

# PICS

## NEWSLETTER

Volume 1 Issue 1 2015

## Purdue Improved Crop Storage

### Our Story

The PICS story begins with insect pests commonly known as weevils that thrive on the stored crops of millions of resource-poor farmers in developing nations. Weevils can literally destroy and render worthless those precious crops within months after harvest. Farmers depend on those crops for food as well as cash incomes. Many sell their grain at low prices at harvest time rather than risk big losses to weevils. Traditional storage methods are largely ineffective and so many farmers began using expensive and potentially dangerous chemical pesticides.

Enter Larry Murdock, Purdue University entomology professor. In the mid-1980's Murdock and his team of scientists focused on devising new methods for weevil-safe grain storage. From 1987 to 2002, Murdock led the Purdue-Cameroon project, funded by the USAID Bean/Cowpea Collaborative Research Support (CRSP) Program. It sought to devise storage technologies that were (1) low-cost, (2) easy to teach and use, (3) were culturally acceptable and (4) relied on common materials. Cameroon farmers and villagers helped develop these technologies by lending their cultural and environmental knowledge and working with the CRSP team in their villages. The Purdue CRSP team subsequently encouraged other projects and NGO's to test and extend the CRSP technologies. Special emphasis was given to (1) a solar heater for disinfesting grain and (2) a triple bagging storage system, both of which were originally devised for post-harvest preservation of cowpeas (black-eyed peas).

In 2007, the Bill and Melinda Gates Foundation began investing in a Purdue-led effort to promote the triple-bagging hermetic technology, a project known as Purdue Improved Cowpea Storage (PICS). In its first phase, several Purdue scientists, including Joan Fulton, Jess Lowenberg-DeBoer, and Murdock led the effort, which aimed to bring PICS storage bags to 3.7 million farm families in ten West and Central African countries.

By 2011, PICS bags had begun having major impact on the storage of cowpea; impressed, many farmers began using PICS bags to store other grains. This led to the PICS2 project (again funded by the Gates Foundation). PICS2 was headed-up by Murdock, Dieudonne Baributsa and Lowenberg-DeBoer. Their lab, field and economic research laid the foundation for the expansion of PICS bags to other crops when it showed that PICS bags are useful for safely storing all major cereals and legumes in Africa. Subsequently, in 2014, the PICS3 project (also funded by the Gates Foundation) came into being. Its goal is (1) to expand the use of PICS bags in West and Central Africa for crops in addition to cowpea and (2) to promote PICS technology for storage of many crops in parts of East Africa as well. Baributsa is the principal investigator of PICS3.



Women demonstrate how to properly close a PICS bag.



