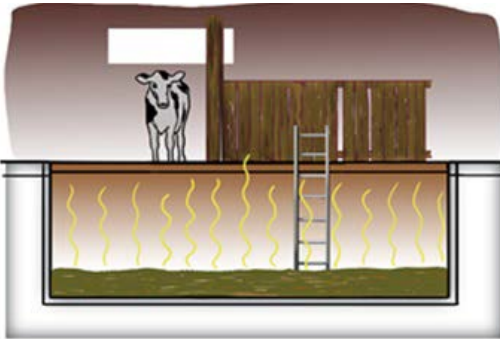


# Agricultural Safety & Health

NCERA-197 (2010-2015)

## *Health & Safety Issues on Farms*

On farms and ranches across the nation, workers and their family members are regularly exposed to toxic chemicals, biological hazards, machinery hazards, sharp tools, falls, loud noises, and extreme temperatures. Farming conditions, equipment, and facilities make agriculture one of the most hazardous industries in the U.S. Despite these hazards, many farmworkers—especially new farmers, youth, and migrant workers—receive little formal training on how to operate equipment, work with animals, handle chemicals, or use facilities. Driving farm machinery on public roads and using confined spaces like grain bins, manure pits, and chemical storage tanks can be especially dangerous, with hundreds of crashes and entrapments reported every year. Furthermore, emergency service providers are often unfamiliar with farm facilities and equipment, meaning they may not react safely or efficiently to the situations they encounter. Over the years, researchers, educators, government, and agricultural industries have made farms much safer, but there are still plenty of opportunities to better protect workers, bystanders, and those living on or near farms.



On farms, grain is often stored and dried in bins. Farmers and ranchers working with grain bins can find themselves in situations that pose serious risk of entrapment, including flowing grain, grain bridge collapse, grain wall avalanche, and use of a grain vacuum. Over the years, grain bin machinery and augers have increased in size and power, giving farmers and ranchers less time to react in dangerous situations. Photo by Aaron Yoder/ University of Nebraska Medical Center.

Manure pits present dangers including oxygen deficiency, combustible gases, and toxic gases. For example, prolonged or high concentration exposures to hydrogen sulfide, a colorless gas with a rotten egg odor, can deaden sense of smell. High concentrations can also stop respiration, and low concentrations can burn the respiratory tract. Illustration and photo courtesy of Penn State Ag Safety and Health Program.

## *Multistate Research Makes Farming Safer for Workers & Bystanders*

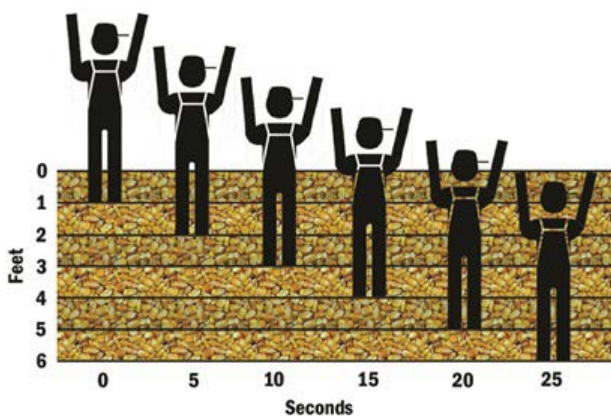
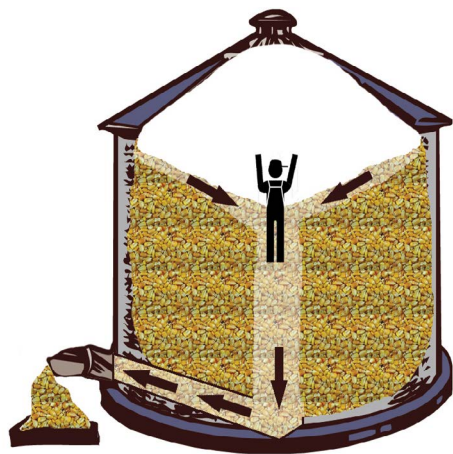
In 2000, researchers and Extension experts at land-grant universities across the U.S. formed Multistate Research Project NCERA-197 to pinpoint knowledge, outreach, engineering, and legislation needed to prevent work-related injury, illness, and death among farmworkers.

Members of NCERA-197 have spent years scouring databases of existing literature, analyzing statistics, conducting surveys, and talking with stakeholders in order to set research and development priorities, make policy recommendations, and design training programs. These efforts have catalyzed greater awareness about the risks of working in agriculture and bolstered infrastructure support and advocacy for agricultural health and safety measures, resulting in new industry standards, design guidelines for farm equipment manufacturers, and warning labels for machines and facilities.

Through the group's outreach efforts, new training programs and resources are reaching an increasing numbers farmers, helping them avoid risky situations, injuries, and deaths. Training programs for emergency service providers have helped them respond quickly and successfully to grain bin and manure pit entrapments and agricultural vehicle crashes, saving the lives of many farmworkers. NCERA-197's work has also informed urban people about driving responsibly in rural areas, encouraging drivers to slow down and give farmers space to move their equipment.



The NCERA-197 project has made significant progress educating urban drivers and addressing issues presented by farm equipment on public roads. Photo by Mississippi State University, Office of Agricultural Communications.



Grain bins can be dangerous if a farmworker is trapped inside. It takes less than 10 seconds for a 150-pound person to be trapped up to the waist in grain and requires about 300 pounds of pulling power to pull the person out of the grain. Top photo by Madison Berndt/Flickr. Illustration and graphs courtesy of Penn State Ag Safety and Health Program.

## Project Outputs

NCERA-197 members developed a National Agenda for Action for Agricultural Safety and Health—the first document to set these priorities since 1943.

Members also produced education programs and resources, including:

- training workshops for farmers, for example, an interactive online road safety training course for tractor drivers
- 4 training modules for Future Farmers of America curriculum
- an 8-hour training course on grain silo entrapment rescue
- a farmworker health and safety resource manual

NCERA-197 members hosted conferences for farmers, community members, and health and safety professionals.

Since 2010, NCERA-197 members published > 15 peer-reviewed papers.

## Who's Using These Outputs?

- Fellow scientists and Extension agents
- Farmers and farming communities
- Agricultural industries
- Farm equipment manufacturers
- Emergency first responders/rescue workers
- Law enforcement agencies and officers
- Legislators and regulators including the U.S. Department of Agriculture, U.S. Department of Transportation, and U.S. Department of Labor, as well as State and county departments of agriculture, transportation, and labor, and Canadian Ag Safety and Health Organizations
- Safety and health professionals such as the National Institute for Occupational Safety and Health, the International Society of Agricultural Safety and Health, and the Agricultural Safety & Health Council of America

## Recognition

Members of NCERA-197 received grants and other donations totaling over \$1.2 million.

NCERA-197 was selected from among all active North Central region multistate projects as the regional nominee for the 2014 Experiment Station Section Award for Excellence in Multistate Research.

## Want to know more?

**For more information on agricultural safety and health topics:**

<http://www.eXtension.org/AgSafety>

<http://www.extension.org/pages/66221/fresh-community-information>

**About this project:**

NCERA-197 was supported, in part, through USDA's National Institute of Food and Agriculture by the Multistate Research Fund established in 1998 by the Agricultural Research, Extension, and Education Reform Act (an amendment to the Hatch Act of 1888) to encourage and enhance multistate, multidisciplinary research on critical issues that have a national or regional priority. For more information, visit <http://ncra.info/>.

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