



# Great Plains Center for Agricultural Health 2023-4 Annual Report

**October 1, 2024**

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**[www.gpcah.org](http://www.gpcah.org)**

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# 2024 GPCAH Annual Report

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## SECTION 1: CENTER SUMMARY

The Great Plains Center for Agricultural Health (GPCAH) is a nationally recognized public health resource that conducts research and provides education and outreach to improve the health and safety of farmers throughout nine states in the Midwestern US: **Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin**. The Center was founded in 1990 and continues to bring together multidisciplinary expertise with an established record of developing and implementing programs of research, intervention, translation, education, and outreach to protect agricultural workers and their families. This Center addresses the health and safety needs of agricultural workers in America's most agriculturally intensive region, which has a significant burden of severe agricultural injuries and illnesses compared to other regions and industries.

The research questions being investigated in our center are formulated to: *reduce the burden of back pain* from a lifetime of tractor use, *reduce injuries from farm vehicles* on roadways, *improve the respiratory health of livestock producers* and the animals they raise, and *prevent traumatic injuries among older farmers* exhibiting cognitive decline. Research is developing innovative technologies needed to close gaps in knowledge (whole-body vibration) and equipment (air quality systems) and develops innovative partnerships to bring new collaborators with unique skills to contribute to agricultural injury reduction. The lessons learned from our research initiatives are translated into outreach materials by being incorporated into national educational curricula, disseminated through partners, and incorporated into multimedia discussions (social media, print media-*Safety Watch*, and *FarmSafe* podcasts) to aid in the dissemination and uptake of these best practices. The Center has established systems to foster communication, identify and build strategic partnerships, and assess the needs of the agricultural community. Our evaluators work within all projects and Cores to maximize our ability to assess the Center's contributions to improved health and safety outcomes for our region's farmers.

### OVERALL CENTER GOALS

- Goal 1: Coordinate activities across all Center Cores (Evaluation and Planning, Outreach, Research) to maximize our ability to improve the safety and health among agricultural communities. To maximize the significance, innovation, and impact of Center activities, the Center conducts ongoing feedback, problem solving, and networking opportunities to strengthen efforts of Center investigators and to maximize Center collaboration.
- Goal 2: Conduct basic and applied research targeting critical hazards to protect agricultural workers throughout the region, including vulnerable workers. We have four funded research projects to address the burden of injuries in the region and to address NIOSH priorities. We also coordinate a pilot/feasibility program explicitly oriented to building research capacity across our region, and we coordinate an emerging issues project to address priority issues that emerge over the multiple years of this project.
- Goal 3: Generate, evaluate, and disseminate guidance to speed the adoption of evidence-based best practices to protect farmers/farm workers. New knowledge developed in Goal 2 is translated, evaluated, and disseminated through partners.

## RELEVANCE

Agricultural workers experience high rates of occupational injury — including fatal injury — and illness when compared to other employed groups. As the region's most well-established agricultural health and safety resource in the nation's most agriculturally intensive region, the Center is highly relevant to agricultural workers, physicians, public health practitioners, and researchers committed to protecting the health and safety of agricultural workers. We describe the relevance for each project and activity in [Section 3](#).

## SECTION 2: KEY PERSONNEL

<b>Center Director:</b>	T. Renée Anthony, PhD <a href="mailto:Renee-Anthony@uiowa.edu">Renee-Anthony@uiowa.edu</a> 319-335-4429
<b>Deputy Director:</b>	Nathan Fethke, PhD <a href="mailto:Nathan-Fethke@uiowa.edu">Nathan-Fethke@uiowa.edu</a> 319-467-4563
<b>Center Coordinator:</b>	Kimberlee McMichael <a href="mailto:Kimberlee-McMichael@uiowa.edu">Kimberlee-McMichael@uiowa.edu</a>
<b>Evaluation Director:</b>	Kanika Arora, PhD <a href="mailto:Kanika-Arora@uiowa.edu">Kanika-Arora@uiowa.edu</a>
<b>Outreach Director:</b>	T. Renée Anthony, PhD <a href="mailto:Renee-Anthony@uiowa.edu">Renee-Anthony@uiowa.edu</a>
<b>Outreach and Evaluation Coordinator:</b>	Marsha Cheyney, MPH <a href="mailto:Marsha-Cheyney@uiowa.edu">Marsha-Cheyney@uiowa.edu</a>
<b>Research Project Leaders:</b>	
<i>Pilot/Feasibility Projects:</i>	Nathan Fethke, PhD <a href="mailto:nathan-fethke@uiowa.edu">nathan-fethke@uiowa.edu</a>
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<i>Community Roadway Campaign</i>	Cara Hamann, PhD <a href="mailto:cara-hamann@uiowa.edu">cara-hamann@uiowa.edu</a>  Laura Schwab-Reese, PhD (Purdue University) <a href="mailto:LSchwabR@purdue.edu">LSchwabR@purdue.edu</a>
<i>Control Technology in Swine Buildings</i>	Matt Nonnenmann, PhD (University of Nebraska) <a href="mailto:mnonnenmann@unmc.edu">mnonnenmann@unmc.edu</a>  Thomas Peters, PhD <a href="mailto:Thomas-M-Peters@uiowa.edu">Thomas-M-Peters@uiowa.edu</a>
<i>Preventing Farm Injuries from ADRD</i>	Kanika Arora, PhD <a href="mailto:Kanika-Arora@uiowa.edu">Kanika-Arora@uiowa.edu</a>  Julie Bobitt, PhD <a href="mailto:JBobitt@uic.edu">JBobitt@uic.edu</a>

## SECTION 3: PROGRAM HIGHLIGHTS AND IMPACT

### Evaluation and Planning Core

(T.R. Anthony)

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The Evaluation & Planning (E&P) Core provides strategic leadership to help the Great Plains Center for Agricultural Health achieve its mission, namely, to prevent agricultural injury and illness and improve safety and health among agricultural communities, by advancing knowledge through scientific research and prevents agricultural injury and illness through education, outreach, and intervention programs. This Core provides structure and programmatic and financial infrastructure needed to meet our aims:

- (1) Provide strategic leadership and effective administration,
- (2) Foster communication and collaboration between Center and its many stakeholders,
- (3) Conduct systematic evaluation of all Center activities, and
- (4) Identify, prioritize, and address emerging issues that arise over the upcoming project period.

This Core facilitates communication with leaders and practitioners in agricultural safety and health by promoting information exchanges at regional and national meetings and with other stakeholder groups to develop new partnerships to make progress toward our common mission of protecting people. To identify hazard priorities, we perform injury surveillance, conduct needs assessments, and routinely solicit feedback from stakeholders on emerging trends. To reach farmers more efficiently, the *E&P Core* has developed a regional *farmer registry* to invite interested farmers in participating in safety and health discussions and research. Our Evaluation Team develops innovative tools to track progress, report and measure outputs, and map all Center contributions to improvements in farmer health and safety in our region's intensive row crop and livestock production operations. This Evaluation Team will lead structured reviews of the strategic plan and the communication plan and will lead the Center administration evaluation process to provide feedback on the effectiveness of this Core.

Below are the key GPCAH activities that helped move us towards meeting these objectives in the past year.

#### Coordinate Communication: Activities and Impact

**Advisory Committees:** Our [advisory committees](#) continued to provide valuable feedback and new suggestions from across our region, leading to improvements in outreach and educational materials and providing new connections with experts and producers to help us all protect farmers. Our *Regional Advisory Committee (RAC)* brought together outreach and research experts from the region to share ideas about products developed by the GPCAH and our partners. In November 2023, the RAC (Fig. 1) members were updated on the new *Ag Health 101* course and gave feedback on style and content of the



Figure 1: Regional Advisory Committee members at MRASH after reviewing *Ag Health 101* course materials and brainstorming to name our new *Flat Farmer* PPE selection tool.

supporting print materials generated to accompany the audio course. In this same meeting, the RAC reviewed and gave suggestions to our new outreach kit for personal protective equipment education and discussions, with the group helping title the project “Flat Farmers.” These advisors also provided guidance on soliciting community organizations for pilot grants (April 2024); provided topic ideas for the 2024 skills development workshop at the MRASH Conference (*Working with the Media*); and provided insights to the Dementia project team’s educational training materials (June 2024). Throughout the project period, members in this group continue to disseminate information and outreach products to the people they serve.

Our annual *External Advisory Committee (EAC)* meeting, consisting of agricultural safety and health experts of national relevance, was held in April 2024. The GPCAH PIs provided project updates and solicited feedback to improve their projects. Advisors provided the following key suggestions to guide projects, including:

- **Control Technology in Swine Building:** confirmed that the addition of new “impaction plate” to the treatment unit could be useful to extend the filter life of the air quality unit in the swine building study; they also suggested looking at new LED UVC lights as a potential power saver (and longer lasting bulbs) for the newly designed units.
- **Preventing Farm Injuries from ADRD:** The EAC supported communicating with succession planning experts and suggested potential new advocacy groups to help at the dissemination stage.
- **Outreach:** The presentation of the education, translation, and partnership to illustrate how GPCAH translational materials (e.g., Fig. 2) was helpful to show how we reach multiple points of contact and take advantage of opportunities to share information among many audiences.

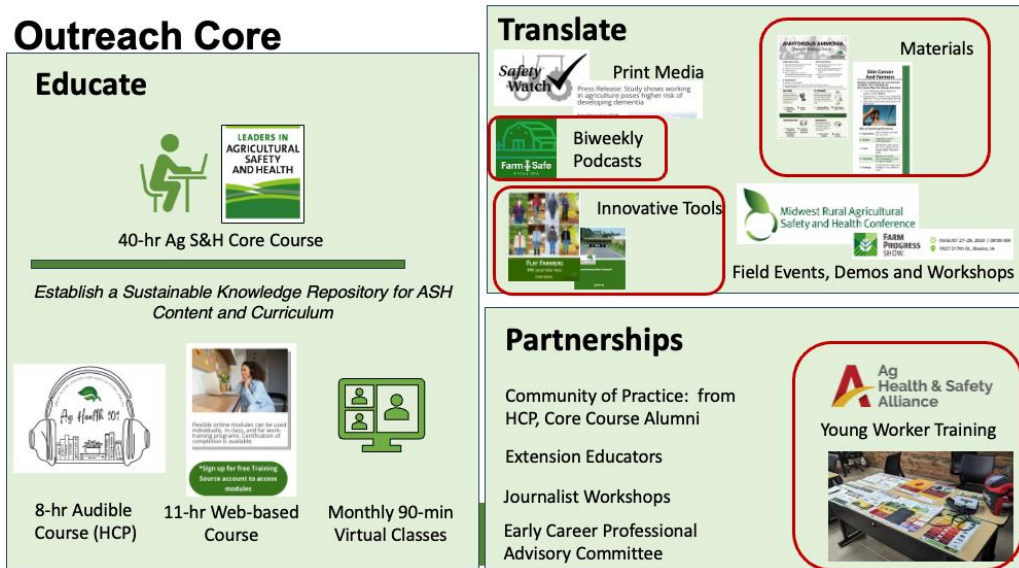


Figure 2: Explanation of Outreach Core activities for EAC, illustrating how materials were used across different partnership opportunities. Red circles illustrate the type of materials used with different partners, in this case, the Ag Health & Safety Alliance.