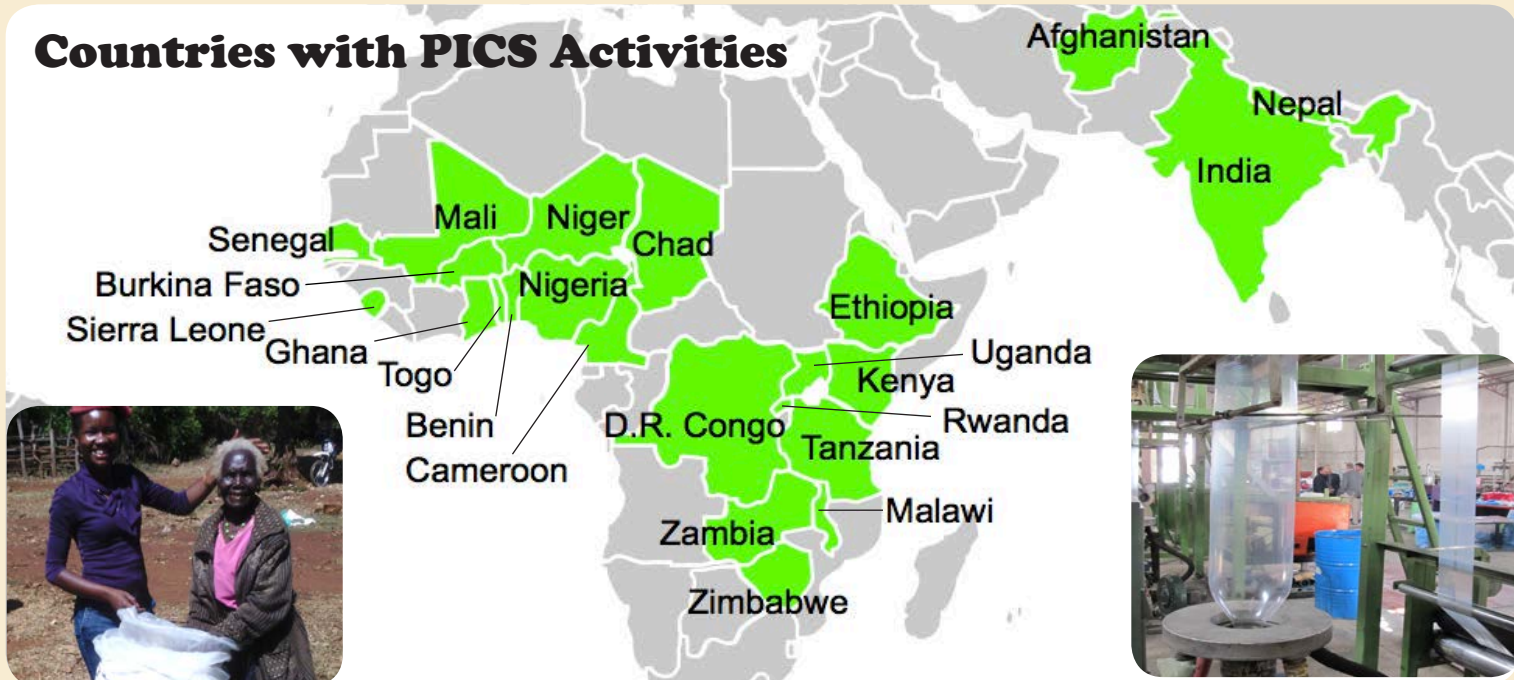
Larry Murdock with Cameroon farmers

### How Do PICS Bags Work?

Sealed PICS bags deprive insects of oxygen- cutting insect damage losses virtually to zero. The bags work, as do other hermetic storage containers such as sealed steel drums, because insects need oxygen to develop. Feeding and growing larvae burn up the oxygen in the airtight container while raising the carbon dioxide level. When the oxygen level in the container falls low enough, insects cease feeding and become inactive. Growth, development and reproduction are arrested. The insect population stops growing and hence damage to the stored grain also stops.

[See instructional videos and posters HERE.](#)

# Countries with PICS Activities



A PICS trainer helps a rural farmer seal her bag.



A plastics manufacturing factory in Herat, Afghanistan.

## Can a Bag Change Everything?

PICS bags are changing how farmers store, sell and producing cowpea grain. Farmers are adopting PICS bags as a multipurpose technology for storage of: i) grain for home consumption or sales and, ii) seed for planting. Cowpea prices often double or triple from harvest to the lean season. On average, a farmer who uses PICS bags gets additional cash flow estimated at \$27 per 100 kg of cowpea above crops sold at harvest. Cowpea production has increased in part due to better storage technology. In Niger, cowpea production has doubled because farmers are confident they can store. The seasonality of cowpea price has been reduced because farmers have the flexibility to store and sell when they wish. African entrepreneurs are finding new business opportunities in producing and selling PICS bags to farmers. PICS bags have also helped reduce the incidence of food poisoning due to misuse and overuse of insecticides.



Rural farmers transport their grains to market on a donkey-drawn cart.

## Community Voices



### Madam Martha's Story

It is the policy of the Purdue University School of Agriculture that all persons shall have equal opportunity and access to the programs and facilities without regard to race, color, sex, religion, national origin, age, marital status, parental status, sexual orientation, or disability. Purdue University is an equal opportunity/equal access Affirmative Action employer.

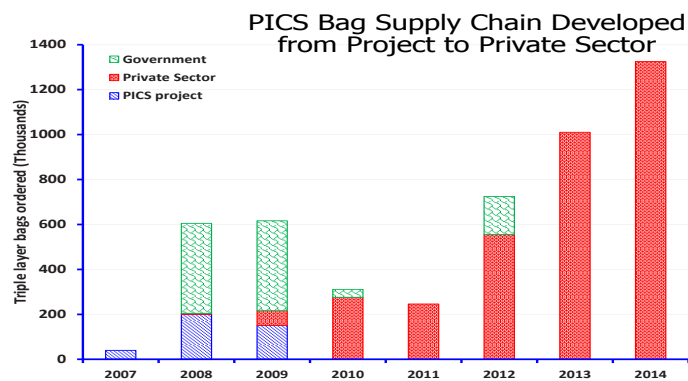
### From the Editor:

If you have a story you would like to share related to PICS for possible publication in our newsletter, please contact us at [PICSinfo@purdue.edu](mailto:PICSinfo@purdue.edu)



## Our Achievements

Over the last seven years, Purdue and partners have transferred the PICS technology effectively to farmers in more than 40,000 villages in Sub-Sahara Africa. More than 2 million farmers have been trained on the use of PICS bags. PICS bags are being manufactured and sold in more than 23 countries in Africa and Asia. More than 15 plastic manufacturers are producing PICS bags including 12 in Sub-Sahara Africa. Since 2007, the private sector has produced and sold more than 5 million PICS bags. The PICS technology has been licensed to more than 10 manufacturers and distributors worldwide.



## Upcoming Events

- August - Training of Trainers in Uganda
- Training of Trainers in Ghana
- September - Training of Trainers in Ethiopia

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Purdue Improved Crop Storage

[Visit the PICS3 Website](http://www.purduepics3.org)

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