tailor recommendations as opposed to using a ‘one-size-fits-all’ approach.



Innovation systems

Hitherto post-harvest service provision and supporting research initiatives have focused on technology development, with less attention being given to understanding delivery system constraints, distinguishing between the needs and priorities of different households, or exploring farmers’ own research capabilities.

Recent approaches suggest that new products and processes are brought into economic and social use through the activities of a diversity of key actors and organisations, as mediated by existing institutional arrangements and policies – all together referred to as the innovation system.

The key challenge to effecting impact is perceived less in terms of devising new technologies – doing different things – and more in terms of improving how the innovation system works – doing things differently.

Post-harvest Innovation: Enhancing the interface between supply and utilisation (R8460; 2005–2006)

Rising to this broader challenge requires a different approach from that permitted by short-term projects with ‘stop-go’ funding regimes.

To this end the partners involved in the DE work in Tanzania and Zimbabwe have formed a learning alliance (LA) with the aim of establishing better ways in which organisations and individuals within national post-harvest innovation systems might work and learn together. Project interests include monitoring and evaluation, and promoting LA learning.

Learning alliances:

- Groups of individuals or organisations with a mutual interest in solving an underlying problem and scaling-up solutions.
- Bring together a wide range of partners with capabilities in implementation, regulation, policy and legislation, research and learning, documentation and dissemination etc.
- Represent part of the bigger whole, and thus capture some of the organisational complexity that constitutes the day-to-day realities of the innovation system.
- Comprise partners who are typically clustered at different ‘administrative’ (e.g. national, regional, district) levels – stakeholder platforms – within the innovation system.
- Aim to identify and breakdown the barriers that constrain learning – both across platforms (i.e. horizontally) and between platforms (i.e. vertically).
- Promote flexible and adaptive working practices, share responsibilities, costs and benefits.

Emerging experiences of the Post-Harvest Innovation Learning Alliance include that PHILA:

- is essentially inclusive, involving a diversity of post-harvest stakeholders;
- has provided wider engagement with new ideas for its members;
- has encouraged new working relationships;
- has more ‘clout’ than any single agency, giving weight to its case study work;
- relies on and encourages use of Information Communication Technologies.

Project websites: Diatomaceous Earths www.nri.org/de/
 Post-Harvest Innovation Learning Alliance (PHILA) www.nri.org/PHILA/ (under construction)
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