Protecting At-Risk Farmers and Employees with Effective, Low-Cost Solutions

The NIOSH-funded Agricultural Centers for Research, Education, and Disease and Injury Prevention are committed to achieving a measurable impact on farm safety and health practice. In this issue, Centers report on projects and activities that are yielding practical solutions to perennial problems, especially physical, biological, chemical, and ergonomic hazards that affect vulnerable workers.

Through an ongoing partnership between the Northeast Center and the Migrant Clinician’s Network, for example, health care professionals have access to the comprehensive *Migrant Clinician’s Occupational Health Reference Manual* in print and electronic format. A recent symposium co-sponsored by the Western Center for Agricultural Health and Safety (UC-Davis) highlighted the voice of immigrant workers, and interagency collaboration between the Pacific Northwest Center (University of Washington) and multiple state-level organizations is leading to improved understanding of pesticide exposures in that region and means to prevent them.

Heat-related illness and sun exposure are perennial challenges for farmers and farm workers, and in this issue Alicia Gonzalez of the National Center for Farmworker Health describes a fresh approach to sun safety being undertaken with support from the Southwest Center (UTHCT-TX).

Prevention protects both human lives and the financial bottom line, and in partnership with the High Plains and Intermountain Center for Agricultural Health and Safety (HICAHS), Colorado dairy farmers are discovering ergonomic improvements that not only protect worker safety but also enhance efficiency and productivity.

Slips, trips, and falls remain a leading cause of injury claims and lost work time among farmers and employees. Thus, we are pleased to include in this issue a close look at tractor mounting and dismounting injuries. Disseminating timely, accurate safety and health information to stakeholders and the public is a key aim of the ag safety community, and in this issue Scott Heiberger of the National Children’s Center describes how workshops for journalists have increased the frequency and accuracy of media reporting on farm and rural safety incidents.

We look forward to providing readers with many more such useful updates in our future quarterly issues.
Equipping health care providers to better meet the needs of migrant and seasonal farm workers

Migrant and seasonal farmworkers are at risk for a range of health problems associated with their work, language and temporary worker status. Ensuring high quality clinical care for these workers requires an understanding of the work environment and job tasks, as well as trust and clear communication between provider and patient.

To address these needs, in 2005 the Northeast Center (NEC) and the Migrant Clinician’s Network (MCN) teamed up to develop the Migrant Clinicians Occupational Health Reference Manual and Web site. This year several of the NIOSH Agricultural Centers and MCN will be collaborating to expand the manual and Web site to meet the needs of farm workers and their health care providers nationwide.

The manual uses occupational health surveillance data collected by the Northeast since the early 1990s (more than 1,500 case reports spanning 7 states) to identify the most frequent injury events and occupational illnesses and contributing factors. In addition, researchers obtained a detailed description of the work environment and job tasks associated with each agricultural commodity.

Once these data were compiled, the Northeast Center (NEC) was assisted by occupational medicine physicians with experience in agricultural health care in adding to the manual sections on occupational exams, diagnostic tests, physical therapy recommendations and patient education. Since the migrant and seasonal farmworker population includes diverse cultural and linguistic sub-groups, cultural competence training also was included.

Initial evaluation results from 20 clinician interviews (2005) revealed that clinicians want both print and online versions of the manual and highly value the occupational health history resources and patient education materials. Clinicians also said that they would like to see the manual expanded to cover more crops and conditions.

In 2006 the manual was placed on the MCN and NEC Web sites, and 200 manuals were disseminated through the network. Trainings in its use also were conducted by MCN. In its first 3 months the Web site received more than 2,000 hits. Today, individual page hits range between 900 and 1,200 per quarter. In 2009 the manual received 4,500 hits.

