



Protecting the Agricultural Safety and Health of Farm Families

GLC Newsletter November 2005

GLC PROJECT UPDATE West Virginia University ROPS Video Project

From January 2000 through July 2005, 29 tractor-related fatalities were identified in West Virginia. The mean age at death was 58 with a range of 31 to 85 years; all but one of the victims were male. These deaths occurred in 20 of West Virginia's 55 counties. Sixty-six percent of the incidents involved tractor overturns or rollovers, 21 percent involved being pinned by a tractor, and 7 percent involved power takeoffs. West Virginia's rugged and generally mountainous terrain increased the risk of rollovers and the subsequent fatal injuries to tractor operators.

As a result of the significant number of tractor rollover deaths, a survey was developed by the West Virginia University Center for Rural Emergency Medicine and the Injury Control Research Center (CREM/ICRC) in collaboration with the West Virginia Farm Bureau to gather information about farmers' work habits, age and make of their tractors, rollover experiences, and their use or non-use of safety devices such as enclosed cabs, ROPS, and seat belts.



These pictures are typical of rollover incidents in West Virginia.

Surveys were mailed out to approximately 7,200 farmers belonging to the West Virginia Farm Bureau. Nearly 40 percent of the farmers completed and returned the survey. Sixty-five percent of the farmers reported that the tractor they most often used was equipped with a cab or roll bar. The most common reasons for not having ROPS were expense, unavailable option for their make of tractor, and belief that a rollover was unlikely. Of those who indicated their tractor was equipped with a seat belt, only 34 percent reported using the belt always or most of the time; yet, about 40 percent of the farmers reported that they experienced a close call with a rollover, 61 percent reported that they knew someone who had lost their life in a rollover event, and 60 percent knew someone who had been hurt in a rollover.

After conducting several farmer focus groups across West Virginia in January and February 2005, a 17-minute ROPS safety video, "A Tractor Accident Can Happen to Anyone," was produced at West Virginia University (WVU). Its objective is to inform local farmers about the risks associated with tractor rollovers and the effectiveness of ROPS and seat belts in reducing traumatic injuries. The video was distributed to over 5,700 farmers in late summer 2005.

(continued on page 2)

GLC PROJECT UPDATE West Virginia University ROPS Video Project

Introduces a new tractor safety video developed for West Virginia farmers.

Simulation of the PTO Environment: Employing Emerging Simulation Technologies to Evaluate Safe Behavior in Agricultural Settings

Examines using virtual-reality to simulate a PTO environment.

GLC STAFF SPOTLIGHT Intervention Director

Introduces Tom Archer, the Intervention Director for the Great Lakes Center for Agricultural Safety and Health.

REGIONAL AGRICULTURAL SAFETY SPOTLIGHT Agricultural Safety and Health Activates at the University of Minnesota

Highlights University of Minnesota's Agricultural Safety and Health Programs.

SAFETY & HEALTH CALENDAR November 2005

Provides dates and locations for various safety and health conferences and events.



**COLLEGE OF
FOOD, AGRICULTURAL,
AND ENVIRONMENTAL
SCIENCES**



Accompanying the video was a survey to determine if the video has influenced farmers' attitudes and habits about tractor safety and the use of ROPS. A toll-free number was provided to farmers who were considering installing ROPS on their older tractors. This project was funded by the Great Lakes Center for Agricultural Safety and Health (GLCASH).



Mrs. Elsie DeHaven (shown above) lost her 73-year-old husband Paul in a tractor rollover crash on January 18, 2003. His 1982 Case Model 1394 tractor overturned on top of him after sliding sideways down a soft shale bank adjacent to his snow-covered work area.



Joe Casto, 45, was more fortunate than Mr. DeHaven. A ROPS and seat belt saved his life in February 2000 when his 1994 Zetor 52-45 tractor lost its brakes causing it to rollover down an 8-foot creek embankment coming to rest upside down in 3 to 4 feet of muddy water.

The West Virginia ROPS video has been adapted for use by GLCASH for regional and national distribution. Dr. Jim Helmkamp, the Director of the WVU Injury Control Research Center, led the project. Wayne Lundstrom,



the West Virginia Fatality Assessment and Control Evaluation (FACE) Program Coordinator, produced the video, and Jacob Young of WVU Television and Radio Services directed the video. Jacob, an Emmy award-winning videographer, has made other videos for CREM/ICRC relating to logging safety, all-terrain vehicle (ATV) safety, and emergency preparedness for elderly persons.

