



Inside Agromedicine

Partners for Health & Safety In Agriculture, Forestry, and Fisheries

North Carolina Agromedicine Institute / Southern Coastal Agromedicine Center

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North Carolina Agromedicine Institute

www.ncagromedicine.org

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Institute Members

East Carolina University
North Carolina A & T State University
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Our North Carolina Partners

Cooperative Extension Service
Eastern Area Health Education Center (EAHEC)
Department of Agriculture & Consumer Services
Department of Health & Human Services
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Department of Environment and Natural Resources
NC Farm Bureau
NC Fisheries Association
NC Forestry Association

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Virginia
South Carolina
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Florida
Puerto Rico
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... from the Director

John R. Wheat, MD, MPH, keynote speaker of the 2006 Agromedicine Research Forum and a member of the SCAC board of advisors, is an internationally recognized physician and scholar in community medicine and agricultural medicine. Dr. Wheat also developed and administers programs for rural health and medicine scholars and minority high school students at the University of Alabama, Tus-

caloosa. He is working with the NCAI and the NC Cooperative Extension Service on strategies for building partnerships among physicians, research scientists, cooperative extension and public health professionals, and farmers to improve the health and safety of the rural agricultural population.

~ Kristen Borré, PhD, MPH

The 2006 Agromedicine Research Forum

The North Carolina Agromedicine Institute (NCAI) and the Southern Coastal Agromedicine Center (SCAC) held the 2006 Agromedicine Research Forum in Greenville, NC, on June 13 and 14. The forum provided a venue to present results of funded research initiatives of the Institute. Themes of the forum were health and safety issues of high risk agricultural workers and reducing risk



Mitch Smith of NC Coop Extension considers in the Department of Environmental and

of exposure to toxic chemicals and natural environmental hazards. Nineteen investigators presented their findings over the two-day conference. Session topics were tractor/road safety, natural environmental exposures, risk reduction for pesticide illness and pesticide-related fatalities, infectious diseases, ergonomics, and high risk agriculture worker populations.

Keynote speaker was **John Wheat, MD, MPH**, University of Alabama Health Sciences, whose topic was "Partnerships for Research, Education, and Outreach to Reduce Health Disparities Among High Risk Agricultural Worker Populations: The Ala-

bama Story." Featured speakers were **Deborah Norton, MD**, Medical Director of the NC Department of Health and Human Services, and **Alton Thompson, PhD**, Dean of the NCA&T School of Agriculture and Environmental Sciences.

NCSU colleagues of the late **Randy Rose, PhD**, presented a celebration of his career and accomplishments in the Department of Environmental and Molecular Toxicology. **Ernest Hodgson, PhD**, Distinguished Professor Emeritus at NCSU, presented findings from Rose's Institute-funded project, Human Metabolism of New and Emerging Pesticides. That study and others are featured in this issue of Inside Agromedicine.



Dr. Ernest Hodgson speaking of Randy Rose.

Projects Reported at the Agromedicine Research Forum



Human Metabolism of New and Emerging Pesticides

PI: Randy Rose, PhD, North Carolina State University

The project aim was to examine the role of specific human xenobiotic metabolizing enzymes in the metabolism

of selected pesticides important to agriculture. Comparative tests for cytotoxicity and apoptosis in the HepG2 cell line and human hepatocytes were conducted with several pesticides: fipronil, fipronil sulfone, endosulfan, deltamethrin, chlorpyrifos, cypermethrin, fenvalerate, and permethrin. Results showed that fipronil and its primary metabolite, fipronil sulfone,

have the greatest potential for cytotoxicity in human hepatocytes. Initial research led to further collaborative studies on endosulfan as a potential probe substrate for CYP2B6 activity in human samples. Further tests had been planned on cytotoxic and metabolic response to chlorpyrifos in human liver samples and lung adenocarcinoma cells.



Ergonomic Interventions and the Agriculture Industry

PI: Gary Al-len Mirka, PhD, North Carolina State University

The project aim is to develop and test ergonomic interventions to reduce the rate of occurrence and severity of musculoskeletal discomfort among

farm workers. Mirka and contributors used surveys, interviews, and focus groups to identify high-risk jobs/tasks and laboratory studies to identify underlying biomechanical issues of task performance (stooped posture; sloped and slanted surfaces). They then designed and tested functional and laboratory prototypes for performing high-risk tasks.

Prototypes include two beef calf lifting mechanisms (lever system and

modified handle system); a height-adjustable tobacco sorting table; and a pepper harvesting work method/cart mechanism. A sweet potato harvesting system was developed as a laboratory prototype. Other prototypes are tobacco harvesting hand tools and wearable kneeling supports. Other products of the project are an educational brochure on work and personal risk factors for musculoskeletal discomfort (English and Spanish versions) and a clinic intake form.