**Social Media:** GPCAH’s E&P Core continues to implement the Center’s social media communications strategy by reaching out to audiences on Facebook, Twitter/X, and YouTube. We disseminate safety

messages, promote events, and share study findings. Between Sept 15, 2023 – Sept 25, 2024, 147 Twitter/X posts (up from 60) and 139 Facebook posts (up from 95) were made.

Our Twitter/X followers are, historically, more engaged in scientific studies and reports. In the past year, we reached 12,385 (up from 6,156) and gained 86 new followers (up from 13). Table 1 shows our most popular tweets of the past year. The total Twitter/X engagement percentage for the year is calculated by dividing the *total engagement* (likes and retweets) by the *number of tweets published* during the past year (147) to get the *average engagement per post* (5.6, up from 4.6). Then, by dividing the *average engagement/post* by the number of followers (466) and multiply by 100, we computed a 1.2% *engagement rate* (same as last year’s 1.2). A 1% engagement rate is typically considered to be “very high” for an organization on Twitter; 0.02% is “very low”.

Our Facebook followers increased from 653 to 689, and 605 individuals “like” our page, a 5.5% increase since September 2023. Facebook’s recommended metric is the *engagement rate*: computed by dividing total post engagements (likes, comments, shares = 1063, up from 775) by the total reach of the page (11,257 down from 15,330) and multiplying by 100 (= 9.4%, up from 5.1%). A Facebook engagement rate of 5% indicates “exceptionally well.” In the next project period, we will develop and test new strategies to maintain and improve our 9.4% (FB) engagement rating even further, to improve indicators of how successfully we connect with our audience, resulting from both higher impressions and increased traffic.

Our most popular Facebook post this year was a promotion of our *FarmSafe* podcast that interviewed Mandy Roome from the Northeast Center for Occupational Health and Safety. This post received 13 shares, 74 engagements total, and 921 impressions. AgSafety4u, UMASH, Missouri Beginning Farmers and Ranchers Program, NYCAMH, and the Northeast Center were some of the organizations that shared this post. This topic engaged our followers again with another tick post with new graphics on July 26<sup>th</sup> (Fig. 3). Our most popular Twitter post with 51 engagements was the recent unveiling of our new Respirator Fit Test Guide. This had 2 quotes and 5 reposts, which gained us 2 direct followers and over 1,000 impressions.

Great Plains Center for Agricultural Health  
July 26  
During the summer months, ticks are more active. Be sure to check these areas of your body after working in potentially tick-infested areas. For more information on preventing tick bites, listen to our FarmSafe episode: <https://gpcah-public-health.uiowa.edu/got-ticks/>

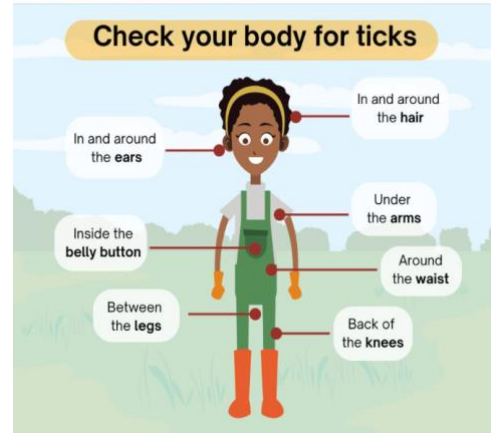


Figure 3: Facebook post during tick season (the 4<sup>th</sup> most active post, see Table 1)

Table 1: Top Five GPCAH Social Media Posts

Twitter	Facebook
New Respirator Fit Test Guide! <a href="https://bit.ly/GPCAHRespiratorX">https://bit.ly/GPCAHRespiratorX</a>	<i>FarmSafe S3E16</i> : Got Ticks? With Mandy Roome <a href="https://bit.ly/47DQrhT">https://bit.ly/47DQrhT</a>
CPR Shared Playlist <a href="https://bit.ly/3XCHy4E">https://bit.ly/3XCHy4E</a>	<i>FarmSafe S3E15</i> : Safe Practices Around Overhead Power Lines with Ann Augspurger <a href="https://bit.ly/3MGyfdK">https://bit.ly/3MGyfdK</a>
Diane Rohlman Article on Hierarchy of Controls <a href="https://bit.ly/3ziY14z">https://bit.ly/3ziY14z</a>	<i>FarmSafe S3E1</i> : Welcome to Season 3 Introducing Libby Presnall <a href="https://bit.ly/3MGgpYd">https://bit.ly/3MGgpYd</a>
<i>FarmSafe</i> : General Farm Emergency Preparedness <a href="https://bit.ly/47IW7ge">https://bit.ly/47IW7ge</a>	“Check your body for ticks” graphic and tips (see Figure 3) <a href="https://bit.ly/GPCAHTicks">https://bit.ly/GPCAHTicks</a>
May is Mental Health Awareness Month <a href="https://bit.ly/3XGlaGx">https://bit.ly/3XGlaGx</a>	<i>FarmSafe S3E7</i> : Grain Bin Safety, Part 3: Stored Grain Management to Minimize Bin Entry <a href="https://bit.ly/GPCAHTicks">https://bit.ly/GPCAHTicks</a>



## Emerging Issues

In previous project periods, emerging issues funds were used to support a survey on respirator use and fit testing and to provide train-the-trainer workshops as “skills development workshop” at MRASH to evaluate training materials. Our internally developed fit-testing training guides (used in 2022 for skills workshop and available online) were used to generate the new [Respirator Fit Test Guide for Agricultural Pesticide Handling](#), a joint effort between the Ag Health and Safety Alliance (*AgHSA*) and the GPCAH. This has been incorporated into *AgHSA* pesticide respirator training programs, was displayed at the 2024 ISASH conference, and is being incorporated into regional outreach efforts.

To improve the region’s capability to provide respirator fit test services, we identified partners at Iowa Extension to help identify whether extension specialists were able and willing to help farmers conduct respirator fit testing. Our 2022 surveys identified that extension would be a place where some farmers would seek fit testing. In collaboration with *AgHSA*, we worked with Betsy Danielson, Extension Specialist with the Pesticide Safety Education Program at Iowa State University, to identify extension agents interested in participating. Ms. Danielson completed our skills development workshop in 2022 and helped establish locations and assist with recruiting extension specialists for a training session at the end of September 2024. These sessions hosted 8 agents (target enrollment was 15), using Emerging Issues funding to support print materials and supplies for this session (Fig. 4). Those that attended received respiratory protection (two elastomeric half mask respirators with P100 filters and disposable FFRs) for training. For those interested in conducting fit testing for farmers in their county, at the conclusion of the training, they were asked to submit a fit testing strategy proposal to receive a fit testing kit, with the only request that they complete a survey about their use of the fit testing kit. Requests for kits and surveys will be tracked and reported in project year 3 to examine the impact of this effort to improve farmer access to respirator fit testers. Results from pre- and post-workshop surveys about the training program will be analyzed in the next project period.



Figure 4: Supplies for respirator fit test train-the-trainer sessions.

## Outreach Core (T.R. Anthony)

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The long-term goal of our Outreach Core is to reduce injury and illness among agricultural workers throughout the region by providing a multi-tiered approach to disseminating health and safety information in a way that maximizes adoption by agricultural workers. Our objective is to increase the speed and uptake of agricultural safety and health programs, practices, and policies among intermediary organizations that engage with the agricultural workforce. We will achieve this by (1) expanding our educational programs, (2) translating and disseminating research into effective prevention messages, and (3) creating mechanisms that facilitate communication between the Center, intermediaries, and end users. Our primary target audiences are healthcare providers (including those serving migrant and seasonal farmworkers), employers (including supervisors of young agricultural workers), and media communicators who can influence perceptions and behaviors through their portrayal of the agricultural industry. These activities will position the GPCAH as a regional and national resource to reduce injury and illness and promote well-being among workers in the agricultural community.

To achieve this mission of the GPCAH, the Outreach Core has three main aims:

- (1) Build capacity and expertise among practitioners to protect vulnerable workers by expanding the adoption of agricultural safety and health educational materials throughout the region and nationally.
- (2) Translate agricultural safety and health research findings using a multimedia approach to encourage adoption of evidence-based practices among stakeholders and target audiences.
- (3) Build new and nurture existing stakeholder partnerships with intermediary organizations to foster bidirectional communication channels

Below summarizes a few highlights of high impact activities during this second year of this project.

### Training

GPCAH investigators have been providing the *Agricultural Safety and Health Core Course* to train health care providers, veterinarians, safety specialists, and farmers for decades. The curriculum has now been remolded to fit today's lifestyle, educational formats, and learning preferences. The 2023-4 project period was the first time that the GPCAH did not offer the core course as a continuing education program in Iowa. While we supported efforts for courses presented by other organizations, including CS-CASH in Nebraska and Dalhousie University (19 2<sup>nd</sup> year undergraduate students), we spent much of this project period designing, developing, and testing a new self-paced curricula that fits the needs of today's learners.

The new reframing of the 40-hour *Core Course* includes a multi-tiered series of curricula that have been designed to be self-paced and include up-to-date content to help our community best protect the health and safety of our essential farming workforce. Through August 2023, we identified that individuals have completed 1644 of our online course modules (1- to 2-hours each), developed by the Outreach Core in the last 6-year project cycle. The number of course completions demonstrates that these educational materials help us extend beyond the class sizes allowed by traditional 40-hour face-to-face or even virtual synchronous courses. Going forward, course content must be both convenient and professionally relevant to those serving to protect farmer/farmworker health to be critical to building the capacity of expertise to serve the farming population.

The new set of Ag Health and Safety courses developed by the Outreach Core were designed to be freely accessible. Since both cost and time have been barriers for health care providers wanting to attend

these courses, this new system will be examined to determine if these modern education styles fit the needs of today’s health and safety practitioners who want to understand hazards and reduce risks of illness and injury from farming operations. This new training program includes four tiers: introductory audio program (8-hr), an intermediate web-based program (12-hr), advanced monthly virtual meetings to learn about emerging issues from topic specialists (12 hr/year), and an annual hands-on skills development workshop (2-4 hours in length, offered across the region).

To enhance the uptake of these courses by health care providers, a critical demographic of our curriculum of the Core Course, the Outreach Core has funded the review and continuing education certification eligibility for the first two asynchronous educational programs for the next three years through the University of Iowa Medical School. The first two programs are [available](#) now, totaling 20 hours of content. Both **Ag Health 101** (the introductory audio program) and the web-based program **Intermediate Ag Health**.

