

Farm families ALIVE & WELL



News from The Great Plains Center for Agricultural Health

Flowing Grain is a Killer

Vol. 16, Issue 2 - March 2010

by Bob Aheirn, PhD, U of IL, and Advisor to GPCAH

Flowing grain can kill, and it can kill quickly. It takes less than five seconds for a person caught in flowing grain to be trapped. This past fall harvest will present enhanced risk with high moisture grain coming out of storage this spring. In recent years the Midwest states, where the largest percentage of on-farm grain storage exists, have averaged 17 food products and grain suffocation related deaths per year (14 in GPCAH states). The number could be much higher this year with the enhanced risk.



Flowing grain in a storage bin or gravity-flow wagon is like quicksand, it can immobilize a person almost instantly, and a person can become totally submerged in flowing grain in 20 seconds or less. To prevent grain bin suffocations, it's necessary to understand the risks and follow the appropriate steps to avoid becoming a victim. Simply "being aware" will not prevent tragedy. The following are recommendations based on research in Illinois and other states.

Even when grain is not flowing, a person can still suffocate, especially when grain is in poor condition.

Moldy or wet grain often clumps or bridges together in the upper layers. As the grain is unloaded from the bottom, a large air pocket may form below the surface. A person who walks over the crusted surface can easily break through and be buried alive under thousands of pounds of grain. A long wooden pole can be used to test for and break up bridges of grain from above, outside the bin.



Work with at least one helper if you need to go into a grain bin; bins are "confined spaces" that require special procedures for safe entry. These procedures include the use of secured lifeline to prevent a worker from being pulled under flowing grain or falling through a crust that formed in the top layers of grain. The lifeline needs to be attached to a harness strapped around the person's torso. The helper or observer should have a cell phone or other communication means to allow them to quickly summon local rescue personnel if needed.

Before entering a bin, turn off all unloading equipment and use a padlock to lock out switches so they can't be activated accidentally. This includes sweep augers and augers on automatic unloading circuits.

[continued on page 2](#)

Director's Message

by Fred Gerr, MD

As you may have heard, I was appointed to be the new director of the Great Plains Center for Agricultural Health following the departure of the previous director, Wayne Sanderson. Those of you who know Wayne know that his shoes will be hard to fill. Fortunately, the Center and the larger agricultural health and safety community include many people with impressive expertise and a deep commitment to protecting the safety and health of agricultural workers, members of their families, and rural community residents.

Many of you don't know me so I thought I might introduce myself. I have been a member of the faculty at the University of Iowa for almost eight years. I am a practicing medical doctor at the University of Iowa Hospitals and Clinics and have a background in occupational medicine and internal medicine. For the past twenty-five years, I have focused my professional attention exclusively on the prevention and treatment of work-related illness and injury. Although my work has not been solely devoted to agricultural health, for decades I have treated patients with pesticide poisoning and have engaged in research on the ways that pesticides can harm the brain and nerves. I have also been involved in efforts to prevent painful conditions of the back, neck, and arms so common among workers in many industries, including agriculture.



Fred Gerr, MD

[continued on page 2](#)



The ***Agricultural Medicine: Occupational and Environmental Health for Rural Health Professionals*** course will be held **June 7-11, 2010** at the Sheraton Iowa City Hotel. Nurses, physicians, nurse practitioners, physician assistants, veterinarians, and other interested health care professionals are invited to participate. The training provides information and skills to enable the health care professional to function in the anticipation, diagnosis, treatment, and prevention of occupational illnesses and injuries in the farm community. The course may be taken for three graduate credit hours from the U of I College of Public Health, and continuing education credits for physicians and nurses are offered. Contact Kay Mohling at 319/335-4219 or kay-mohling@uiowa.edu for more information.

2010 Agricultural Machinery Conference will be held May 3-5 in Cedar Rapids, Iowa. The conference serves as a forum for engineers, managers and other professionals in the field of agricultural equipment design to gather with the purpose of exchanging ideas, see the latest component technology, and learn new design practices, techniques and methods of importance to the industry. For more information visit www.amc-online.org

Director's Message continued from page 1

The Great Plains Center is at an important turning point in its history. In addition to Wayne's departure, we (and the other US Agricultural Health and Safety Centers) will be required over the next several months to redefine ourselves and submit a request for five additional years of funding. We are now in the process of assessing priorities and identifying those areas of greatest agricultural health and safety need for the region. Some areas of traditional strength will continue. For example, our efforts to educate health care providers about the special needs of agricultural workers and to evaluate and prevent lung problems among farmers are world-class. In addition, we are intending to broaden our emphasis on prevention of injuries and will also build new programs devoted to limiting common and painful musculoskeletal conditions such as low back pain and shoulder disorders.

Despite progress in our field, there is still much to be done. All members of the Center welcome your input about our activities. Our goal is to protect the health and safety of agricultural workers, members of their families, and rural community residents. Please feel free to contact me or other Center staff with ideas and suggestions for achieving this goal.

