

ANNUAL REPORT

October 1, 2003 to September 30, 2004

SOUTHEAST CENTER FOR AGRICULTURAL HEALTH AND INJURY PREVENTION

Award # U50 OH07547-03

University of Kentucky
College of Public Health
1141 Red Mile Road, Suite 102
Lexington, Kentucky
40504

Prepared for NIOSH
December 1, 2004



TABLE OF CONTENTS

I. INTRODUCTION AND EXECUTIVE SUMMARY	3
A. CENTER ACCOMPLISHMENTS	3
B. REGIONAL ACTIVITIES	4
II. REPORT ON THE OUTREACH PROGRAM	4
III. CENTER PROJECT REPORT BY CORE OR TYPE	5
<i>Cost Effectiveness of Promoting Roll-Over Protective Structures (ROPS) and Seat Belts on Family Farm Tractors</i>	5
<i>Improving Surveillance of Pesticide and Other Agricultural-Related Poisonings</i>	16
<i>Farmer Suicides: A Nine-Year Analysis in Three Southeastern States, 1990–98: KY, NC, & SC</i>	19
<i>Nurse Agriculture Education Project</i>	25
<i>Health of Agricultural Populations Emphasis Area</i>	28
<i>Partnering with Stakeholders for Prevention: Regional Outreach and Capacity Building</i>	33
IV. PROGRESS REPORT ON FEASIBILITY PROJECTS	49
<i>The Epidemiology of Helicobacter pylori in a Selected Population of Southeast Georgia Farmworkers</i>	49
<i>Asthma in Kentucky and North Carolina Farm Children: A Pilot Proposal</i>	52
<i>Airborne Exposure to Pathogens and Endotoxins During Farmland Application of Class “B” Biosolids</i>	54
<i>Addressing Agriculture Health and Safety Issues Through a High School Applied Learning Project</i> ..	56
<i>The Nurse Practitioner Agricultural Study</i>	58
<i>Mercer County Farm and Family Practice Demonstration Project</i>	60
V. SPECIFIC IMPROVEMENTS IN AGRICULTURE SAFETY AND HEALTH THAT RESULTED FROM CENTER ACTIVITIES (R2P ACTIVITIES)	61
VI. COLLABORATION	65
APPENDIX	67

SOUTHEAST CENTER FOR AGRICULTURAL HEALTH AND INJURY PREVENTION

I. INTRODUCTION AND EXECUTIVE SUMMARY

September 30, 2003 to September 29, 2004 was the third of five years in the Southeast Center's current grant cycle. The Southeast Center continued to grow in scope and influence both within southeastern region of the United States and throughout the nation. During the 12 months of the review, the Center closely examined the research-to-practice aspects of its work, looking for better ways to facilitate the adoption of new techniques and strategies by agricultural populations at risk as well as other groups, such as educators, agricultural engineers, and rural practitioners, who focus on the health of working agriculture populations.

A. CENTER ACCOMPLISHMENTS

- 1) The Southeast Center provided significant leadership for the development of the *National Agricultural Tractor Safety Initiative*, spearheading the epidemiological components of the document.
- 2) The Southeast Center worked with other NIOSH Centers to propose a social marketing campaign for the *National Agricultural Tractor Safety Initiative*. This proposal was submitted to NIOSH as part of a supplemental application in late September 2004.
- 3) The Southeast Center submitted four projects as part of a supplemental application to NIOSH in March 2004. Three of these were funded, including two new projects. Additionally, one existing project, Health of Agricultural Populations Curriculum, received supplemental funding.
- 4) The organizational placement of the Southeast Center was elevated within the University of Kentucky. The Southeast Center was moved from a Center within the Department of Preventive Medicine to a College-wide Center in the College of Public Health. This was effective May 2004 and was concurrent with the establishment of the College of Public Health at the University of Kentucky.
- 5) The Southeast Center acquired additional office space within its headquarters at 1141 Red Mile Road in Lexington, Kentucky. An additional 1,450 square feet of second floor office space was designated for Southeast Center's purposes. This additional space houses the offices of Henry Cole, EdD, and his staff, as well as providing a conference room and room for expansion. This new space, when added to the Center's existing 2,900 square feet on the first floor, provides the Center with 4,350 square feet of office space for agricultural health projects.
- 6) Dr. Robert McKnight, Center Director and PI, completed his term as Chair of the North American Agromedicine Consortium during this grant cycle.
- 7) Dr. Robert McKnight co-authored an article titled "Issues of agricultural safety and health," which was published in the 2004 edition of the *Annual Review of Public Health*.

- 8) In May 2004, the University of Kentucky recognized the accomplishments of Center Director Robert McKnight by presenting him with a \$25,000 Charles T. Wethington Award for Outstanding Research Productivity.

B. REGIONAL ACTIVITIES

1. **States served by Southeast Center:** Kentucky, Tennessee, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi
2. **States with Southeast Center activity:** Alabama, Arkansas, California, Colorado, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, West Virginia, Wisconsin

II. REPORT ON THE OUTREACH PROGRAM

Unlike most other Agricultural Health Centers, the Southeast Center has a peer-reviewed, five-year project — *The Stakeholders Project* — that was specifically designed to facilitate the outreach mission of the Center. Outreach activities are managed and budgeted through this project and discussed in Section III under the project title “Partnering with Stakeholders for Prevention: Regional Outreach and Capacity Building” — (#6 of 6 core projects).

III. CENTER PROJECT REPORT BY CORE OR TYPE

Research project — #1 of 6 core projects

A. PROJECT TITLE

Cost Effectiveness of Promoting Roll-Over Protective Structures (ROPS) and Seat Belts on Family Farm Tractors

B. PROJECT OFFICERS

Principal Investigator

Henry P. Cole, EdD

Department of Preventive Medicine

University of Kentucky

1141 Red Mile Road, Suite 102

Lexington, KY 40504-9842

Tel: (859) 323-5202

Fax: (859) 254-3760

hcole@uky.edu

Co-Principal Investigator

Melvin L. Myers, MPA

1293 Berkeley Road

Avondale Estates, GA

30002-1517

Tel: (404) 288-7085

Fax: (404) 288-7166

melmyers@bellsouth.net

C. PROJECT DESCRIPTION

Research description

The problem

Tractors are the leading cause of fatal farm injuries. Most of these fatalities result from overturns. Roll-over protective structures (ROPS) in combination with seat belts are a cost-effective means for preventing overturn-related fatalities. In combination, these two simple devices keep tractor operators in a protected zone during overturns and collisions. When tractors without ROPS are involved in overturns or collisions, operators frequently are severely injured or killed by being crushed by the tractor or ejected from the tractor seat. Before this study, no accurate estimate of the denominator of all fatal and non-fatal tractor overturns existed for tractors with or without ROPS. Thus, accurate calculations of the cost effectiveness of equipping tractors with ROPS could not be completed.

Objectives

The five study objectives are listed below.