**Ag Health 101** provides *introductory* information on both farming and health protective practices. For those new to either farming or health and safety, this is the best place to start. The training contains 10 units focused on common health hazards that affect farmers, with micro-lessons in audio format for self or group listening (Fig. 5). Each unit has summaries and a set of reflection questions, one for each “chapter” in that unit, designed to allow either individual reflection or group discussion. After completing the Introduction unit, students can complete the program in any order that suits their needs. After completing all chapters within each unit, anyone can take an online quiz, which provides a score and certificate of completion. This structure was established to allow organizations to adopt the course materials as stand-alone content or to supplement their existing courses. Once a student completes all 10 units, which add up to an 8-hour listening experience, a participant can complete a survey (using details from each quiz certificate) to submit for continuing education credit. Continuing education credit for health care providers is offered for those who complete the full 8-hour Ag Health 101 audio course. The course can be accessed by anyone at: <https://gpcah.public-health.uiowa.edu/ag-health-101/>.

To date, health care providers at Proteus have provided feedback and tested the utility of the materials with their new summer 2024 health aids. An international group of ag safety and health students from the American University of Beirut have completed the course, with English transcripts to aid in the adaption of the course to their region’s languages. Additional promotion efforts are underway at rural health associations, among other organizations.

**Intermediate Ag Health** is the second tier of self-paced educational components. These interactive modules provide detailed information on 11 topics relevant to farming health and safety. These modules were developed throughout the previous 6-year project period, to assist other organizations by providing

**Chapter 4**  
**Pesticide Application Guidelines (DRIFT)**

**TEMPERATURE & HUMIDITY**  
The combination of temperature & humidity is important for pesticide application. When temperatures are ABOVE 70°F & when humidity is BELOW 40%, droplets coming out of the sprayer evaporate quickly. This means that particles that come out of the nozzle become very small & fast. Therefore, these small particles may travel much further than the droplets originally generated, resulting in pesticides drifting away from the target area. Herbicides in particular have temperature & humidity warnings. Most labels recommend not applying when temperatures are ABOVE 90°F.

**BUFFER ZONES**  
Defined as the distance between the point of Direct Pesticide Application & the nearest downwind boundary to a sensitive habitat.  
Buffer zones are important to protecting areas where pesticide travel is unwanted.  
**Drift Reduction Recommendations:** Zones ranging from 200 to 500 feet

**WIND SPEED**  
When wind increases, sprayed pesticides do not deposit on the plants as intended. When the wind is too low, the pesticides may also not deposit well on plants. The pesticide label will provide wind recommendations & should be reviewed before pesticide application. While labels often go up to 15 mph as an upper limit for application, it is important to know that most extension offices around the Midwest recommend safe wind speeds are typically 3 to 7 mph. The upper limit recommended by most is 10 mph.

**GLYPHOSATE:**

- Lowest Potential Drift: Wind 3-10 mph
- Wind Up to 5 mph: Do not apply aerially within 500 ft of other crops
- Wind 5-10 mph: 500 ft buffer zone may not be sufficient
- Wind Exceeds 10 mph: Do not apply

**2,4-D:**

- Wind Speeds > 15 mph: Do not apply; Buffer zone of 250 ft
- Wind Speed < 3 mph: Do not apply unless no inversion layer is confirmed

**DICAMBA/2,4-D DMA MIX:**

- Wind Speeds > 15 mph: Do not apply; Buffer zone of 250 ft
- Wind Speed < 3 mph: Determine if temperature inversion is present or stable atmospheric conditions are at or below nozzle height; if yes to either, do not apply

Figure 5: Example of supporting materials for *Ag Health 101* course (Pesticide Unit: Chapter 4 on Pesticide Application Guidelines)

consistent information on important topics of the traditional 40-hour *Ag Safety and Health Core Course*. The goal of these modules was to make sustainable materials that could be used by anyone to gain insights into a variety of farming hazards. This project period (2023-4), courses have been completed 782 times, totaling 2415 completed courses across all modules.

Over this past year, we have also secured continuing education credit approval for each of these modules: occupational health practitioners can obtain CEUs for the stand-alone topics rather than a complete 40-hour course. We are promoting these nationally as intermediate level courses in the Ag Safety & Health program. Each module takes about an hour, with one module (Personal Protective Equipment) taking longer. Continuing education is provided for each module completed, so students can pick and choose which topics are most relevant to their practice. After completing the *Overview of Agriculture, Forestry and Fishing* module, examples of class bundles include the following selections:

- *Occupational Medicine*: Occupational Diseases of the Lung, Occupational Skin Disorders, Musculoskeletal Disorders
- *Livestock Hazards*: Hazards Associated with Livestock Handling, Illness & Injury Prevention among Animal Caretakers, Biological Risk Management
- *Industrial Hygiene*: Physical Agents, PPE for Ag Health, Occupational Diseases of the Lung
- *Safety*: Transportation Hazards, Off-Road Vehicles, Illness & Injury Prevention among Animal Caretakers

Visit <https://gpcah.public-health.uiowa.edu/core-course-online-modules/> for details and continuing education information for the intermediate ag health courses.

Figure 6 tracks the use of these modules over time. The first module was deployed in 2016, and the following are the most widely used courses: Occupational Lung Diseases (published 12/17, completed 442 times), Occupational Skin Disorders (9/18, 425), and Physical Agents (2/16, 374). These modules have been incorporated into *Core Course* curriculum offerings with our partner institutions as asynchronous materials around the country.

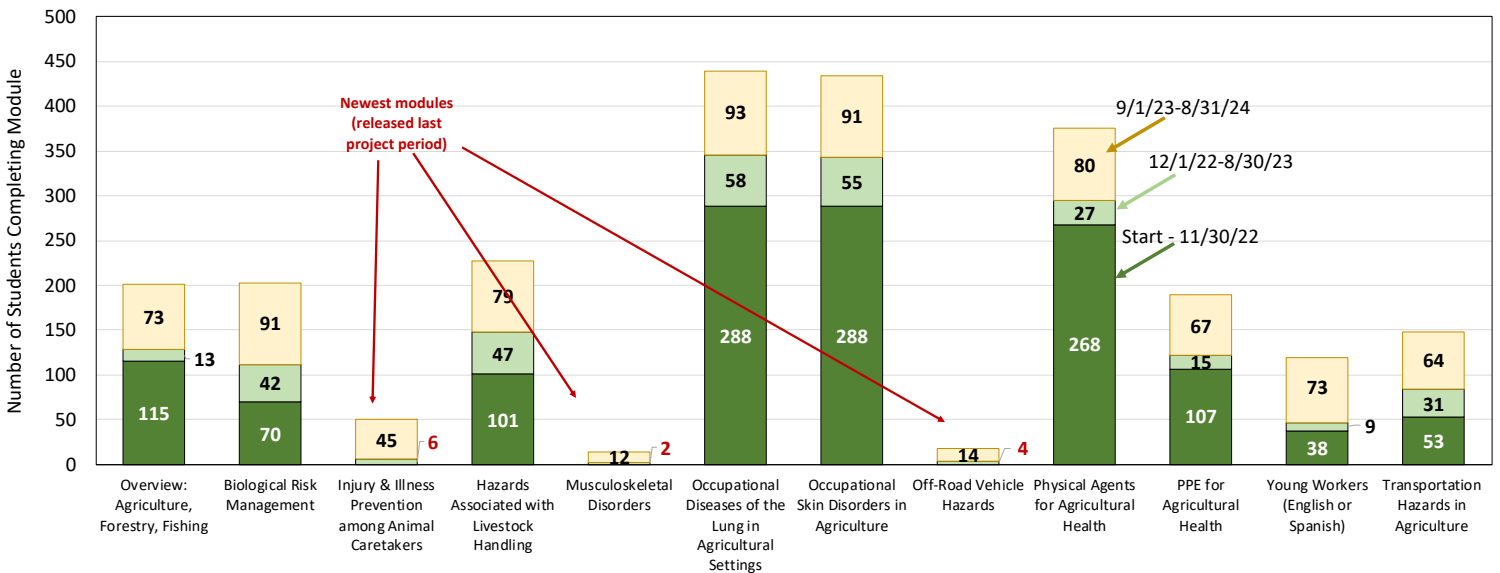


Figure 6: Use of online modules by topic, stacked bars over time. The stacked yellow bars show the number of times each course was completed in this past project period (total 782 completed sessions).

**Ag Health Academy** is the advanced educational training level. We have completed our survey of alumni to determine frequency, mode, length of courses, and topics of interest to establish the format for the upcoming Ag Health Academy. This will include monthly virtual meetings to continue the agricultural safety and health education beyond the two asynchronous modes. We anticipate that this will both build and advance the expertise in our community of ag health and safety experts across the region. The synchronous 90-minute sessions will provide insights on relevant persistent and emerging hazards facing farmers, particularly those across the Midwestern US. This will allow participants to hear current updates on best practices from top experts around the country.

In 2024-5, we will invite those who have completed any of the 40-hour *Core Courses* (offered by the GPCAH or by a partner site) to apply to be in this *Academy*. In addition, anyone completing the *Ag Health 101* program and *all* the 11 courses in the *Intermediate Ag Health* program modules would be eligible to enroll in this Academy. We anticipate rolling out this program early 2025, likely building members slowly and seeing if this fills a gap in the education of those striving to protect the health and safety of those working in agriculture. At least initially, we are not intending on securing CEUs for these monthly courses, but we will evaluate this opportunity as the Academy project progresses.

**Solutions Workshops** is the final leg of this program, providing hands-on skills development courses offered in conjunction with regional meetings and other events. Those who are enrolled in or who have completed the Ag Health Academy will be notified of events. Our next *Solutions Workshop* will be a Media Skills workshop on November 6, 2024 in Ames Iowa, in conjunction with the [2024 MRASH conference](#).

## Translation

The GPCAH Outreach Core translates research findings into multimedia formats to encourage the adoption of evidence-based practices. As key contributions to our translation objectives, our key contributions this project period include our podcasts, monthly newspaper column, field events, and a new interactive tool for PPE education.

**FarmSafe Podcast:** This year, we developed and aired Season 3 of the *FarmSafe Podcast*. Research assistant and outreach staff for the Great Plains, Libby Presnall (now Ritchie), served as our new host for Season 3 (Nov 2023-June 2024). She led the content development and conducted interviews across the season. Although our season was shorter than in the past, we generated 17 episodes with a total run time of 4 hours, 41 minutes (Fig. 7). While episodes covered only 8 broad topics, these episodes were prepared with experts across the country and most topics were covered across multiple episodes to provide more depth to the coverage than is allowed in a single 15-minute episode. The format of each episode was more structured this season: episodes lead with voices or stories from farmers followed by subject experts discussing hazards and best practices and practical tips. Each episode ended with Ms. Presnall's summary and a specific request for a safe behavior or action for the listener to take based on what was learned in the episode. All podcasts are available on our [website](#), where the resources mentioned in each episode are posted, and can be found on all streaming platforms.

