

**NIOSH AGRICULTURAL CENTERS**

**ANNUAL REPORT**

**FISCAL YEAR 2005**

**October 1, 2004 - September 30, 2005**

**Submitted by Center Director, Dr. Thomas L. Bean**

## OHIO

### Great Lakes Center for Agricultural Safety and Health

#### I. CENTER OVERVIEW

##### A. INTRODUCTION & EXECUTIVE SUMMARY OF THE PROGRAM

The Great Lakes Center for Agricultural Safety and Health (GLCASH) serves the states of Illinois (IL), Indiana (IN), Kentucky (KY) Michigan (MI), Ohio (OH), Pennsylvania (PA), West Virginia (WV) and Wisconsin (WI). These states share many common attributes, i.e. crops, farming practices, farm size, migrant streams, poverty in Appalachian areas, strong commercial fishing or timber harvesting, and Amish populations, to mention a few. The overall objective of the Great Lakes Center for Agricultural Safety and Health is to promote safety and health through education, prevention, outreach, intervention, and research. Our target audience is employers, domestic workers, migrant workers, and families located within agricultural communities of the states served by the GLCASH.

GLCASH initially received approval for three years of funding in 2001 and an additional three years of funding in 2003. To that end, GLCASH staff and Principal Investigators (PI's) of Center Projects have: established the Center; completed the first four years of a five year research project on farm-related asthma; completed a prevention/intervention project on the effectiveness of sun safety behavior of agricultural workers; initiated research on testing a grain hazard assessment tool in the field; initiated an intervention project to evaluate impacts of the Great Lakes Center Fellows Program; completed a project to develop an audiovisual approach to train West Virginia farmers on prevention effectiveness of Roll Over Protective Structures (ROPS) in reducing traumatic injury; began adapting best management practices for the agricultural sector in the insurance industry; completed four feasibility projects and started working on one new feasibility project; developed and implemented projects for an aggressive outreach program; conducted one national meeting and one regional meeting; continued to maintain an existing state database to track agricultural related fatalities in Ohio; participated in the NIOSH Agricultural Safety and Health Center's "National Agricultural Tractor Safety Initiative" and submitted a grant as part of the initiative; participated in the Agricultural Center Evaluators Initiative; conducted major national presentations with each being published as part of the proceedings; journal publications have added to the body of available knowledge; continued to work on extramural projects which include two USDA grants, a state of Ohio grant, one OSHA grant, one Susan Harwood OSHA grant and one additional RO1 NIOSH grant.; and the GLCASH Directors completed an application for Outreach supplemental funding to enhance the outreach activities of the Center.

## **B. CENTER ACCOMPLISHMENTS FOR FY 2005**

For additional detail see the Administrative Core subpart E.

1. Site visits were conducted to all PI's with major projects as well as one feasibility project.
2. Collaboration meeting conducted with Northeast Center and Pennsylvania State University.
3. Groundwork began on a new collaboration with the University of Minnesota in an effort to add MN to the GLCASH region.
4. GLCASH Director's attended two NIOSH Agricultural Centers Director's meetings.
5. A new marketing campaign began during FY 2005 in an effort to reinforce the theme of GLCASH and expand the Center's network and accessibility.
6. GLCASH hired a Center Manger.
7. The Center Director and Manger participated in the NIOSH Agricultural Center's Multi-Site Evaluation Initiative.
8. A Research to Practice meeting including GLCASH Director's, a NIOSH representative and OSU Research staff was conducted.
9. A Request for Pre-Proposals was released in an attempt to identify possible collaborators for the NIOSH Agricultural Center PAR.
10. Due to new University regulations GLCASH was required to develop an IRB Umbrella Protocol for future projects.

## **C. REGIONAL ACTIVITIES**

1. **States Served by Center** Illinois, Indiana, Kentucky, Michigan, Ohio, Pennsylvania, Wisconsin and West Virginia
2. **States with Center Activity for FY 2005** Illinois, Michigan, Ohio, Pennsylvania, Wisconsin and West Virginia

## **D. REPORT ON THE OUTREACH PROGRAM**

An active outreach program is essential for the promotion of our Center. Also, outreach is an effective tool for name recognition and gaining support and cooperation of the

clients we serve. NIOSH funding of such outreach programs support the efforts of the Center Outreach Director, Ms. Dee Jepsen. Ms. Jepsen is responsible for the development, coordination and implementation of outreach programs conducted by the Center. In addition Ms. Jepsen and others on her staff answer the many questions that the Center receives from the agricultural community.

During this reporting period the Center utilized funds from the outreach budget to support multiple efforts. The first effort supported train-the-trainer programs for the Hazardous Occupations Safety Training in Agriculture (HOSTA) project in Ohio. Ten sessions were conducted around the state between November 2004 and July 2005. Over 100 participants attended the training workshops, and these educators are now teaching the tractor certification program to youths in their communities. GLCASH funds supported the reproduction of notebook training materials. Because of this sponsorship, the GLCASH logo was added to the front cover of the instructor notebooks.

The second effort supported a national train-the-trainer program for sun safety and skin cancer prevention. Outreach Director Jepsen presented a workshop for 34 American Farm Bureau Safety Coordinators from across the nation. The materials developed for this training were pilot tested in a past GLCASH research project. This research to practice effort incorporated a Power Point presentation, educational content, and the intervention device, the Dermascan® skin analyzer. Training materials for the workshop were organized onto a CD-ROM and used for this program as well as future training sessions. Additional sun safety and skin cancer prevention workshops are planned for FY 2006. Collaborations with the American Farm Bureau Federation are also likely to continue.

The third outreach effort is the marketing and distribution of a national tractor safety video. The funded project "Audiovisual Approach to Train WV Farmers on Prevention Effectiveness of ROPS in Reducing Traumatic Injury" resulted in a locally developed video to inform West Virginia farmers about the risks associated with tractor rollovers and the effectiveness of ROPS in reducing traumatic injuries. The Principal Investigator has taken the video and adapted it to a national audience. Currently, GLCASH is developing a flyer to market the video to agricultural safety and health professionals. This flyer includes a 1-800 number in which copies of the video can be requested at no cost as well as have farmers inquire about installing ROPS and seatbelts on their tractors. This effort will also support the goals of the NIOSH Agricultural Safety and Health Centers' National Agricultural Tractor Safety Initiative.

Additional outreach efforts are planned to support future HOSTA instructor trainings in the states served by GLCASH. All states received initial State Master Trainings by the HOSTA project, sponsored by USDA-CSREES. However, individual states may need additional support to adequately implement the training to their local instructors. Using the training program developed in Ohio as the model, additional workshops will be scheduled in FY 2006.

## II. CENTER PROJECT REPORT BY CORE / TYPE

### ADMINISTRATION CORE

#### A. PROJECT TITLE

Administration of the Center

#### B. PROJECT OFFICER (S)

Dr. Thomas L. Bean  
Center Director  
Great Lakes Center for Agricultural Safety and Health  
Professor, Extension Safety Leader & Interim Chair  
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Dr. Jay Wilkins  
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Great Lakes Center for Agricultural Safety and Health  
Professor  
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Dr. Karen Bruns  
Director of Outreach and Education  
Great Lakes Center for Agricultural Safety and Health  
Director  
OSU Extension and University Outreach  
OSU Extension  
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Columbus, OH 43210  
614-292-9613  
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Since our last application, three new team members have joined the GLCASH staff:

Dr. Thomas Archer  
Director of Prevention & Intervention  
Great Lakes Center for Agricultural Safety and Health  
Evaluation Specialist  
Ohio State University Extension  
Room 6 Agricultural Administration Building  
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Ms. Shelly Dee Jepsen  
Director of Outreach Programs  
Great Lakes Center for Agricultural Safety and Health  
Director of Agricultural Safety and Health Program  
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### **C. PROJECT DESCRIPTION**

The overarching goal of the Center is to contribute to the saving of lives and improving of the quality of life of agricultural communities through distinctive education, cutting-edge interdisciplinary research, and the most progressive outreach and prevention programs. The primary objective of the Administrative Core is to provide the leadership for action, resource allocation, and fiscal management, guided by the Center Advisory Committee.