1. Conduct a cost-effectiveness analysis of the Kentucky “Promoting ROPS and seat belts on family farm tractors” community intervention project by making use of existing data from that project (Cole and Westneat, 2001), using a recently developed decision-analysis tool (Pana-Cryan and Myers, 2000; Myers and Pana-Cryan, 2000) and previous cost-effectiveness studies. (Year 1)
2. Design and administer a telephone survey to a statewide large random sample of 6,063 Kentucky principal farm operators to provide population-based estimates of key parameters for the Myers and Pana-Cryan decision analysis tool and subsequent cost-effectiveness evaluations of ROPS and seat-belt promotion efforts. The Kentucky Tractor

Overturn Survey was designed, pilot tested, and perfected during Year 1. It was then administered to the statewide random sample in Year 2. The survey interview collected data about the (a) frequency and severity of injury resulting from tractor overturns; (b) probability of annual tractor overturns; (c) probability of injury outcomes during tractor overturns; and (d) effectiveness of ROPS and seatbelts for preventing injuries and fatalities in situations other than overturns. The survey data were analyzed during the latter part of Year 2 and throughout Year 3.

3. Recalculate the cost analysis of retrofitting tractors with ROPS based on the Year 2 telephone survey data and the more accurate estimates of the values used in the decision-analysis tool. (*Year 3 and ongoing*)
4. Determine the distribution of costs and benefits of the Kentucky ROPS Project retrofit program (and other ROPS promotion and intervention programs) from a societal perspective, an equipment dealer perspective, and a farmer perspective, compared with no intervention, by conducting three separate decision and economic analyses. (*Year 3 and ongoing*)
5. Apply the updated decision and cost-effectiveness model to other ROPS promotion projects and efforts. To date, these include a study of the cost effectiveness of an equipment dealer's intervention, and the Virginia Farm Bureau ROPS-promotion program. In October 2004, a major proposal was prepared and submitted to CDC/NIOSH (Cole and Myers, 2004). If that proposal is funded in 2005, the updated decision tool and model will be applied to cost studies of ROPS promotion programs nationally in cooperation with researchers from four other universities affiliated with four other NIOSH Agricultural Health and Safety Centers.

Study significance

Prior studies have not included robust estimates of the costs and benefits of programs that promote retrofitting tractors with ROPS. This is the case because before the present study no population-based census of total tractor overturn events and the six categories of operator injury outcomes that result from overturns had been completed. (The six classes of overturn injury outcomes are (1) no injury or minor injury that requires no medical treatment; (2) injury that requires outpatient medical treatment but not hospitalization; (3) injury that requires hospital admission; (4) injury that results in temporary disability; (5) injury that results in permanent disability; and (6) injury that results in death.)

Before this study, cost-effectiveness analyses of ROPS-promotion efforts were deficient for the following reasons. First, the denominator of total tractor overturn events was underestimated. Second, without a population-based denominator of all tractor overturns events (non-fatal and fatal), estimates of the frequency and severity of overturn injuries of tractors with and without ROPS are inaccurate.

Most surveillance systems identify tractor overturn cases based on death certificate records and newspaper articles. Newspapers typically report only newsworthy overturns that result in severe injury or death. Death certificates frequently do not provide sufficient detail about the circumstances of tractor-related deaths. As a result, many farm tractor overturns that result in

non-fatal injury and many others that result in death are not included in surveillance data. Furthermore, farmers typically do not report tractor overturns that result in no or minor injury because they are embarrassed by these events. Even when overturns result in injuries that require visits to clinics and emergency departments, many of these cases are not reported for lack of a standard surveillance system. Thus, the denominator values used in previous analyses omit many non-injury events, many non-fatal injury overturn events, as well as fatal events.

Study population and sample

The population consisted of Kentucky principal farm operators. Principal operator is a Census of Agriculture category that refers to people who own and operate farms. Kentucky's principal operators have a mean age of 55 years, 92% are male, and their typical farm size is about 200 acres (Census of Agriculture, 1997). The Kentucky Tractor Overturn Survey was developed and administered to a statewide random sample of 6,063 farms. The sample represents about 8% of the 76,017 principal farm operators in the state who collectively operate 150,268 wheel-type farm tractors.

Study methodology

Before interviewing the statewide sample of farmers, the Kentucky Tractor Overturn Survey was pilot tested with a random sample of 39 farmers. Following multiple revisions and user tests with small groups of farmers, the survey was then administered to farmers sampled randomly from a larger statewide random sample of 10,000 Kentucky principal farm operators. From its master list of farms, the Kentucky Agricultural Statistics Service (KASS) prepared the 10,000 farm sampling frame. The intention was to oversample to ensure a sufficiently large number of completed surveys. KASS enumerators called and interviewed farmers from this pool until the target sample of 6,000 completed interviews was achieved.

The desired sample size was based on earlier work conducted at the Southeast Center as part of the Farm Family Health and Hazard Surveillance Study funded by NIOSH (Browning et al., 1998; McKnight et al., 1996). That study suggested that about 11% of farmers age 55-years or older had overturned a tractor. This information and other data led us to believe that in a random sample of 6,000 farms, approximately 600 would have family members or workers who had experienced tractor overturns. The unit of analysis was the farm, not individual people or individual tractors. Overturn histories from a sample of at least 6,000 farms were needed to obtain sufficiently large numbers of cases from each of the six classes of overturn injury outcomes. After the Kentucky Tractor Overturn Survey was administered to 6,063 farms we found that 555 farms had experienced one or more overturn events among their family members, workers or both. The survey data provided the first population-based estimates of the frequency and severity of each of the six classes of injury outcomes during overturns of tractors with and without ROPS.

Human subject recruitment methods

All subjects were randomly selected by KASS from its master list of all farms in Kentucky. KASS is part of the National Agricultural Statistics Service and Census of Agriculture. By law, its list of farms and farmers' identities are confidential and not available to any other persons or organizations. KASS assigned a random number to each farm that was interviewed. The University of Kentucky researchers received the completed surveys with individuals and farms

identified only by these random numbers.

Before their conducting the telephone survey, 35 KASS enumerators were trained in administering the 40-item Kentucky Tractor Overturn Survey. All participants interviewed were adults ranging from 18 to 85 years. The survey began with an explanation of the study purpose, who was doing the study, and why. It then solicited the participant's verbal informed consent to participate in the interview. The participant was instructed to *not* answer any questions he or she felt uncomfortable with, as well as to end the interview at any time he or she wished. Our experience with similar telephone interviews suggested that the human subjects protection procedures built into the telephone survey would work well. We typically achieve participation rates of around 80% with these types of surveys. In this current study, the 6,063 completed farm surveys represented a 79% response rate. Farmer's primary reason for non-participation was lack of time. No complaints about the survey or the study were received.