Since we began on Aug 20, 2021, our 59 episodes (plus trailer) have had 2683 downloads. Our new listeners are listening to back episodes: 30% of downloads are from episodes released in previous seasons. We had 306 downloads of our new Season 3 episodes, but listeners downloaded almost 700 episodes this year across the three seasons (383 from Season 1 and 2).

In every season, our kick-off episode is among the most listened. Of the new Season 3 episodes, the most listened-to episodes this season were on Safe Operation and Maintenance of Tractors (Season 3 Episode 3) and Community Building for Rural Response to Emergencies (S3E12). Over all three seasons, the top episodes are: Cold Weather Training Tips (173 downloads total, S1E12), Sleep (156 downloads; S1E6), and Back Pain and Whole-Body Vibration (78 downloads, S1E7). Our original trailer also has 255 downloads, the most downloaded episode, likely a function of podcasting promotion algorithms beyond our control. Our evaluation identified that for episodes in Seasons 1 and 2, only 16% of episodes had more than half of their downloads happen within the first two weeks of the episode drop: this shows that a bi-weekly release format may not be the best strategy. In Season 4, we will investigate the impact of dropping bundled episodes throughout the year to evaluate whether this engages more listeners, as this format will allow us to link seasonal episodes together with a new promotion strategy.

**Safety Watch:** Additional other translational activities in the Outreach Core included sharing messages in the [Safety Watch column](#) in *Iowa/Illinois/Missouri Farmer Today* publication. This year, topics included wildfire air quality (July 2024 with interviews of John Flunker from the PNASH center), drought-related stress (May 2024, with interviews from Jesse Berman who conducted foundational research in this area with GPCAH Pilot Grant funds), agrotourism (Sept 2024), equipment safety checks (March 2024), falls (Jan 2024), emergency preparedness (Nov 2023), and roadway crash studies (Sept 2023). We also promoted best practices in the [Farm Families Alive and Well Newsletter](#).

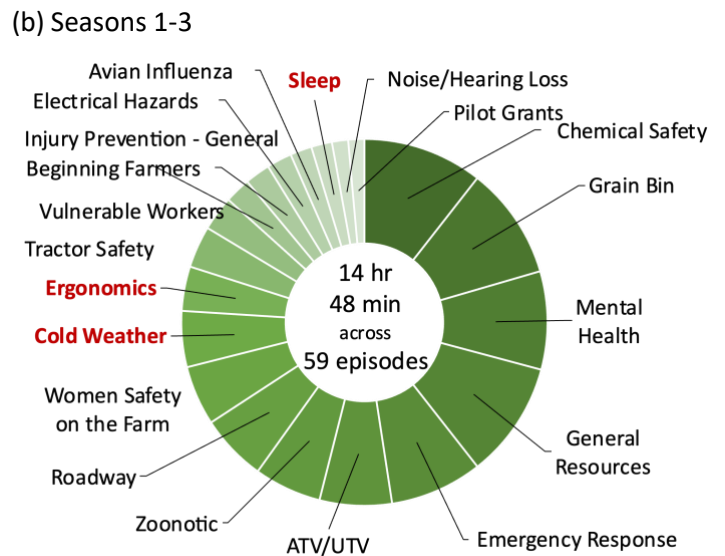
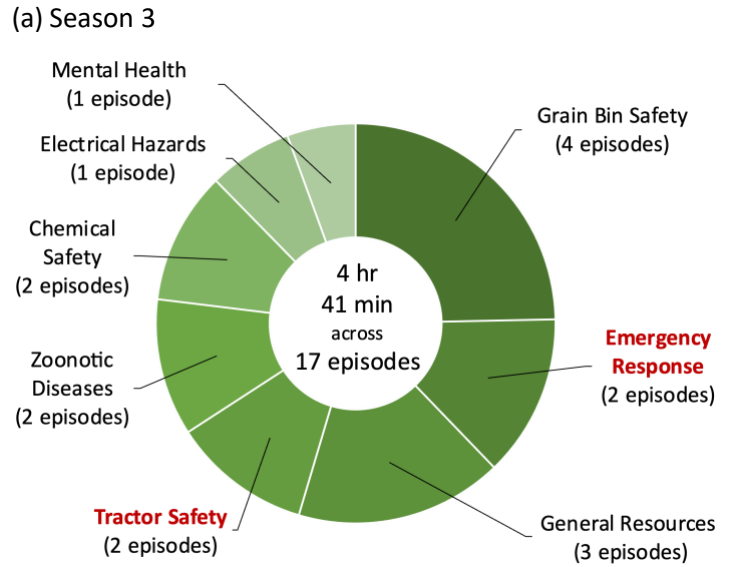


Figure 7: *FarmSafe Podcast* topics presented in (a) Season 3 and (b) all 3 seasons. Topics in red indicate categories with a top downloaded episode.

**Outreach Events:** Our Outreach Core staff provided hands-on demonstrations at farm/safety shows, community colleges, and conferences across the region as another translational leg of the Outreach Core. We started our outreach year at the National FFA Convention, where we debuted the new PPE selection teaching tool, after which became known as *Flat Farmers* (Fig. 8). The FFA participants were randomly assigned to a farm chore, for which they had to select the safest clothing and PPE options and “dress” a *Flat Farmer*. The PPE selections were then discussed with participants, which led to rich conversations about why a particular choice was best for that situation or when a different choice may be appropriate. The *Flat Farmers*, along with our new *Ag Health 101* curriculum, were also displayed at the 2023 MRASH conference and the 2024 ISASH conference, to solicit feedback from other health and safety professionals.



Figure 8: Promotional materials for the new [Flat Farmer](#) outreach tool.

Summer outreach focused on sun safety. We shared sun safety best practices with over 250 elementary and high school students in June and July at the Progressive Ag Safety Days hosted by the National Education Center for Agricultural Safety (NECAS), using our Sun Safe Animals curriculum. In August 2024, the GPCAH outreach staff assisted in the pilot-testing of a new health and safety education format at farm shows this summer - the Progressive Ag Foundation’s *Safety Zone*. *Safety Zones* bring a condensed Ag Safety Day-like program to a larger event, using a passport system with a prize after completing all activities. The GPCAH used the *Flat Farmers* to teach participants about sun safety and PPE selection during hot weather in the UMASH Safety Pavilion at the Minnesota Farmfest and at the 2024 Farm Progress Health and Safety Tent. Over 1200 youth and family members completed the Safety Zone programs, with additional attendees participating in only one or two exhibits. The GPCAH was once again in charge of coordinating the *Farm Progress Show’s* Health & Safety tent, which hosted 15 organizations dedicated to improving health and safety on the farm, two lactation rooms, and the Farmers’ Corner (an area to take a break and enjoy coffee, cold water, and light snacks).

### New and Existing Stakeholder Education

**Agricultural Health & Safety Alliance (AgHSA):** The AgHSA is contracted to bring educational materials to college age farmers across the GPCAH region. During the 2023-2024 program year, AgHSA delivered outreach materials during Gear Up for Ag™ programs to 535 students across the region: Iowa State (Ames, IA), South Central Community College (Mankato, MN), University of Nebraska (Lincoln, NE), Morningside University (Sioux City, IA), Iowa Lakes Community College (Estherville, IA), Dordt University (Sioux Center, IA), Nemaha Central High School (Seneca, KS), and Kirkwood Community College (Cedar Rapids, IA). In Seneca Kansas, Carolyn Sheridan was a guest speaker at the Nemaha Valley Community Hospital nurse manager (25 nurses) meeting, where she shared Ag Health and Safety information and share GPCAH resources as well as information about the new asynchronous *Ag Health 101* and *Intermediate Ag Health* curricula. Beyond the GPCAH region, AgHSA shared information with 147 young adults in programs in Mississippi (Mississippi State University), North Dakota (North Dakota State University), South Dakota (South Dakota State University), and Arizona (University of Arizona) as well as 791 students throughout

Canada (Alberta, Saskatchewan, Manitoba, Ontario, Quebec, Prince Edward Island, and Nova Scotia). Motion graphics, developed with the GPCAH, have been incorporated into Gear Up for Ag Health & Safety, with three videos incorporated into a [Pesticides Handling Motion Graphics Series](#). The new [Respirator Fit Test Guide](#) (Fig. 9) was finalized in 2024 and was promoted by AgHSA at the June ISASH meeting and used to conduct train-the-trainer workshops provided to Iowa Extension agents in September 2024, with coordination by the Pesticide Education Program at Iowa State University (detailed in Emerging Issues). Graphic images from the Fit Test Guide are also used by AgHSA in their many programs to promote the importance of respirator fit testing in agriculture.

Throughout training events, the AgHSA shares GPCAH resources with students, including information on manure gas hazards, hearing conservation information and the E-A-Rfit validation system, and gas monitor tools for manure gas hazard training. The AgHSA has adopted GPCAH materials (e.g., respiratory protection, hearing protection, manure gas safety) into their in the Gear Up for Ag™ program curriculum and promote GPCAH resources on their [online platform](#). Agriculture students and instructors in all Gear Up for Ag outreach programs are directed to the online platform to learn about the resources and how to use safety equipment properly.

**MRASH:** The GPCAH helped coordinate and sponsor the regional Midwest Rural Agricultural Safety and Health ([MRASH](#)) conference. In 2023, the conference was live and hybrid, with the theme of “Celebrating Youth on the Farm,” held in Dubuque, Iowa.

Partners at [Minnesota](#), [Nebraska](#), and [National Children’s](#) AgFF Centers, as well as several regional agricultural safety and health non-profit organizations, participated in MRASH conference planning. Regional Advisory Committee members in Missouri, Illinois, and the Ag Health & Safety Alliance, along with personnel from all AgFF centers in our region, contributed expertise to the session presentations. GPCAH Center personnel helped coordinate meetings, managed social media, provided introductions at the event, coordinated several roundtables, and coordinated evaluation for the event. This one-and-a-half-day conference was attended by 66 people from 9 states (IA, IL, NE, MN, TX, WI, MO, KY, PA; Fig. 10), representing ag safety and health non-profits, healthcare systems, research universities, FFA members and advisors, extension, public health, and agribusiness. We also had several agricultural producers present in this year’s conference, beginning with the first keynote session that included an intergenerational panel of farmers. Conference

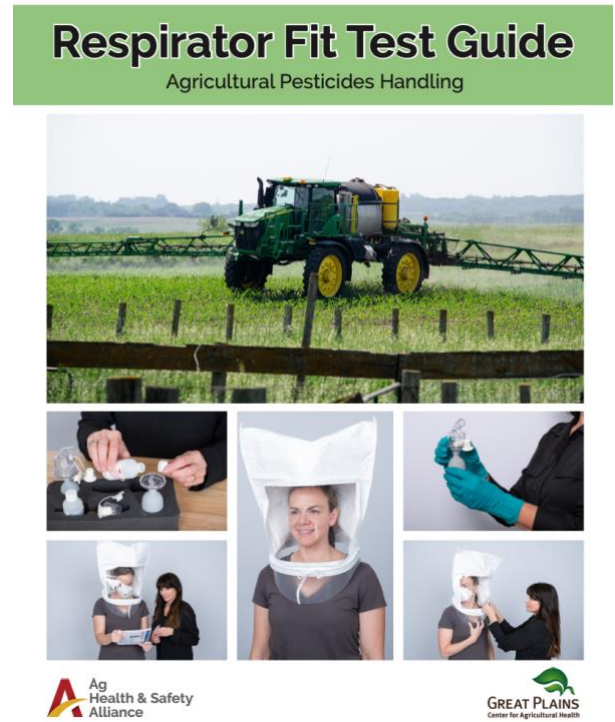


Figure 9: Cover of 27-page respirator fit-test guide.