#### Project Aims

1. To provide strong leadership for the Great Lakes Center for Agricultural Safety and Health
2. To provide a theme for the Great Lakes Center for Agricultural Safety and Health

3. To provide adequate organization and facilities for conducting Center activities
4. To provide support for feasibility projects
5. To use existing state/national databases
6. To establish an External Advisory Committee
7. To establish an Internal Advisory Committee
8. To assure Human Subject review
9. To complete any necessary subcontracts

**D. PROJECT START AND END DATES** October 1, 2003 - September 30, 2006

**E. PROJECT ACTIVITIES / ACCOMPLISHMENTS FY 2005**

Major Project Accomplishment 1: In an effort to provide strong leadership for GLCASH, the Director and Manager conducted site visits with the currently funded researchers throughout the winter and spring of 2005. The PI's from all five of the major projects were visited and one PI of a feasibility project. These visits resulted in a thorough examination of the work being done by the PI's and an update on their progress. In addition these visits allowed for time to discuss future collaborative efforts.

Major Project Accomplishment 2: In the spring of 2005 a collaborative meeting occurred between the GLCASH Director and Manager, the Northeast Center Director and a currently funded GLCASH PI who is funded in a state shared between the two Centers. This was an important meeting that discussed future collaborative efforts and commonalities between the Centers.

Major Project Accomplishment 3: In the summer of 2005 GLCASH expanded it's network by approaching Dr. John Shutske of the University of Minnesota for possible collaboration with GLCASH. Dr. Shutske agreed that Minnesota would become part of the GLCASH region. In addition, the Center Director will be asking Shutske to participate with GLCASH as one of its External Committee members in the NIOSH PAR-06-057.

Major Project Accomplishment 4: Center Director and the Outreach Director attended the NIOSH Agricultural Centers Director's meeting in Kentucky. The Outreach Director gave a presentation on behalf of GCLASH at this meeting. The Center Director attended and presented on behalf of GLCASH at the NIOSH Agricultural Centers Director's meeting in Texas.

Major Project Accomplishment 5: Throughout FY 2005 the Center has begun a

marketing strategy to reinforce the theme of GLCASH. This has included a revamping of the electronic newsletter and publishing it quarterly; updating the website; and increasing the Center's availability to the public through a 1-800 number and a general inquiry email address.

Major Project Accomplishment 6: In January, 2005 GLCASH hired a Center Manager. The new manger comes to the Center with a strong experience in operations, accounts and administrative management as well degrees in public administration specializing in public policy and analysis.

Major Project Accomplishment 7: The Center Director and Manager participated in the NIOSH Agricultural Center's Multi-Site Evaluation Initiative, which is spearheaded by the High Plains Center. The Center Manager has attended multiple meetings regarding the initiative, assisted in the data gathering required for the project and serves on the report writing committee.

Major Project Accomplishment 8: In an effort to discuss and have a better understanding of the NIOSH Research to Practice ("R2P") initiative, the GLCASH Research Director arranged a meeting with local Ohio researchers, the GLCASH Administrative personnel, Ohio safety and health professionals and NIOSH representative DeLon Hull to discuss "R2P".

Major Project Accomplishment 9: In preparation of the NIOSH PAR-06-057, GLCASH released a Request for Pre-Proposals. This RFPP allowed for GLCASH Director's to identify potential collaborators and provide feedback to potential PI's on their proposed projects. This effort was a great success with over twelve pre-proposals submitted to GLCASH and then reviewed by the Internal Committee. Many researchers were identified as possible future collaborators and encouraged to expand upon their proposals.

Major Project Accomplishment 10: During the summer of 2005 GLCASH developed an IRB Umbrella Protocol. Due to new University regulations GLCASH was asked to develop and submit a protocol to ensure proper IRB approval through the Center's Office of Responsible Research and any subcontracted University. A copy of the IRB approval is included in Appendix 1.

## **F. PROJECT PRODUCTS**

### **1. Presentations**

Dee Jepsen, GLCASH Outreach Director, gave a presentation at the NIOSH Agricultural Center Director's meeting in Kentucky, 2004.

Thomas L. Bean, GLCASH Director, gave a presentation at the NIOSH Agricultural Center Director's meeting in Texas, 2005.

## **2. Publications**

### **a. Peer Reviewed Journal**

David Atrubin, J.R. Wilkins III, J. Mac Crawford and T.L. Bean.  
Self-Reported Symptoms of Neurotoxicity and Agricultural Injuries Among  
Ohio Cash Grain Farmers. *American Journal of Industrial Medicine*,  
47:538-549, April 2005.

## **3. Education / Training / Outreach**

### **a. Training Seminars**

Jepsen, S.D. Skin Cancer Prevention Program. National training program  
for the *American Farm Bureau Safety and Health Network*. Kansas City,  
Kansas 2005.

### **b. News Letters**

Great Lakes Center Agricultural Safety and Health News. Issue 8/May  
2005, [http://www.ag.ohio-  
state.edu/~agsafety/glc/documents/glcnewsprint.pdf](http://www.ag.ohio-state.edu/~agsafety/glc/documents/glcnewsprint.pdf)

Great Lakes Center for Agricultural Safety and Health News. Issue  
9/August 2005, [http://www.ag.ohio-  
state.edu/~agsafety/glc/documents/correctedglcnewsPrint8\\_05.pdf](http://www.ag.ohio-state.edu/~agsafety/glc/documents/correctedglcnewsPrint8_05.pdf)

### **c. CD-ROMs or other Computer-Based Training Programs**

Jepsen, S.D. Skin Cancer Prevention Program. National training program  
for the *American Farm Bureau Safety and Health Network*. Kansas City,  
Kansas 2005.

## **4. Conferences / Meetings Sponsored**

Research to Practice Meeting. August 16<sup>th</sup>, The Ohio State University.  
Approximately 20 individuals from various research institutions and universities  
attended.

## **G. STATES THE PROJECT WAS ACTIVE IN**

Illinois, Michigan, Ohio Pennsylvania, Wisconsin, and West Virginia

## **IV. PROGRESS REPORT ON FEASIBILITY PROJECTS**

### **Feasibility Project 1**

#### **A. PROJECT NAME OR TITLE**

Midwest Landscape Intervention Evaluation Pilot Program

#### **B. PRINCIPAL INVESTIGATOR(S) NAME AND CONTACT INFORMATION**

Larry Chapman  
125 Agricultural Engineering Building  
460 Henry Mall  
Madison, WI 53706  
608-262-1054  
ljchapman@facstaff.wisc.edu.

**C. PROJECT START AND END DATES** September 14, 2004 - September 14, 2005

#### **D. PROJECT DESCRIPTION**

Objective: Prepare for an application in the landscape sector of the agricultural industry in the Great Lakes states. Dr. Chapman intended to use GLCASH funding to begin a very preliminary investigation of the landscape operations sector of the agricultural industry as a candidate for a future application for a NIOSH intervention evaluation award or other funding.

Project Aims:

1. Learn from landscape operation growers and landscape industry resource people about the industry. This includes work activities, job hazards, safer and more profitable work practices and tools, and sources for a sampling frame of landscape operations in the Great Lakes states.
2. Learn from previously published research and on-going projects about the landscape industry. This includes work activities, job hazards, safer and more profitable work practices and tools, and sources for a sampling frame of landscape operations in the Great Lakes states.

#### **E. EXECUTIVE SUMMARY OF THE PROJECT**

This feasibility project worked towards accomplishing the project's aims. In regards to the first aim, two staff members attended the landscape industry's largest, most important annual meeting in Portland, OR and several Midwest meetings. The PI

viewed exhibits and learned more about landscape operation activities in general. The PI also visited landscaper operations.

In regards to the second aim, Dr. Chapman searched on-line for information about the size of the industry and its workforce, spoke with key industry contacts, and read trade journals. Dr. Chapman learned about one other important landscape practice research project (at OSU). No final report was prepared. We hope the information may be useful for a future NIOSH application for an intervention with the landscape industry.

#### **F. PROJECT ACTIVITIES/ACCOMPLISHMENTS FOR FY 2005**

1. Attended the 3 largest Midwest landscape and nursery shows, toured exhibits, met landscapers, made contacts, learned about the work.
2. Read each issue of 5 regional landscape trade publications to learn about the industry.
3. Met with 2 local landscapers.
4. Identified 8 tasks (aside from stonework installation) which may pose occupational health and safety risks to landscapers: weeding, pruning, raking, using backpack sprayers, lifting plants, loading and unloading trucks, digging, and tarping trucks.
5. Collected research literature on landscape industry.
6. Reviewed information on commercially available devices that could reduce work risks and increase efficiency while performing landscaper tasks.
7. Located four legitimate sources of names and addresses of landscapers in Ohio.

