2019 YEAR IN REVIEW

AG SAFETY AND HEALTH: From theory to the field
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## National Farm Medicine Center Team

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TRANSLATING RESEARCH AND INCREASING ITS VALUE FOR AGRICULTURAL COMMUNITIES

Rural health research has been integral to Marshfield Clinic Research Institute since its founding 60 years ago. Its first grant, awarded by the National Institutes of Health to Dean Emanuel, M.D., provided $9,999 for “experimental investigation of farmer’s lung disease.”

To this day, the National Farm Medicine Center works closely with agricultural owners/operators, workers, youth, farm visitors, agri-business and others to ensure that our research is relevant and strengthens rural and agricultural communities. Examples in 2019 included:

• Trained rural emergency responders to become agricultural injury prevention advocates through the Rural Firefighters Deliver Agricultural Safety and Health (RF-DASH) project.

• Hosted influential community members at Child Agricultural Injury Prevention Workshops in Marshfield, WI; Des Moines, IA; Lexington, KY; and Hershey, PA.

• Utilized Auction of Champions’ donor support to implement Mental Health First Aid trainings in central Wisconsin farm communities.

• Advocated for state policy addressing farmer mental health and the retrofitting of tractors without rollover protection structures.

Our work is made possible by generous donors, funding agencies and Marshfield Clinic Health System’s support of Marshfield Clinic Research Institute. Thank you!

Casper “Cap” Bendixsen, Ph.D.
Center Director, National Farm Medicine Center
Marshfield Clinic Research Institute

Our Mission

With the ultimate goal of improving human health, well-being, and safety of rural and agricultural communities, the National Farm Medicine Center was established in 1981 and will continue to be a national resource by conducting high quality research, developing and disseminating health and safety information, exploring innovative intervention models, and leading initiatives that bring about broad, positive change.
FARMER MENTAL HEALTH AND RESILIENCY

The mental health of farmers and their families is one of the most talked about topics in the agriculture industry. While mental health is shedding its taboo label, much work is needed to build a better support system for farmers. Many are reaching out for help after years of depressed commodity prices and many other variables out of their control.

Everyone wants to help, but how? The first step is knowing the warning signs. In March, Farm Medicine collaborated with Mental Health First Aid to facilitate three workshops in central Wisconsin. Forty-nine workshop participants learned how to identify, understand and respond to signs of mental illness and substance use disorders.

"Just as CPR First Aid teaches individuals what to do in case of a heart attack, the Mental Health First Aid certification program prepares individuals to assist farmers experiencing a mental health crisis," said Josie Rudolphi, Ph.D., associate research scientist. "This project brought together central Wisconsin farmers, their families and agricultural support services to recognize, react to and prevent mental health emergencies in our communities."

The Mental Health First Aid workshops were supported by $55,200 pledged during the Fund-a-Need portion of the Auction of Champions in 2018.

"The creation of a program like this is critical in the current stress on farmers," said Brad Guse, Auction of Champions committee chair and senior vice president, BMO Harris Bank. "Our supporters saw that and came through in a big way for the Fund-a-Need."

In search of long-term solutions, Dr. Rudolphi convened a national agricultural mental health research meeting in April with 15 experts from across North America. Researchers, social workers and Extension personnel gathered for two days to discuss current research projects, gaps in work and identify research priorities related to agricultural mental health for the future. The group is moving forward with a special issue of the International Journal of Environmental Research and Public Health (IJERPH) dedicated to mental health in agriculture. Dr. Rudolphi and Andria Jones-Bitton, Ph.D., University of Guelph, are serving as guest editors.

There are many ways to describe mental health. Some definitions emphasize positive psychological well-being; others cite an absence of mental health. However it is described, farmers have a lot on their minds every day. Mental health is just as important as physical health. Farm Medicine, in partnership with many other NIOSH-funded agricultural centers, is working to promote positive mental health in every person.
USING RURAL FIREFIGHTERS TO DELIVER SAFETY MESSAGES TO FARMERS

Imagine you are a firefighter and are responding to a farm emergency. Not knowing where the power shut off is, water source or the location of the incident itself can make it hazardous for not only the farmer, but the emergency personnel responding. This is why the Rural Firefighters Delivering Agriculture Safety and Health (RF-DASH) program was developed with support and funding from the Upper Midwest Agricultural Safety and Health Center.