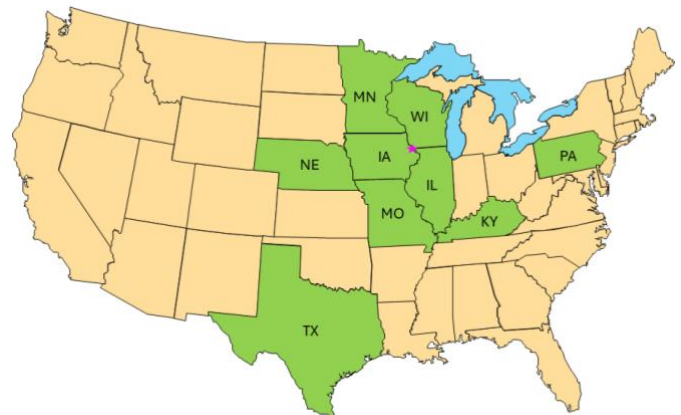


Figure 10: Home locations of 2023 MRASH attendees.



evaluations showed that MRASH participants especially appreciated the producer and youth perspectives presented. In 2023, 36% of attendees were first time conference attendees.

The keynote session on Wednesday (Schmitt, Iowa FFA President) included a panel discussion from farm youth and grandparents to discuss opportunities and concerns of youth in agriculture. On Thursday morning, attendees participated in both *Integrating Research and Public Policy* and *Youth Employment: Policies, Guidelines, and Best Practices* sessions. Roundtable and breakout sessions on Wednesday discussed many research and outreach projects, including needs assessment results of educators (WI, IA), attitudes and use of helmets, innovations in outreach (Fig. 11), personal protective equipment usage rates, factors influencing worker safety in grain handling, reducing barriers to mental health care, why do young adults prioritize speed over safety, among others. Presenters of both oral talks and posters were from across the region: 2 were GPCAH regional advisory committee members, 2 were previous GPCAH pilot grant awardees, 3 were trainees funded from NIOSH ERC programs, and 12 were from neighboring NIOSH Ag Centers.

Immediately following MRASH, the GPCAH coordinated a skills development workshop (*"Solutions Workshop"*) in neighboring Peosta, IA, at the National Education Center for Agricultural Safety (NECAS). The workshop focused on Emergency Preparedness, bringing together three organizations involved in this field who had not worked together (NECAS, Farm Mapper, and Disaster PrepWise). Figure 12 illustrates one of many hands-on activities demonstrated at NECAS, which are used to formally train emergency responders, farmers, and safety advocates about hazards on the farm. Each workshop presenter identified ways to cross-promote and use each other's resources in their respective programs as well as informing health and safety practitioners about their tools. Attendees (18) included university graduate students and staff, Cooperative Extension educators, ag safety and health organizations, safety professionals, and a large healthcare system.



Figure 11: Cheyney presenting with other AgFF center outreach staff during the *Innovations in Outreach* breakout session at 2023 MRASH.



Figure 12: Dan Neenan (RAC member) presented at the Emergency Preparedness workshop after MRASH. He is demonstrating using the manure rescue trailer at PEOSTA, IA, with attendee (Matison Howard, graduate student) entering with gas monitor and harness and lifeline.

## Pilot/Feasibility Grant Program (N. Fethke)

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The Pilot/Feasibility Projects Program is a vibrant and vital component of the GPCAH. The Program strengthens the Center’s impact on agricultural safety and health (ASH) by operating a competitive funding opportunity using two “tracks,” one designed to support new academic research and the other to support community-based education/outreach/translation projects.

*Academic-Track Awardee Characteristics.* A key goal of the Program is to support investigators new to the field of agricultural safety and health.

*Community-Track Awardee Characteristics.* A key goal of the Program is to support regional organizations in their efforts to develop, implement, evaluate, and deliver evidence-based ASH services (e.g., educational programming for agricultural workers).

Applicants for community-track pilot funding must first submit a brief Project Concept about six weeks in advance of the deadline for full applications. The Center provides feedback and invites discussion with project leaders to strengthen alignment of the project scope of work with the Center’s priorities and expectations for evaluation.

### Program Highlights

For the 2023-2024 project year, the Program received two Project Concepts and six full applications for pilot funding (five academic track and one community track). Applicants were affiliated with academic institutions in Illinois (3), Minnesota (1), and Wisconsin (1) and one community organization in Iowa (1). Applications addressed a broad range of high priority regional ASH topics, including mental health (two applications), respiratory health, heat safety, and traumatic injury.

Two applications were funded, both of which were for the academic-track.

**Gabriela Gracia, PhD**, Research Assistant Professor of Environmental and Occupational Health Sciences, University of Illinois Chicago

*Pilot project to learn farmworkers’ and farm labor supervisors’ perspectives on protective work clothing for heat safety*

**Jessica Brinkworth, PhD**, Assistant Professor, and **Grace Shaw**, PhD student in the Department of Anthropology at the University of Illinois Urbana-Champaign

*The impact of working conditions on immune function and respiratory health of Illinois seasonal and migrant farmworkers*

An important goal of the Program is to support the career development of academic-track pilot project awardees and capacity building among the organizations awarded community-track pilot funding. An important step in achieving this goal is to invite awardees to discuss their projects during meetings of the Center’s internal advisory committee. Academic-track awardees from the 2022-2023 project year with project timelines extending into the 2023-2024 project year participated and discussed their results, expected scientific products (e.g., peer-reviewed manuscripts), collaborative opportunities, and potential avenues for continued funding of their research.

We have also continued to expand the number of individuals and organizations to whom our requests for proposal (RFPs) are distributed. Our communications strategy for 2024-2025 pilot funding was effective, yielding 14 full applications across seven states served by the Center. Funding decisions will be announced early in year 3 of our project period, once contracts have been executed.

## Advancing Whole-Body Vibration (WBV) Exposure Control in Agriculture (N. Fethke)

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Mechanized row crop production exposes agricultural workers to whole-body vibration (WBV), a key risk factor for back problems. Suspension systems of the seats in agricultural machines can reduce WBV exposures. However, the performance of seat suspension systems varies (i) between-operators under controlled conditions in the laboratory and (ii) within-operator under variable conditions in the field. Both circumstances limit our understanding of how effective seat suspensions are in reducing WBV exposures. This project offers methodological improvements to the assessment of seat suspension system performance under actual production conditions.

Ultimately, our goal is to instrument 40 machines across several farms and then, for each time that each machine is used over a period of many weeks, to measure vibration both at the seat pad and at the base of the seat suspension system. The resulting data will then be used to (i) estimate the magnitude and precision of between-day, between-operator, and within-operator contributions to the variability in seat suspension performance and (ii) empirically address ambiguities in the ISO's standards for measuring and evaluating WBV exposures.

Because of the large number of machines and the multi-week measurement campaign we have planned, using typical ("gold-standard") WBV measuring equipment is cost-prohibitive and logistically infeasible. Therefore, *we are developing a low-cost WBV measurement system*. Our system includes additional features to help us understand the variability in seat suspension performance, such as machine start-up detection (to enable remote sensing), GPS (to track machine location and speed), automatic detection of operator presence (to ensure our analyses include only periods when an operator is on the seat), and sensors/algorithms to estimate operator posture (e.g., leaning forward or reclining, which influences seat suspension performance).

### Key Achievements in the Past Year

**Aim 1.** We have completed the specifications and circuit design of our low-cost instrumentation system (Fig. 13) and, in the laboratory, collected data needed to validate the accelerometers used in our system against gold-standard sensors. Results suggest that acceleration levels measured with our low-cost system are within 3% of those measured with gold-standard sensors across all tested acceleration directions, frequencies, and magnitudes. This level of error is within tolerances for WBV measuring equipment specified by the ISO. We will present these results at the 2024 Midwest Rural Agricultural Safety and Health conference. Ongoing validation work involves ensuring our data processing algorithms yield metrics of WBV exposure and seat suspension performance that agree with metrics obtained from gold-standard instrumentation systems.

**Aims 2 and 3.** We are in the pilot data collection phase for Aim 2 through March 2025, in accordance with the overall project timeline. Aim 3 involves secondary analysis of Aim 2 data and is scheduled to commence in October 2026.

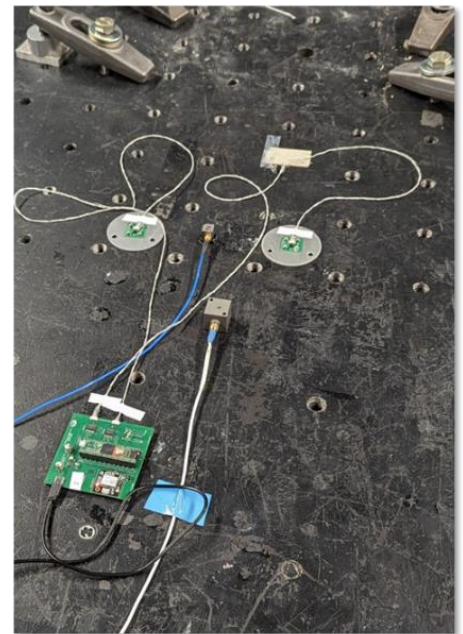


Figure 13: Illustration of components used for the low-cost WBV system.

## Community Campaign to Reduce Farm-Vehicle Roadway Crashes (C. Hamann, L. Schwab-Reese)

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Motor vehicle crashes are a leading cause of injuries and fatalities in the agricultural industry, and drivers of passenger vehicles are most often at fault. This project will use a novel approach to improve rural driver behaviors around farm vehicles on the roadway through a community-level intervention packaged into a toolkit and disseminated through Extension Educators. The long-term goal of this project is to reduce the burden of agricultural injuries from motor vehicle crashes and increase rural roadway safety.

The *long-term goal* of this research is to reduce injuries and fatalities associated with farm-vehicle-involved roadway crashes. The *central objectives* of the proposed study are to develop a “We’re on This Road Together” Toolkit and training module, then evaluate its reach and implementation. All aspects of this study will strive for equity and inclusivity (e.g., representation of historically underrepresented groups in advisory board and translation of campaign materials to Spanish). Our team has a unique combination of interdisciplinary expertise in agricultural and road traffic injury prevention and development and evaluation of community-based behavioral interventions. To achieve these objectives, we propose two specific aims:

- (1) Translate the “We’re on This Road Together” community-level rural roadway safety campaign to a Toolkit that can be implemented directly by community groups.
- (2) Evaluate the implementation and impact of the “We’re on This Road Together” campaign Toolkit.

