

PICS

NEWSLETTER

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Purdue Improved Crop Storage

Empowering the private sector to reduce hunger - PICS Sales crossed 5 million bags per year in 2018

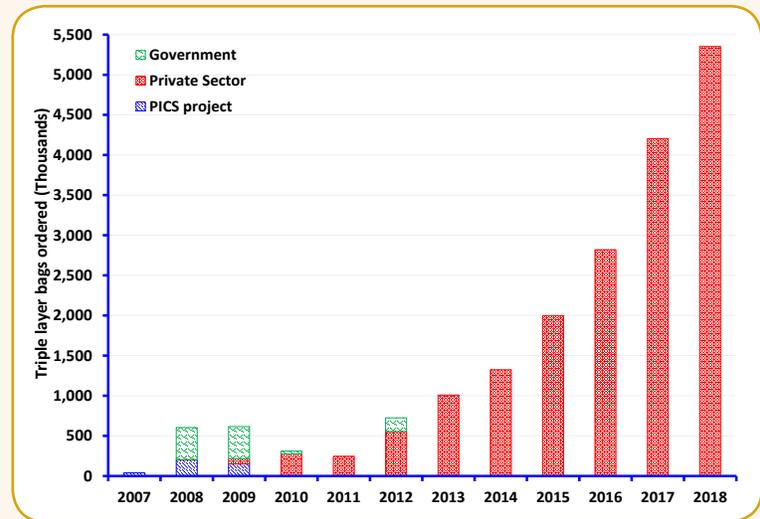
Dieudonné Baributsa; Purdue University - USA

We continue to make the PICS supply chain more robust by supporting the private sector to expand and strengthen the distribution networks of the PICS bags. As a result of PICS activities during the 2018 harvesting season, 5.3 million bags were sold globally. This brought the total bags sold globally to 19.3 million by February 2019. PICS Global, a private start-up company, is now working with licensed manufacturers and distributors to expand PICS bags markets in new and existing countries. New licensed countries include Ivory Coast, Sudan, Burkina Faso, Ghana, Guatemala and India. Globally there are 23 licensees supplying bags to 35 countries, 29 of which are in Africa.



PICS is now active in 34 countries in Africa, Asia and South and Central America.

In 2018, \$4,306,866 was leveraged for PICS activities through grants, awards, and investments. Several organizations and projects implemented training of trainers for 989 extension agents. These extension agents conducted 4,821 village demonstrations and 154 market demonstrations, reaching 281,799 farmers. Bell Industries emerged as the overall winner of the AgResults competition in Kenya with a total prize of about US \$3 million for selling more than half of the 1.3 million hermetic bags bought by smallholder farmers in several regions of Kenya.



PICS bags sales climbed to 19.3 million by February 2019.

Some PICS licensees are seizing on the business opportunity by investing in manufacturing of PICS bags. Bell Industries in Kenya has invested in a new manufacturing facility that has substantially reduced their PICS bag imports from PPTL Tanzania. PHK Trading in Ethiopia has invested in machinery to start the production of PICS liners for the 2019 harvest season. The private sector is sustainably making the PICS technology available to farmers and other users, thanks to the Bill and Melinda Gates Foundation's key investment in the commercialization of this innovation to reduce post-harvest losses.



Bell Industries was the overall winner of the AgResults competition in Kenya.

PICS Expanding into New Markets

Holly Fletcher-Timmons, Purdue University - USA

Ashini Gupta

is the Director of International Marketing for Arvind Chemi Synthetics, a family-run company in India in business since 1984. Her company produces Polypropylene and HDP woven and fabric plastics. Arvind has the capacity



Ashini during the introduction exercise at the Supply Chain Meeting.

to produce 7,000 metric tons of plastics per year, much of which they export to the US and Kuwait.

Ashini is excited about PICS because there is a huge population of small-holder farmers in India, annually producing 13 million tons of rice, of which 10 million tons is stored. Also important, in lesser quantities, are wheat, maize and pulses. She sees great potential in PICS bags to bring its benefits to the Indian farmers and consumers to address issues of insect infestation, money saving, and reduce chemical use due to health concerns. Ashini sees the early challenges would be support for building awareness for the initial adoption of the bags in India and imitation bags that will presumably come on the market very quickly.



Arvind Chemi Synthetics facility in India.

