

# INNOVATIONS FOR SMALL SCALE FARMERS



**CRSP**  
COLLABORATIVE RESEARCH  
SUPPORT PROGRAMS

**Collaborative Research Support Program (CRSP)** researchers have developed many innovative technologies to help smallholders enhance food security, nutrition and agricultural productivity. These innovations help farmers improve product quantity and quality, facilitate their entry into the market, and help them to manage the risks associated with farming.

## Food safety and nutrition

Reducing human disease and death from **afatoxin exposure** has for many years focused on interventions to reduce contamination of grains and peanuts at the production level. Research from the **Peanut CRSP** demonstrates in contrast that using a **clay food additive**, Novasil™, post-harvest can significantly reduce toxicity and does not interfere with vitamin or micronutrient utilization. Moreover it removes the burden from smallholder farmers to find cost-effective production and storage solutions to reduce contamination.



TIFFANY WOODS/AQUAFISH CRSP

**Tilapia farmers** often use food containing the synthetic steroid methyltestosterone (MT) to turn their young tilapia population into males. While this helps farmers produce larger more valuable fish, MT, which can cause cancer, leaks into local streams and rivers jeopardizing the health of nearby residents. To combat this problem the **AquaFish CRSP** developed a simple bio-filter covered with bacteria that eat MT that can be used on the fish hatcheries' water filtration systems.

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## Storage solutions

In West Africa, **farmers store cowpeas** using non-chemical storage technologies developed by the **Bean/Cowpea CRSP** (predecessor to the **Pulse CRSP**). The most common methods include double or triple bagging, combining heavy duty plastic bags with an outer woven jute or polypropylene bag. This simple and cost-effective technique extends the quality of stored crops so that smallholder farmers can sell them when prices are higher. The triple bagging technology is now being widely disseminated under the Purdue Improved Cowpea Storage (PICS) project funded by the Bill and Melinda Gates Foundation.



HORTICULTURE CRSP

**Traditional drying methods** in tropical regions do not sufficiently reduce humidity in the air to ensure seed viability from one season to the next. Research by the **Horticulture CRSP** is exploring the potential for storing seeds in airtight containers with reusable desiccant beads. Results from research in Thailand reveal higher germination rates of chili pepper seeds stored with beads (89%) versus traditional methods (54%). Farmers recover the costs of their investment in the beads in the first year with the greater seed productivity and see minimal additional costs in subsequent years because the beads are reusable.

## Improving water use

Gravity-driven **drip irrigation systems** are a cost-effective, efficient and easily maintained technology for small farms, but water distribution through the system can vary and limit the maximization of crop yields. **SANREM CRSP** research examines how to maximize water distribution on sloped or upland watersheds to support farmers who wish to exploit this land for dry season cropping.



MANNY REYES/SANREM CRSP

For many small scale farmers, **rain water** is the major source of irrigation for their crops and identifying technologies to improve its use can significantly increase yields. The **INTSORMIL CRSP** is increasing sorghum yields using technologies that enhance the efficiency of harvesting rain water. The use of tied ridges and contour ridges on the one hand and grass strips and rock bunds on the other have increased sorghum yields by 100% and 25% respectively.



## Insurance

Unpredictable changes in weather patterns and other shocks make agriculture a risky business. The **BASIS AMA CRSP** works with pastoralists in the Marsabit District of northern Kenya to **manage drought risk** with livestock insurance. Satellite-based measures of vegetative cover predict average livestock mortality experienced in local communities. Households who purchase insurance can receive payouts when the predicted average livestock mortality rate reaches 15%.



SUSAN JOHNSON/GLOBAL LIVESTOCK CRSP