The ADM Institute for the Prevention of Postharvest Loss

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Introduction

Postharvest loss of agricultural commodities has become an increasing prevalent topic in the news over the last few years. In addition, major reports on the magnitude and cause of loss have been prepared by global organizations such as the UN Food and Agricultural Organization (FAO) and the World Bank . Connected to issues such as food security, malnutrition, poverty, food waste, and more, the problem of postharvest losses is now recognized has having global implications.

Recent reports indicate that massive amounts of food are lost every year to postharvest waste. According to a 2011 FAO study (Global Food Losses and Food Waste), "Roughly one-third of food produced for human consumption is lost or wasted globally, which amounts to about 1.3 billion tons per year." An FAO/World Bank report (Missing Foods) published in May 2011 said that "[t]he value of post-harvest grain losses in sub-Saharan Africa [are estimated] at around $4 billion a year …. This lost food could meet the minimum annual food requirements of at least 48 million people." Without successful innovation, the amount of production lost each year will continue to grow.

In 2011, the ADM Institute for the Prevention of Postharvest Loss was founded to combat these concerns. The ADM Institute is a collaborative venture between the Archer Daniel Midlands (ADM) company and the University of Illinois at Urbana-Champaign. Although only one year old, the ADM Institute is already contributing to research and outreach efforts associated with reducing loss.

Background

The Archer Daniel Midlands (ADM) company is a multinational corporation with 28,000 employees, headquartered in Decatur, Illinois. The company's operations include converting corn, oilseeds, wheat and cocoa into food ingredients, animal feed ingredients, renewable fuels, and industrial products. With more than 265 processing plants and more than 330 sourcing facilities, ADM manages sourcing, transportation, storage, and processing assets in more than 75 countries. Net sales for the fiscal year ended June 30, 2011, were $81 billion.

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The current CEO and President of the Archer Daniel Midlands Company, Patricia Woertz, was appointed in 2006. She has championed the issue of decreasing postharvest losses within ADM and the broader agribusiness community. At her keynote address at the 2009 World Food Prize, President Woertz noted that innovation on the farm alone isn't sufficient to meet current global demands and that protecting the crops that are already harvested is critical to reaching those who need them most.

In response to this issue, the ADM Institute for the Prevention of Postharvest Loss was founded in January 2011. ADM committed to provide a $10 million dollar gift to the University of Illinois at Urbana-Champaign to establish the Institute. The Institute's vision is to "serve as an international information and technology hub for evaluating, creating and disseminating economically viable technologies, practices and systems that reduce postharvest loss in staple crops such as rice, corn, wheat and oilseeds." This funding is provided in five annual increments by ADM Cares, ADM's corporate social-investment program. ADM Cares directs up to one percent of ADM's pretax profits to initiatives and organizations that drive meaningful social, economic and environmental progress worldwide.

Organizational Structure

The governance structure of the Institute includes an External Advisory Board and an internal Steering Committee. Including participants from organizations and institutions from several countries, the External Advisory Board is comprised of an international board of experts who will shape the future of the ADM Institute's research, education, and outreach programs. Current members of External Advisory Board include:

Robert Easter of the University of Illinois at Urbana-Champaign, Chair;
Usha Barwale-Zehr, Maharashtra Hybrid Seeds Company Limited (Mahyco);
Carlos Campabadal, Asociación Americana de Soya-IM;
Ashok Gulati , Government of India;
Hans Joehr , Nestle;
Domingo Lastra, ADM;
Dirk Maier, Kansas State University;
Kent Miller, John Deere;
Steve Mills, ADM;
Elizabeth Mitcham, University of California-Davis;
Arlene Mitchell, Gates Foundation; and
Daniel Queiroz, Universidade Federal de Viçosa.

The ADM Institute Steering Committee is comprised of a multi-disciplinary group of University of Illinois faculty:

Andrew Alleyne, Engineering;
Peter Goldsmith, Agricultural and Consumer Economics;
Udatta Palekar, Business Administration;
Steve Sonka, ADM Institute Director; and

KC Ting, Agricultural and Biological Engineering.

Steve Mills and Domingo Lastra from ADM are members of the Committee as well.

The diversity of backgrounds and expertise of the members of the External Advisory Board and the Steering Committee will allow the ADM Institute to address postharvest losses on multiple levels.

Institute Functions

The ADM Institute's research, education, and outreach functions are multifaceted. It strives to support and conduct transformational R&D activities that will lead to reduced post-harvest loss through implementation of technology advancements and improved supply chain and information systems. Success in those efforts likely will require establishing strategic partnerships with numerous government organizations, private sector firms, and key academic and NGO partners to build the network of global institutions necessary to identify important research needs and to enhance implementation of research results. The ADM Institute has established and continues to develop a postharvest loss website **(http://postharvestinstitute.illinois.edu/)** to rapidly disseminate information and accelerate the transformation of postharvest loss science into practices and systems implemented throughout the relevant supply chains. It will also develop courses to provide training on best practices and technologies for minimizing postharvest loss.