During 2010 the NEC will be collaborating with our fellow NIOSH-funded Agricultural Centers to expand the manual. Each participating center will collect data on one major commodity from its region, working with local migrant health centers. This epidemiologic data will be collected from the migrant health centers, while more descriptive photo and videographic descriptions of the farm environment and work tasks will be added as well. The new Web site will have enhanced technical capabilities and will allow each participating center to play a leadership role with respect to occupational medical care for migrant and seasonal farmworkers in its region. The project brings epidemiologic research into medical practice and disseminates to other regions a model of technical assistance in migrant health that has been shown effective in the Northeast.

--- Giulia Earle-Richardson, PhD

Migrant Clinicians Occupational Health Reference Manual online:


http://www.nycamh.com/resources/manualindex.htm
Western Center at UC-Davis
Symposium features voices of immigrant workers

Faculty, students and policy makers, along with industrial hygienists, safety professionals, insurers, occupational health nurses, physicians and union representatives gathered on January 25 in Oakland, California, to participate in Immigrant Workers II: Voices from the Workplace.

Sponsored by the Center for Occupational and Environmental Health (COEH) and facilitated by UC Berkeley’s Robin Baker, MPH, and WCAHS Director Marc Schenker, MD, MPH, the symposium featured presentations by immigrant workers describing the reality of their work and workplaces. The day-long event also examined current research on occupational health and safety hazards affecting immigrant communities.

Plenary presentations were made by Carlos Felix Corona, the Mexican Consul General in San Francisco; Maria Echaveste, Professor of Law at UC Berkeley; and Len Welsh, Chief of the CA Division of Occupational Safety and Health.

True to its theme, Voices from the Workplace, the symposium featured three panels, each of which included immigrant workers or their representatives: Healthy Jobs: Making Workplaces Safer; Healthy Lives: Issues Beyond the Workplace; and Research for Action.

The Pacific Northwest Agricultural Safety and Health (PNASH) Center and the Washington State departments of health, agriculture and labor have launched a collaborative effort to analyze and use evidence to reduce pesticide over-exposure in agriculture. A 12-member working group is tapping into expertise from the major agricultural areas of central and eastern Washington, the state government seat, and the University of Washington School of Public Health to learn from regional data: How are workers being exposed? Why? How can we reduce those exposures?

Between 2003 and 2008, the state Department of Health (DOH) surveillance system detected 351 agricultural workers in Washington State with possible, probable or definite acute pesticide-related illness. During a similar 6-year window, the Department of Labor and Industries (L&I) identified an additional 346 pesticide handlers with biological markers of over-exposure to cholinesterase-inhibiting pesticides, although none of these handlers reported symptoms. Actual incidence is likely higher.

By analyzing research from PNASH, surveillance data from DOH, cholinesterase-monitoring data from L&I, and the types of Worker Protection Standard violations cited by the Department of Agriculture (WSDA) and L&I, the working group has found correlating contributing factors in occupational exposures. They include (1) misuse, poor maintenance or lack of required Personal Protective Equipment; (2) high-risk work practices such as contamination during spray equipment maintenance or mixing and loading pesticides; (3) drift; (4) violations of restricted entry intervals; and (5) over-exposures occurring even when labels are properly followed.

Underlying many of these factors was a pervasive lack of sufficient, high quality trainings and supervision. Members of the inter-agency working group are now analyzing root cause data from DOH and results from exploratory discussions with handlers facilitated by WSDA. PNASH-facilitated advisories and interviews are building on these results to develop practical safety measures – ideas developed and reviewed by handlers, managers and safety educators.

For more information contact Dr. Matthew Keifer or Marcy Harrington at pnash@uw.edu or 206-616-1958.


-- Coby Jansen, MPH
University of Washington School of Public Health
Occupational exposure to heat puts farmworkers at high risk for heat illness. Heat illness can usually be avoided by taking simple precautions, but farmworkers face many barriers to performing preventive behaviors on the job. While some of these barriers are under the control of the employer, some may be overcome by the individual farmworker through effective education.

The National Center for Farmworker Health (NCFH) received a NIOSH-funded grant from the Southwest Center for Agricultural Health, Injury Prevention, and Education at the University of Texas Health Science Center at Tyler (UTHCT) to develop a research to practice (r2p) occupational safety program titled Project FRESCO. The goal of Project FRESCO is to develop a targeted education program to decrease sun and heat-related illnesses among farmworkers.