Dr. Fred Gerr directs the GPCAH, housed in the Department of Occupational and Environmental Health of the College of Public Health. He can be reached at 319/335-4212 (fred-gerr@uiowa.edu).


If someone on your farm has become totally engulfed in grain, shut off power to unloading equipment immediately. Then turn on the aeration fan and call your local rescue squad. The best way to rescue a completely submerged victim is to rapidly remove the grain by cutting open the bin with special rescue tools.

If a person is partially submerged in grain, the observer or first person on the scene should not attempt to enter the bin, and only allow trained rescue personnel to attempt the rescue. Grain will typically be bridged up around and above the person. To protect the person from the grain avalanching down on them, a dam or barrier needs to be placed near and around their body. Rescue workers can often set up rigging that will allow them to reach the victim by entering from the top of the bin. The goal should be to protect and secure the victim so the grain can be moved away from the person to safely extricate them.

First and foremost, take every step possible to manage stored grain to prevent problems that might increase the need to enter the bin. Grain quality management begins at harvest but includes close monitoring and supervision throughout the storage period. It is important to take the appropriate steps to manage risks associated with grain storage to protect the most valuable resource you have on a farm...those who live and work on it.

Dr. Bob Abeirn is the Agricultural Safety and Health Program Leader at the University of Illinois, Department of Agricultural and Biological Engineering. He can be reached at 217/333-9417 or raberin@illinois.edu

For more information contact your local extension office or see the NASD Grain Safety Resources at www.nasdonline.org/browse/200/grain-handling-harvesting-storage.html



Great Plains Center for Agricultural Health
 100 Oakdale Campus
 The University of Iowa
 Iowa City, IA 52242-5000

Farm Families Alive & Well
 Published 4/yr
 Kay Mohling, Ed.
 319/335-4219
 fax-319/335-4225
kay-mohling@uiowa.edu

www.public-health.uiowa.edu/GPCAH

To receive this newsletter through the US mail notify kay-mohling@uiowa.edu

2010 GPCAH Pilot and Feasibility Projects

by Murray Madsen, GPCAH Associate Director

Eleven proposals were submitted to the Great Plains Center for Agricultural Health (GPCAH) for FY 2010 pilot/feasibility project funding that began in October. The chosen projects listed below represent an investment of the entire budget allocation to GPCAH by NIOSH for pilot/feasibility projects. Details about the GPCAH pilot/feasibility project program can be accessed at www.public-health.uiowa.edu/GPCAH.

Reminder - the request for FY2011 proposals is due March 31, 2010.

Individual Variation in Paraoxonase 1 Activity in Human Serum Over Time (University of Iowa, Human Toxicology - Laura Badtke)

Paraoxonase 1 (PON1) is a serum glycoprotein capable of hydrolyzing many pesticides. Genetic and environmental factors influence PON1 levels, leading to a substantial variation in PON1 among individuals within a population. The hypothesis is that individual serum PON1 levels vary significantly over time due to changes in lifestyle, dietary, and occupational exposure factors. By using three serum samples taken since 1994 (roughly every 5 years) from 256 participants as part of the Keokuk County Rural Health Study, we will determine the genotypes represented and PON1 activities at those three time points. These results will help to counsel rural populations in identifying lifestyle and dietary changes that could limit adverse health effects and decrease chronic illness related to environmental exposures.

Improving Agricultural Environmental Health Literacy (AgriWellness, Inc. - Mike Rosmann) Among the biggest challenges facing agricultural environmental health are limited understanding of environmental health concepts and issues among the public, health professionals and policy makers, along with inadequate community capacity to address agricultural environmental health concerns. This project will carry out pilot work to link a nonprofit healthcare organization, two colleges of public health, educators and concerned citizens in a western Iowa agricultural county to address emerging agricultural environmental health concerns. During this pilot phase investigators will conduct focus group forums, establish cooperative agreements, collect initial study data on health literacy, public health variables, air and water quality, and complete two research proposals to carry out the follow-up work to enhance health literacy and to build capacity to address identified environmental health concerns.

Neurobehavioral Effects of Organic Solvent Exposure among Farmers (University of Iowa, Epidemiology - Sara Starks) The widespread use of organic solvents in agricultural products and processes results in substantial risk of exposure to farmers and farm workers. To better estimate effects of solvent exposure on the central nervous system (CNS), we propose analyses of data from an epidemiological study of 701 farmers from Iowa and North Carolina from whom information about solvent exposure and measures of CNS function were obtained. The primary aims of the study are 1) to characterize occupational solvent exposures among farmers and 2) to model exposure-effect associations between estimates of cumulative lifetime organic solvent exposure and neurobehavioral measures of CNS function while controlling for relevant covariates.