Assessment of Health and Safety of Black Farmers in the Southern Coastal Region

PI: Alton Thompson, PhD, North Carolina A&T State University

The project objectives were to identify farm-related health issues, illnesses, and injuries among black farmers; identify safety training needs; and develop an Agromedicine Alliance among 1890 Land Grant Universities to address the

health and safety issues. Methods included developing and pre-testing a survey instrument in North Carolina for interviews conducted by Extension agents in seven southern states (VA, NC, SC, GA, AL, MS, FL). Agents interviewed a total of 700 farmers (100/state). Data were analyzed using descriptive and non-parametric statistical methods.

The profile of a typical African American farmer in this exploratory study is one who is 59 years old, male, with income derived from a livestock enter-

prise, and who farms an average of 48 acres. Over half the respondents were part-time farmers who had few injuries from pesticides, tractors, or other agricultural equipment. Results of the project are expected to provide a basis for future research to address health and safety issues of African American farmers and develop effective education, prevention, and intervention methods. Results also will serve as a model for future collaborative projects of the 1890 Agromedicine Alliance and other NIOSH-affiliated institutions.

Promoting Health and Safety Through the NC Gold Star Growers Program

The North Carolina Agromedicine Institute, in conjunction with the NC Department of Labor and the NCSU Department of Visual Communications, is creating a video highlighting the achievements of Gold Star Growers. They are agricultural employers who strive to improve working conditions for migrant workers in North Carolina. Of approximately 1,200 growers who register 1,600 housing sites, 10%-15% receive Gold Star status.



The video will be used to promote better housing and safer agricultural workplaces among producers. It will include scenes from the 2006 Gold Star Growers Award luncheon, a tour of Gold Star housing, and interviews with growers, Cooperative Extension specialists, and agricultural migrant workers. Labor safety topics will include field sanitation, preventing heat stroke, and safety training for workers on NC Christmas tree farms.

In North Carolina, producers are not obligated to provide housing to their agricultural employees. If they choose to provide housing as a condition of employment, they must register the housing with the North Carolina Department of Labor 45 days prior to occupancy and have the local health department inspect water and septic systems. The Gold Star Grower program was created by the North Carolina Department of Labor Agricultural Safety and Health Bureau in 1992 to recognize growers who provide migrant housing that is 100% in compliance with regulations at the time of the pre-occupancy inspection. Gold Star Growers may provide housing features that exceed current regulations, such as more toilets and showers, laundry facilities, and additional stoves and refrigerators. Growers also may conduct safety training during work hours for agricultural workers.

Reported by **Regina Luginbuhl, MS**, Bureau Chief of the Agricultural Safety & Health Section of the NC Department of Labor. Luginbuhl serves as a member of the NCAI Board of Collaborators.

Report on the NIFS Annual Meeting

The National Institute for Farm Safety (NIFS) 46th Annual Meeting and Conference was held June 25-30 in Sheboygan, Wisconsin, hosted by the National Farm Medicine Center. NIFS president Dee Jepsen of the Ohio State University Cooperative Extension Service convened the meeting. The National Institute for Farm Safety is a non-profit partnership of farmers, cooperative extension, scientists, agricultural business leaders and research centers, government agencies and international members from Canada and Mexico.

Key speakers included **John Howard, MD**, Director of the National Institute for Occupational Safety and Health, **Brad Rein**, Director of US Department of Agriculture CSREES, **Glen Blahey**, Chair of the Canadian Agricultural Safety Association, and **Michael Gempler**, Executive Director of the

Washington Growers' League. Dr. Howard reminded attendees that although the percentage of the population engaged in agriculture as an occupation had dropped from 16% in 1946 to 2% in 2004, agricultural injuries and deaths have not had a similar decline. Making farms safe places to work will require a community approach with a focus on programs that address 21st century agricultural practices. The theme of the conference was "Meeting Challenges Together."

For more information on the conference, see <http://www.ag.ohio-state.edu/~agsafety/NIFS/nifs.htm>. The North Carolina Agromedicine Institute is a member of the NIFS and has been asked to host a NIFS meeting in our state.

CALENDAR

- Sept. 9-10, 2006** La Fiesta del Pueblo 2006! Arts and cultures of Latin America and the Caribbean, including health and public safety fairs. NC State Fairgrounds, Raleigh. www.elplueblo.org
- Sept. 20-22, 2006** Fourth Biennial Agricultural Health & Safety Conference, "Health & Safety in Western Agriculture: Research to Practice (r2p)." Asilomar Conference Grounds, Pacific Grove, CA <http://agcenter.ucdavis.edu/Announce/R2P2006.php>
- Oct. 15-17, 2006** North American Agromedicine Consortium 19th Annual Meeting, "Encouraging Community Preparedness for Agromedicine Concerns." Tuscaloosa, AL www.agromedicine.org/Conferences/2006.htm
- Oct. 19-21, 2006** 19th Annual East Coast Migrant Stream Forum, "Completando el Círculo de Salud: Meeting the Well-being of Farm workers and Farmworker Health Leaders," Myrtle Beach, SC. North Carolina Community Health Center Assoc. www.ncchca.org