Indian government is currently supporting a project through ICRISAT which has funded training and two free bags to 25,000 farmers. Arvind Chemi currently supplies to agricultural markets; with those connections already in place, they plan to build awareness as quickly as possible. Ashini expects that in the next 1 – 2 years, the PICS network will be in place to serve the needs of India.

Arvind Chemi Synthetics plans to expand their market slowly by building awareness and reaching out to the government to help facilitate this process. The



Lourdes outside the Kigali Convention Center in Rwanda.

Lourdes Salvatierra is responsible for Marketing at Sacos Agroindustriales (SACOS – serving Mexico and Central American countries) where she has worked for 4 years as the Marketing Coordinator in the Sales and Marketing department. She works hand-in-hand with research and development and is the PICS project manager. SACOS, a part of Grupo DISAGRO in Central America, is a packaging company and leading producer of polypropylene sacks in Central America.

SACOS has been in the market for 33 years and commercializes world class packaging solutions in polypropylene and polyethylene to Canada,

USA, Central America, the Caribbean, and Columbia in South America. Their main operation is based in Guatemala where they have a high-quality production plant. They also have operations in Nicaragua, Honduras and Costa Rica. Some 60% of their customers are oriented toward the food industry.



Disagro facility in Guatemala.

The core production of DISAGRO is fertilizers, thus their brand is well positioned with agricultural markets and has developed a solid network of reaching farmers. DISAGRO/SACOS together with PICS Global are poised to take advantage of a great market opportunity to commercialize the PICS bags to smallholder farmers. Smallholder farmers who grow corn and beans for local consumption as well as to store for sale at market will significantly benefit from the PICS technology. Lourdes is optimistic that the PICS bags will be well received in Guatemala and Central America because the bags address many of the challenges faced by local smallholder farmers.

PICS in India – Launch and ongoing efforts

Venu Margam & Hari Sudini

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) - Patancheru, India

This year (2019) has been a big one for PICS in India, thanks to PICS2 project efforts that began in 2011 and established a successful collaboration with ICRISAT. Subsequently, this partnership evaluated PICS bags for two major mandate crops of ICRISAT, groundnut (peanut) and pigeonpea. Laboratory experiments followed by on-farm testing and training conducted between 2012-14 established that PICS bags effectively prevented storage pest damage while protecting both the grain quality as well as the seed viability for groundnut and pigeonpea.



A groundnut farmer transporting harvested crop in Anantpur District, Andhra Pradesh, India.

PICS Global has licensed Arvind Chemi Synthetics Pvt. Ltd. (based in Delhi) to manufacture PICS bags in India. Thanks to ICRISAT's efforts in testing and evaluating the performance of PICS bags at the smallholder farmer level in Andhra Pradesh and Odisha states, the Odisha State Agricultural Department (OSAD) has funded a project for PICS bags distribution to groundnut farmers as part of the "Incentivization of non-paddy crops — oilseeds". The OSDA has sought the help of ICRISAT for capacity building, training and distribution of the bags. This project aims to provide 50,000 PICS bags benefit-



Training and evaluation of PICS bags for groundnut storage at smallholder farmer level in Anantapur, Andhra Pradesh.

ting approximately 25,000 farmers in 17 districts of the state for storing groundnut seed until the next season (storage from May/June through Oct/Nov).



Dr. Hari Sudini, Principal Scientist ICRISAT, explaining about PICS to groundnut farmers in Anantapur District, Andhra Pradesh.

In addition, the All India Coordinated Research Project on Groundnut (AICRP-G) set up by the Indian Council of Agricultural Research - Directorate of Groundnut Research (ICAR-DGR) has completed its first year of evaluation of PICS bags, wherein results were promising. Subsequent to their second year's evaluation and upon confirmation of the first year's results, AICRP-G shall provide a national level recommendation for storage of groundnut in PICS bags.

Efforts are ongoing for testing other crops produced in India including chickpea, pearl millet, coffee, dry red chilli, turmeric and milled rice. Rice is a staple food in most of the southern and eastern states of India. A common practice for households is to buy rice in bulk quantities sufficient for their family's consumption for the entire year and store them in the house. Insect pest infestation during storage is a common issue and women have to periodically dry and clean the rice.



Planning meeting for PICS training and distribution in Odisha State, India.