For more information on the GPCAH Feasibility Projects for 2010, or information on the 2011 Pilot Research Proposals contact Murray Madsen at murray-madsen@uiowa.edu or 319/335-4481 or visit the GPCAH website at www.public-health.uiowa.edu/GPCAH

calendar

April 7-11

Agricultural Medicine Training

Fairlee, VT

www.public-health.uiowa.edu/icash

April 23

I-CASH Annual Spring Meeting

Neil Smith National Wildlife Refuge

Prairie City, IA

www.public-health.uiowa.edu/icash

May 3-5

Agricultural Machinery Conference

Cedar Rapids, IA

www.amc-online.org

May 22-27

American Industrial Hygiene

Conference: New Frontiers in Science and Practice

Denver, CO

www.aihce2010.org/aihce10/default.htm

June 7-11

Agricultural Medicine: Occupational and Environmental Health for Rural Health Professionals

Iowa City, IA

www.public-health.uiowa.edu/icash

June 21-24

ASABE Annual International Meeting

Pittsburgh, PA

www.asabemeetings.org

June 26-July 1

National Institute for Farm Safety, Inc. Annual Conference and Meeting

Wilmington, NC

<http://nifsagsafety.org/index.cfm>

August 12-14

Agricultural Medicine: Occupational and Environmental Health for Rural Health Professionals - Session I

Dickenson, ND

www.public-health.uiowa.edu/icash

August 31-September 2

2010 Farm Progress Show

Boone, IA

www.farmprogressshow.com

September 19-25

National Farm Safety and Health

Week: ATVs - Work Smart - Ride Safe

September 23-25

Agricultural Medicine: Occupational and Environmental Health for Rural Health Professionals - Session II

Devils Lake, ND

www.public-health.uiowa.edu/icash

The University of Iowa prohibits discrimination in employment and in its educational programs and activities on the basis of race, national origin, color, creed, religion, sex, age, disability, veteran status, sexual orientation, gender identity, or associational preference. The University also affirms its commitment to providing equal opportunities and equal access to University facilities. For additional information on nondiscrimination policies, contact the Coordinator of Title IX, Section 504, and the ADA in the Office of Affirmative Action, (319) 335-0705 (voice) and (319) 335-0697 (text), 202 Jessup Hall, The University of Iowa, Iowa City, Iowa 52242-1316.



RETURN SERVICE REQUESTED

+++++It All Adds Up Fatal Grain Bin Engulfment Incidents in Press Clippings, GPCAH 9-States, 2007 to Date*

(Source: GPCAH FAIMS – Farm and Agricultural Injury Monitoring Services)

Contact murray-madsen@uiowa.edu or 319/335-4481 for additional information

2010

JAN	MN	Age 55	Working with vacuum conveyor inside grain bin which held wet corn with frozen crust
JAN	IL	Age 22	Engulfed working with 2 co-workers moving corn with auger inside grain bin

2009

JAN	MO	Age 84	Covered to neck after falling from top of silo into soybeans while unloading it
FEB	SD	Age 23	Fell through surface of corn in grain bin while working to empty it
MAR	IA	Age 70	Climbed into grain bin and was engulfed in soybeans flowing from bin into bottom auger
APR	IA	Age 60	Engulfed inside grain bin that was being unloaded
JUL	MN	Age 13	Engulfed under corn in a grain bin being emptied
AUG	MO	Age 61	Engulfed in corn attempting to remove crusted layer in grain bin
SEP	MN	Age 75	Engulfed by corn inside bin attempting to clear a blockage as the bin was being emptied
SEP	IA	Age 54	Engulfed in grain bin of corn as it was being emptied at co-op elevator
NOV	MN	Age 75	Engulfed by corn inside grain bin
NOV	KS	Age 59	Employee engulfed in milo at co-op elevator
DEC	SD	Age 52	Trying to free sunflowers stuck to silo wall when covered by shifting grain

2008

APR	NE	Age 43	Engulfed in corn inside grain bin
JUN	ND	Age 66	Engulfed while using grain vacuum to free stuck auger in partially full bin of corn
NOV	MN	Age 63	Engulfed in bin half full of shelled corn
DEC	ND	Age 45	Engulfed in corn while working inside bin as it was being filled

2007

FEB	WI	Age 63	Engulfed in corn inside bin while investigating unspecified problem
FEB	KS	Age 66	Engulfed in soybeans inside bin while breaking crust to maintain flow to unloading auger
FEB	MO	Age 28,30	Engulfed in grain while breaking clods to allow flow through ground level grate
MAY	NE	Age 34	Engulfed in grain at grain storage facility on farm
AUG	MN	Age 20	Trapped in a grain bin
SEP	NE	Age 66	Engulfed by corn in bin while unloading bin into semi-trailer
OCT	ND	Age 51	Engulfed removing canola that had caked to inside of bin



* For the period 2004-8, the 9-state GPCAH region averaged 14 fatal occupational injuries from engulfments in food products and crops according to The US Bureau of Labor Statistics Census of Fatal Occupational Injuries.