#### **G. REGIONAL OR NATIONAL ACTIVITIES ATTENDED**

1. PLANTS Conference and Trade Show, Indianapolis IN, Jan.12-14, 2005
2. Mid-Am Conference and Trade Show, Chicago IL, Jan. 19-21, 2005
3. CENTS Show, Columbus OH, Jan. 24-26, 2005
4. FAR WEST Show in Portland Oregon

#### **H. PROJECT PRODUCTS**

Hazardous task list for landscapers

**I. REPORT ON THE OUTREACH PROGRAM**

None

**J. SPECIFIC RESULTS OR PRODUCTS OF YOUR PROJECT THAT RESULTED IN ANY RESEARCH TO PRACTICE**

None

**K. COLLABORATION**

None

## **Feasibility Project 2**

### **A. PROJECT NAME OR TITLE**

Vehicle-in-the-loop Virtual Reality Simulation of Tractor Rollover

### **B. PRINCIPAL INVESTIGATOR(S) NAME AND CONTACT INFORMATION**

Dr. Qin Zhang  
Associate Professor  
Department of Agricultural and Biological Engineering  
University of Illinois at Urbana-Champaign  
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(217)333-9419  
qinzhang@uiuc.edu

**C. PROJECT START AND END DATES** September 16, 2004 – March 15, 2006

### **D. PROJECT DESCRIPTION**

This project is a pilot research intends to collect preliminary data for designing a “vehicle-in-the-loop” (VIL) virtual reality simulator of tractor rollover. As proposed, this pilot research focused on collecting field data of tractor dynamics under various terrains and studying the feasibility on developing such a VIL simulator based on obtained field data.

Project Aims

1. Prepare a research platform with a field image recorder for field data collection
2. Perform baseline tests for field data collection under the normal field operation conditions
3. Design a conceptual system of the VIL virtual reality simulator

### **E. EXECUTIVE SUMMARY OF THE PROJECT**

Tractor-related fatalities are the one of the leading causes of the fatal accidents in agricultural production industry of the U.S. Of these accidents, the tractor overturn consistently yields over 50% of the fatalities each year. The final goal of this research project is to reduce the number of the tractor overturn accidents through several approaches such as safety devices, studying tractor rollover mechanisms, or educational tools. As a pilot project for this research, we have focused on collecting field data of tractor dynamics under various terrains and studying the feasibility on developing such a VIL simulator based on obtained field data.

The outcome from this pilot project proved that it is practical to create a 3D virtual terrain map based on stereo scenery images acquired using a tractor-mount stereovision camera. As the core technology for developing the proposed VIL virtual reality simulator, a stereo image processing and virtual representation algorithm has been created and validated. A full-scale research project is recommended to accomplish the ultimate goal of developing an active rollover prevention technology implemental on tractors for eliminating rollover caused injuries and fatalities.

## **F. PROJECT ACTIVITIES/ACCOMPLISHMENTS FOR FY 2005**

The major accomplishments in performing this pilot research against the specific proposed objectives include:

1. The creation of a research platform for conducting baseline data collection
2. The implementation of field dynamic tests under various operations condition for collecting the baseline data
3. The investigation of fundamental data processing methods for utilizing the collected baseline data in supporting the VIL simulator development
4. The preparation of a technology news letter for GLCASH News
5. The preparation of a manuscript for submission to a peer-reviewed journal for consideration of publication
6. The preparation of an invention disclosure on the developed conceptual active rollover prevention technology.

## **G. REGIONAL OR NATIONAL ACTIVITIES ATTENDED**

Technical shows of automation technologies for agricultural equipment at Farm Machinery Antique Show (Rantoul, IL). A poster of "New Iron" with an agricultural tractor equipped with stereo sensor for guidance and active rollover were presented.

## **H. PROJECT PRODUCTS**

### **1. Presentations**

Poster presentation of "New Iron" at Farm Machinery Antique Show (Rantoul, IL)

### **2. Publications**

**a. Peer Reviewed Journal**

Kise, M. and Q. Zhang, 2005. Online vehicle pose and motion simulation for rollover precaution based on on-board sensors. *Computers and Electronics in Agriculture*, (submitted for consideration of publication).

**b. Other Publications**

Great Lakes Center for Agricultural Safety and Health News: A Camera-based Predictive Safety Device for Tractor Rollover Prevention

**3. Education / Training / Outreach**

**a. Academic Training**

One post-doctoral student was partially sponsored from this project in performing this pilot project. His major responsibilities in this project included the collecting field data, and software programming for analyzing the obtained field data.

**b. Other**

Technical shows of automation technologies for agricultural equipment at Farm Machinery Antique Show (Rantoul, IL). A poster of “New Iron” with an agricultural tractor equipped with stereo sensor for guidance and active rollover were presented.

**4. Other Products**

An invention disclosure, titled “Sensor-based Active Rollover Prevention Device for Vehicles and Mobile machinery”, has been prepared based on the developed conceptual active rollover prevention technology.

**I. REPORT ON THE OUTREACH PROJGRAM**

None

**J. SPECIFIC RESULTUS OR PRODUCTS OF YOUR PROJECT THAT RESULTED IN ANY RESEARCH TO PRACTICE**

None at this time.

**K. COLLABORATION**

None

### **Feasibility Project 3**

#### **A. PROJECT NAME OR TITLE**

Simulation of a PTO Environment

#### **B. PRINCIPAL INVESTIGATOR(S) NAME AND CONTACT INFORMATION**

Don Stredney  
1224 Kinnear Road  
Columbus, Ohio 43212  
(614) 292-8447  
don@osc.edu

#### **C. PROJECT START AND END DATES** May 1, 2005 – April 20, 2006

#### **D. PROJECT DESCRIPTION**

This applied research aims to harness emerging technologies to simulate a common occupational setting that provides the potential for experiencing acute traumatic injuries. The investigators will adapt current technologies to simulate an environment with a power take off (PTO), an indispensable tool found on farms and other work environments that transfers power from a common tractor to be redirected to drive various implements. The PTO has continuously proven to be problematic in providing acute unintentional injuries through entrapment or entanglement.

This preliminary research will extend our current work to this specific scenario, the PTO environment, which is exemplary of high-risk agricultural work settings. The pilot study will help delineate advantages and limitations of our approach and the data collected will help us generate study designs for future submissions. Long term, the use of virtual environments can serve to elucidate the etiology of occupational injuries and possibly help identify high-risk populations.

#### **E. EXECUTIVE SUMMARY OF THE PROJECT**

##### **Integration of components**

We have integrated a digital representation of a tractor, a hay baler, and a PTO shaft into a synthetic Shared Virtual Environment (SVE). This environment (See Figure 1 LEFT) is presented to the user via a head mounted display (HMD) with a resolution of 1280x1024 per eye, thus providing a stereo visual presentation. Auditory presentation is through separate wireless earphones.

In October, we provided a white paper to Immersion Corporation regarding the release of their new wireless CyberGlove™. Although this product currently does not support tactile feedback necessary for the project, it does support more natural hand movements by the

user than the tethered version. This in conjunction, with the new hand data, is being integrated into the SVE. The data was obtained from an online source for 3D data sets. Current efforts involve natural deformation on the hand in real-time and increased realism/lighting through work with the shaders available on the graphics processing unit (GPU) (See Figure 1 RIGHT).



**Figure 1 LEFT: Synthetic PTO environment. RIGHT: Subjective view from user's perspective.**

#### **Establishment of IRB approved protocol**

In order to study Human Subjects, we must have an IRB approved protocol in place. The IRB protocol, 2004H0297, Evaluating Elicited Anxiety in a Simulated Environment, was awarded to the PI, Don Stredney.

Related to this effort, we are establishing a second environment to support this effort in our Springfield Office. We have requested a revised assurance to add the Springfield site as a secondary lab to run these studies is currently under federal agency review, and approval is expected shortly.