This is time consuming, laborious, and leads to ergonomic issues due to manual winnowing. The same issue exists with other grains including pulses and millets stored for domestic use. Currently, few of the Krishi Vigyana Kendras (KVKs – farm science centers) in Andhra Pradesh state are promoting the PICS bags based household storage as part of a "Drudgery reduction" project.

Farmers in Arequipa (Peru) give thumbs up to PICS

Jorge R. Díaz-Valderrama, Charlie Woloshuk, and Dieudonné Baributsa, Purdue University - USA

Thanks to the Nexus Institute, a partnership between Purdue University and the “Universidad Nacional de San Agustín” (UNSA) in Peru, communities in the Arequipa region of Peru will benefit from a project focusing on improving postharvest crop management. This two-year project that started in January 2019 aims to build the capacity of UNSA faculty and students to conduct research and scaling-up postharvest technologies including PICS bags, moisture assessment devices and grain driers. Several Purdue faculty and staff including Dieudonné Baributsa, Charlie Woloshuk, Jorge Díaz-Valderrama and Bradley Smith traveled to Arequipa three times in 2019. During these trips, the team has interacted with UNSA faculty, and regional agricultural leaders and stakeholders; and conducted a hands-on workshop on various postharvest topics including insect pests, molds, mycotoxins, new technologies, etc.



Dieudonné Baributsa showing the importance of hermetic storage to UNSA student during the workshop on April 2019.

During the most recent trip, from June 29th to July 13th, a team led by Jorge conducted a survey in four major agricultural areas in Arequipa: Camaná, “Irrigación Majes” and Majes Valley in the lowlands, and Cabanaconde in the highlands. Some 503 farmers representing 41 “irrigation commissions” were interviewed to collect basic information about their postharvest management challenges. The survey team consisted of four facilitators, several leaders of “irrigation commissions” and six enumerators who interviewed farmers. Preliminary results suggest that only 27% of farmers store their grain for later sale during the lean season, probably because of high



The enumerator team starting a field day in Camaná, Arequipa in July 2019.

incidence of storage pests. About 66% of farmers noted that insect pests are the most important problem during storage. Most farmers who store grain, either do nothing to protect it or apply insecticides. Virtually none of the farmers uses hermetic methods to protect their grain against insects. However, 92% of farmers said they are willing to purchase PICS bags to store their grain (Figure 1). Another important take-home message is no farmer uses a moisture meter- 93% of farmers rely on subjective methods (grain biting, sound of grain, and color) to estimate grain dryness before storage. Our UNSA-Purdue project is looking forward to introducing postharvest technologies such PICS bags, hygrometers and dryers in Arequipa. The project will train farmer leaders and extension agents to scale-up these innovations and will also develop a local supply chain for these technologies.



Figure 1. Farmers' willingness to buy PICS bags in the Arequipa region, Peru. Data from 503 farmers interviewed during a survey conducted in July 2019

Youth Entrepreneurship in Ethiopia

Holly Fletcher-Timmons, Purdue University - USA

Unemployment in Ethiopia is a major problem, particularly in urban areas, where the rate approaches 15 percent. Because of high unemployment, Ethiopian youth (aged 15 – 24) are faced with grim prospects. They face many challenges and are susceptible to substance abuse. Migration of youth, in search for better prospects, from Ethiopia to Europe and the Middle East is a major concern for the government. PICS has found a way to

offer much better opportunities to the youth in Ethiopia. An innovative program initiated in Ethiopia to engage the youth in the promotion and sale of PICS bags, has opened a new path for young people to pursue for a better future.

PICS bags are manufactured in Addis Ababa, the capitol of Ethiopia. From there, the bags are distributed in small regional cities throughout the country. Unfortunately, farmers from rural areas often do not have good access to the urban markets and find it difficult, if not impossible, to travel into the larger city markets. This resulted in low sales of PICS bags as vendors only sell to a limited number of buyers near urban centers. This, in turn, affects the overall cost of the bags which become more expensive



For the past 10 years, Amin Mohamed was one of the many unemployed youth of Ethiopia. In September of 2018, he was recruited as a PICS bags Youth Reseller in Goma woreda to distribute and retail PICS bags in the area. He was trained on how to use a PICS bag through a partnership between USAID Feed the Future Value Chain Activity and Shayashone PLC. In one year, Amin has distributed over 9,000 PICS bags with a margin of 5 birr per bag. With his earnings, he has been able to support his five family members and purchase his own home.