Previous research indicated that farmers were willing to make changes in behavior and operations if given advice from their local fire department. RF-DASH is a trainer program designed to increase rural firefighter knowledge and ability to promote injury prevention on local farms and ranches. The program utilizes existing networks of firefighter and emergency medical services training to equip first responders with the tools and knowledge to perform basic farm safety consultations. These consultations are designed to improve farm safety and ensure the safety of first responders in the event of an emergency.

The RF-DASH team conducted a national training in September in Minneapolis, attended by 18 individuals from around the country. They included a mixture of agricultural health and safety specialists, fire, EMS, health care providers and National Fire Protection Association (NFPA) committee members. The goal was to encourage partnerships between stakeholders. The training consisted of two full days of instruction in a classroom and on a farm. Attendees also participated in a round table discussion on the feasibility and adaptations needed to create the program on a national level. The hope for the program is to instill collaboration amongst the newly-trained partners and encourage them to implement the project in their regions.

The NFPA representatives confirmed that the RF-DASH program follows many of the NFPA standards, specifically the 1300 standard regarding community risk analysis and reduction. In the future, participation for fire departments in the program may provide a means to have their departments compliant with this standard.

On November 14, an additional training was carried out at the Wisconsin EMS Association (WEMSA) conference in Wisconsin Dells. The program trained 11 firefighters and first responders on how to pre-plan in case of farm emergencies, perform and assess hazards on the farm, and provide farm first aid training for farmers.

The RF-DASH project is entering its fourth year. With increasing support from rural fire departments, the program will hopefully continue to reduce the damage of farm fires and make farms safer places to live, work and visit.

DAIRY COWS AND THEIR IMPACT ON OUR MICROBIOMES

Research has revealed that the trillions of bacteria, viruses, fungi and other microorganisms living in and on our bodies can play a significant role in our health. Studies have shown that the environment in which we work and live contributes to the makeup of our microbiome.

Over a 4-year period, the Dairy Microbiome (DOME) study will research the effect dairy cows have on the microbiome and health of an individual who works on a dairy farm. The project will investigate the make-up of skin, nasal, oral and gut microbiota of both the farmers and cows.

Kyle Koshalek, research coordinator, swabbing a cow’s nose for the Dairy Microbiome (DOME) study.
GROWING UP ON A FARM: ITS IMPACT ON THE IMMUNE SYSTEM

The Wisconsin Infant Study Cohort (WISC), a project involving Farm Medicine and the University of Wisconsin, compares farm-exposed children to rural, non-farm children from birth to 8-years-old on immunological outcomes such as eczema, hay fever and asthma.

With the project nearing its enrollment goals, the most powerful comparisons are about to begin. Preliminary findings suggest farm-exposed children have reduced incidence of eczema in the first year of life. Furthermore, while both groups of children have similar immune function at birth, farm-exposed children had a stronger response to bacteria, suggesting farm exposure may help “train” the immune system to fight off infection later in life. Farm-exposed children also had different bacteria in their stool, and future analyses will examine whether these bacteria are related to the risk of infections or allergic disease.

Recently, WISC joined the Children's Respiratory and Environmental Workgroup (CREW). It integrates a dozen established asthma birth cohorts to understand different ways asthma can present and potential causal pathways by focusing on the interaction between genetics, lifestyle and environmental exposures prenatally through early childhood.

Data from nearly 9,000 children can be combined to understand the development of the immune system in ways a single cohort could not. CREW also enables comparison of health outcomes between rural (farm and non-farm exposed) children to children in urban environments. Preliminary data indicate our rural children in Wisconsin are less likely to wheeze than their urban counterparts. Wheezing is a key early indicator of developing asthma, so these data indicate children in rural areas, regardless of farm exposure, are less likely to develop asthma.

Eventually, WISC and CREW researchers hope to accurately describe the development and appearance of asthma and other allergic health outcomes. Perhaps one day, WISC participants can even contribute to a body of literature that leads to new therapies for those affected by allergic diseases. Since asthma is one of the most expensive diseases, society at large stands to benefit through reduced health care spending.
A newly updated online tool is providing an increasingly clear picture of injuries in agriculture. AgInjuryNews.org enables users to search the largest database of publicly-available U.S. agricultural injury and fatality reports, getting a near real-time snapshot of the distribution and nature of trauma incidents, both nationally and locally.