### Key Achievements in the Past Year

This past year we have accomplished multiple goals under Aim 1. Using the conjoint and qualitative content analysis we did in the first year, the team drafted the toolkit outline and created digital and physical materials for the campaign. We recruited and trained three Iowa State University Extension Educators to pilot the campaign in their communities. Our team drafted and finalized the workbook that was included in the toolkit for educators. The research team trained the educators via Zoom. The training session was led by two research members who walked the educators through the workbook by section and answered any questions or concerns. The workbook was sent to the educators as a hard copy, but the team also provided a digital version. Highlighted sections in the workbook include an introduction, purpose, evaluation plan, engaging and identifying community partners to create an advisory board, key strategies to deliver the campaign, social media templates and how to use them, and promotional materials (“swag”). Our team created a website that could be easily accessed by extension educators that is password protected. We learned from focus groups conducted in the first year, that having one location for all the materials is ideal. The website acts as the hub for all digital content, ensuring educators that they only need to go to one place to find what they need. We created and hand-delivered the physical toolkit to create rapport with the educators by meeting face-to-face since the educator training was done remotely. We included various items in the physical toolkit like stickers, window clings, banners, t-shirts, etc.

The three Iowa communities have all completed their pre-intercept surveys and they are currently working to distribute their campaign materials. The extension educators have completed three surveys throughout the campaign and will complete two more before the Iowa pilot is complete. Through these surveys, our team will receive feedback to improve the campaign design for Indiana’s community campaign in this upcoming year. Our team has been providing technical assistance for the community campaigns as needed. We will continue to process and analyze the outcome data for each community including both the reach/impact.

## Design and Evaluation of a Control Technology for Dust and Bioaerosol in Swine Buildings

(M. Nonnenmann, T. Peters)

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Swine production workers are exposed to dust and bioaerosols (e.g., zoonotic organisms), and there is a need to develop scalable, cost-effective engineering control that includes recirculating ventilation systems that are effective and scalable for use across a range of swine building designs. This project used a participatory approach with swine industry stakeholders to design, optimize, and field-validate a prototype miniaturized recirculating ventilation system. The long-term goal of this project is to optimize a **recirculating ventilation system (RVS)** to control worker exposure dust and bioaerosols in livestock production buildings.

Our *long-term goal* is to develop an RVS to control dust and bioaerosols in livestock production buildings and translate our findings using the National Institute for Occupational Safety and Health (NIOSH) research to practice (r2p) approach. The primary objectives of this project are to demonstrate the effectiveness of a low-cost ( $\leq$ \$1500), **miniaturized RVS (mRVS)** to control dust and bioaerosols when integrated into swine buildings. We will communicate with stakeholders to identify optimized design and cost parameters, and we build and evaluate the mRVS technology performance in swine production. Our research team integrates a swine industry Stakeholder Advisory Group (SAG) (e.g., swine producers, producer associations, building designers, swine industry educators, veterinarians) involvement with NIOSH investigators experienced with translating research findings. Our team has experience with RVS design, cost and contaminant simulation, field validation, and evaluation. Our rationale is that effectively translating research findings about mRVS effectiveness, costs, and cost-savings into solutions that address specific barriers identified by stakeholders will lead to adoption, and concurrently improve worker and animal health in the swine industry. This project consists of three aims:

- (1) Communicate with stakeholders to develop design criteria for the mRVS
- (2) Refine and optimize the mRVS to meet design criteria
- (3) Conduct field validation of the optimized mRVS

### Key Achievements in the Past Year

#### ***Aim 1: Communicate with stakeholders to develop design criteria for the mRVS***

Our goal is to gather producer/building designer/swine industry opinions related to mRVS design characteristics (i.e., materials), production costs and parameters of the experiment (i.e., phase of production) we are planning on conducting in Year 3 (Aim 3: Study 3). We organized one focus group with only two producers in attendance. Our proposed approach was to have six to eight producers in attendance for focus group activities. Therefore, we changed our approach and started to conduct phone interviews to gather opinions. To date, we have conducted 15 interviews with producers, swine industry experts in production and construction. Most interviewees indicated that mRVS use will be beneficial in mitigating pig diseases or reducing hog mortality and labor costs associated with attending sick animals, especially for nursery and sow units. Most wean-to-finish producers would adopt the technology if it were mandated by the integrators. Polyvinylchloride plastic, aluminum, wood, or polyester fabrics has been identified as potential construction materials that will not corrode in a hog confinement environment. Interviewees suggested using mRVS filters that are washable and reusable. Installation location(s) should be in a building location with easy access to electrical outlets (e.g., middle of the building or near heaters) but out of the way for daily chores. Information for production costs remain difficult to gather given that most

interviewees did not pay for any costs associated with feed, vet services, nor medication. Nursery and sow units have been identified as the most appropriate phase of production for future testing.

***Aim 2: Refine and optimize the mRVS to meet design criteria***

The mRVS design continues to be revised based on materials suggested by interviewees. We have been updating materials to optimize cost. Costs of mRVS materials have increased threefold since the development of the proposal. To date, we have modified the mRVS prototype from the original design as follows: updated the lighting source to increase UVC dose at lower costs, created a UVC lighting harness to support the weight of the lighting, and increased the fan size to allow for decreased cost and improved efficiency. We have fabricated a washable impaction device to remove larger particles (~10 µm and greater) from the air inlet of the mRVS to improve efficiency and durability in the swine production environment. We are assembling multiple mRVS prototypes for the field experiment planned for winter 2024-25. We are hopeful that outbreaks of emerging disease (e.g., H5N1) will not impact our data collection, but we are developing alternative approaches if outbreaks occur and access to commercial swine production sites are limited.

## Farm Safety for Rural Families Coping with Dementia (K. Arora)

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The *long-term goal* is to prevent traumatic injuries among older farmers exhibiting cognitive decline and to improve mental health outcomes among agricultural residents/workers balancing competing demands of work and family caregiving. The primary objective of this study is to test a Stage 1 intervention (“Farm Families Coping with Dementia” or FFCD) that provides structured education to family caregivers of farm workers/residents with suspected or diagnosed dementia. Here are our three project goals:

Goal 1: Finalize Farm Families Coping with Dementia (FFCD) toolkit and implementation protocol and train Cooperative Extension Specialists (ES) to deliver program. Conduct formative research and finalize FFCD toolkit (consisting of educational modules identified to support farm families coping with dementia) and implementation protocol in collaboration with advisory team. Train ES on FFCD delivery.

Goal 2: Evaluate FFCD efficacy in improving family caregiver’s dementia knowledge, burden, and self-efficacy, and person-living-with-dementia’s (PLwD’s) farm safety risk. Conduct a two-arm randomized control trial involving an intervention group and a waitlist-control group. Compare participant data between baseline and 3-month follow-up surveys. Interview a sample of family caregivers to explore participant experience in FFCD.

Goal 3: Evaluate implementation outcomes (feasibility, acceptability, and fidelity). Assess feasibility and acceptability from the perspectives of participants and ES through course evaluations and interviews. Assess fidelity by observing program delivery and completing and analyzing a fidelity checklist.

### Key Achievements in the Past Year

In our first project year, our team developed three of the four modules of the FFCD toolkit and implementation protocol. Completed modules focus on 1) Dementia Disease Education, 2) Dementia and Farm Safety, and 3) Improving Safety with Dementia. We are currently finalizing the fourth FFCD module on communication and resources for rural families coping with dementia. We built a new partnership with *EasterSeals Iowa*, now on the advisory committee, and welcomed an expert from their Rural Solutions group to join our advisory committee. We also identified a farm family caregiver who is providing dementia care, who is now on the advisory board as well. Consequently, the project advisory committee now comprises of a farm family caregiver and an EasterSeals representative in addition to our original members that include experts in occupational safety and health, neuropsychology, aging, dementia, and agricultural assistive technology. We also developed a collaboration with Johnson County Historic Poor Farm, using the site to identify and demonstrate safety risks and scenarios for FFCD educational modules. Our advisory committee met twice to provide feedback on module materials.

The project team is also preparing a manuscript focused on agricultural injuries in older adults with dementia. Using cases from the National Trauma Data Bank from 2017-2020, we compared risk factors for injuries in older adults with agricultural injuries and dementia to those with agricultural injuries without dementia as well as those with dementia but no agricultural injuries. Our results show that agricultural injuries for persons with dementia have a unique risk profile, not overlapping with either of the two other groups, but with features reflecting a hybrid of both agricultural (e.g., motor vehicle) and dementia-related (e.g., falls) injuries. We are currently examining differences in injury severity across groups. Initial results from this analysis were presented at the *International Society for Agricultural Safety and Health* in Portland, Oregon (June 2025).

We have also been involved in outreach and raising awareness about dementia in agricultural occupations. We shared information on the project at the Farm Progress Show in Boone, Iowa (August 2024). One of the lead investigators of the project was invited by a nonprofit theater in Iowa City to serve as a panel discussant for the screening of the film, *Away from Her*, as part of the national *Science on Screen* series – a multi-film program, supported by the Alfred P. Sloan Foundation, exploring depictions of neuroscience in Hollywood films.



## Output Summary: October 2023 through September 2024

The table below summarizes the number of outputs over the one-year project period. Details on current project year outputs follow.

Table 2: Number of Output Types for Project Period 2

OUTPUT TYPE	Year 1 2022-23	Year 2 2023-24
Publications	11	5
Abstracts & Presentations	6	10
Lectures, Seminars, & Workshops	20	11
Consultations	18	15
Grant Funding	1	1
Information to Policy Makers	1	1
Student Dissertations or Thesis	2	0
Press Releases, Media Stories	39	40
FarmSafe Podcasts	17	17
<b>Total Output Count</b>	<b>115</b>	<b>100</b>

### Published Manuscripts

1. Sousan S, Anthony TR, Altmaier R, Gibbs J, Nonnenmann M. Use of prototype side stream filtration system to control dust levels in a commercial swine farrowing building. *Journal of Occupational and Environmental Hygiene*. 2023 December;20(12):633-645. PubMed PMCID: PMC10918672; DOI: [10.1080/15459624.2023.2247457](https://doi.org/10.1080/15459624.2023.2247457).
2. Ghanbari A, Hamann C, Jansson S, Reyes M, Faust K, Cavanaugh J, Askelson N, Peek-Asa C (2023) Predictors of rural driver self-reported passing behaviors when interacting with farm equipment on the roadway. *Transportation Research Interdisciplinary Perspectives*, 2023 November; 22:100926. PubMed PMCID: PMC10565725 <https://doi.org/10.1016/j.trip.2023.100926>
3. Kline, A., & Lindstrom, M.(2024). Mexican sending region and workplace experience: A preliminary study of agricultural guestworkers in Ohio. *Journal of Agriculture, Food Systems, and Community Development*. Advance online publication. <https://doi.org/10.5304/jafscd.2024.134.006> (Pilot)
4. Pratt AA, Brown GD, Perencevich EN, Diekema DJ, Nonnenmann MW. Comparison of virus aerosol concentrations across a face shield worn on a healthcare personnel during a simulated patient cough. *Infection Control & Hospital Epidemiology*. 2024;45(2):221-226. PMID: 37609833 <https://doi.org/10.1017/ice.2023.130>
5. Morley E, Rohlman D, Cheyney M, Lansing A. Impact of Training on Addressing Farmer Mental Health in Occupational Therapy Practice. *Occupational Therapy Journal of Research*. 2024 (in press, available at: <https://doi.org/10.1177/15394492241279781>) PMID: 39286954

### Abstracts/Presentations at Scientific Meetings

1. Arora K, Cheyney M: [2023] Longitudinal Evaluation of Federally Funded Agricultural Centers: A Case Study of the Great Plains Center for Agricultural Health. *Evaluation 2023*. Oct 9-14, 2023. Indianapolis, IN.
2. Cheyney M & Presnall L: [2023] Flat Farmers, FarmSafe Podcast, Farmer/Rancher Registry. *Midwest Rural and Agricultural Safety and Health Conference*. Dubuque, IA. Nov 8-9, 2023.