PICS market demonstration at East Gojam.

due to low turnover. The low turnover and higher prices further impedes the ability of urban vendors to reach farmers in rural areas with PICS bags.

To address the problem, Shayashone, a PICS distributor in Ethiopia, began an initiative to engage the youth in PICS bag distribution. Initially, three vendors were involved in selecting five youths to be trained by Shayashone. Shayashone provided technical and business training to these youth including the proper use of the PICS bag, as well marketing of the technology to rural farmers in villages and weekly markets. The idea was that each youth would travel out into villages and rural markets with a stock of PICS bags, perform small demonstrations, answer questions and have the bags on hand to sell to interested farmers. The initial trial went very well and soon led to scaling up to 15 vendors with 5 resellers each (75 youth resellers).

An unexpected side effect of this process was the vendors who recruited the youth became promoters of PICS bags. This youth initiative helped to spread the word, and led to the bags penetrating into the hard-to-reach areas of the country and to increased awareness. The project has been so successful that by February 2019, 187 youth resellers had been trained in the PICS bag technology, with 120 actively selling bags. Three years ago, out of 150 vendors, only 60 purchased PICS bags for resale. Today that number is now 150 out of 150. Volume per vendor has gone up so that they are positioned to sell 500 – 1,000 bags per market in just 2 – 3 years.



PICS bag opening ceremony at Goma woreda, Jimma zone.

A single youth reseller can sell up to 200 bags in one day during the peak season, making about \$32 (USD). Working only 2 – 3 days a week, a reseller can make approximately the average salary for Ethiopia, which is 9060 ETB per month (\$315 USD). Shayashone plans to expand the youth reseller model in the future and further spread PICS bags awareness across the most remote areas of Ethiopia. This model will not only benefit the rural farmers as they gain access to the PICS technology, it will also provide sorely-need opportunity for the country's vulnerable youth.

Profits Double with Purdue Improved Crop Storage (PICS) Bags

Ligaya Diaz, AMPLIFIES, Ghana

Mr. Clovis Swale had challenges storing his maize. This produce which greatly affected his profits and his ability to feed and care for his family. He resorted to the use of chemicals such as Actellic and other expensive pesticides which can also result in chemical poisoning. However, Mr. Swale, thanks to the assistance of AMPLIFIES (Assist in the Management of Poultry and Layer Industries with Feed Improvement and Efficiency Strategies), has been able to turn his luck around. Not only has he eliminated his need for dangerous chemicals, he has also doubled his profits and has been able to invest more in his farming business. Swale belongs to the Songzel Farmers Group at Wurumpo in the Wenchi District in the Brong Ahafo region where AMPLIFIES has been conducting interventions. AMPLIFIES Ghana Project is a five-year project aimed at value chain capacity building for Ghana's agriculture industry.



Mr. Clovis Swale - Member, Songzel Farmers Group.

AMPLIFIES introduced the Purdue Improved Crop Storage (PICS) bags to farmers for storing their harvested grains without losing quality due to insect infestations. Mr. Swale, who cultivates 15 acres of maize and 2 acres of cowpea, attended an AMPLIFIES Post-Harvest Loss training session that highlighted the effectiveness of the PICS bags. As a result, he decided to adopt the PICS technology. He first employed the use of PICS bags during the 2016 cropping season and has continued its use since. He recognizes that though the PICS bags are slightly expensive (\$2.50 per bag), they are far better in the long term as compared to the use of chemicals or the polypropylene (PP) bags.

According to Mr. Swale, "The use of chemicals for storage [allows me to store my grains] for about 3 to 4 months, but the PICS bags [can] store grains up to a year without any problem."

In the minor season in 2016, Mr. Swale harvested and stored 60 bags of maize using PICS bags and experienced no losses. He was able to sell his clean maize during the lean season in the open market at \$42.50 per bag instead of \$25.00 per bag at farm gate during harvest season. In 2017, he harvested and stored 120 bags of maize using the PICS bags. He delayed the sales of the maize because he knew the PICS bags would safely store the maize. By delaying the sale of the maize and selling during the lean season, Mr. Swale earned a revenue of about \$5,100.00 from the sale of the 120 bags.

"I got this much money because I was able to store my maize for a long time using the PICS bags, and the maize I had was very clean without any insects," says Swale.



Mr. Swale outside his newly completed home.