“The innovation here is the combination of capturing, coding and redistributing publicly available data on agricultural injuries and fatalities, primarily mined from media reports, and coupled with relevant prevention materials,” said project leader Bryan Weichelt, Ph.D.

There is no comprehensive federal surveillance program for agriculture-related injuries, so insurers, lenders, agricultural employers, government statisticians, media professionals, educators, policy-makers and researchers are using AgInjuryNews.org to guide research priorities, safety initiatives and public policy.

New features and design changes include an interactive map display, more data granularity for search and filters, and customizable email alerts.

“Custom email alerts allow users to choose what types of injury reports they want to see and how often they want to receive them,” Dr. Weichelt said. “For example, someone might want weekly reports of ATV-related adult injuries, or skid steer-related youth injuries from a particular state or region.”

Anyone can set up a free account and search thousands of unique incidents. To create an account, visit www.AgInjuryNews.org and click “Register.”

The U.S. Bureau of Labor Statistics has begun using AgInjuryNews as part of its Census of Fatal Occupational Injuries case discovery quality assurance. The Bureau of Labor Statistics may be the most well-represented organization in terms of user registrations on AgInjuryNews.org. Other active user groups include the National Institute for Occupational Safety and Health-funded agricultural centers, Childhood Agricultural Safety Network, Agricultural Safety and Health Council of America, Canadian Agricultural Safety Association and various professional groups.

Funding support was provided through the National Farm Medicine Center, Marshfield Clinic Research Institute, Agricultural Safety and Health Council of America (ASHCA), Dean Emanuel Endowment, and National Children’s Center for Rural and Agricultural Health and Safety via the National Institute for Occupational Safety and Health (NIOSH; grant number 5U54 OH009568).

Barbara Marlenga, Ph.D., a champion for agricultural safety and health, has announced her retirement. Marlenga was a leader in the formation and evaluation of the North American Guidelines for Children’s Agricultural Tasks (NAGCAT). With Canadian colleagues, her research revealed that nearly all childhood farm fatalities occurred in the presence of an adult, thus confirming that “supervision” is not a sufficient protective strategy on farms. “This was a game changer in our field,” said Farm Medicine Director Casper Bendixsen. Marlenga established and led the Wisconsin Rollover Protection Structure (ROPS) Rebate Program, which has retrofitted more than 250 tractors since 2013. “We’re very lucky that Barbara chose Farm Medicine as her professional home since 1995,” Bendixsen said.
Our research starts here as a theory, and ends on the farm as a new service. Follow this path to see where each of our research projects are along their journey.

**Dairy Microbiome**
- Dairy workers had less MRSA in their nose and 4 times the variety and density of microorganisms in their nose versus non-dairy workers
- 1,804 samples collected (human + animal)
- 37 Farms Participating

**Environmental Influences on Child Health Outcomes**
- 70 cohorts in ECHO
- 50,000+ children represented in ECHO
- 180+ institutions involved

**Child Agricultural Safety Network**
- 77 organizations participating in the network
- 48 people at in-person meeting in Iowa (June 2019)
- Over 100 child ag injury/fatality news clippings shared via email

**Ag Youth Work Guidelines**
- 54 guidelines complete
- 3 languages
- 4 years of support from CHS

**Beginning Farmers and Ranchers**
- 550 farmers estimated to have been reached
- 52% of farms surveyed reported a pediatric injury
- 10 publications associated with the BFR project

**AgInjuryNews**
- Just over one tweet per day yielded 86,100 impressions in the past year
- @AgInjuryNews
- Over 6,700 new visitors to AgInjuryNews.org in the past year
- Nearly 50,000 news reports crawled and analyzed in the past year

**Agritourism**
- 238 participants in 8 workshops and presentations
- 48% of agritourism operations employ youth under 18 years old
- 25% is the average number of farms that provide safety training on relevant topics
**Environ on Influences on Child Health Outcomes**

70+ cohorts in ECHO

50,000+ children represented in ECHO

180+ institutions involved

**Wisconsin Infant Study Cohort**

28,500 total samples collected

134 farm families

147 non-farm families

**Nebraska Flood Survey**

1 million acres of U.S. farmland were flooded in 2019

1 billion or more: Cost of Midwest floods

1 in 5 (22%) people will experience mental health issues as a result of an emergency situation

**Journal of Agromedicine**

Received 19,499 article downloads in 2018, which is 14% higher than 2017.