Survey results

From the entire random sample of 6,063 farms, 5,512 (90.09%) reported having had no tractor overturns. A total of 551 farms reported having had at least one overturn (9.09%). The overturns spanned the period 1925 to 2002. Of the total 551 overturns, 92 (16.70%) involved ROPS-equipped tractors and 445 (80.76%) involved tractors without ROPS. The overturns of the non-ROPS tractors were distributed as follows: year unknown — 16 (3.52%), 1925 to 1955 — 29 (6.76%), 1956 to 1965 — 62 (13.9%), with the remaining 338 (76.0%) distributed approximately equally within five-year intervals from 1966 to early 2002. Injury outcomes were known for 443 overturns of non-ROPS tractors and distributed as follows: No or minor injury — 312 (70.43%), outpatient medical treatment — 97 (21.90%), hospital admission — 68 (15.35%), temporary disability — 60 (13.54%), permanent disability — 14 (3.16%), and death — 24 (5.42%). Operator gender was male (n=433, 97.96%), female (n=9, 2.04%), with three of unknown gender. The type of tractor stance reported for 400 overturns were distributed as follows: Narrow front end — 166 (41.5%), wide front end — 234 (58.50%), and unknown — 45. The types of overturns reported for 419 events were distributed as follows: on side 90-degree roll — 217 (51.79%), sideways upside down 180-degree roll — 121 (28.88%), sideways roll \geq 360 degrees — 37 (8.83%), backward 180 degree flip — 44 (10.50%), and unknown — 16.

This study provides population-based estimates of the frequencies for six classes of operator injury outcomes resulting from overturns of farm tractors without ROPS as well as the types of overturns. The probability of death during overturns of unguarded tractors is estimated at 24/443 events or 0.0542. This value is eight times smaller than the current commonly accepted value of 0.44 (CDC, 1993). Accurate estimates of the frequency of overturns and their injury outcomes are needed to calculate the cost effectiveness of ROPS promotion programs. Previous estimates of the probability of death during overturns of unguarded tractors may be too high. Population-based estimates of the probabilities of non-fatal outcomes of overturn events have not been available previously.

The frequency and severity of overturn injuries for tractors equipped with ROPS were calculated for the 89 cases in which the injury outcomes were known. Table 1 presents the frequency of the six classes of overturn injury outcomes for tractors without ROPS. Table 2 presents the data for overturns of tractors equipped with ROPS. Comparing the values in the two tables clearly

demonstrates the injury protection provided by ROPS.

Table 3 addresses the nearly identical frequency of operators' temporary disability that results from overturn injuries for tractors without ROPS compared with ROPS-equipped tractors. Temporary disability was recorded as the number of days the tractor operator could not engage in his or her regular farm work after an overturn. Permanent disabling injury cases and deaths were excluded from the category of temporary disability. Inspection of Tables 1 and 2 reveals that the frequency of operator temporary disability is about the same for ROPS-protected as for ROPS-unprotected tractors. However, as can be see from Table 3, the duration of temporary disability is much shorter for operators of ROPS-equipped tractors than for unguarded tractors. This suggests that ROPS dramatically reduce operator injury severity during overturns.

Table 1. Frequency of injury outcomes from overturns of 443 tractors without ROPS.*

Overturn injury outcomes for non-ROPS Tractors	Frequency*	Frequency%
No injury or minor injury — no treatment required	312	70.43
Required treatment by doctor/clinic/hospital	97	21.89
Required hospital admission	68	15.35
Resulted in ≥ 1 day to ≤ 365 days of lost work**	60	13.54
Injury resulted in permanent disability	14	3.16
Injury resulted in death	24	5.42

* Frequency values sum to more than the 443 overturn cases because many individuals who were injured and required treatment also required hospital admission, were temporarily or permanently disabled, or died. Conversely, some who died were never treated or admitted to a hospital. The values in the last column are the fraction of persons in each category divided by the total 443 overturn events.

** Days of work lost: M = 97.8, SD = 122.6, Median = 36 (range 364), Mode =365 (8)

Table 2. Frequency of operator injury outcomes from overturns of 89 ROPS-equipped tractors.*

Overturn injury outcomes for tractors with ROPS	Frequency*	Frequency%
No injury or minor injury — no treatment required	73	82.02
Required treatment by doctor/clinic/hospital	8	9.00
Required admission to hospital	3	3.37
Resulted in > 1 day to < 93 days of lost work*	13	14.61
Injury resulted in permanent disability	0	0.00
Injury resulted in death	1	1.12

* Frequency of treatment events sum to more than the 89 overturn cases because individuals who were injured and required treatment also sometimes required hospital admission, were temporarily disabled, or died. The one death was to a 19-year-old involved in a roadway collision overturn. He was admitted to hospital and died a few days later. The values in the last column are the fraction of persons in each category divided by the total 89 overturn events for

which injury outcomes were known.

** Days of work lost: M = 21.9, SD = 28.5, Median = 7 (range 92), Mode = 1 (3)

Table 3. Days farm work lost from overturn injuries by tractor ROPS status.

Tractor ROPS status	Mean	SD	Median	Range	Mode
No ROPS (n = 60)	97.8	122.6	36	364	365 (8)
With ROPS (n = 13)	21.9	28.5	7	92	1 (3)

D. PROJECT START AND END DATES

September 30, 2003 to September 29, 2004

E. PROJECT ACTIVITIES AND ACCOMPLISHMENTS

This study involved much more than designing and conducting the Kentucky Farm Tractor Overturn Survey. The survey was one of three major activities. Survey data were needed to define more precisely the values for “gaps” in an existing ROPS cost-analysis decision-tree model developed by Myers and Pana-Cryan (2000) and Pana-Cryan (2000). Key among these missing values was the frequency and severity of non-fatal injuries that result from tractor overturns and their associated costs. Other key variables included the probability of annual tractor overturns, and the probability of nonfatal and fatal injury in the event of an overturn.

The second major activity involved cost-analysis and cost-effectiveness studies of three intervention programs that successfully promoted farmers’ acquiring ROPS-protected tractors. All three analyses used the Myers and Pana-Cryan model. The first analysis was of the University of Kentucky community-trials ROPS-promotion program, conducted from January 1997 to January 2000 with two intervention and two control counties. The KY program was found to be cost effective (Myers, et al., 2004). The second analysis was conducted on a natural experiment that occurred during the 1997–2000 Kentucky ROPS intervention project. In one control county an equipment dealer undertook his own ROPS-promotion program after a customer and friend died in an overturn of a tractor without a ROPS. The analysis revealed that the dealers’ efforts did not have as wide an impact but were more cost effective than the larger University-directed community intervention project (Myers et al., in press). The third analysis was conducted using data from the Virginia Farm Bureau statewide ROPS promotion program. That program also was found to be cost effective.

The third major activity followed the analysis and collection of the survey data. This activity involved updating the Myers and Pana-Cryan analytical model with more precise estimates of values for key variables. The revised model was then used to recalculate more accurate cost-effectiveness analyses for various ROPS-promotion programs.

Decision and cost-effectiveness analyses are currently underway to better understand the

distribution of the ROPS-promotion program costs of these three and other intervention programs. These include the costs to farmers, equipment dealers, and society. The improved precision of the cost-analysis analytic model will be useful for similar cost-effective analyses in other states as policy makers promote retrofitting unguarded tractors with ROPS or their replacement with ROPS-equipped tractors.

Study impact

The study results are being used in a major project that seeks to advance the *National Agricultural Tractor Safety Initiative* (2004). A primary goal of this proposed project is to determine the cost of fatal and non-fatal injuries to operators when farm tractors without ROPS overturn and when the tractors are involved in collisions on public roadways. The second is to determine the costs of intervention efforts to prevent these types of tractor-related injuries by equipping all farm tractors with ROPS and seatbelts. The project team consists of accomplished researchers from five universities affiliated with five of the 10 Agricultural Health and Safety Centers. All the researchers have completed studies on various aspects of tractor safety. By combining resources, and by using the findings and methods from these past studies, the proposed project will provide more complete and accurate information about the cost of these injury events and the cost of their prevention.