With his earnings, Mr. Swale was able to complete the construction of part of his house he had been struggling to finish for some years. He also was able to provide for his daughters' schooling as well as support his younger brother's senior year of high school education.

"I never imagined that I would be able to support my children's education, especially the girls. Through the gains made as a result of the sales, I have been able to buy learning materials for my last child to enable her to be in school. I have also made some savings to reinvest in my farming business, and have acquired a plot of land at the cost of \$880.00 at Wurumpo which I intend to develop into shops and rent out in the future."



Mr. Swale on the front porch of his home.

Fourth PICS Supply Chain Workshop

Holly Fletcher-Timmons, Purdue University - USA

PICS held its fourth annual workshop in Kigali, Rwanda at the Grand Legacy Hotel on March 4 – 5, 2019. Over 40 people attended representing 18 countries and 14 companies, including PICS Global. The Permanent Secretary in the Rwandan Ministry of Agriculture addressed the group and discussed the Rwandan strategic plan for agricultural innovation, outlining their needs and the challenges they face. Participants discussed challenges and opportunities in improving the PICS supply chain. Recurring issues of most concern were (1) how to deal with fake hermetic bags in the market, and (2) future perspectives for PICS beyond grants and projects. The PICS Global representative, Laurie Kitch, addressed these issues.



Dieudonné Baributsa presents a PICS bag to the Permanent Secretary in the Rwandan Ministry of Agriculture.

Wencelas Habamungu, owner of Ecoplastics based in Kigali, gave an overview on recycling plastic business in Rwanda.

PICS thanks the Gates Foundation and PICS Global for sponsoring this event. Thanks to everyone who participated and made this year's meetings so successful. As has been the case in past years, this meeting is an opportunity for PICS actors to connect and share experiences.



Group photo taken outside the Grand Legacy Hotel in Kigali.

Farewell to Rico Natali

PICS Team Members

The PICS Team would like to thank Rico for his help and dedication to make the PICS3 Project a success. Rico worked with us to design activities that build PICS sustainability. His active engagement led to the development of new initiatives to strengthen the PICS supply chain such as the incentive based hiring of PICS business consultants. Thanks Rico for your engagement with the PICS stakeholders during the PICS supply chain meetings to help shape the future of the PICS program. The PICS team wishes you continued success in all your future endeavors.



The PICS Team is Happy to Welcome Rafael Flor as the New PICS3 Program Officer

Rafael Flor has 20 years of progressive work experience in international development. He has worked with development institutions, in academia, the private sector, and philanthropy. Currently, he is a Senior Program Officer, Agricultural Development at the Bill and Melinda Gates Foundation. In this role, Rafael is leading our work on shaping inclusive markets in our Africa portfolio.



Before joining the Bill and Melinda Gates Foundation, Rafael was a Director at the Rockefeller Foundation, leading the YieldWise Initiative. YieldWise supports a wide range of partners to embed the food loss and waste agenda into their institutional priorities, investments, and operations. As part of these efforts, the first 123 SDG bond—with an initial subscription of \$300M—was launched in partnership with the World Bank and the first global consortium of universities focused on innovation for post-harvest loss and food waste reduction was initiated.

Rafael has held positions with the Earth Institute at Columbia University, Armajaro Trading—now Ecom Trading, the MDG Centre | West and Central Africa, the United Nations Development Programme, and Escuela Agrícola Panamericana, Zamorano. Rafael has served as a member of the World Food Programme's Working Group on Productive Safety Nets, member of the United Nations Millennium Project Task Force on Hunger, and Peer Reviewer of the 2006 Environmental Performance Index. In 2019, Rafael was asked by the Danish Think Tank on Prevention of Food Loss and Waste to join as member of its Advisory Panel.

Rafael holds a Master's degree in Public Administration from the School of International and Public Affairs (SIPA) at Columbia University and a Bachelor degree in Agricultural Engineer from Escuela Agrícola Panamericana, Zamorano.



UPCOMING EVENTS

[2nd All Africa Postharvest Congress & Exhibition](#)

Addis Ababa, Ethiopia
September 17 - 20, 2019

[84th Annual Purdue Pest Management Conference](#)

West Lafayette, Indiana - USA
January 6 - 8, 2020

[14th Fumigants and Pheromones Conference](#)

Victoria Falls, Zimbabwe
May 12-14th, 2020

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If you have a PICS story to share,
please contact us at
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