Simulation of the PTO Environment: Employing Emerging Simulation Technologies to Evaluate Safe Behavior in Agricultural Settings

Unintentional occupational injuries remain problematic. This applied research aims to harness emerging computer technologies to simulate a common occupational setting that provides the potential for experiencing acute traumatic injuries.

Researchers at the Ohio Supercomputer Center (OSC) and The Ohio State University (OSU) with funding from the Great Lakes Center for Agricultural Safety and Health (GLCASH) are adapting emerging computer technologies to simulate an environment with a power take off (PTO), an indispensable tool found on farms and other work environments. The PTO transfers power from a common tractor to drive various implements. This specific scenario is exemplary of high-risk agricultural work settings and has continuously proven to be problematic in providing acute unintentional injuries through entrapment or entanglement.

The virtual environment is being integrated with the capacity to monitor autonomic responses to measure the level of anxiety a subject experiences during presentation of dangerous and possible injury producing events. Following integration of the environment, local experts will provide formative evaluation to determine face validity of the simulation.

GLC STAFF SPOTLIGHT **Director of Prevention and Intervention**

Tom Archer became a member of the GLCASH internal committee in August 2004. He has worked with Ohio State University (OSU) Extension since October 2000 as a Leader in Program Development and Evaluation. He is also one of the subject matter specialists for the GLCASH Fellows program and is a member of the Social and Behavioral Sciences Institutional Review Board at OSU.

Before that he was 4-H Youth Development Agent in Shelby County, Ohio, for 24 years. He has always possessed an interest in Farm and Machinery Safety, and taught 4-H Tractor Safety Certification courses each year, reaching over 250 14-15 year old youth. He was also the director of one of the first Farm Safety Day Camps conducted in Ohio.

He currently lives in the farmhouse that his grandparents built in eastern Shelby County, rents out the tillable acreage, but maintains the pastures, buildings, and a small flock of registered sheep.

The combination of impact evaluation and program development related skills and practical knowledge of both machinery and livestock safety, while living in a rural community, provide insights and resources to many GLCASH dimensions.

Thomas M. Archer, Ph.D.
Program Development and Evaluation
Ohio State University
Extension
Room 6 Agricultural Administration Building
2120 Fyffe Road
Columbus, Ohio 43210
Phone: 614-292-0179
Fax: 614-688-3807
E-mail: archer.3@osu.edu

After implementation of expert recommendations, in the spring of 2006, the researchers will conduct a small exploratory study to collect data on the efficacy of their design to illicit a sense of realism and subsequently evoke a physiological response of anxiety in the subject. This exploratory evaluation will take the form of the following:

- Demographic survey to quantify level of expertise
- Session in the VR PTO virtual environment with physiological monitoring
- Summative survey to quantify user experience and the realism of the simulation

“The innovation of this proposal is the integration of emerging computer/virtual simulation technologies to provide a unique environment to safely study behaviors in high-risk agricultural work settings with an unprecedented precision,” stated Don Stredney, Principal Investigator on the project. “The unique approach is, through the representation of the user’s body (i.e. hands),” continued Stredney, “the user will be able to indirectly experience trauma to their body through the simulation (see Figure 1). This heightens the sense of consequences of one’s activities, and provides a more realistic environment for studying unsafe behaviors.



Figure 1: View from synthesized environment showing representations of the users hands.

The pilot study will help delineate advantages and limitations of the approach, and the data collected will help to generate study designs for future grant submissions. Long term, the use of virtual environments can serve to elucidate the etiology of occupational injuries and possibly help identify high-risk populations. Furthermore, the virtual environment will provide a safe methodology to evaluate the efficacy of occupational and safety training methods currently being employed.

Individuals interested in participating in this study should contact Don Stredney through e-mail at don@osc.edu, or by calling Don at 614-292-8447.

REGIONAL AGRICULTURAL SAFETY SPOTLIGHT

Agricultural Safety and Health Activities at the University of Minnesota

The University of Minnesota’s Agricultural Safety and Health Program, run primarily out of the Department of Biosystems and Agricultural Engineering, has many exciting research, outreach, and extension activities underway. Many are in non-traditional areas, reaching diverse audiences and targeting unique issues.