The program has been developed using Intervention Mapping, which is a rigorous process for applying theory and research to design effective, sustainable health promotion programs. Key messages were selected to target only those OSHA-recommended behaviors over which the farmworker has some control. [A Guide to Heat Stress in Agriculture, Environmental Protection Agency and Occupational Safety and Health Administration, EPA Publication No. EPA-750-b-92-001 (1993)]

Key messages include:

- drink water,
- avoid alcohol and caffeine,
- cover the skin, and
- cool down by resting in the shade.

The program will be implemented by lay health workers (LHW), who will deliver individual and group sessions to farmworkers through door to door outreach and community networking. During the sessions, LHWs will use the culturally appealing FRESCO teaching tools, including a bilingual flipchart and a photo novel, to deliver key messages. The goal of the educational sessions is to impact farmworkers’ knowledge, attitudes, and self efficacy around sun and heat illness prevention behaviors, which will lead to an increase in these behaviors, and ultimately lower the rate of related illnesses.

This r2p project is particularly innovative because it will be one of the first sun and heat illness prevention programs to target program implementers and adopters in addition to farmworkers. For example, a LHW curriculum and workbook will be used to train LHWs to reach and educate farmworkers and support behavior changes. Additionally, a program adoption manual will be developed to provide organizations with programmatic guidance.

The FRESCO materials are currently being finalized and NCFH is coordinating with health centers and LHW programs to test the products and messages with LHWs and farmworkers to assess their effectiveness, cultural appeal, and usability. This testing phase will begin in May 2010 and the pilot is scheduled for August 2010.

The final FRESCO Tool Kit will be available in late 2011 and will include the following resources:

- flipchart
- photo novel
- lesson plan guide
- LHW curriculum and workbook
- program adoption manual

For more information contact Alicia Gonzales, MSSW, Project Director, at the National Center for Farmworker Health, 512-312-5469 or gonzales@ncfh.org.

-- Alicia Gonzales, MSSW
Natl Center for Farmworker Health

High Plains and Intermountain Center (HICAHS) Slips, Falls Cost $$$

David Douphrate, PhD, MPT, MBA
John Rosecrance, PhD, PT
Steve Reynolds, PhD, CIH
Victoria Buchan, PhD
Colorado State University
Henry P. Cole, EdD
University of Kentucky

A recent case-based study by the High Plains and Intermountain Center for Agricultural Health and Safety/Colorado State University used workers’ compensation claims data to investigate tractor-related injuries (Douphrate, 2009). Researchers analyzed 642 tractor-related injury claims from a 12-year period. Approximately one-fifth (21%) of these claims were associated with the worker mounting or dismounting a tractor, and an additional 10% of claims were associated with the worker falling, jumping, or slipping off a tractor. Among all claims associated with tractor mounting or dismounting, 50% involved the ankle or knee. The average medical plus indemnity claim cost was $335.

Safety inspections of 153 farm tractors in Kentucky revealed that only 45% of tractors
Dairy Farms Benefit from Ergonomic Analysis of Milking Processes

Doughrate D,1 Rosecrance J,1 Reynolds S,1 Buchan V,1 Nonnemann M,2 Levin J2
1 Colorado State University, Fort Collins, CO
2 University of Texas Health Science Center at Tyler, Texas

Dairy workers in the US have the second highest prevalence of agriculture-related injuries (Boyle, 1997; Crawford, 1998; NIOSH, 1993). More than 80% of dairy workers have musculoskeletal symptoms (MSS), with milking and feeding tasks being the most demanding (Gustafsson, 1994, Pinzke, 2003, Stål, 1996).

Dairy production in the US has steadily moved toward large-herd industrialized parlor operations because of associated economies of scale. As the industry has moved to a mass production model, the number of workers involved has increased, along with occupational risk factors related to repetitive movements and extreme postures of the upper extremity associated with milking tasks. Working in proximity to large animals increases the risk for traumatic injury (Douphrate, 2009).