Institute Projects

The Institute's R&D activities focus on four key areas: measurement and technology development, systems informatics and analysis, policy analysis, and education, training and information transfer.

- **Measurement and technology development** efforts strive to determine methods to better assess the extent of loss and to create specific innovations that, if successful, can effectively reduce postharvest loss.
- **Systems informatics and analysis** relates to data organization, quantitative modeling, and results delivery to analyze specific settings of interest, explicating including relevant supply chains and systems.
- **Policy analysis** efforts analyze the effects of public and private sector institutional policies and the evaluation of potential improvements.
- **Education, training, and information transfer** works to implement tools to enhance the performance of farmers and supply chain participants, providing thought leadership at significant conferences, sponsorship of events, and dissemination of findings through electronic and other media.

Examples of activities supported and conducted by the ADM Institute include several case studies on crops in India, including corn in Rajasthan, rice in Tamil Nadu, the red gram (pigeon pea) in Maharashtra, and the black gram in Madhya Pradesh and Maharashtra. Additionally, a number of publications were completed in 2011 and are on the ADM Institute website or are currently being prepared for

publication. Examples include *Farmer Surveys of Postharvest Loss in India*, *Postharvest Loss of Staple Crops: A Compendium*, and *A Summary of Postharvest Loss in the literature*.

A table of current research initiatives and projects can be seen below:

Focus	Project
Measurement and Technology Development	Measurement, Documentation and Postharvest Processing for the Prevention of Postharvest Losses of Soybeans and Corn
	Managing Grain Losses in Continuous Cropping Systems of the Tropics through On-Farm or Cooperative Storage
Education, Training and Information Transfer	Education, Training and Information Transfer to Minimize Postharvest Losses – Scientific Animations Without Borders
Policy Analysis	Supply Chain Policy and Strategy Analysis for Prevention of Postharvest Loss
	The Nature of Small Landholder Agriculture in the Brazilian States of Sao Paulo and Parana and Implications for Understanding Postharvest Loss
Systems Informatics and Analysis	Concurrent Science, Engineering, and Technology for the Prevention of Postharvest Loss
	Appropriate Technology Development and System Integration for Postharvest Loss Prevention

The Institute's postharvest loss website already has been published online (http://postharvestinstitute.illinois.edu/), and is routinely being updated. The site includes information about the Institute, key issues in postharvest loss, current and past research in this field, and a list of resources comprised of Literature, Databases, Tools, Projects, Videos, and Events. The Institute website provides a section for Outreach, which includes Periodic Reports, Reviews, and a 'PHL in the News' newsletter. The "PHL in the News" segment is published weekly and contains recent PHL information

from newspapers, blogs, websites and other media. Interested parties can visit the ADM Institute website to subscribe to this feature.

One component of the initial work of the ADM Institute focused on tool development to document and visualize future trends in postharvest loss. For example, losses of rice in India by 2030 could equal the total expected rice production in the Philippines or the combined expected production of Cambodia and Egypt. Effective reduction of post harvest loss can materially affect available food supplies. If the expected 2030 losses of India's rice production could be cut in half, those reduced losses would be equivalent to the total expected production of rice in the United States. Enhanced tools to better anticipate these trends are in development.

The Institute has already completed several initial activities. It has commissioned innovative research projects to systematically address losses of staple crops in India and Brazil, committing more than $2.1 million for research across the four themes noted previously. To give a sense of the emphasis of current efforts, in this round of funding about 37% of the funds were allocated to Measurement and Technology Development, 42% Systems Informatics and Analysis, 13% to Policy Analysis, and 8% to Education, Training, and Information Transfer. Engaging both graduate and undergraduate students in research and project efforts is a key outcome. In the spring of 2012, undergraduate students in agricultural engineering and in supply chain management students will conduct part of their senior practicum projects in India, with a focus on postharvest loss issues.

The Institute also has a strong focus on thought leadership and awareness-raising within the international community, and has provided programmatic leadership for the "Opportunities for Innovation in Indian Agriculture" symposium sponsored by the Consulate General of India (Chicago) in October and for a follow-up conference in Delhi in 2012. The Institute will also be publishing papers, presentations and sponsorships at key international events in the future. Additionally the Institute seeks to continue building relationships for collaboration with organizations including the World Bank, UN Food and Agricultural Organization (FAO), Peace Corps, the International Rice Research Institute (IRRI), US and international universities, international NGOs, and US and key international government agencies.

Conclusion

The ADM Institute for the Prevention of Postharvest Loss seeks to alleviate loss of staple crops around the world. To accomplish this goal, the ADM Institute will rely upon collaboration and cooperation with entities from diverse geographic locations and with varied backgrounds, skill sets and expertise. It will function not only as a coordinating unit of its current resources, but will generate new research, technologies, and methods to innovatively address this age-old issue. Through partnerships already formed, projects are being supported and funded that are actively changing the state of loss worldwide. With continued support and a growing network, the Institute hopes to expand and deliver increasingly beneficial results in all locations experiencing postharvest loss.