1.294 Impact Factor

The Journal is available in 679 libraries worldwide

**Advanced Knowledge Mobilization and E-Communication**

3,227 Facebook followers

1,381 Twitter followers

Over 360,000 people reached by Facebook posts

**Rural Firefighters Delivering Agriculture Safety and Health**

70+ farm hazard analyst trainers

10 states represented (MN, WI, NY, MA, OH, ID, UT, WA, NE and PA)

70 unique connections (including people trained by trainers)

**Child Agricultural Injury Prevention workshops**

22 participants at Iowa workshop

24 participants at Kentucky workshop

20 participants at Pennsylvania workshop

**Substance Abuse and Recovery in the Northwoods**

10 participants

4,388 minutes of audio interviews

239 hours driving to meet participants

**Dairy Microbiome**

Dairy workers had less MRSA in their nose and 4 times the variety and density of microorganisms in their nose versus non-dairy workers

1,804 samples collected (human + animal)

37 farms participating

**Our research starts here**

as a theory, and ends on the farm as a new service. Follow this path to see where each of our research projects are along their journey.

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WORKSHOPS BRING SYNERGY TO CHILD AGRICULTURAL INJURY PREVENTION

The Child Agricultural Injury Prevention (CAIP) Workshop series wrapped up during 2019 National Farm Safety and Health Week, a fitting conclusion for an initiative that carries national implications.

“What we’re seeing in the preliminary evidence is that this workshop can be an effective model for building capacity in organizations,” said Marsha Salzwedel, Ed.D., workshop director. “We can use that information not only in the realm of child agricultural injury prevention, but in agriculture injury overall, both child and adult, and maybe extending outside the agriculture arena.”

The workshops are part of the Strengthening Organizational Capacity project, which aims to protect children from agricultural injury and death. The project works with others to share safety strategies and resources so farm families and employers can adopt them as best practices.

Interactive, 1.5-day workshops took place in Marshfield, WI; Des Moines, IA; Lexington, KY; and Hershey, PA. The combined attendance of more than 100 included representatives of insurance companies, health care systems, Extension, government agencies, media, farm organizations and agribusinesses.

The impact of the workshops continues to grow. As a result of one of their members attending, SafeKids Worldwide added a rural/agricultural focus to its annual conference in 2019, inviting National Children’s Center staff to present and moderate the panel. Five other workshop participants carried out projects in 2019, ranging from creating farm safety videos to projects that targeted health care workers, the Latino population and the Amish population. Six additional grants were awarded, and projects are in progress.

The business world also saw value in the initiative. Co-sponsoring the 2019 workshops were Westfield Insurance and John Deere, as well as the National Farm Medicine Center.

Each workshop saw the National Children’s Center partner with an agricultural center funded by the National Institute for Occupational Safety and Health, including the Great Plains Center for Agricultural Health and Central States Center for Agricultural Safety and Health (Iowa); Southeast Center for Agricultural Heath and Injury Prevention and the Southeastern Costal Center for Agricultural Health and Safety (Kentucky); and the Northeast Center for Occupational Health and Safety in Agriculture, Forestry, and Fishing, along with Pennsylvania State University (Pennsylvania).

The workshops have also provided a blueprint for additional educational opportunities. More CAIP workshops may be held in the future, and the workshop format, or portions of it, may be adapted for other topics. For example, the learning lab portion of the workshop is being expanded and set up as an adjunct session for larger conferences and meetings, the first of which will be the 2020 Agricultural Safety and Health Council of America Summit in Las Vegas.

SUBSTANCE ABUSE AND RECOVERY IN THE NORTHWOODS

According to the National Institutes of Health, nearly 64,000 Americans died from drug overdoses in 2016, roughly as many American people as were lost in the wars in Vietnam, Iraq and Afghanistan combined. Substance abuse impacts individuals, families and communities across the U.S. without bias. Important differences in substance abuse in urban and rural areas have been described, but most information about the scope of the problem and how to address it continues to come.
DEVELOPING A ‘ROADMAP’ FOR DELIVERING CHILD CARE SERVICES FOR HIRED FARM WORKER FAMILIES

At a time when agricultural employers are struggling to find workers, access to quality child care can aid in worker recruitment, improve retention and boost employee morale. A new resource, “Roadmap for delivering child care in agricultural communities,” can help ensure that children of workers are kept safely away from dangers on the farm.