#### **Subject Recruitment**

We have commenced recruitment through word of mouth. In addition, we have a planning session scheduled for Tuesday, December 6<sup>th</sup> with Dee Jepsen, Outreach Director of GLCASH. Through her work with the Agricultural Extension Offices, Ms. Jepsen will also help us identify extension officers who teach tractor safety to either serve as human subjects for this study or help us identify individuals who might serve. Additional reviews were provided to Dr. Thomas Bean, Director of GLCASH, June 2, and Dr. Jay Wilkins, Deputy Director and Associate Director of Research, GLCASH, September 15<sup>th</sup>.

**F. PROJECT ACTIVITIES/ACCOMPLISHMENTS FOR FY 2005**

1. Received IRB approval
2. PI Stredney has integrated the PTO machinery into a virtual simulation environment.
3. Stredney is meeting with Ms. Dee Jepsen to discuss formative evaluation on 12/06/05

**G. REGIONAL OR NATIONAL ACTIVITIES**

None

**H. PROJECT PRODUCTS**

None

**I. REPORT ON THE OUTREACH PROGRAM**

None to report at this time

**J. SPECIFIC RESULTS OR PRODUCTS OF YOUR PROJECT THAT RESULTED IN ANY RESEARCH TO PRACTICE**

None

**K. COLLABORATION**

Dee Jepsen, Program Director, Ohio State University Extension  
J.R. Wilkins, Research Core Director, GLCASH

## **V. REPORT ON SPECIFIC IMPROVEMENTS IN AGRICULTURAL SAFETY AND HEALTH THAT RESULTED FROM CENTER ACTIVITIES (RESEARCH TO PRACTICE).**

GLCASH has been able to translate results from sponsored projects into the agricultural workplace. Through the Ohio Extension Service, GLCASH Outreach Director, Dee Jepsen has developed a national train-the-trainer program for sun safety and skin cancer prevention. Jepsen presented a workshop for 34 American Farm Bureau Safety Coordinators from across the nation. The materials developed for this training were pilot tested in a past GLCASH research project. This “R2P” effort incorporated the Power Point presentation, educational content, and the intervention device, the Dermascan® skin analyzer. Training materials for the workshop were organized onto a CD-ROM and used for this program as well as future training sessions. Additional sun safety and skin cancer prevention workshops are planned for FY 2006. Collaborations with the American Farm Bureau Federation are also likely to continue.

A second R2P effort underway at the Center is the marketing and distribution of a national tractor safety video. The funded project “Audiovisual Approach to Train WV Farmers on Prevention Effectiveness of ROPS in Reducing Traumatic Injury” resulted in a locally developed video to inform West Virginia farmers about the risks associated with tractor rollovers and the effectiveness of ROPS in reducing traumatic injuries. The PI has taken the video and adapted it to a national audience. Currently, GLCASH is developing a flyer to market the video to agricultural safety and health professionals. This flyer includes a 1-800 number in which copies of the video can be requested at no cost as well as have farmers inquire about installing ROPS and seatbelts on their tractors. This effort will also support the goals of the NIOSH Agricultural Safety and Health Centers’ National Agricultural Tractor Safety Initiative.

A third R2P effort underway at the Center is through the project “Evaluating for Impact GLCASH Fellows Program”. This program focuses on program evaluation. As a result, research related to program evaluation is used to help agricultural safety and health professionals practice program evaluation. Also, the professionals will use the program evaluation they conduct to improve future health and safety programs

## **VI. COLLABORATION**

American Farm Bureau Federation  
Illinois State University  
National Safety Council  
The Ohio State University  
The Pennsylvania State University  
University of Wisconsin – Madison

Children’s Hospital, Columbus, OH  
Michigan State University  
Ohio Department of Public Safety  
The Ohio State University Extension Service  
University of Illinois Champaign-Urbana  
West Virginia University

## **RESEARCH CORE**

### **Research Project 1**

#### **A. PROJECT NAME AND TITLE**

Farm-Related Asthma

#### **B. PRINCIPAL INVESTIGATOR(S) AND CONTACT INFORMATION**

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#### **C. PROJECT START AND END DATES** September 1, 2001 – August 31, 2006

#### **D. PROJECT DESCRIPTION**

This farm-asthma proposal was submitted as a 5-year project. Our specific objective has been to identify the prevalence of work-related asthma in farmers and compare these results with data generated by the NIOSH SENSOR surveillance program.

##### Specific Aims

1. To estimate the prevalence of asthma in the adult farm population that is farm-related.
2. To estimate the proportion of farm-related asthma in the farm population that occurs after a latency period from onset of exposure, that occurs without a latency period from onset of exposure [Reactive Airways Dysfunction Syndrome (RADS)], or occurs from aggravation of pre-existing asthma.
3. To determine how the estimated proportion of types of farm-related asthma and incidence of farm-related asthma changes when the subjects with asthma have objective testing to confirm both the diagnosis of asthma and farm-related asthma.
4. To determine how the proportion and incidence generated from active case ascertainment differs from the ongoing more passive case ascertainment of the Sentinel Event Notification System for Occupational Risks (SENSOR) surveillance system among farmers.

## **E. EXECUTIVE SUMMARY OF THE PROJECT**

This project has been identifying and interviewing all farmers and family members treated for asthma over a three-year period between the ages of 18 to 65 who obtained their health insurance through the Michigan Farm Bureau. There were 1,388 adults treated for asthma among the members during the three-year period. All eligible subjects who agreed to participate were interviewed with a standardized questionnaire. Individuals who did not have documented pulmonary function testing showing hyperactive airways were offered such testing. Using questionnaire data, we classified subjects as having or not having work-related asthma and their type of work-related asthma. We used the current NIOSH Sentinel Event Notification System for Occupational Risks (SENSOR) criteria for work-related asthma to perform this classification. All subjects who met the NIOSH SENSOR criteria for work-related asthma were offered electronic peak flow and Forced Expiratory Volume in one second testing over a two-week period, to determine if there were changes on pulmonary function testing in relation to their farm work. The OASYS software system, developed in England, was used to interpret the results of the pulmonary function testing done over this two-week period. Prevalence rates were calculated for farm-related asthma. Additionally, we compared prevalence rates using individuals who met the NIOSH SENSOR criteria, without objective documentation of asthma and pulmonary function changes associated with farm work, versus those individuals who met the criteria because they have objective documentation of asthma and pulmonary function changes associated with farm work. This project is ongoing as we have received funding to continue the project over another year. Accordingly, data collection and analysis have not been finalized.

## **F. PROJECT ACTIVITIES/ACCOMPLISHMENTS FOR FY 2005**

1. Blue Cross Blue Shield (BCBS) Insurance of Michigan completed a third mailing to 796 Farm Bureau and small business subscribers treated for asthma in 2003.
2. Ag Expo 2005 was held July 19, 20, 21. Three Hundred sixty seven people completed information cards providing information on their and family asthma conditions as well as occupation, many more picked up the information available there: Hazard Alert describing the 2005 Farm Asthma death, Asthma Fact Cards, prepared for AgExpo 2003, Project Information Brochures, also prepared for 2003, Bookmarks with information on the Asthma Initiative in Michigan at [www.getastmahelp.org](http://www.getastmahelp.org), and pencils and pens with project hot line phone numbers. The computerized spirometer was displayed for demonstrating technology used on this project. Forty-five people signed up to get more information, indicating that they or a family member on a farm had asthma. They were sent letters about the study, asking them or a family member to participate.

3. One hundred and twenty one new participants responded to the letter from BCBS and were contacted with project information by MSU.
4. Forty individuals were interviewed for this project from 10/2004 to 9/2005.
5. Twenty-three had previous breathing tests that were reviewed by Dr. Rosenman.
6. Four were invited to further testing that the project would pay for, a project total of 6 were tested in fiscal year 2005.
7. Three new participants qualified and a total of 7 completed the computerized spirometer testing on their own farms in fiscal year 2005.
8. Preliminary analysis was completed:
  - a. Mailings have been sent to 1374 subscribers and 148 individuals heard about the project and contacted us. One Hundred and thirty-three of the 148 individuals who contacted us, signed up at the 2003, 2004 or 2005 Agricultural Exposition. Only a few of these individuals were on our original mailing. To determine this Blue Cross/Blue Shield checked their names against the original mailing. This is a prevalence of adults with asthma who received medical care in one year of 4.2%.
  - b. We were contacted by a total of 487 individuals. One hundred and ten were not eligible (outside age limits, not farmers or their dependents), 53 refused to be interviewed, 63 still need to be interviewed, and 307 individuals were interviewed.
  - c. Of the 307 individuals interviewed, 212 have had spirometry, 67 have had pre/post bronchodilator testing and 15 have had methacholine testing as part of their regular medical care. We have performed 15- pre/post bronchodilator, and 29 methacholine tests (1 individual had both). Seventeen individuals have completed the computerized spirometry/peak flow on their farm.
  - d. One hundred eleven individuals met the SENSOR criteria for work-related asthma related to farm exposures. Seventy-seven reported their symptoms were worse with exposure to a known workplace allergen, 17 reported their symptoms were worse with exposure to a substance not previously associated with work-related asthma, 3 had onset of symptoms consistent with RADs and 14 had symptoms consistent with work aggravated asthma.