3. Duysen E, Cheyney M, Davidson J, Yoder A, Ploekelman M: [2023] What's New and Innovative in the World of Outreach? *Midwest Rural Agricultural Safety and Health Conference*. Dubuque, IA. Nov 8-9, 2023.
4. Cheyney M, Ostrem N, Hanshu J, Neenan D: [2023] Disaster Preparation and Emergency Planning workshop. Post-conference workshop, *Midwest Rural and Agricultural Safety and Health Conference*, Dubuque, IA, Nov 9, 2023
5. Arya MS, Reyes M, Arabi S, Sharma A, Hamann C: [2024] Unsupervised learning-based classification of driver following behavior in agricultural traffic. *Transportation Research Board Annual Meeting*, Washington, DC. January 9, 2024.
6. Gibbs J: [2024] Speed vs Safety Culture: Farm youth and safety risks associated with livestock handling. *Orthopedic Nursing Conference and Continuing Ed*. University of Iowa Hospitals and Clinics. April 17, 2024. 1 hour. 75 registered attendees. (Outreach: AgHSA)
7. Arora K & Bobitt J: [2024] Farm Safety for Rural Families Coping with Dementia. Oral presentation given at *International Society for Agricultural Safety and Health (ISASH) Conference*, Portland, OR. June 17-20, 2024.
8. Rudolphi J & Hamann C: [2024] We're on This Road Together: Building a Toolkit for Enhancing Rural Road Safety around Farm Vehicles. *International Society for Agricultural Safety and Health (ISASH) Conference*, Oregon, Portland. June 17-20, 2024.
9. Nonnenmann M and Wei, M: [2024]. Design and Evaluation of a Miniaturized Recirculating Ventilation System (mRVS) for Controlling Dust and Bioaerosol in Swine Production Buildings. Oral technical session given at *ASABE Conference*. Anaheim, CA, July 29, 2024.
10. Fethke NB, Thomas G, Ramker A, Rahmatalla S, Dhahi Y, Presnall E, Wilder D: [2024, accepted] Low-cost measurement of whole-body vibration during agricultural machine operation. Oral presentation accepted for *Midwest Rural Agricultural Safety and Health (MRASH) Conference*, Ames IA, Nov. 6-8, 2024.

### Lectures, Seminars, or Workshops Delivered in Academic Settings

1. Casteel C, Roth L, and Hamann C: [June 11, 2024] Violence and injury prevention work of University of Iowa: Motor vehicle/transportation, older adult falls, suicide prevention, and disaster preparedness. Tri-State Injury Prevention Partnership (TIPP)- Addressing Violence and Injury Prevention in Indian Country, Pine Ridge, South Dakota.
2. Cheyney M and McMichael K: [2024] Display and demonstration within Safety Zone, focused on Sun Safety and PPE selection for outdoor tasks during hot weather. Minnesota Farmfest, Redwood Falls, MN, Aug 6-8, 2024 (Outreach).
3. Cheyney M and McMichael K: [2024] Display and demonstration within Safety Zone, focused on Sun Safety and PPE selection for outdoor tasks during hot weather. Minnesota Farmfest, Redwood Falls, MN, Aug 6-8, 2024 (Outreach).
4. Nonnenmann, M: [2024, February 5] Evaluation of a prototype recirculating ventilation system to reduce dust and bioaerosol in swine production. [Seminar]. University of Nebraska Lincoln, College of Agricultural Sciences and Natural Resources, School of Veterinary Medicine and Biological Sciences. <https://events.unl.edu/svmbms/2024/02/05/178247/>
5. Nonnenmann, M: [2024, September 3] *Indoor Air Quality – In Room Air Cleaners*. [Webinar]. Nebraska Department of Health and Human Services, Division of Public Health, Healthcare Associated Infections-Antimicrobial Resistance Program. <https://sonvideo.webex.com/sonvideo/j.php?MTID=m74f9389447f771a4cf7c25ca9b7263d9>

## Courses Taught in Agricultural Safety and Health

1. Outreach Core: [2023-4] Partnered with Dalhousie University and local ASH consultants to provide an academic course to nineteen college students from the Agricultural Business Management and the Dairy Management programs, based on our ASH Core Course.
2. Nonnenmann, M: [2024, June 14]. *Case Study: Highly Pathogenic Avian Influenza – Dairy Production*. Learning across borders: A global health experience. University of Nebraska Medical Center, College of Public Health, Center for Global Health and Development and Rwandan Institute of Conservation Agriculture (RICA). Learning across borders: A global health experience. Rwanda, June 11 – 19, 2024.
3. Nonnenmann, M: [2024, July 12] *Injury prevention using the Industrial hygiene paradigm*. University of Nebraska Medical Center, College of Public Health, Central States Center for Agricultural Safety and Health, Agricultural Health and Safety Course for Medical and Safety Professionals. Omaha, Nebraska, July 9 – August 9, 2024.

## Lectures, Seminars, or Workshops Delivered to the Agricultural Community

1. Qualitative Respirator Fit Testing: Methods and Practice: [Sept. 27, 2024] a train-the-trainer program for conducting qualitative respirator fit testing, see <https://gpcah.public-health.uiowa.edu/respiratoryprotection/> <https://gpcah.public-health.uiowa.edu/wp-content/uploads/2024/09/GPCAH.ISU-September-27-Respirator-Fit-Test-Workshop.pdf>
2. Cheyney M and Archer A: [2024] Roadway safety and PPE selection training given to 75 undergraduate students. Kirkwood Community College. Sept 19, 2024

## New Agricultural Curriculum

1. Anthony TR, Presnall L: [2024] Ag Health 101. Ten units of asynchronous audio lessons and companion print materials; 8-hours total run time. Continuing Education Credit through the College of Medicine available upon completion of all units. Available at <https://gpcah.public-health.uiowa.edu/ag-health-101/>
  - Unit 1 – Introduction (20 min) [LINK](#)
  - Unit 2 – Heat Illness Prevention (39 min) [LINK](#)
  - Unit 3 – Sun Safety (37 min) [LINK](#)
  - Unit 4 – Hearing Protection (55 min) [LINK](#)
  - Unit 5 – Air Quality and Gas Exposures (63 min) [LINK](#)
  - Unit 6 – Confined Spaces (49 min) [LINK](#)
  - Unit 7 – PPE (90 min) [LINK](#)
  - Unit 8 – Pesticides (38 min) [LINK](#)
  - Unit 9 – Falls (42 min) [LINK](#)
  - Unit 10 – Tractor Safety (44 min) [LINK](#)

## Consultation or Information Exchange

1. Anthony TR: [2023] Request from PhD student at UC Berkeley for information on cost effective ventilation or air filtration methods in livestock buildings. Nov 15, 2023 (E&P)
2. Arora K: [2024] New collaboration formed between EasterSeals Iowa and the Farm Safety for Rural Families Coping with Dementia study. Jan 5, 2024. (Dementia)
3. Cheyney M: [2024] Information request for speakers to talk on a podcast about cleaning animal buildings from farm safety program coordinator for a major healthcare system. Audience is mothers and grandmothers as influencers. Nov 16,2023 (Outreach).

4. Cheyney M: [2024] Email request from a hearing loss educator to use our hearing loss prevention materials in an online presentation. About 30 people saw the presentation live. Feb 2024 (Outreach).
5. Arora K: [2024] Invitation to speak about Alzheimer's/dementia on a panel at screening for movie *Away from Her*. Feb 2024. (Dementia)
6. McMichael K: [2024] Email request from a research analyst, asking for mental health information to use on her website. March 2024 (E&P)
7. Cheyney M: [2024] Request to use manure gas monitor resources for exhibit at World Pork Expo. ~500 people saw the display. June 2024 (Outreach).
8. McMichael K: [2024] Request from Penn State Extension educator to use our skin cancer poster. July 2024 (Outreach).
9. Anthony TR: [2024] Telephone request from The Big Show on Radio News 1040 WHO for interviews about farm safety topics in advance of National Farm Safety and Health Week. Sept 9, 2024. (E&P)
10. Nonnenmann, M and Farfalla, A: [2024] *Potential Influenza Impacts on Swine Industry Workforce during H5N1*. [Information exchange]. University of Minnesota, Upper Midwest Agricultural Safety and Center. June 27, 2024. (Air Quality)
11. Nonnenmann, M: [2024] 6<sup>th</sup> Annual Bison Worker Safety and Herd Health Roundtable. [Information exchange]. University of Nebraska Medical Center, College of Public Health, Central States Center for Agricultural Safety and Health. Winnavegas Casino Resort, Sloan, Iowa, July 24-25, 2024. (Air Quality)
12. Nonnenmann, M: [2024] United States Air Force School of Aerospace Medicine Missile (USAFSAM) Community Cancer Study Report. [Consultation, Review Request]. United States Air Force, School of Aerospace Medicine Missile. August 1, 2024. (Air Quality)
13. Nonnenmann, M: [2024] Ventilation in livestock buildings. Christopher LeBoa, PhD student at UC Berkeley. (Air Quality)
14. Nonnenmann, M and Anthony TR: [2024] Email request from Stepan Engelman, grade 12, Pennsylvania. Technical assistance with specific product used for return air ducts from Anthony project. (Air Quality)
15. Cheyney M: [2024] Request received from Lakes Regional Healthcare Director of Population and Public Health to resize and print skin cancer poster to put in Harvest Outreach bags for farmers in Dickinson County, IA. Sept 23, 2024. (Outreach)

### Grant Funding

1. U54 OH010162 CDC/NIOSH Central States Center for Agricultural Safety and Health (CS-CASH) (PI. Rautiainen) Role: Principal Investigator (Nonnenmann) for Project: Distribution of Worker Educational Materials and Personal Protective Equipment in Response to Highly Pathogenic Avian Influenza in Dairy and Poultry Facilities. 9/1/24 – 08/30/25

### Information Provided to Policy Makers

1. Anthony, Fethke, Nonnenmann M: [2024]. Washington DC Hill Visits for Ag Centers. February 2024.

### Media Stories and Press Releases

#### Media Stories

1. Mehling S: [2024] 'I'm just happy to be alive': Farmer recounts hours-long grain bin rescue in Henderson Co. Quotes GPCAH website. 14 News.com. Online at: [LINK](#). Mar 25, 2024.