The study is unique in that the costs of these tractor-related injuries are based on three large independent population-based databases that report not only tractor overturn fatalities but also the frequency, severity, and costs of non-fatal injuries. One of these databases consists of the Kentucky Tractor Overturn Survey data that, in combination with the updated Myers and Pana-Cryan model, is the core foundation for the new National Agricultural Tractor Safety Initiative cost study. The other two databases are two very large sets of worker compensation records, one from the western U.S. and the other from Sweden. The tractor injuries reported in these worker compensation records have detailed medical and non-medical costs that when combined with the Kentucky Tractor Overturn Survey data will provide even better estimates of the medical, non-medical, and indirect costs of tractor overturn injuries and the cost effectiveness of guarding all tractors with ROPS.

The study findings from the Kentucky cost-effectiveness analyses studies and the new findings that will result from the National Tractor Initiative cost study will serve multiple groups. Armed with this information, farmers, farm organizations, farm insurance companies, public health officials, and others may better understand that the relatively small cost of equipping farm tractors with ROPS and seat belts is an effective risk management strategy that protects farmers, their families, and communities from the catastrophic economic and social losses frequently associated with injuries that occur when unguarded tractors overturn or are involved in collisions.

References cited in this progress report

- Browning, S. R., H. Trusczyńska, D. Reed, and R.H. McKnight. (1998). Agricultural injuries among older Kentucky farmers: the Farm Family Health and Hazard Surveillance Study. *Am J Industrial Med.* 33:341-353.
- CDC. (1993). Public health focus: Effectiveness of roll-over protective structures for preventing injuries associated with agricultural tractors. *MMWR* 42(3): 57-59.
- Census of Agriculture. (1997). Kentucky State and County Data, Volume 1, page 22, Table 13. USDA.
- Cole, H. P. (2004, October 1). Costs of tractor operator injuries from overturns and highway collisions. Proposal submitted to CDC/NOISH as part of the *National Agricultural Tractor Safety Initiative* cooperative outreach and intervention project by the Agricultural Centers.
- Cole, H. P. and S. Westneat. (2001). *The Kentucky ROPS Project. Final Technical Report for Partners in Prevention: Promoting ROPS and Seat Belts on Family Farm Tractors.* Southeast Center for Agricultural Health and Injury Prevention, University of Kentucky, Lexington, Kentucky, February 15, 2001.
- Cole, H. P., S. C. Westneat, and M. L. Myers. (2004). Frequency and severity of operator injuries during overturns of farm tractors without ROPS. Technical Paper No. 04-02, Proceedings of the National Institute for Farm Safety Summer Conference, Madison, WI: National Institute for Farm Safety.
- Cole, H.P. (2003). Farmers' perceptions of ROPS and tractor safety: Studies, stories, and statistics. Presented at the February 13-14, 2003 NIOSH Tractor-Related Injury and Death Meeting, Pittsburgh, PA. (Available in the meeting *Record*, pp. 221-228). Morgantown, WV: NIOSH.
- McKnight, R., S. Browning, and D. Reed. (1996). Survivors of farm tractor overturn: A profile from the USA. Paper presented at the Third International Conference on Injury Control, Melbourne, Australia, February 1996.
- Myers, M. L., H. P. Cole, and S. C. Westneat. (2004). Cost-effectiveness of a ROPS retrofit education campaign. *J. Agric. Safety and Health.* 10(2): 77-90.
- Myers, M.L. and R. Pana-Cryan. (2000). Prevention effectiveness of rollover protective structures, Part II: Decision analysis. *J. Agric. Safety and Health.* 6(1): 41-55.
- National Agricultural Tractor Safety Initiative* (2004). Seattle, WA: University of Washington, School of Public Health.
- Pana-Cryan, R. and M. L. Myers. (2002). Cost-effectiveness of Roll-over Protection Structures. *Am Journal Ind Med.* Suppl. 3:1-4.
- Pana-Cryan, R. and M.L. Myers. (2000). Prevention effectiveness of rollover protective structures, Part III: Economic analysis. *J. Agric. Safety and Health.* 6(1): 50-70.

F. PROJECT PRODUCTS

- The 40-item Kentucky Tractor Overturn Survey
- The Kentucky Tractor Overturn Survey data coding dictionary
- The Kentucky Tractor Overturn Survey data file
- The updated Myers and Pana-Cryan decision-analysis and cost-analysis models

1. Presentations

Cole, H.P., Myers, M.L., and Westneat, S.C. (2003) *Cost-effectiveness of a ROPS retrofit education campaign*. University of Kentucky, Center Advisory Committee meeting, Lexington, KY, October 9, 2003.

Cole, H.P. (2003). *Applications of narrative psychology and injury epidemiology to prevent occupational injuries*. Invited keynote address to the Fifth International Symposium, Future of Rural Peoples, Saskatoon, sponsored by Institute of Agricultural Rural and Environmental Health, Saskatchewan, Canada, October 19–23, 2003.

Cole, H.P. (2003). *Effectiveness of narrative approaches to occupational injury prevention interventions*. Paper presented at the National Occupational Injury Research Symposium, Pittsburgh, PA, October 28, 2003.

Myers, M.L. (2003). *Road Compactor Overturn Injury Risk Factors*. Paper presented at the National Occupational Injury Research Symposium, Pittsburgh, PA, October 28, 2003.

Myers, M.L., Cole, H.P., and Westneat, S.C. (2003). *Cost-effectiveness of a dealer's ROPS retrofit program*. Paper presented at the National Occupational Injury Research Symposium, Pittsburgh, PA, October 28, 2003.

Cole, H.P. (2004). *Epidemiology, embedded testing and multi-method approaches to measuring outcomes and impact of community safety education materials and programs*. Invited paper presented at the NIOSH Great Lakes Center for Agricultural Safety and Health, Improving Agricultural Health and Safety Programs Through Evaluation: Rigorous and Practical Strategies. The Ohio State University, Columbus, OH, March 15–16, 2004.

Myers, M.L. (2004). *The evaluation of tractor safety interventions*. Invited paper presented at the NIOSH Great Lakes Center for Agricultural Safety and Health, Improving Agricultural Health and Safety Programs Through Evaluation: Rigorous and Practical Strategies. The Ohio State University, Columbus, OH, March 15–16, 2004.

Myers, M.L. (2004). *Cost-effectiveness of public health interventions*. Health and Safety Summit. Mississippi State University and the Mississippi Farm Bureau, Jackson MS, March 23, 2004.

Myers, M.L. (2004). *Cost of ROPS retrofits*. Georgia Section ASAE Conference, Macon, GA, June 5, 2004.

Cole, H.P., Westneat, S.C., and Myers, M.L. (2004). *Frequency and severity of operator injuries during farm tractor overturns*. Paper presented at the 2004 NIFS Summer Conference, Keystone, CO, June 20–24, 2004.