“Providing adequate child care services for farm workers is beneficial to both employers and workers, as well as the children,” said Barbara Lee, Ph.D., director, National Children’s Center for Rural and Agricultural Health and Safety. “Making sure the children of workers are kept safely away from dangers on the farm can improve productivity, reduce absenteeism and improve public relations.”

The resource, developed with input from agricultural business owners, human resources directors, insurance providers, Head Start child care specialists and farm worker parents, is part of the, “Protecting Children While Parents Work in Agriculture” project, an initiative of the National Children’s Center and Migrant Clinicians Network. Funding is provided by the National Institute for Occupational Safety and Health.

“This resource is much needed in farmworker communities,” said Amy K. Liebman, MCN’s Director of Environmental and Occupational Health. “There are some amazing programs throughout the United States that are providing excellent child care services to farmworker families. This resource incorporates their strategies so that others can do the same.”

The Roadmap will walk stakeholders through each step on the road to accessible child care. It breaks down the processes of conducting a needs assessment, building a team of stakeholders, identifying funding sources, and implementing and marketing new child care services to those in the community. Utilizing community resources and links.

Barbara Lee, Ph.D., Director, National Children’s Center for Rural and Agricultural Health and Safety.

Highlights

CHS GRANT HELPS FINISH AGRICULTURAL YOUTH WORK GUIDELINES

The Agricultural Youth Work Guidelines are now complete, thanks in large part to a grant from CHS, which augmented NIOSH funding. There are now guidelines available for more than 50 farm tasks. All guidelines and supplemental materials have been translated into Spanish and French and are available at CultivateSafety.org. The updated guidelines were promoted extensively through the Child Agricultural Injury Prevention Workshops, at conferences, in media releases and in listserv posts. The guidelines have been included in safety videos (Extension and Progressive Agriculture Foundation), in the AgriSafe “Invest in Your Health” activities and included as part of grant proposals. The Agricultural Youth Work Guidelines help parents and supervisors determine which tasks youth can perform safely.

FARM MEDICINE TO CO-HOST AG SAFETY SUMMIT

Farm Medicine, in cooperation with the Agricultural Safety and Health Council of America, will promote collaboration between researchers and agricultural industry partners when it co-hosts the North American Agricultural Safety Summit, March 19-20, 2020, in Las Vegas, Nevada. Farm Medicine is a founding member of the not-for-profit council, established in 2007.
AUCTION OF CHAMPIONS
Each year, dedicated supporters come together at the Auction of Champions to raise awareness and funds for the National Farm Medicine Center. The 2019 gala, hosted by Marshfield Clinic Health System Foundation, raised $227,411 to benefit farmer health and safety.

Support for this year’s Fund-a-Need reached a record $52,500 to bring back agricultural rescue training. Back in 1982, Farm Medicine helped develop and deliver a Farm Accident Rescue Training program with support from Drs. Dean Emanuel and Dean Stueland. Over the next 18 years, well over 1,400 firefighters and EMTs in Wisconsin and beyond were trained in farm accident rescue techniques.

SUPPORTING FARM FAMILIES THROUGH MARSHFIELD CLINIC HEALTH SYSTEM FOUNDATION
$284,812
Total donations for 2019 through Marshfield Clinic Health System Foundation
For information regarding how to support the important work of the National Farm Medicine Center, please contact Tiffany Halan, Marshfield Clinic Health System Foundation, at 715-387-9189 or halan.tiffany@marshfieldclinic.org.
A new generation of firefighters, medics and rescue personnel are now on the front lines responding to farm accidents without appropriate farm rescue training. There have been little-to-no new training programs developed since those early years. These funds will be used to change this.

7-8x as dangerous – ag workers are more likely to be fatally injured; half of youth injured at work are working in agriculture

78% of Wisconsin firefighters are volunteer

ART Agricultural Rescue Training aims to protect rescuers and improve patient outcomes.

$53,000 approximate amount raised

500 the number of people ART plans to train as rural WI first responders

49 people trained at four Mental Health First Aid programs for farmers. Supported by Fund-a-Need in 2018.