2. Geiger D: [2024]. Safety Precautions Needed with Bird Flu Cattle Cases. Interview of Renee Anthony. Southern Farm Network, SFN Today, [LINK](#) April 4, 2024. Also quoted or copied at:
  - a. Quinn, B: [2024]. Included in This Is Ag Life Podcast at [LINK](#) April 4, 2024.
  - b. Red River Farm Network April 5, 2024 [LINK](#)
  - c. Shipp H: [2024] Bird to Cow to Human: A TX HPAI Story. SouthEast Regional Ag, AGinfo.net, at: [LINK](#) Apr 5, 2024.
3. Our View: Spring requires caution on the road. Summarizes Farm Vehicle Crash Study. Eau Claire Leader-Telegram. Online at: [LINK](#). May 2, 2024.
  - a. Picked up by AP. Also published in Wausau Pilot & Review (May 8, 2024), Eagle Herald (May 15, 2024), Ashland Daily press (May 10, 2024)
4. Nohrenberg, Taylor: [2024] Area fire departments participate in grain bin training. Oelwein Register, Aug 24, 2024. (GPCAH website quoted)
5. [2024] Illinois AgrAbility will host health, safety tent at 2023 Farm Progress Show. Marsha Cheyney quoted about noise-induced hearing loss, GPCAH exhibit at 2023 Farm Progress Show. Morton Courier, online at [LINK](#). Aug 23, 2023.
6. Geiger D: [2024] Roadway safety around farm equipment on the road. Interview of C. Hamann for The Big Show on News Radio 1040 WHO. (Interview) Sept 10, 2024. [LINK](#)
7. Geiger D: [2024] Roadway safety around farm equipment on the road. Interview of C. Hamann for National Association of Farm Broadcasting. Sept. 17, 2024. [LINK](#) Also at:
  - a. Geiger D: [2024] Harvest Safety Needed from Non-Farmer Drivers. Southern Farm Network Today. Online at [LINK](#). Sept 19, 2024.
  - b. Also picked up by Western Iowa Today (Tom Robinson, Sept 20, 2024) and Ground.news (Sept 20, 2024)
8. Falmmi D: [2024] Farmers and motorists will be sharing the road during the harvest season (quotes GPCAH website and Cara Hamann). Farms.com Ag Industry News. Online at [LINK](#). Sept 23, 2024.
9. Fisher B: [2024] Accidents on rural roads key focus during National Farm Safety and Health Week (quotes Cara Hamann). North Iowa Now. Found online at [LINK](#). Sept 19, 2024.
10. Hamman C, Randall L Interview: [2024] Roadway safety interview for National Farm Safety and Health Week, KCRG Television. Sept. 18, 2024. [LINK](#)
11. Grassley C: [2024] Q&A: Farm Safety Week with U.S. Sen. Chuck Grassley (quotes website on Roadway Safety, links to resources and FarmSafe podcast). Online at: [LINK](#) Sept 13, 2024.
12. Ritchie (Presnall) L, Geiger D: [2024] Highlighting harvest hazards and resources for National Farm Safety and Health Week. Interview for The Big Show on News Radio 1040 WHO. Sept 13, 2024. [LINK](#)
13. Illinois Farm Bureau: [2024] Farmer & Rural Resources, Safety & Health. Quotes GPCAH website on grain safety. [LINK](#)
14. Danielson S: [2024] Fire safety during fall harvest. Interview of Renee Anthony for IHeartMedia, WHO/WMT Radio. Sept 25, 2024. Picked up by:
 

Explore Okoboji, Officials Urge Extra Caution During Harvest, Sept. 26, 2024 at [LINK](#)

### **Safety Watch News Column in Lee Agrimedia Publications**

1. T Kuehn: [2023] Tractor fire a reminder to be prepared. *Iowa Farmer Today*, October 13. [LINK](#).
2. M Archer: [2023] Tools help farmers prep for emergency. *Iowa Farmer Today*. November 17. [LINK](#).
3. T Kuehn: [2023] Navigating the winter wonderland by snowmobile. *Iowa Farmer Today*. December 8. [LINK](#).
4. M Archer: [2024] Falls on any surface can result in costly injury. *Iowa Farmer Today*. January 10. [LINK](#).

5. T Kuehn: [2024] Young Iowans work to improve farm safety. Iowa Farmer Today. February 12. [LINK](#).
6. M Archer: [2024] Equipment and workspace checks kick off the season. Iowa Farmer Today. March 11. [LINK](#).
7. T Kuehn: [2024] Test time: Regular radon, paint and water checks keep rural homes safe. Iowa Farmer Today. April 12. [LINK](#).
8. M Archer: [2024] Drought serves as a magnifier for stress. Iowa Farmer Today. May 12. [LINK](#).
9. T Kuehn: [2024] Storm safety: Plan ahead for severe spring storms that can damage farms. Iowa Farmer Today. June 8. [LINK](#).
10. M. Archer: [2024] Air quality conditions hard to predict. Iowa Farmer Today. July 21. [LINK](#).
11. T. Kuehn: [2024] Pond safety starts with limiting access. Iowa Farmer Today. August 11. [LINK](#).
12. M. Archer: [2024]. Biosecurity a top safety concern for agrotourism ventures. Iowa Farmer Today. September 13. [LINK](#)

**Farm Families Alive & Well Newsletter Articles** [LINK](#).

1. Anthony R: [2023] Director's Message. Alive & Well Newsletter. 30(1):2. December [LINK](#)
2. Presnall L: [2023] FarmSafe Podcast – Season 3. Alive & Well Newsletter. 30(1):3. December [LINK](#)
3. Anthony R: [2023] Lessons Learned from the Post-MRASH Skills Workshop. Alive & Well Newsletter. 30(1):5. December [LINK](#)
4. Cheyney M: [2023] Meet the Flat Farmers! Alive & Well Newsletter. 30(1):7. December [LINK](#)
5. Presnall L: [2024] Upcoming on the FarmSafe Podcast. Alive & Well Newsletter. 30(2):4. March [LINK](#)
6. Archer M: [2024] Spring Safety Watch topics. Alive & Well Newsletter. 30(2):4. March [LINK](#)
7. Anthony R: [2024] Director's Message. Alive & Well Newsletter. 30(3):2. June [LINK](#)
8. Sheridan C: [2024] Educational Resources for Safe Pesticide Handling. Alive & Well Newsletter. 30(3):5. June [LINK](#)
9. Cheyney M: [2024] Visit GPCAH at Outreach Events This Summer! Alive & Well Newsletter. 30(3):7. June [LINK](#)
10. Cheyney M: [2024] The Flat Farmers are Here! 30(3):8. June [LINK](#)
11. McMichael K: [2024] Call for Pilot Grant Applications. 30(3):9. June [LINK](#)
12. Cheyney M: [2024] Great Plains Summer Events. 30(4):4. September [LINK](#)
13. Presnall L: [2024] Season 4 FarmSafe Podcast. 30(4):5. September [LINK](#)
14. Mohling K: [2024] Agricultural Safety and Health Training Held for AUB Students. 30(4):6 September [LINK](#)

**FarmSafe Podcasts (all available at [LINK](#))**

1. Presnall L: [2023] *FarmSafe Podcast: Welcome to Season 3!* [Audio podcast episode]. In *FarmSafe*. GPCAH. Nov 8, 2023.
2. Presnall L: [2023] *FarmSafe Podcast: Safe Tractor Operation: ROPS* [Audio podcast episode]. In *FarmSafe*. GPCAH. Nov 22, 2023.
3. Presnall L: [2023] *FarmSafe Podcast: Safe Operation and Maintenance of Tractors* [Audio podcast episode]. In *FarmSafe*. GPCAH. Dec 6, 2023.
4. Presnall L: [2023] *FarmSafe Podcast: New Year's Special* [Audio podcast episode]. In *FarmSafe*. GPCAH. Dec 27, 2023.
5. Presnall L: [2024] *FarmSafe Podcast: Grain Bin Safety, Part 1: Motivation and Tips to Prevent Engulfment* [Audio podcast episode]. In *FarmSafe*. GPCAH. Jan 10, 2024.
6. Presnall L: [2024] *FarmSafe Podcast: Grain Bin Safety, Part 2: Considerations for Preparing Bins for Grain* [Audio podcast episode]. In *FarmSafe*. GPCAH. Jan 24, 2024.

7. Presnall L: [2024] *FarmSafe Podcast: Grain Bin Safety, Part 3: Stored Grain Management to Minimize Bin Entry* [Audio podcast episode]. In *FarmSafe*. GPCAH. Feb 7, 2024.
8. Presnall L: [2024] *FarmSafe Podcast: Grain Bin Safety, Part 4: Equipment Safety* [Audio podcast episode]. In *FarmSafe*. GPCAH. Feb 21, 2024.
9. Presnall L: [2024] *FarmSafe Podcast: Poisons, Part 1: Exposure Prevention* [Audio podcast episode]. In *FarmSafe*. GPCAH. Mar 6, 2024.
10. Presnall L: [2024] *FarmSafe Podcast: Poisons, Part 2: Exposure Response* [Audio podcast episode]. In *FarmSafe*. GPCAH. Mar 20, 2024.
11. Presnall L: [2024] *FarmSafe Podcast: General Farm Emergency Preparedness* [Audio podcast episode]. In *FarmSafe*. GPCAH. Apr 3, 2024.
12. Presnall L: [2023] *FarmSafe Podcast: Community Building for Rural Response to Emergencies* [Audio podcast episode]. In *FarmSafe*. GPCAH. Apr 17, 2024.
13. Presnall L: [2024] *FarmSafe Podcast: Exploring the Multi-Generational Perspective on Health and Safety with The Millennial Farmer* [Audio podcast episode]. In *FarmSafe*. GPCAH. May 1, 2024.
14. Presnall L: [2024] *FarmSafe Podcast: Support for Farmers' Mental Health and Well-Being* [Audio podcast episode]. In *FarmSafe*. GPCAH. May 15, 2024.
15. Presnall L: [2024] *FarmSafe Podcast: Safe Practices around Overhead Power Lines* [Audio podcast episode]. In *FarmSafe*. GPCAH. May 29, 2024.
16. Presnall L: [2024] *FarmSafe Podcast: Got Ticks? How and Why to Take Action* [Audio podcast episode]. In *FarmSafe*. GPCAH. Jun 12, 2024.
17. Presnall L: [2024] *FarmSafe Podcast: Lessons on Lyme* [Audio podcast episode]. In *FarmSafe*. GPCAH. Jun 26, 2024.