

Stored Grain

Department of Entomology

A GUIDE ON THE USE OF PICS BAGS FOR GRAIN STORAGE

D. Baributsa¹, I. Baoua², T. Abdoulaye³, and L. Murdock¹

¹*Department of Entomology, Purdue University, West Lafayette, IN, USA;*

²*Universite de Maradi, Maradi, Niger;*

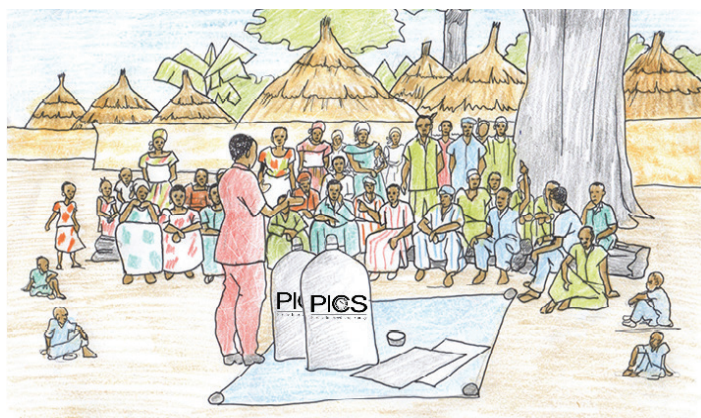
³*International Institute of Tropical Agriculture, Nigeria*

Post-harvest storage losses of grain to insects are at least 30% in Sub-Saharan Africa. There are many control methods but most are minimally effective, expensive, not scalable, or present health hazards.

The Purdue Improved Crop Storage (PICS) technology, a triple layer bag composed of two polyethylene bags and one outer woven polypropylene bag, minimizes insect storage losses. The PICS bag works like other hermetic containers, by limiting the supply of oxygen to insects living in stored grain. After PICS bags are closed, insects in stored grain use up much of the oxygen left inside the bag. When oxygen becomes too low, the insects cease feeding, and stop growing and reproducing; this prevents serious damage to the grain.

PICS bags were originally developed for cowpeas but later shown to be effective against pests of several other stored crops including maize, beans, sorghum, pigeon pea, peanuts, and rice. A major effort to disseminate PICS bags in West and Central Africa began in 2007. Work has since been expanded to East and Southern Africa as well as Asia. By June 2015, more than 5 million bags had been produced and sold by manufacturers and vendors to small-holder farmers and other users. PICS training has reached millions of farmers in more than 37,000 villages in Sub-Sahara Africa.

The PICS initiative aims to reduce post-harvest losses through the use of hermetic storage methods; PICS bags being the main driver. The instructions outlined here will serve as a guide for extension agents while implementing PICS activities. It describes steps in



A PICS extension training.

using PICS bags, key recommendations, and questions frequently asked by farmers.

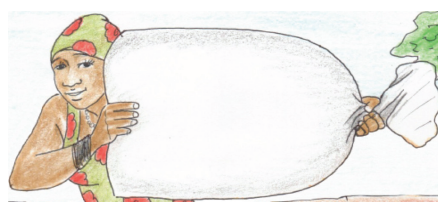
Use of PICS bag - Procedure

The triple layer bag consists of two high density inner polyethylene plastic bags (inner liners) and a third outer sack (a woven polypropylene bag). PICS bags should be handled carefully to prolong their use and effectiveness.



- Buy PICS bags from recognized vendors.
- Make sure the bags being sold are genuine, not counterfeits.
- The bag should have the PICS logos displayed on both sides of the woven bag.
- The two inner liners should be thick and fairly opaque.

- Store only dry and clean grain that contains no debris.
- This will minimize damage to the inner liner which could diminish effectiveness.
- Drying the grain adequately before storage may help reduce the infestation, maintain seed viability, and minimize mold growth.



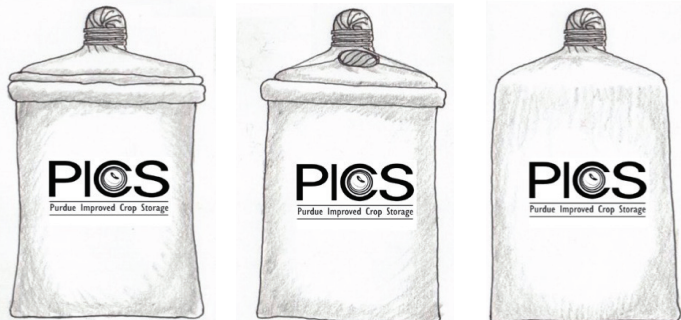
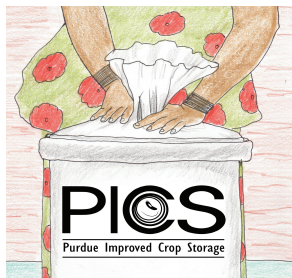
- Separate the three bags.
- Check the integrity of the two inner liners for holes and tears.