2. Publications

a. Peer-reviewed journal

Myers, M. L., H. P. Cole, and S. C. Westneat. (2004). Cost-effectiveness of a ROPS retrofit education campaign. *J. Agric. Safety and Health*. 10(2): 77-90.

Myers, M. L., H. P. Cole, and S. C. Westneat. (2004). Cost-effectiveness of a dealer's intervention for retrofitting rollover protective structures. Accepted for publication in *Injury Prevention*, October 12, 2004.

b. Trade journals: none

c. Fact sheets, brochures and technical publications

Myers, ML. (2004) *Compactor Overturns and Rollover Protective Structures*. Report. Silver Spring, Maryland: Center to Protect Workers' Rights. April 2004.
<http://www.cpwr.com/krm Myers.pdf>

d. Other publications

Richardson, C. (2004). Community Partners for Healthy Farming Project/The Kentucky ROPS Project. In R. Volpe and J. Lewko, (Eds.) *Preventing neurotrauma: A casebook of evidence-based practices*, pp. 184–221. Toronto: Ontario Neurotrauma Foundation.

This document is one of seven chapters in the University of Toronto Neurotrauma Casebook. Cynthia Richardson from the University of Toronto is the author of the chapter. The cases were selected as among the seven best evidenced-based practice community interventions in the world. The book is published on CD and is one of a series of community-based, evidence-based practice successful interventions. The Kentucky ROPS project and the other six interventions included in the book are said to already have made an international impact. (See letter from Richard Volpe in the Appendix.)

3. Education, training and outreach

a. Training seminars: none

b. Short courses: none

c. Hazard surveys and consultations

The Kentucky Tractor Overturn Survey — A 40-item telephone survey instrument that collects detailed information on the tractor overturn history of farms. (The survey was used to interview a random sample of 6,063 Kentucky farm operators. The survey measure has also been shared with the University of Iowa and other groups.)

Consultation — Telephone consultation to Max Lum and Melissa VanOrman of CDC on community intervention theory, methods, and strategies. Provided telephone consultation services and reports to staff of the Northeast Center for Agricultural Health and Safety on the planning and evaluation of community-based health and safety interventions.

Served as a member of the editorial board for the *Journal of Agricultural Safety and Health*.

Served as a peer reviewer for technical/scientific articles submitted to the following journals.

- *American Journal of Preventive Medicine*
- *Journal of Agricultural Safety and Health*
- *Journal of Agromedicine*
- *Journal of Rural Health*

d. Newsletters: none

e. CD-ROMs or other computer-based training programs

Tractors, Farm Safety and Economics (revised February 2004). The CD contains the *Kayles' Difficult Decisions* farm safety simulation exercise and the bilingual (Spanish and English) *Preventing Tractor Overturns*. The purpose of the CD is to educate users about the cost of tractor overturn injuries and effectiveness of ROPS and seat belts for preventing these costly injuries.

f. Other: none

4. Conferences and meetings sponsored: none

5. Other Products: none

G. STATES THE PROJECT WAS ACTIVE IN
Kentucky, Virginia

Research project — #2 of 6 core projects

A. PROJECT TITLE

Improving Surveillance of Pesticide and Other Agricultural-Related Poisonings

B. PROJECT OFFICERS

Robert McKnight, MPH, ScD

Southeast Center for Agricultural Health and Injury Prevention

University of Kentucky

1141 Red Mile Road, Suite 102

Lexington, KY 40504-9842

Tel: (859) 323-6836

rmcknig@uky.edu

Phyllis Bryden, RN, MSPH (DrPH candidate)

Pmbryd0@uky.edu

(also at the Southeast Center)

Susan Westneat, MA

Swest1@uky.edu

(also at the Southeast Center)

C. PROJECT DESCRIPTION

The aims of the project are to:

Aim 1: Describe the epidemiological characteristics of agricultural-related chemical exposures (e.g., pesticides and fertilizers) reported from 240 Lower Mississippi River Delta counties during calendar year 2001 and 2002 (retrospective phase)

Aim 2: Work cooperatively with nine poison centers to modify and broaden an existing telephone follow-up interview survey of agricultural poisonings to include exposure and word circumstances for the exposures

Aim 3: Obtain supplemental data on reported agricultural-related chemical exposures through use of a structured telephone interview (prospective phase)

Aim 4: Develop a mechanism to share the results of Aims 1 and 3 with citizens, agricultural extension agents, and health providers in the lower Mississippi River Delta

D. PROJECT START AND END DATES

September 30, 2001 to September 29, 2004

(Although funding has ended, data analysis will continue.)

E. PROJECT ACTIVITIES AND ACCOMPLISHMENTS

Pesticide project meetings

Conference calls — Dec. 2, 2003 and March 8, 2004

A recast of the data search for 2001 and the addition of 2002 data on poisonings from any of the 240 Delta counties received by any of the poison centers serving Delta counties were completed. However, Mississippi continues to have difficulties delivering data because of data harmonization issues as well as HIPAA-related procedural delays. Therefore, Mississippi 2002 data are not yet merged with the other data.

Preliminary descriptive statistics have been calculated on the available 2001 and 2002 retrospective phase data. Case notes have been identified and staff at the Southeast Center are currently reading these reports to determine agricultural relatedness. Because of delays in data procurement, the closing of the poison control center in Memphis, Tennessee, and insurmountable HIPAA issues, we will not conduct the planned prospective phase of the study. Rather, a more thorough analysis of the two-year retrospective data is underway. The analysis of the retrospective data will be presented to the citizens, agricultural extension agents, and health providers of the communities involved, as well as to the Mississippi Delta Commission.

F. PROJECT PRODUCTS

1. Presentations

Bryden, P., McKnight R., and Westneat, S. (2004). *Poison Center Surveillance of Bystander Pesticide Exposures*. In Abstracts, 5th International Symposium on the Future of Rural Peoples, Saskatoon, Canada, October 19-23, 2003; p.T-40. (Full manuscript submitted for peer review for inclusion in the *Journal of Agricultural Safety and Health* January 2005 edition.)

Bryden, P., McKnight, R., and Westneat, S. (2004). *Toxicovigilance of Youth/Adolescent Pesticide Exposures*. (Accepted for oral presentation at the University of Kentucky College of Public Health Inaugural Research Symposium, Lexington, Kentucky, October 25, 2004.)

Bryden, P., McKnight, R., and Westneat, S. (2004). *Therapeutic Error and Pesticide Ingestion: The Role of Lindane*. (Accepted for oral presentation at University of Kentucky College of Public Health Inaugural Research Symposium, Lexington, Kentucky, October 25, 2004.)

Bryden, P., McKnight, R., and Westneat, S. (2004). *Poison Center Surveillance of Bystander Pesticide Exposures*. (Accepted for oral presentation at the University of Kentucky College of Public Health Inaugural Research Symposium, Lexington, Kentucky, October 25, 2004.)

McKnight, R., Bryden, P., and Westneat, S. (2004). *Agricultural Pesticide Poisonings in the Southeast United States*. (Accepted for presentation at the Nordic Meeting on Agricultural Occupational Health (NMAOH), November 29 – December 1, 2004.)