- e. Based on reports to the SENSOR system the prevalence of work-related asthma among farmers was 19/100,000 (36). The prevalence among farmers from this current project using the same clinical history criteria used in the SENSOR program is 309/100,000. This difference, which indicates the SENSOR system is missing 94% of cases, is large but is consistent with our published estimate that SENSOR misses 82% of cases (18).
- f. Among the 111 individuals with potential farm-related asthma, 90 (81.1%) have been tested as part of their medical care or by this project for hyperactivity. Forty of the 77 (51.9%) for whom we have reviewed their pulmonary function test results have evidence of hyperactivity. Seventeen individuals tested to date that met the SENSOR criteria for work-related asthma by history and had evidence of hyperactivity did not have evidence of pulmonary function changes on the computerized spirometry in relation to farm exposures. We are still evaluating the computerized spirometry results since farmers are not spending sufficient time away from their farm to obtain measurements during non-exposed periods that can be compared to measurements during periods when they are exposed.
- g. Dr. Rosenman is also still testing additional individuals and reviewing additional pulmonary function test results. The percentage of individuals meeting the SENSOR criteria for farm work-related asthma is high (111 of 307, 36%). Dr. Rosenman has had a limited response rate and potentially individuals with farm-related problems were more likely to participate, although the contact letters did not indicate he was studying asthma in relationship to farm exposures. The percentage of individuals who met the SENSOR criteria for farm work-related asthma and who had tests of hyperactivity as part of their regular medical care was 34 of 111, 30.6%. This is less than the result of 65% having such testing in the overall SENSOR database. Among the 77 tested and reviewed who met the SENSOR criteria for work-related asthma, 37 (48.0%) had negative results for hyperactivity and the 17 individuals with tests done in relationship to work had negative results. This is consistent with data from Quebec indicating the SENSOR criteria based on history are sensitive but not specific (37). The data from the Quebec study which compared a history of symptoms in relation to work with specific antigen testing reported the history of symptoms in relation to work had a specificity of only 33-45% using a positive specific antigen test as the “gold standard”.

## **G. REGIONAL OR NATIONAL ACTIVITIES ATTENDED**

Michigan Agricultural Expo, East Lansing, Michigan

## **H. PROJECT PRODUCTS**

### **1. Publications**

#### **a. Fact Sheets / Brochures / Technical Publications**

MIFACE Hazard Alert #6 "Fatal Asthma Attack While Cleaning Bulk Milk Tank".

#### **b. Other Publications**

"Breathing problems? MSU asks for help", *MICHIGAN FARM NEWS* August 15, 2005, Vol. 82 No. 12, page 4.

### **2. Education / Training / Outreach**

#### **a. Academic Training**

One second-year Internal Medicine Resident, Amarbir Mattewal, participated in data collection and analysis.

#### **b. Other**

Description of Farm Asthma Project added to Occupational Environmental Medicine web site at: [www.oem.msu.edu](http://www.oem.msu.edu).

## **I. REPORT ON THE OUTREACH PROGRAM**

Nothing to report at this time.

## **J. SPECIFIC RESULTS OR PRODUCTS OF YOUR PROJECT THAT RESULTED IN ANY RESEARCH TO PRACTICE**

One participant of this project stopped by the AgExpo 2005 booth to relay that he had benefited by this project in becoming much better aware of Farm triggers for his asthma. The extensive testing and consultation with Dr. Rosenman had helped him better manage his asthma.

## **K. COLLABORATION**

Michigan Farm Bureau  
Blue Cross Blue Shield Health Insurance of Michigan

## **Research Project 2**

### **A. PROJECT NAME OR TITLE**

Field Test Farm Grain Hazard Assessment Tool

### **B. PRINCIPAL INVESTIGATOR(S) NAME AND CONTACT INFORMATION**

Douglas M. Kingman  
Illinois State University  
Campus Box 5020  
Normal, IL 61790-5020

### **C. PROJECT START AND END DATES**

This project has a two-year duration beginning October 1, 2003 and ending September 30, 2005. However, funding for this project was not established until February of 2004 due to circumstances beyond the control of Illinois State University and the PI.

### **D. PROJECT DESCRIPTION**

In a previous study by the PI, a systems approach was used to complete a hazard analysis of on-farm metal grain storage bins in order to develop and test a farm grain hazard assessment tool that could predict the increased likelihood of an engulfment. The preliminary study was limited by the fact that most of the farms evaluated were located in Indiana and no commercial grain storage operations were assessed with the tool. This study broadens the application of the tool by applying it to commercial operations and farms in Illinois.

#### Project Aims

1. Field test the Farm Grain Engulfment Hazard Assessment Tool with at least 100 Illinois farm owners/operators and compare responses to previous findings reported by the PI in the preliminary study.
2. Field-test the Farm Grain Engulfment Hazard Assessment Tool with at least 25 Illinois commercial grain-handling sites and compare the responses to previous findings reported by the PI in the preliminary study.
3. Develop an interactive website that records user's responses to the assessment tool and provides the user with real-time risk assessment, identifies specific risky behaviors, and recommends preventative measures to reduce the risk of engulfment.

4. Develop recommended strategies for introduction and adoption of the Farm Grain Engulfment Hazard Assessment Tool as a means of identifying and correcting grain bin and handling equipment designs, engulfment warning labels on grain storage structures, work conditions and human behaviors that contribute to an increased likelihood of engulfment and suffocation.

## **E. EXECUTIVE SUMMARY OF THE PROJECT**

Grain storage is vital to agriculture throughout the Midwest. In many instances grain storage may pose risks that producers are unaware of such as; falls from heights, entanglement in augers, electrocution, and toxic atmospheres are specific hazards associated with the storage of grain. One specific hazard that is often disregarded is engulfment in grain. Identifying contributing factors to engulfment may play a key role in reducing the risks associated with the storage of grain. Previous studies have indicated that a systems approach can be used to identify hazards associated with on-farm metal grain storage bins and that the presence of those factors increased the likelihood of an incident occurring. The objective of this study is to further identify the practices of those in the grain handling and storage industry that lead to a greater risk of engulfment, and assess whether or not contributing factors are present. In order to achieve our goal a modified version the previously developed Farm Grain Hazard Assessment Tool (FGHAT) was used to identify specific practices of farmers that store grain throughout the state of Illinois. The tool was distributed to 92 farm bureau offices throughout the state and data was collected on a voluntary basis. On site visits were made to discuss grain-handling procedures directly with producers. The data was then analyzed to determine those practices that increase the likelihood of an engulfment incident occurring.

## **F. PROJECT ACTIVITIES/ACCOMPLISHMENTS FOR FY 2004**

1. To date, we have collected and begun to analyze over 200 assessment responses from Illinois farm owners/operators and over 20 responses from commercial grain – handling sites. The responses have been entered into an electronic database, summarized and compared to previous findings. A statistical consultant has been utilized on this project to coordinate the summary of the responses.
2. Aim 3: To date, a web-based version of the assessment tool has been developed and some individuals involved with the storage and handling of grain have provided responses.
3. Aim 4: We have continued to facilitate the ASABE proposed grain bin safety standard, X523, Grain Bin Safety Standard.

## **G. REGIONAL OR NATIONAL ACTIVITIES ATTENDED**

1. NIFS 2005, Wintergreen, VA
2. ASABE International Meeting, Tampa, FL

## **H. PROJECT PRODUCTS**

### **1. Presentations**

Nelson, K. and D.M. Kingman. 2005. Presentation: Cultivating Youth for Farm Safety. National Institute of Farm Safety, Wintergreen, Virginia.