- Assess whether the bottom of both liners are well sealed.
- Don't use PICS bags with holes; they will be less effective.



- Pour a small amount of grain into the first liner to allow it to be more easily inserted into the second liner; then put both liners into the woven sac.
- Fold the lips of the three bags together - from inside out.

- Fill the inner bag with grain while shaking gently to eliminate pockets of air.
- Make sure no grain gets between the liners.
- Ensure a lip remains at the top for tying. Pack the grain tightly to remove air.



Step 1: Gently twist the lip of the most inner liner, fold it over and tie.

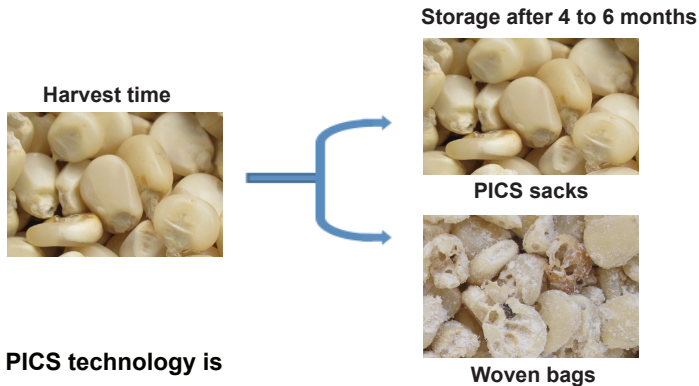
Step 2: Tuck the knot from the first liner inside and repeat for the second liner.

Step 3: Finally, tie the woven bag. Be sure to fold and tie each bag separately.

Remember to:

- Store PICS bags away from sunlight or extreme heat. Exposing bags to sunlight for long periods of time may damage the woven bag and reduce its durability/usefulness.
- Store PICS bags on an elevated platform and away from walls to facilitate inspection and minimize rodent attacks.
- Inspect PICS bags at least once a month.
- Keep PICS bag sealed at all times during grain storage. If grain must be removed for home use or sale, ensure that excess air is pressed out and the bag is resealed.

Benefits of using PICS Technology



PICS technology is

- Easy to use, effective and no need to apply insecticides.
- Increases income and improves food security.
- Safely stores seed and grain.
- Grain stored in PICS bags may command a premium over grain stored with chemicals.

Questions frequently asked by farmers.

- **Should we add insecticides to the PICS bag to improve its effectiveness?**
No, there is no need to add insecticides.
- **Can PICS bags be opened to remove some grain?**
Yes, but the bag should be closed and resealed right away to avoid reinfestation or resurgence of the insect population.
- **Can seeds stored in PICS bags germinate?**
Yes, but grain should be dried below 13% before storage to maintain viability.
- **Can PICS bags be reused?**
Yes, three seasons on average. Avoiding holes in the liners increases bag longevity
- **Can I store several commodities in a PICS bag?**
Yes, put each type of grain into a single small bag and put all bags into a PICS bags. Seed and grain for home consumption can be stored this way.
- **Why are PICS bags not available in smaller size?**
Larger PICS bags (100 or 50 kg) can store smaller quantities of grain (e.g. 20 kg). In addition, the storage cost per kg is lower with larger bags, saving money.
- **Can I store grain in PICS bag for one year or more?**
Yes, grain can be stored in PICS bags for a year or more. There are reports of grain being stored in PICS bags for 2 years or more.



READ AND FOLLOW ALL LABEL INSTRUCTIONS. THIS INCLUDES DIRECTIONS FOR USE, PRECAUTIONARY STATEMENTS (HAZARDS TO HUMANS, DOMESTIC ANIMALS, AND ENDANGERED SPECIES), ENVIRONMENTAL HAZARDS, RATES OF APPLICATION, NUMBER OF APPLICATIONS, REENTRY INTERVALS, HARVEST RESTRICTIONS, STORAGE AND DISPOSAL, AND ANY SPECIFIC WARNINGS AND/OR PRECAUTIONS FOR SAFE HANDLING OF THE PESTICIDE.

October 2015

It is the policy of the Purdue University Cooperative Extension Service that all persons have equal opportunity and access to its educational programs, services, activities, and facilities without regard to race, religion, color, sex, age, national origin or ancestry, marital status, parental status, sexual orientation, disability or status as a veteran.

Purdue University is an Affirmative Action institution. This material may be available in alternative formats.



Order or download materials from
Purdue Extension • The Education Store
www.the-education-store.com