A NIOSH-funded project being conducted by the High Plains and Intermountain Center for Agricultural Health and Safety (HICAHS/Colorado State University) seeks to reduce the incidence of musculoskeletal injuries among dairy workers. HICAHS researchers have partnered with colleagues at the Southwest Center (UTHCT Texas) to expand the project scope and industry impact.

The project aims to (1) reduce unintentional injuries; (2) improve the use of appropriate livestock-handling procedures, and (3) reduce adverse safety and health events among a vulnerable workforce (predominantly Latino). The project emphasizes a business-friendly model that seeks not only to improve worker safety, but also to increase operational efficiency and productivity -- the bottom line to dairy sustainability.

Researchers have partnered with dairy owners and managers, state dairy extension specialists, dairy veterinarians, dairy equipment manufacturers and service companies, and other industry stakeholders. Partnerships have been formed with more than 50 dairies representing 7 states. Participating dairies have already received beneficial practice suggestions to improve milking routines thereby increasing milk production and milking practice efficiency. Health and safety recommendations have also been made such as suggestions to wear eye protection and gloves when applying chemicals in the cow preparation process. Other safety recommendations include proper machine guarding, lockout/tagout practice and safe animal-handling. Veterinarians on the project provide free consultations to owners and dairy workers to improve cow health and comfort which are key to high milk production and reduced animal disease. The provision of immediate feedback on parlor performance for the dairy owners has led to continual access to the dairies.

This innovative, research-to-practice (r2p) project is identifying safety interventions through active partnerships with dairy owners, managers and operators. This and other HICAHS studies have shown that “r2p” does not need to wait until research has been completed or a final product (in this case a safety intervention) is produced, but can become part of the research process itself.

For more information contact
David Doughrate, PhD, MPT, MBA
Phone: 970-491-6152
david.douphrate@colostate.edu

Slips/Falls Cost $$$ cont. from pg 4

had properly maintained and fully functional access steps and handholds. Steps were missing, bent, broken, placed too high, or obstructed on 17% of the tractors. No handholds were found on 13% of the sampled tractors, and 9% had bent, broken, loose or rusted handholds (Cole, 2009).

The American Society of Agricultural Engineers has developed voluntary safety standards for the design, manufacture, and use of agricultural machinery (ASAE S318.10). Tractors should have steps and handholds that make it easy for the operator to get on or off the tractor safely:

- height of the first step should not be more than 27 inches off the ground
- distance between steps should be between 12 and 16 inches
- steps should be ≥ 10 inches wide
- steps should have a slip-resistant surface
- steps should be kept free of oil, mud and other debris.
If you’re trying to promote agricultural safety and health, helping the media to understand what you do is vital. One tool that has shown to be successful in forging effective media relations is the Journalists’ Workshop.

The National Children’s Center for Rural and Agricultural Health and Safety conducted five such workshops (2004-2008) and published lessons learned in *Agricultural Safety and Health Workshops for Journalists: Strategies that Work* (Heiberger et al., 2008).

The workshop’s story-generating format gathered researchers, child safety advocates, medical professionals, agricultural producers, and journalists for field trips and discussion that focused on leading causes of childhood injuries on farms and effective interventions for prevention.

The project achieved its aim of building a cadre of journalists who understand the scope and the preventability of childhood farm injuries. Fifty journalists (10 per year) “graduated” from the workshop. They represented more than 2.2 million readers participated.

Workshops were held in Marshfield, WI; Cooperstown, NY; Wenatchee, WA; Harrodsburg, KY; and Texarkana, on the Arkansas-Texas border. Each was adapted to local agricultural issues. The last four workshops were co-hosted by NIOSH-funded agricultural centers. Immediate post-workshop evaluation results showed that the workshop was valuable to participants. Journalists reported that they were very likely to change the way they approached stories related to childhood agricultural injury prevention. On the six-month telephone follow-up evaluation, journalists reported that they had written an average of six stories that they attributed to their participation in the workshop. Further evaluation should be conducted to explore the extent to which the workshop influenced social norms regarding safety on farms.