G. STATES THE PROJECT WAS ACTIVE IN

Alabama, Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee

In addition, collaborative efforts have been secured with the following centers and organizations:

- The Southwest Center for Agricultural Health, Injury, and Education — Tyler, TX
- Regional Poison Center, Cardinal Glennon Children’s Hospital — St. Louis, MO
- Arkansas Poison & Drug Information Center — University of Arkansas, Little Rock, AK
- Louisiana Drug and Poison Information Center — University of Louisiana-Monroe, LA
- Kentucky Regional Poison Center — Louisville, KY
- Southern Poison Center — Memphis, TN
- Regional Poison Control Facility — University of Mississippi Medical Center, Jackson, MS
- Alabama Poison Center — Tuscaloosa, AL
- Regional Poison Control Center, Children’s Hospital — Birmingham, AL
- Illinois Poison Center — Chicago, IL

Research project — #3 of 6 core projects

A. PROJECT TITLE

Farmer Suicides: A Nine-Year Analysis in Three Southeastern States, 1990–98: KY, NC, & SC

B. PROJECT OFFICERS

Steven R. Browning, PhD

Co-Principal Investigator
549 College of Nursing
University of Kentucky
Lexington, Kentucky 40536-0232
Tel: (859) 323-6354
srbrown@uky.edu
(also at the Southeast Center)

Robert McKnight, MPH, ScD

Susan Westneat, MA

swest1@uky.edu
(also at the Southeast Center)

C. PROJECT DESCRIPTION

The specific aim of this project is to examine the descriptive epidemiology of farmer suicides in the southeastern states of Kentucky, North Carolina, and South Carolina. Death certificate data were obtained from the National Center for Health Statistics (NCHS) for 1990 through 1998. We will compare the results in Kentucky to a previous study of farmer suicides in Kentucky. We will also perform a comparative analysis among Kentucky, North Carolina, and South Carolina.

D. PROJECT START AND END DATES

September 30, 2001 to September 29, 2004

E. PROJECT ACTIVITIES AND ACCOMPLISHMENTS

The majority of the analyses for the Farmer Suicide Project have been completed and the remaining work for the project includes preparation of a final report and manuscript.

The case distribution of farmer suicide deaths in Kentucky, North Carolina, and South Carolina yielded 645 deaths over the nine-year period under analysis. White males (N=590) composed 91.5% of the reported deaths, with 6.4% of the deaths among black male farmers, and 2.0% of the deaths among females. Consequently, the majority of the analyses were limited to white male farmers in the three states. Of the total, 53% of the suicide deaths occurred in Kentucky, 37.5% in North Carolina, and 9.7% in South Carolina. The primary cause of suicide death (86%) for farmers was use of a firearm compared with 74% of all white males in these states who used a firearm in their death.

We completed development of a database to analyze suicide mortality rates for the farmers in these three states relative to the total white male population. We used data estimating the number of farmers by age groups in each state that were available from the Census of Agriculture reports for 1992 and 1997. For the intercensal years, we interpolated the total number of farmers using linear regression and applied the age-specific distribution of farmers from the census years to generate the age-specific estimates of farmers for each year from 1991–98. For the denominator for the total suicide rate in white males, we used state-specific population estimates from the US Census. The primary comparisons made in the study were between the white male farmer population age 25 years and older and the total white male population. Age-adjusted and age-specific rates for the comparative analyses were calculated using standard methods and are presented graphically in the final report. A Poisson regression analysis was undertaken to generate incidence density ratios to evaluate the risk factors for suicide mortality in the study and evaluate the temporal trends. Selected results from the analyses are given below.

Selected results

Table 1 presents the crude and adjusted suicide mortality rates by state, comparing the farmers with all white males. Age-adjusted rate comparisons between farmers and total males indicate that farmer suicide rates were higher than total male rates in all three states. The rates were significantly higher in Kentucky and North Carolina, with a rate difference of 18.6 deaths per 100,000 persons per year in North Carolina. While North Carolina had the highest farmer suicide mortality rate of the three states in the study, the largest burden of suicide cases was in Kentucky.

Table 1. Crude and adjusted suicide mortality rates for white males compared with white male farmers for three southern States, 1990–98.

State	Crude rate per 100,000 (All white males/ Census denom)	Crude rate per 100,000 (White male farmers /Ag stat denom)	Age-adjusted rate (White male farmers/referent: white male population for state) (95% CI)	Rate difference (Farmers – total per 100,000 per year)
Kentucky	31.15	39.24	39.50 (34.3-45.1)	8.35
North Carolina	29.53	47.26	48.09 (39.63-57.44)	18.56
South Carolina	32.16	30.48	35.51 (22.47-51.43)	3.35

Figure 1.

Comparison of suicide rates for white male farmers and total white male population in three southern states by calendar year (Age adjusted and smoothed rates)

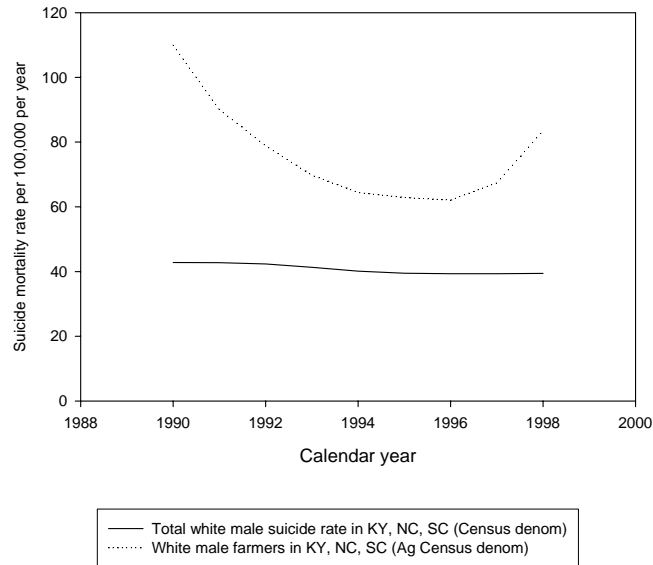


Figure 1 provides a comparison of the suicide rates for white male farmers and the total white male population by calendar year. The elevated suicide mortality rate for farmers is evident over the entire period of the study compared with the white male rate. Since 1990, on average, there was a modest decline in the farmer suicide mortality rate, although a slight increase may be evident at the end of the decade.

Figure 2.

White male farmer suicide mortality rates by calendar time and state from 1990-1998.