Meteer, W., K. Nelson, and D.M. Kingman. 2005. Poster: Application and Assessment of the Farm Grain Hazard Assessment Tool. National Institute of Farm Safety, Wintergreen, Virginia.

Meteer, W. and D.M. Kingman. 2005. Presentation: Field Testing the Farm Grain Hazard Assessment Tool. National Institute of Farm Safety, Wintergreen, Virginia.

### **2. Publications**

#### **a. Peer Reviewed Journal**

Rhykerd, R.L., K.W. Tudor, B.R. Wiegand, D.M. Kingman, and D.G. Morrish. 2005. Enhancing experiential learning through a hands-on crop production and marketing contest. Submitted in September, 2005, to NACTA for review.

Kingman, D.M. and W.E. Field. 2005. Using fault tree analysis to identify contributing factors to engulfment in flowing grain in on-farm grain bins. *Journal of Agricultural Safety and Health*. American Society of Agricultural Engineers. Vol. 11(4).

Kingman, D.M., A.M. Yoder, N.S. Hodge, R. Ortega, and W.E. Field. 2005. Utilizing expert panels in agricultural safety and health research. *Journal of Agricultural Safety and Health*. American Society of Agricultural Engineers. Vol. 11(1).

#### **b. Other Publications**

Patent Pending: Kingman, D.M. 2005. Liberty Tube - Plastic device for use during the rescue of an individual partially engulfed in loose grain or other flowable material.

### **3. Education / Training / Outreach**

#### **a. Academic Training**

One graduate student assistant

One undergraduate assistant student

Ag Awareness Week(s), Child Safety Demonstrations, Illinois State University Research Farm, September and April 2005.

### **4. Other Products**

Undergraduate research project : Nelson, K. 2005. Cultivating Youth for Farm Safety

Meteer, W. 2005. Masters Thesis: Application and Evaluation of the Farm Grain Hazard Assessment Tool in Illinois.

### **I. REPORT ON THE OUTREACH PROGRAM**

Nothing to report at this time

### **J. SPECIFIC RESULTS OR PRODUCTS OF YOUR PROJECT THAT RESULTED IN ANY RESEARCH TO PRACTICE**

Although it is anticipated that the Farm Grain Engulfment Hazard Assessment Tool will be used in the future for engulfment hazard awareness efforts, it has not evolved to a commercial product.

### **K. COLLABORATION**

Aslihan D. Spaulding, Ph.D., Assistant Professor of Agribusiness, Illinois State University, Normal, Illinois

Mike Swartz, Director of Programs, McLean County Farm Bureau, Bloomington, Illinois

Ellen Culver, State Program Director, Illinois Farm Bureau, Bloomington, Illinois

Gary Chandler, Manager Culver Elevator Cooperative, Athens, Illinois

Steve Dennis, Manager Grain Department Evergreen FS INC Bloomington, Illinois

## **INTERVENTION/PREVENTION CORE**

### **Intervention/Prevention Project 1**

#### **A. PROJECT NAME OR TITLE**

Audiovisual Approach to Train WV Farmers on Prevention Effectiveness of ROPS in Reducing Traumatic Injury

#### **B. PRINCIPAL INVESTIGATOR(S) NAME AND CONTACT INFORMATION**

Jim Helmkamp, PhD.  
WVU Injury Control Research Center  
PO Box 9151  
Morgantown, WV 26506-9151  
304-293-0253  
jhelmkamp@hsc.wvu.edu

**C. PROJECT START AND END DATES** October 1, 2003 – September 30, 2005

#### **D. PROJECT DESCRIPTION**

The overall goal of the project was to use a locally developed video to inform West Virginia farmers about the risks associated with tractor rollovers and the effectiveness of ROPS in reducing traumatic injuries and determine whether the video influences change in tractor safety.

##### Project Aims

1. Creation of a tractor safety video based on feedback gathered from farmer focus groups
2. Distribution of the video to West Virginia farmers
3. Evaluation to determine if the video changed farmer's knowledge and actions concerning rollover risks, causal factors, and ROPS as a means of injury prevention.

#### **E. EXECUTIVE SUMMARY OF THE PROJECT**

Twenty-nine of 37 tractor-related deaths identified in West Virginia from 1997 to 2002 were caused by overturns and rollovers with none of the tractors equipped with ROPS. As a result, a safety intervention plan was developed to inform WV farmers about the risks associated with tractor rollovers and the effectiveness of ROPS in reducing injuries. The plan had three phases: 1) conduct a ROPS Use Prevalence Survey; 2) use survey results and farmer focus groups to create a tractor safety video; 3) conduct a

survey to determine if the video has influenced farmer's safety attitudes and behaviors. This NIOSH-funded grant supported the last two phases of the plan.

#### **F. PROJECT ACTIVITIES/ACCOMPLISHMENTS FOR FY 2005**

1. Mailed baseline survey (*ROPS and Seat Belt Survey - 1*) in May 2005 to 5,786 farmers belonging to the West Virginia Farm Bureau. Slightly over 39% responded. Data has been compiled and cleaned and is currently being analyzed.
2. Produced a 17-minute ROPS safety video, "A Tractor Accident Can Happen to Anyone."
3. Mailed evaluation survey (*ROPS Video Evaluation Survey - 2*) with the video to this same group less the 155 who responded that they did not currently own a tractor, had retired, were deceased, or who submitted an incomplete baseline survey. Thus far, slightly over 12% responded after watching the video. We continue to receive completed ROPS Video Evaluation Surveys each day. Data will soon be analyzed.
4. Assisted 15 respondents who called the 1-800 # listed in the video asking for assistance in obtaining information on ROPS for their model tractor. ROPS had been located for 13 of the 15 who requested assistance.
5. Responded to 43 individual farmers seeking a copy of the video after learning of its existence via a news press release.
6. Responded to several local and nationally-based corporations, organizations, governmental agencies including DuPont Corporation, Veterans' Administration, and Indiana State University who have asked for multiple copies of the video for their internal training programs and lending library inclusion.
7. A summary article appeared in the November 2005 GLCASH Newsletter.
8. A copy of the newsletter article and video were sent to the CDC/NCIPC Injury Control Research Center Program Manager (Tom Voglesonger).
9. Forwarded a copy of the completed WV video and its written script to GLCASH for review and comment to facilitate adaptation to a wider regional and potentially national audience of farmers and tractor operators. Modifications have made to the video and approximately 1,000 videos will be provided to the GLCASH for distribution in late November.

#### **G. REGIONAL OR NATIONAL ACTIVITIES ATTENDED**

None

## **H. PROJECT PRODUCTS**

### **1. Publications**

#### **a. Fact Sheets / Brochures / Technical Publications**

One-page summary of the video project was sent to the WV Agriculture Department

#### **b. Other Publications**

Article in the GLCASH November 2005 Newsletter

News release, distributed to approximately 200 outlets including WV and regional newspapers, TV and radio stations.

### **2. Other Products**

None

## **I. REPORT ON THE OUTREACH PROGRAM**

None

## **J. SPECIFIC RESULTS OR PRODUCTS OF YOUR PROJECT THAT RESULTED IN ANY RESEARCH TO PRACTICE**

None

## **K. COLLABORATION**

West Virginia Farm Bureau  
NIOSH-funded WV Fatality Assessment and Control Evaluation (FACE) Program.

## Intervention/Prevention Project 2

### **A. PROJECT NAME OR TITLE**

Adapting the ASHBMP for the Insurance Industry

### **B. PRINCIPAL INVESTIGATOR(S) NAME AND CONTACT INFORMATION**

Dennis J. Murphy  
221 Dept. of Agricultural and Biological Engineering  
The Pennsylvania State University  
University Park, PA 16802  
814-865-7157  
djm13@psu.edu

**C. PROJECT START AND END DATES** October 1, 2003 – September 30, 2006

### **D. PROJECT DESCRIPTION**

The specific aims of this Prevention/Intervention project are threefold. The first aim is to take an experimentally evaluated farm hazard audit tool and further develop it so that it is more useful to insurers of agricultural work sites, work activity, and farm residences. The second aim is to evaluate specific loss control efforts by farmers when the specific effort is requested by their insurer and facilitated by the ASHBMP document. The third aim is to provide a mechanism by which an insurance company can reliably correlate a farm hazard score to actual hazard reductions and claims costs. Hazard audits are a fundamental tool for identifying and correcting hazards of any type. Best Management Practices (BMP's) normally incorporate flexible and practical guidelines for addressing a specific topic or area of concern. The format of a Penn State developed hazard audit tool, formally known as Agricultural Safety and Health Best Management Practices (ASHBMP) used hazard gradation scales and other features to objectively and efficiently describe the condition of a particular hazard, thus the ASHBMP hazard audit tool conveys important intervention information to users by its very use (Legault & Murphy, 2000). The use of gradation scales in the ASHBMP provides a mechanism for an objective means of evaluating hazards and risks.