*Agricultural Safety and Health Workshops for Journalists: Strategies that Work* provides a blueprint that can be adapted to local needs. The resource is available at: [http://www.marshfieldclinic.org/nccrahs/default.aspx?page=nccrahs_edu_and_train_journ_wkshp_welcome](http://www.marshfieldclinic.org/nccrahs/default.aspx?page=nccrahs_edu_and_train_journ_wkshp_welcome)

Funding for the Journalists’ Workshop was provided by NIOSH award U50 OH008107.

-- Scott Heiberger, NCCRAHS

---

Save the Date:
Upcoming Events in Ag Safety

The Agricultural Safety and Health Council of America (2010) will host its next annual meeting on January 7, 2011 in Atlanta, GA. Stay tuned at [www.ashca.com](http://www.ashca.com) for details. Also coming up:

June 7-11, 2010

June 26 - July 1, 2010
Annual Meeting of the National Institute for Farm Safety; Wilmington, NC; in collaboration with the North Carolina Agromedicine Institute, North Carolina Cooperative Extension, and the Iowa Center for Agricultural Safety and Health. Details at [http://nifsagsafety.org/events/](http://nifsagsafety.org/events/)

October 18-20, 2011
Aquaculture: Needs and Novel Solutions in an Emerging Sector

Aquaculture presents many of the same hazards as agriculture generally, but also poses additional dangers related to water impoundments, unique biological and chemical exposures, and nighttime work.

Occupational fatalities in aquaculture have included, among other causes, drowning, electrocution, and tractor rollovers into levees or ponds. Non-fatal injuries include, but are not limited to, slips, trips and falls, musculoskeletal disorders, hypothermia, allergy/dermatitis, needlesticks, puncture wounds from fish teeth or spines, and infectious disease. Several such hazards may be identified in the photograph above; e.g.,

• risk of tractor overturn due to a slippery or eroded bank or operator misjudgment;
• entanglement and drowning hazard in the presence of moving nets and aerator paddles
• lack of personal flotation devices/drowning hazard

A first-of-its-kind study of aquaculture operations in 7 southeast states has identified hazards associated with specific environments and tasks, as well as lower cost, simple solutions devised by fish farm operators and managers. These and numerous other findings are described in upcoming publications of the Southeast Regional Aquaculture Center (SRAC) and in the Journal of Agromedicine.

-- Melvin Myers, MPA
melvinmyers@chartner.net

The Economics of Preventing Injuries to Adolescent and Adult Farmers (EOP) is a 4-year project targeting four types of injury events that are prevalent among adolescents and adults who live and/or work on farms:

1. crush injuries to operators when tractors without rollover protective structures (ROPS) overturn
2. deadly collisions between farm tractors and other motor vehicles on public roadways,
3. traumatic brain injuries to horseback and ATV riders without helmets, and
4. hearing loss to individuals with long-term exposure to high frequencies and loud noises.

The Economics of Prevention uses narrative simulation exercises and computerized cost analysis tools to help the next generation of high school teachers and agricultural Extension agents understand the individual and social costs of injury. As a scale-up strategy, it is anticipated that, in turn, these professionals will employ EOP methods and materials to reach at-risk adolescents and adult farmers where they are accessible: in their classrooms and community activities.

EOP tools and resources support a virtually seamless translation of research to practice (R2P):

For researchers, the innovative online data collection tool
• provides built-in compliance with procedures for the protection of human subjects;
• enables timely access to data that can be used for both instruction and surveillance; and
• ensures accurate, efficient data transfer for analysis and evaluation. Data transfer is accomplished through a point-and-click protocol that moves data from the online database to EPIData, Excel, SPSS, or other analysis packages.

For teachers, EOP materials and methods
• incorporate state-required Core Content requirements for many subject areas including economics, social studies, and practical living curricula.
• allow immediate access to student responses and scores, which in turn allows educators to quickly evaluate instruction and progress.