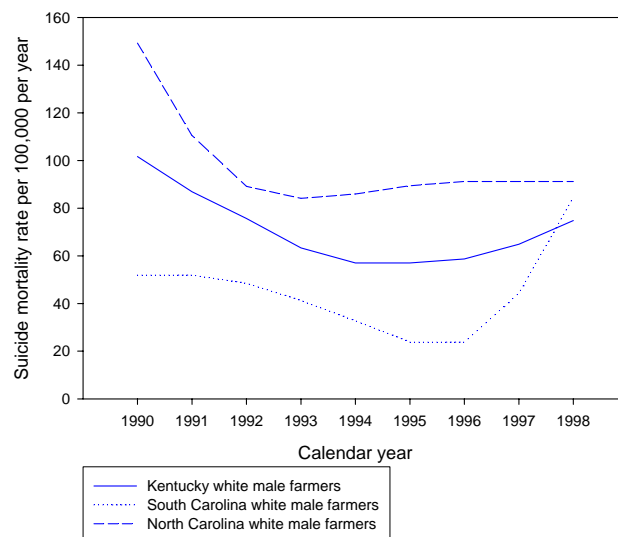
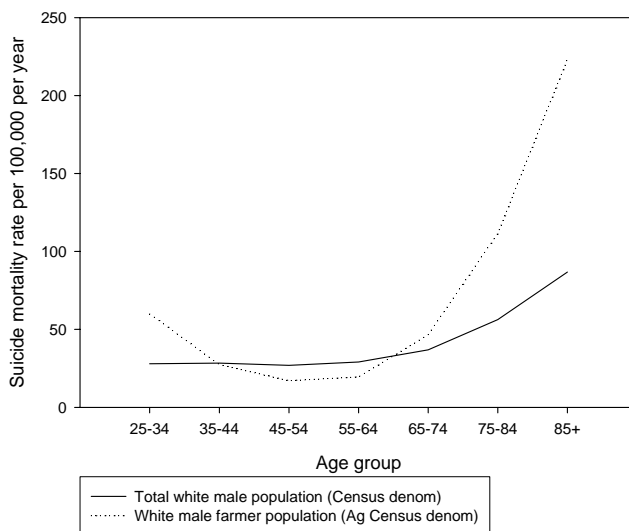


Figure 2 illustrates the changing pattern in suicide mortality rates over the study period in the three states. The decline in rates in the early 1990s is apparent in all three states. The white male farmer rates are consistently highest in North Carolina and lowest in South Carolina over the study period. There is some indication of an increase in the rates near the end of the decade, particularly in South Carolina, although the rates for this state are less stable given the small number of farmer suicide deaths in South Carolina, about three to four annually.

Figure 3.

White male suicide mortality rates in three Southern States by Age Group.
Comparison of total population to farmers 1990-1998.
(Rates adjusted for calendar year)



In confirmation with other work in the farmer suicide literature, the finding that older white male farmers (>75years) are at an increased risk of suicide compared with the total white male population is apparent from the data in Figure 3. Farmers in the 75-84 age group are approximately twice as likely to die from suicide as the total white male population is, and farmers age 85+ are four times more likely to die from suicide. The adjusted incidence density ratios, which confirm the graphical finding, are given in Table 2 below. Suicide mortality rates for white male farmers in North Carolina are significantly higher than either Kentucky or South Carolina, after adjustment for age and calendar year (Table 2).

Table 2. Poisson Regression Analysis for White Male Farmer Suicides in Kentucky, North

Carolina, and South Carolina, 1990–98.

Variable	Incidence density ratio	95% confidence limits
State		
Kentucky	0.82	.64–0.99
North Carolina	1.00	-----
South Carolina	0.62	0.32–0.91
Age group		
25-34	1.0	-----
35-44	0.51	0.17–0.85
45-54	0.32	0.04–0.67
55-64	0.38	0.03–0.72
65-74	0.86	0.55–1.17
75-84	2.06	1.76–2.36
85+	4.01	3.66–4.36

Poisson regression analysis, controlling for age group, state, and calendar year.

Conclusions

The results of this study confirm the increased risk of suicide mortality among white male farmers compared with the total white male population in these three southern states. The increased risk of suicide death is significantly elevated among farmers age 75 years and older. The use of a firearm is the primary cause of death for the majority of the cases. White male farmer suicide mortality rates vary substantially by state and over time. The elevated rate of white male farmer suicides in North Carolina requires further explanation and is likely associated with a complex of social, economic, cultural, and temporal factors. It is evident that interventions in the prevention of suicide need to be directed to older male farmers who consistently have higher suicide mortality rates than similar males in other occupations. These interventions need to address and target their access to firearms as the primary contributing cause of death.

IRB approval (IRB # 01-0780-P2B) is valid through December 2, 2004.

F. PROJECT PRODUCTS

1. Presentations

Preliminary data were presented at the Southeast Center for Agricultural Health and Injury Prevention’s External Advisory Committee meeting in October 2003.

Accepted for presentation during the report period

McKnight, R. (2004). *Suicide Among Older Farmers in Kentucky, USA: 1990–98*.

Second International Symposium on Work Ability, Verona, Italy. October 18–20, 2004.

Browning, S. (2004). *Farmer Suicide Deaths in Kentucky, North Carolina, and South Carolina: 1990–1998*, Research seminar – College of Nursing, University of Kentucky. November 19, 2004.

2. Publications

Publication of a manuscript titled “Suicide Mortality Among Farmers in Three Southeastern States from 1990–1998” is in preparation and will be submitted to the *American Journal of Industrial Medicine*.

3) Education, training, outreach: none

G. STATES THE PROJECT WAS ACTIVE IN
Kentucky, North Carolina, and South Carolina

Education project — #4 of 6 core projects

A. PROJECT TITLE

Nurse Agriculture Education Project

B. PROJECT OFFICER

Deborah B. Reed, PhD

553 College of Nursing/HSLC

University of Kentucky

Lexington, KY 40536-0232

Tel: (859) 257-9636

dbreed01@uky.edu

C. PROJECT DESCRIPTION

The intent of the proposed project is to provide multiple venues for learning about agricultural health and safety in a cost- and time-effective manner and encourage local stakeholders (nurse educators, researchers, and nursing students) to adapt and develop content that is culturally suited for their areas.

Aim 1: Increase nurses' awareness of the magnitude of farm-related injuries

Aim 2: Complete an assessment of how nurse educators would use and currently use agricultural curriculum within their course work

Aim 3: Provide formats for nurse educators/researchers to learn about agricultural illness/injury and prevention

Aim 4: Develop instructional materials on agricultural illness/injury prevention for use in undergraduate and graduate nursing curricula

Aim 5: Provide opportunities for graduate nursing students to complete research and dissertations focusing on agricultural health

D. PROJECT START AND END DATES

September 30, 2001 to September 29, 2006

E. PROJECT ACTIVITIES AND ACCOMPLISHMENTS

Two undergraduate nursing students were awarded scholarships: Megan Popielarczyk (KY) received a student poster award at the Southern Nursing Research Society Annual Conference; Hadley Jenner (VA) received an award for her work on the research study "Poultry Roxarsone Use and Public Health Impact in Rockingham County, Virginia."

The second biennial survey of schools of nursing was completed in July 2004 (N=109). Analysis is currently underway.

F. PROJECT PRODUCTS

1. Presentations

Reed, D.B. *Agriculture curriculum and knowledge development in nursing schools in the Southeast USA* (oral). Future of Rural Peoples: Rural Economy, Healthy People, Environment, Rural Communities: Fifth International Symposium, Saskatoon, SK, Canada, October, 2003.

Reed, D.B. and Davis, L. *Discovering agri-nursing education and research* (oral). Gamma Omicron Chapter at Large (nursing honor society), 25th Anniversary Conference, Charleston, South Carolina, March 2004.