The objectives of this project are to:

1. Develop additional hazard gradation scales for hazards and risks identified by the cooperating insurance company.
2. Develop a flexible format for creating customized hazard audits utilizing the WWW and personal digital assistant (PDA) technology.

3. Develop a tracking system regarding the use of the ASHBMP by the cooperating insurance company and their clients.
4. Begin regular use of the ASHBMP by the cooperating insurance company.
5. Document the impact on hazard levels and insurance claims from the use of the ASHBMP based on the experimental design implemented through objective 4.

Agricultural insurance providers strive to provide each client with full-service insurance coverage, including all types of property and liability coverage. The vast majority of hazard scales developed for the current ASHBMP are directed toward machinery risks. Hazard scales for many major property and liability risks of interest to insurers are missing. These must be developed for the ASHBMP to be useful to the insurance industry.

## **E. EXECUTIVE SUMMARY OF THE PROJECT**

The specific aims of this Prevention/Intervention project are threefold. The first aim is to take an experimentally evaluated farm hazard audit tool and further develop it so that it is more useful to insurers of agricultural work sites, work activity, and farm residences. The second aim is to evaluate specific loss control efforts by farmers when the specific effort is requested by their insurer and facilitated by the ASHBMP document. The third aim is to provide a mechanism by which an insurance company can reliably correlate a farm hazard score to actual hazard reductions and claims costs. Hazard audits are a fundamental tool for identifying and correcting hazards of any type. Agricultural insurance providers strive to provide each client with full-service insurance coverage, including all types of property and liability coverage. The vast majority of hazard scales developed for the current ASHBMP are directed toward machinery risks. Hazard scales for many major property and liability risks of interest to insurers are missing. These must be developed for the ASHBMP to be useful to the insurance industry.

## **F. PROJECT ACTIVITIES/ACCOMPLISHMENTS FOR FY 2005**

1. Development of additional hazard gradation scales for hazards and risks identified by the cooperating insurance company.
  - a. Developed 72 new audit item topics using gradation scales to characterize hazard/risks. The new audit topics were identified by the cooperating insurance company as typical of the types of hazards and risks they inspect for when they write insurance policies and perform hazard audits. Ten of the new hazard/risk topics and 13 hazard/risk topics (23 total) were selected by the insurance company for use with their clients.
  - b. Hazard/risk topics reviewed by others familiar with specific topics.

- c. Many of the 23 ASHBMP audit topics selected by the cooperating insurance company were field tested with the loss prevention representative that will be performing the audits.
2. Development of a flexible format for creating customized hazard audits utilizing the WWW and personal digital assistant (PDA) technology.
  - a. Developed a database drive computer program for data collection, viewing, and hazard gradation scale printing. Data collection to be from personal data assistant (PDA) or input by computer keyboard. In the long term, database format for hazard gradation scale will allow web-based audit activity and customized audit program to be formulated by the user.
  - b. PDA audit tool completed for use with cooperating insurance company and 23 selected audit topics.
  - c. Web based \*.PDF formatting of topic pages model development and refinement continues.
  - d. Web based \*.PDF formatting of self-audit forms development and refinement continues.
3. Development of a tracking system regarding the use of the ASHBMP by the cooperating insurance company and their clients.
  - a. Developed a protocol for use of the ASHBMP by the cooperating insurance company. Protocol used in #4 below.
4. Regular use of the ASHBMP by the cooperating insurance company.
  - a. Cooperating insurer has performed 60+ audits using the 23 audit topics chosen by the insurance company. These audits followed the prescribed experimental format.
  - b. Field training and testing of second cooperating insurance company Loss Control Representative with ASHBMP hazard audit tool plus PDA based farm audit tool.
  - c. Development of a cover letter and self-audit packet for 6-month follow-up hazard audit by insurance company client.

5. Document the impact on hazard levels.

- a. Follow-up self-audit materials have been distributed to 35 farms audited in first and second quarter of 2005. Audit returns from farmer self-audits continue to be returned.
- b. Cooperating insurance company continues to use the ASHBMP hazard audit with additional insurance company clients. Number of audits conducted is increasing due to expanding the project to a second Loss Control Representative, but is still lower than anticipated at this stage due to internal logistics difficulties with the cooperating insurance company. Additionally the number of field audits originally anticipated by the insurance company is lower than what they have conducted in the past. The audits follow the prescribed experimental format. Analyses of data will commence in February of Year 3.

**G. REGIONAL OR NATIONAL ACTIVITIES ATTENDED**

None

**H. PROJECT PRODUCTS**

**1. Hazard Surveys /Consultations**

Agritourism hazard survey conducted at one site

**I. REPORT ON THE OUTREACH PROGRAM:**

Not Applicable to Date

**J. SPECIFIC RESULTS OR PRODUCTS OF YOUR PROJECT THAT RESULTED IN ANY RESEARCH TO PRACTICE:**

Developed 72 new audit item topics using gradation scales to characterize hazard/risks. The new audit topics were identified by the cooperating insurance company as typical of the types of hazards and risks they inspect for when they write insurance policies and perform hazard audits. A second Loss Control Representative was trained to help with audits.

**K. COLLABORATION**

Greg Kirkham, Farm Insurance Marketing, Westfield Insurance  
Brian Musser, Westfield Insurance  
Mark Byers, Westfield Insurance

## **EDUCATION/OUTREACH CORE**

### **A. Project Name or Title**

Evaluating for Impact GLCASH Fellows Program

### **B. Principal Investigator(s) name and contact information**

Karen Bruns  
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1050 Carmack Rd.  
Columbus Ohio 43210  
614.292.9613  
bruns.1@osu.edu

**C. PROJECT START AND END DATES:** October 1, 2003 - September 30, 2006

### **D. PROJECT DESCRIPTION**

The objective of the GLCASH Fellows Program is to increase the level of evaluation for impact conducted related to agricultural/rural safety and health outreach and educational programs. Evaluation for impact is the documentation of the effect outreach and educational programs have on participants. This impact includes sustained and substantial change in agricultural health and safety behaviors and practices. These changes are documented through quantitative and qualitative research methods.

To achieve this objective the project is developing a cadre of safety and health education practitioners (fellows) who will have the skills to conduct and analyze quantitative and qualitative research. These practitioners will use these skills to assess the impact of the outreach and education programs developed within their organizations and in selecting health and safety outreach and education programs to implement.

Through the program, 11 fellows from six states are participating in the 20-month GLCASH Fellows Program. The program started in February, 2005 with a face-to-face conference between the fellows, their mentors (there are a total of 7 mentors from five states involved with the program) and the program staff. Since that meeting in February, the fellows and their mentors have been engaged in on-line activities focused on helping them expand their understanding and application of program evaluation skills. They have also been involved with their mentors who are available to help guide and support the development of the fellows' evaluation impact skills. As the fellows progress through the on-line course they will also conduct a research project to evaluate for impact an agricultural safety and health outreach or educational program. In summer, 2006 the fellows, along with their mentors will share the results of their evaluations with stakeholders and other health and safety professionals.

As a next phase of the project, the authors are taking the on-line content developed for the GLACSH Fellows and converting it to a on-line training program that can be accessed by anyone interested in expanding their evaluation skills (GLCASH Version 2). The GLCASH mentors and fellows will be able to use this version with colleagues. It will also allow agricultural and safety professionals from around the world to use the content at anytime. The current format encourages a cohort to go through the course all at the same time – Version 2 will be more flexible allowing people to start and end the course at any time.