The National Farm Medicine Center Team with the Executive Director of the Marshfield Clinic Research Institute, Amit Acharya, Ph.D., at the 2019 Auction of Champions.
PROJECTS

The high-five icon indicates National Farm Medicine Center projects made possible by donors.

All donors are a critical part of our success in research, outreach, and providing services.

NATIONAL FARM MEDICINE CENTER (NFMC)

- AgInjuryNews.org
- Agriculture Rescue Training (ART)
- Dairy Microbiome (DOME)
- Geo-mapping Antimicrobial Resistance in E. coli from Humans and Animals
- Journal of Agromedicine
- Mental Health First Aid
- Skin Cancer Screening
- Substance Abuse and Recovery in the Northwoods
- Understanding and Addressing the Disparity in Vaccination Coverage Among U.S. Adolescents Living in Rural Versus Urban Areas.
- Veterans to Farmers
- Wisconsin Farm Fatalities Report
- Wisconsin Infant Study Cohort (WISC)
- Wisconsin Rollover Protective Structure (ROPS) Rebate Program
NATIONAL CHILDREN’S CENTER FOR RURAL AND AGRICULTURAL HEALTH AND SAFETY (NCCRAHS)

- Advanced Knowledge Mobilization and E-Communication (AKME)
- Ag Youth Work Guidelines
- Childhood Agricultural Safety Network (CASN)
- Child Agricultural Injury Prevention
- Enhancing Supervisors’ Skills and Employer Policies to Promote and Protect the Health of Young Agricultural Workers
- Evaluation of Safety in Agriculture for Youth (SAY) National Clearinghouse
- Filling Gaps in Child Agricultural Injury Data
- Grain Handling Safety Coalition via CASN
- Integrating Safety into Agritourism
- Intervention through Inquiry: Understanding Beginning Farmers and Ranchers
- Mini-Grants
- Protecting Children While Parents Work in Agriculture
- Strengthening Organizational Capacity in Child Agricultural Injury Prevention

UPPER MIDWEST AGRICULTURAL SAFETY AND HEALTH CENTER (UMASH)

- Assessing and Preventing Occupational Injuries in Animal Agriculture
- Rural Firefighters Delivering Agricultural Safety and Health (RF-DASH)
- Telling the Story of Agricultural Safety
- Tickborne Disease Risk for Agricultural Workers and their Families in the Midwest

CENTRAL STATES CENTER FOR AGRICULTURE SAFETY AND HEALTH

- Assessing the Prevalence and Underlying Causes of ATV/OHV-related Youth Injuries
- Health and Safety Risks among Immigrant Cattle Feedlot Workers in Nebraska and Kansas
- Identifying the Sources of Stress and Prevalence of Anxiety and Depression Symptoms Among Young Farmers and Ranchers in the Midwest
- Improving Safety and Health in the Cattle Feed Yard Industry

Highlights

WISCONSIN FARM FATALITY REPORT PROJECT

Led by Principal Investigator Bryan Weichelt, Ph.D., and Emily Redmond, the team has been collaborating with partners at the University of Wisconsin Extension and the Department of Human Services to resurrect the annual Wisconsin Farm Fatality Report. The report summarizes many aspects of fatal injuries in Wisconsin agriculture. The team expects the first report to be published in early 2020.

EXAMINING THE PSYCHOLOGICAL EFFECTS OF FLOOD AMONG AGRICULTURAL PRODUCERS

In March 2019, Nebraska experienced historic flooding. While only 1-3 inches of rain fell, the resulting ice melt caused all-time high water marks on river gauges. Floods wiped out crops and killed animals. Rains also collapsed a century-old tunnel that carried irrigation water across Nebraska. The implications for Nebraska’s farmers are grim. In an area already plagued with mental health woes, practitioners brace for an increase in substance abuse, suicide, depression and anxiety. This project aims to quantify the impact of flooding on farmer mental health to better predict and assist farmers in need.
ACKNOWLEDGMENTS

The National Farm Medicine Center expresses its appreciation to the organizations and individuals that enable NFMC to stay ahead of evolving health and safety concerns in agriculture.

The following federal grants provided programmatic support in 2019. National Institute for Occupational Safety and Health (CDC/NIOSH) provided NCCRAHS Award U54OH009568; UMASH Award U54OH010170; CS-CASH Award U54 OH010162. National Institute of Health provided WISC 5U19AI104317/UG3OD023282 and CREW 4U19A104317-04/UG3OD023282