At a time of high-stakes performance testing in schools and data-driven decision-making, EOP’s user-friendly features are invaluable. With immediate access to student responses, teachers may ascertain quickly who in class lives or works on a farm, who has been involved in a tractor overturn, or who has suffered financial consequences from an agricultural injury. Instruction can then be tailored accordingly, making instruction about risk/hazard reduction and injury prevention personally relevant and meaningful.

Partners:
• University of Florida College of Agriculture
• University of Kentucky College of Agriculture
• Mississippi State University Department of Ag Economics
• Kentucky Council for the Social Studies
• National Association of Agricultural Educators (NAAE)

Narrative Simulation Exercises & Computerized Cost Analysis Tools:
• No Way to Meet a Neighbor,
• Kayles’ Difficult Decisions,
• Heather on Horseback,
• Sound Advice through the Years
• Brad’s Last Ride

-- Joan Mazur, PhD, PD/PI
Henry P. Cole, EdD, Co-PD/PI
jmazur@uky.edu

Work supported by CDC/NIOSH Cooperative Agreement U50 OH007547
The Centers for Agricultural Disease and Injury Research, Education, and Prevention represent a concerted effort of CDC/NIOSH to protect the health and safety of farm operators, hired farm workers, and their families. The Centers act by cooperative agreement to address urgent, persistent, and/or emerging problems related to occupational safety and health in agriculture, forestry, and fishing. The Centers are located in geographically diverse regions and respond to the unique needs of their stakeholder populations.

**Great Plains Center for Agricultural Health**
Director: Fred Gerr, MD
100 Oakdale Campus #120 IREH
University of Iowa
Iowa City, IA 52242-5000
Telephone: 319-335-4419
http://www.public-health.uiowa.edu/gpcah/

**High Plains Intermountain Center for Agricultural Health and Safety**
Director: Steve Reynolds, PhD, CIH
Department of Environmental and Radiological Health
133 Environmental Health Building
Colorado State University
Fort Collins, CO 80523-1681
Telephone: 970-491-6152
http://www.hicahs.colostate.edu/

**National Children’s Center for Rural and Agricultural Health and Safety, Marshfield Clinic**
Director: Barbara C. Lee, RN, PhD
1000 North Oak Avenue
Marshfield, WI 54449-5790
Toll-free: 800-662-6900
Telephone: 715-389-4999
http://www.marshfieldclinic.org/NCCRAHS

**Northeast Center for Agricultural Medicine and Health**
Director: John J. May, MD
1 Atwell Road
Cooperstown, NY 13326
Toll-free: 800-343-7527
Telephone: 607-547-6023
http://www.nycamh.com/

**Pacific Northwest Agricultural Safety and Health Center**
Director: Richard Fenske, PhD, MPH
Department of Environmental & Occupational Health Sciences
University of Washington
Box 357234
Seattle, WA 98195-7234
Toll free: 800-330-0827
Telephone: 206-616-1958
http://depts.washington.edu/pnash/

**Southeast Center for Agricultural Health and Injury Prevention**
Director: Robert McKnight, MPH, ScD
University of Kentucky
College of Public Health
Suite 1A, 342 Waller Avenue
Lexington, KY 40504-9842
Telephone: 859-323-6836
http://www.mc.uky.edu/scahip/

**Southwest Center for Agricultural Health, Injury Prevention, and Education**
Director: Jeffrey L. Levin, MD, MSPH
University of Texas Health Science Center
11937 US Hwy 271
Tyler, TX 75708-3154
Telephone: 903-877-5896
http://www.swagcenter.org

**Western Center for Agricultural Health and Safety**
Director: Marc Schenker, MD, MPH
Western Center for Agricultural Health and Safety
One Shields Avenue
University of California
Davis, CA 95616-8757
Telephone: 530-752-4050
http://agcenter.ucdavis.edu

---

More on the WorldWideWeb

National Agricultural Safety Database
www.nasdonline.org