## **E. EXECUTIVE SUMMARY OF THE PROJECT**

The GLCASH Fellows Program is a 20-month web-based educational and mentoring program for agricultural safety and health practitioners. Through the Fellows Program, participants are expanding their knowledge and skills related to documenting the impact of agricultural health and safety outreach/education programs. As they go through each web-based lesson, the fellows work with a mentor to apply this knowledge to developing and implementing an evaluation of an agricultural safety and health program in their community. Through the support of a mentor and the other fellows in the program, the participants are not only broadening their knowledge, but are practicing evaluation skills as they document the impact of a program. The results of the evaluations will be made available to others to assist them in assessing the impact of programs. The web-based educational program will be available for others to use to expand their skills through GLCASH (Version 2). This version is web-based with open access to potential students to start and end in their own time frame.

## **F. PROJECT ACTIVITIES/ACCOMPLISHMENTS FOR FY 2005**

1. 11 Fellows and 7 mentors identified to participate in the GLCASH Fellows Program
2. Held orientation/kickoff workshop with mentors and fellows in Columbus, Ohio (February 2005).
3. On line web-based course developed. 18 modules put on line.
4. Continual monitoring and assessment of program. As a result, have introduced monthly live online chat sessions for fellows and mentors
5. Based on the pilot of the GLCASH fellows website, began development of a larger, more cohesive, and concise GLCASH (version 2) website that will be available to anyone interested in evaluating a health and safety related outreach program.
6. Completed research on GLCASH (version 2) website and started an internal beta version of the site for testing

7. Working with content experts to expand content of GLCASH Fellows on-line course and to incorporate additional multimedia into the new GLCASH (Version 2) website.

## **G. REGIONAL OR NATIONAL ACTIVITIES ATTENDED**

None to date

## **H. PROJECT PRODUCTS**

### **1. Publications**

#### **a. Other Publications**

Article in GLCASH Newsletter

Website <http://glcfellows.osu.edu/> developed for the GLCASH Fellows Program

### **2. Education / Training / Outreach**

#### **a. CD-ROMs, videos or other Computer-Based Training Programs**

Development of GLCASH Fellows on line course

#### **b. Academic Training**

One graduate student is currently being sponsored.

#### **c. Conferences / Meetings Sponsored**

GLCASH Fellows/Mentors Orientation – February 10-11, 2005, Columbus Ohio

## **I. REPORT ON THE OUTREACH PROGRAM**

This entire program is an Outreach Program. See details listed above.

## **J. SPECIFIC RESULTS OR PRODUCTS OF YOUR PROJECT THAT RESULTED IN ANY RESEARCH TO PRACTICE**

This program focuses on program evaluation. As a result, research related to program evaluation is used to help agricultural safety and health professionals practice program evaluation. Also, the professionals will use the program evaluation they conduct to improve future health and safety programs.

## **K. COLLABORATION**

Dr. Thomas Archer, Associate Professor, The Ohio State University Extension  
Dr. Catherine Heaney, Associate Professor, Stanford University

Below is a listing of all members in the GLCASH Fellows advisory committee who are collaborators in addition to the two people listed above. \* Denotes GLCASH Fellows Mentors.

### **GLCASH Fellows Advisory Committee**

\* Ted Scharf, Research Psychologist, National Institute for Occupational Safety & Health (NIOSH)

Janet Ehlers, Occupational Health Nurse, National Institute for Occupational Safety & Health (NIOSH)

Mike Hogan, Extension Agent, Carroll County Ohio State University Extension

Ronald L. St. Pierre, Ph.D., Special Assistant to the Senior Vice President for Health Sciences Associate Vice President and Professor Emeritus, The Ohio State University

Robert J. Birkenholz, Chair , Department of Human and Community Resource Development College of Food, Agricultural and Environmental Sciences, The Ohio State University

\* J. Mac Crawford, Assistant Professor, Department of Environmental and Health Sciences, School of Public Health, The Ohio State University

Joanne Thompson Pearsoll, Program Director, Office of Public Health Practice, School of Public Health, The Ohio State University

\* Roger Rennekamp, Assistant Director, Oregon State University Extension

\* Joan M. Mazur, Professor, Department of Curriculum and Instruction, University of Kentucky

\* Deborah Reed, Professor, College of Nursing, University of Kentucky

\* Charles Clark, Program Planning and Assessment Specialist, University of Illinois Extension Program Support

Chip Petrea, Ag Extension Professor, Department of Agricultural Engineering, University of Illinois Champaign-Urbana

Nancy Ellen Kiernan, Program Evaluator, Office of the Director of Cooperative Extension, The Pennsylvania State University

Connie Baggett, Associate Professor, Department of Agricultural and Extension Education, The Pennsylvania State University

Rama B. Radhakari, Associate Professor, Department of Agricultural and Extension Education, The Pennsylvania State University

Teri Palermo, Public Health Advisor, National Institute for Occupational, Safety & Health (NIOSH)

Jim Helkamp, Rural Safety and Health, West Virginia University

\* Harry N. Boone, Jr., Assistant Professor, Division of Resource Management, Davis College of Agriculture, Forestry and Consumer Science, West Virginia State University, Cheryl A. Skjolaas, Senior Outreach Specialist, Agricultural Engineering Building, University of Wisconsin-Madison

Ronald T. Schuler, Chair, Department of Biological Systems Engineering. College of Agricultural and Life Sciences, University of Wisconsin-Madison

## **APPENDIX 1**

### **I. TOTAL CENTER BUDGET FOR FY 2005**

- 1. Total NIOSH Expenditures: \$ 633,522.08**
- 2. In-Kind Contributions: \$ 0.00**
- 3. Other Outside Funding: \$ 0.00**

### **II. CENTER PROJECTS / ACTIVITIES FOR FY 2004**

- 1. Ongoing Projects: 5**
- 2. Projects Completed: 3**

Audiovisual Approach to train WV Farmers on Prevention Effectiveness of ROPS in Reducing Traumatic Injury

Grain Engulfment Hazard Assessment Tool

Midwest Landscape Intervention Evaluation Pilot Program (Feasibility)

- 3. New Projects: None**

- 4. Feasibility Projects: 2**

Simulation of a PTO Environment

Vehicle-in-the-Loop Virtual Reality Simulation of a Tractor Rollover

### **III. CENTER INVESTIGATORS**

- 1. Scientific Investigators: 13**
- 2. Program Support Staff: 8**

## **IV. CENTER PRODUCTS**

### **1. Presentations**

Dee Jepsen, GLCASH Outreach Director, gave a presentation at the NIOSH Agricultural Center Director's meeting in Kentucky, 2004.

Thomas L. Bean, GLCASH Director, gave a presentation at the NIOSH Agricultural Center Director's meeting in Texas, 2005.

### **2. Publications**

**a. Peer Reviewed Journal 4**

**b. Trade Journals 0**

**c. Fact Sheets / Brochures / Technical Publications 1**

**d. Other Publications 4**

### **3. Education / Training / Outreach**

**a. Training Seminars 2**

**b. Short Courses 0**

**c. Hazard Surveys / Consultations 1**

**d. Academic Training**

2 Graduate Students

1 Undergraduate Student

1 Second Year Internal Medicine Resident

**e. News Letters**

2 News Letter generated, each distributed to over 150 people

**f. CD-ROMs or other Computer Based Training Programs 2**

**g. Other**

Description of Farm Asthma Project added to Occupational Environmental Medicine website at <http://www.oem.msu.edu>

**4. Conferences / Meetings Sponsored**

Research to Practice Meeting, August 16, 2005, The Ohio State University  
GLCASH Fellows/Mentors Orientation, February 10 & 11, 2005, Columbus, OH.

**5. Other Products**

Hazardous Task List for Landscapers

Undergraduate Research Project: Nelson, K. 2005. *Cultivating Youth for Farm Safety*

Meteer, W. 2005. Masters Thesis: *Application and Evaluation of the Farm Grain Hazard Assessment Tool in Illinois.*

**V. ADMINISTRATIVE REPORT**

GLCASH added two members to its staff during FY 2005. The first is Outreach Director Ms. Dee Jepsen. Ms. Jepsen has extensive experience and expertise in developing outreach programs for youth and adults in agricultural safety and health. Ms. Jepsen is expected to receive her Doctorial degree in 2006.

The second addition to the Center's staff is Center Manager, Cynthia V. Brundage. Ms. Brundage comes to the Center with a strong experience in operations, accounts and administrative management as well degrees in public affairs in the fields of public policy and analysis.