Culturally and Ethnically Appropriate Interventions for the Hmong

One important project has targeted Minnesota’s Hmong farming community and their occupational health and injury concerns. Many of the Hmong, who immigrated to the United States from Southeast Asia approximately 30 years ago, have continued their farming traditions. In the Twin Cities, there are approximately 200 Hmong families who farm and sell their produce in local markets. Almost always, children work alongside their elders on the farm. Thanks to a grant from NIOSH (CDC/1R01-OHO4215-01), John Shutske, the project’s principal investigator, and Michele Schermann, co-investigator, studied the community and collected unique exposure data to develop prototype injury prevention guidelines to protect Hmong children.



The theory and methods underpinning the new guidelines were based on the original North American Guidelines for Children's Agricultural Tasks (NAGCAT). But since many Hmong elders (parents and grandparents) do not read English (or the written Hmong language), Shutske and Schermann developed new methods for providing the protective intervention in a manner that was linguistically and culturally relevant and appropriate.



Cover of the book *Orphan Boy the Farmer*

The resulting delivery system included three Hmong "folktales" that follow the Hmong oral storytelling tradition, a bilingual book written and illustrated by Hmong professionals, and dramatic readings of the book to Hmong audiences. The stories and the book, *Orphan Boy the Farmer* (Tub Ntsuag, Tub Ua Teb), teaches parents, grandparents, and children about hazards not covered in the original NAGCAT guidelines including rototillers, knives/sharp tools, and hazards associated with direct marketing to consumers including personal safety, hygiene, and lifting/set-up activities.

Follow-up grants from the National Children's Center for Rural and Agricultural Health and Safety and the University of Minnesota Agricultural Experiment Station allowed Shutske and Schermann to conduct an extensive community outreach effort and in-depth evaluation of the newly created intervention in Minnesota and Wisconsin. Several manuscripts are in preparation documenting the evaluation activities. An important outcome also includes two successful MPH projects by Penny Bartz and Ruth Rasmussen, students who were supported by the NIOSH-funded Educational Resource Center (ERC) program at the University of Minnesota.

AGRICULTURAL AND FOOD SYSTEM WORKERS AND HOMELAND SECURITY ISSUES



A second initiative in the last four years has included a look at new homeland security issues in the agricultural workplace, including the implications related to workers. John Shutske, Michele Schermann, Ruth Rasmussen, and others affiliated with the program have partnered with state and federal agencies to use funds from the CDC-funded University of Minnesota Center for Public Health Preparedness to develop programs, materials, and to provide statewide and national leadership to agricultural preparedness activities. There are also several related research projects funded by the Department of Homeland Security, including one that examines the vulnerability of the milk system in the United States from "farm to table." This project is being coordinated by another NIOSH-funded ERC student (in industrial hygiene) who is examining points in a milk system where workers have direct access to products as well as potential exposures to biological or chemical agents.

A professional curriculum has been developed that includes in-depth technical information and two three-hour tabletop educational exercises examining issues such as Highly Pathogenic Avian Influenza and a potential attack on a dairy farm with a bioterrorism agent. Since workers are on the "front lines" of all agricultural and food operations, and will be the first to recognize (and be exposed) to potential homeland security threats and hazards, their role is critical. However, the interests and implications for workers are rarely included in other programs and intervention efforts. Minnesota's program also provided leadership to a national CDC-funded "exemplar group" effort that collected information on and assessed more than 80 "agroterrorism" and rural preparedness programs from around the United States.

SAFETY & HEALTH CALENDAR November 2005

January 8-9, 2006

American Farm Bureau Federation Annual Meeting

Nashville, TN

January 27-29, 2006

Western Migrant Stream Forum

Portland, OR

April 18-20, 2006

NORA Symposium 2006: Research Makes a Difference (NIOSH)

Washington, DC

May 13-18, 2006

American Industrial Hygiene Association

Chicago, IL

June 11-14, 2006

American Society of Safety Engineers

Seattle, WA

June 25-29, 2006

National Institute for Farm Safety Annual Meeting

Sheboygan, WI

Support for this newsletter provided to the Great Lakes Center for Agricultural Safety and Health through Cooperative Agreement Number R01 OH04192 from Centers for Disease Control and Prevention.

THE OHIO STATE UNIVERSITY

glc

Great Lakes Center for Agriculture Safety and Health