

ADM Institute Seed Research Funding

Progress Report (4/11-3/12)

Name	<u>Eckhoff, Danao and Ting</u>
Research Project	<u>Engineering Solutions for Postharvest Loss Monitoring and Prevention</u>
Department/s	<u>Agricultural and Biological Engineering</u>
Date	<u>7 May 2012</u>

Please provide a brief response below.

1. Please provide a brief statement of the project accomplishments thus far.

CO₂ diffusivity measurements and modeling (Huang, Danao) – The traditional method of detecting spoilage in stored grain has been through monitoring temperature across the stored grain. However, because the diffusivity of CO₂ is expected to be higher than diffusivity of heat through stored grain, we propose the development of a better monitoring system based on embedded CO₂ sensors. For this approach to work, the effects of temperature, porosity, and moisture content of the grain on CO₂ diffusivity need to be modeled. The model will then be used to recommend proper spacing and implementation of CO₂ sensors in bulk and bagged stored grains.

Storage and Postharvest Loss Issues in Tamil Nadu and Haryana (Yin, Danao, Viswanathan) – Working with Dr. Viswanathan and Marketplace Literacy (NGO), we compared information on the methods and practices by farmers for storage of food grains. This information was useful in (a) getting a better understanding of purpose, quantity, and storage structures available to small farmers in two regions and (b) developing appropriate low- cost strategies for aerating and storing grains at farm-level.

Mold growth and chemical changes in high moisture corn grain (Wang, Eckhoff) – This project focused on evaluating the feasibility of storing high moisture corn at low temperatures.

Project planning with in-country partners in India and Brazil (Danao, Eckhoff, Paulsen) – In November 2011, Danao, Eckhoff and Paulsen traveled to Viçosa, Brazil to develop research collaborations with Universidade Federal de Vicosa (UFV) faculty.

2. Has the project completed its objectives? Yes or No. If no, please describe the activities planned for the remainder of the project (4/12-3/13).

CO₂ diffusivity measurements and modeling (Huang, Danao) – A chamber for testing CO₂ diffusivity will be built in May/June 2012 and all tests and data analysis will be completed by January 2013.

Storage and Postharvest Loss Issues in Tamil Nadu and Haryana (Yin, Danao, Viswanathan) – Our analysis was presented at the 2012 Indian Society of Agricultural Engineers Annual Meeting in Pantnagar, India in February 2012. Results were used as basis for research proposals (written and submitted to ADM Institute in March 2012) to Mr. Basu, Secretary of the Ministry of Ag and Cooperation.

Mold growth and chemical changes in high moisture corn grain (Wang, Eckhoff) – Experiments have been completed and student plans to graduate by August 2012.

Project planning with in-country partners in India and Brazil (Danao, Rausch). In June/July 2013, Rausch will replace Eckhoff on the project and travel with Danao to Universidade Federal de Mato Grosso – Sinop campus and develop a research project on assessing changes in nutritive quality and processing properties of soybeans and corns resulting from agronomic practices in northern Mato Grosso.

3. Please attach (or provide a URL to products electronically available) work products that has been completed.

None