2. Publications

a. Peer-reviewed journal

Agriculture-focused issue of *American Association of Occupational Health Nurses' Journal*, September 2004 (Volume 52, issue 9)

Reed, D.B. (2004). Caring for the families that feed the world. *American Association of Occupational Health Nurses' Journal*, 52(9), 361-362. (Invited Guest Editorial).

Reed, D.B. (2004). The risky business of production agriculture. *American Association of Occupational Health Nurses' Journal*, 52(9), 401-409. (CE article).

Journal of Nursing Education

Reed, D.B., Hoffman, C. and Westneat, S.C. Nurses' agricultural education in the southeast United States. Submitted Jan. 23, 2004 to the *Journal of Nursing Education*. Accepted May 18, 2004.

b. Trade journals: none

c. Fact sheets, brochures or technical publications: none

d. Other publications: none

3. Education, training and outreach

a. Training seminars

Campus visits with introduction to agricultural health/safety and faculty consultations – Eastern Mennonite University School of Nursing (February 2004); Medical University of South Carolina (March 2004); Georgia Southern University College of Nursing (May 2004).

b. Short courses: none

c. Hazard surveys and consultations

University of Oklahoma — National AgrAbility Project: assessing what health professionals need to know regarding disability and rehabilitation of farmers (continued from previous year).

d. Newsletters

Southern Connection, Spring 2004. This is the newsletter of the Southern Nursing Research Society. The featured article was about the PI's research in agricultural health and safety and, in particular, this project.

e. CD-ROMs or other computer-based training programs

A Web-based CE course was submitted to the UK College of Nursing Continuing Education Department in September 2004.

f. Other

Display/exhibit Southern Nursing Research Society Annual Conference, Louisville, KY, February 2004.

“What's a Nurse Needs to Know about Farming.” Six-hour CE offered through Eastern Kentucky University, October 10, 2003.

“Peanuts, Poultry, Peaches and Practitioners.” One hour CE offering at the Georgia Southern University Nurse Practitioner Annual update, May 20, 2004.

4. Conferences and meetings sponsored: none

5. Other products

Consultation with Dr. Sharon Lock, UK College of Nursing, resulted in a feasibility study awarded through the Southeast Center in August 2004. This is Dr. Lock's first endeavor in the agricultural health area. The intended outcome of the survey of rural nurse practitioners is to develop appropriate and desired agricultural health continuing education.

G. STATES THE PROJECT IS ACTIVE IN

Kentucky, Tennessee, Alabama, Georgia, Maryland, West Virginia, Virginia, Florida, Texas, Louisiana, Missouri, North Carolina, and South Carolina

Education project — #5 of 6 core projects

A. PROJECT TITLE

Health of Agricultural Populations Emphasis Area

B. PROJECT OFFICER

Robert McKnight, MPH, ScD

Southeast Center for Agricultural Health and Injury Prevention

University of Kentucky

1141 Red Mile Road, Suite 102

Lexington, KY 40504-9842

(859) 323-6836

rmcknig@uky.edu

C. PROJECT DESCRIPTION

The Health of Agricultural Populations (HAP) Emphasis Area is a trans-departmental, three-course sequence that allows University of Kentucky College of Public Health students from any division within the College (health behavior, statistics, environmental health, health services management, epidemiology, and aging) to add an agricultural health emphasis to any track. Each of the three courses can be used to meet elective requirements within the required curriculum.

Students also arrange practicum experiences in agencies or areas related to agricultural populations and their capstone projects involve research on agricultural populations. It is expected that graduates with this emphasis area will be employed in county and state health departments, Cooperative Extension offices, colleges of agriculture and public health, as well as federal agencies such as EPA, NIOSH and USDA. The skills acquired at the MPH and DrPH levels will allow graduates to maintain leadership roles in agricultural health, particularly in areas of needs assessment, policy development and translational research.

D. PROJECT START AND END DATES

September 30, 2001 to September 29, 2006

E. PROJECT ACTIVITIES AND ACCOMPLISHMENTS

In March 2004, a supplemental grant proposal, entitled “Enhancement of Health of Agricultural Populations Curriculum,” was submitted to NIOSH. It was approved in August 2004. The grant proposal was prepared by Nancy Johnson, MSPH, CIH, as part of her practicum experience undertaken in association with the Southeast Center.

The supplemental grant is intended to enhance the ongoing HAP project by modifying the project in four ways. First, it will add Web-based distance learning to the three core courses in the HAP sequence. Second, an Agricultural Safety and Health (ASH) graduate certificate will be created, based on the three core courses, which will award nine hours of graduate credit and which can be transferred toward coursework required for the MPH or DrPH degrees, should the student choose to pursue a graduate degree. Third, the supplemental dollars will establish annual competitive HAP Scholar awards within the UK College of Public Health, providing two DrPH students each with \$3,825 in tuition support and \$1,500 in research funds, and three MPH

students each with \$2,835 in tuition support and \$1,000 in research funds. Fourth, once the ASH graduate certificate is established, the supplemental grant will provide six ASH grants of \$1,000 each to support travel and other expenses for students pursuing an ASH certificate. The enhancement was designed to broaden participation in the HAP emphasis area and facilitate inclusion of working professionals in public health, medicine, nursing, allied health, agricultural science education, and Cooperative Extension. It is expected that the enhancements will increase overall enrollment in the Health of Agricultural Populations curriculum from the current six students to at least 18 by September 2006.

SPH 778/998 — *Health of Agricultural Populations* will be offered in spring 2005 with the intention of offering an online version concurrently with the didactic course. It is expected that on-campus participants will provide real-time feedback on content delivery and interactive features. As a number of students are faculty at the University of Kentucky, they should provide reliable and constructive feedback.

Initial contacts are beginning to solicit contributions to *Advanced Issues in Agricultural Health*, a clinically oriented course covering medical issues relevant to agricultural populations. Upon completion, this and the other courses comprising the three-course sequence will be submitted for approval as a graduate certificate and accredited for medical continuing education units. Contacts are being made with stakeholder representatives to ensure that courses will meet standards for dual accreditation, including representatives of Area Health Education Centers, the UK College of Nursing, the UK Colleges of Medicine and Pharmacy, and the UK Agricultural Extension office.

At this time, two of the three courses in the HAP curriculum have been developed and offered.

- 1) SPH 810 — *Injury Epidemiology and Control* (3 hrs) examines conceptual issues related to injury and injury prevention, with emphasis on the Haddon Matrix. Last offered spring 2003; may be offered summer 2005.
- 2) SPH 778/998 — *Health of Agricultural Populations* (3 hrs) is an introductory seminar that examines a broad range of issues related to agricultural safety and health, supplemented with an exceptional array of guest speakers. Last offered spring 2003; to be offered again in spring 2005.
- 3) A third course, *Advanced Issues in Agricultural Health*, will cover agriculture-related diseases, such as hearing loss, pesticide poisoning, green tobacco sickness, and asthma, as well as agricultural injuries. These topics, not covered in-depth in the introductory survey course, will provide a strong foundation in disease recognition, causation, and prevention strategies.

To meet graduation requirements, students then participate in lengthy practicums at agencies with agricultural health applications. This experience often provides a basis or data collection point for the student's "capstone project," the equivalent of a thesis or dissertation in other graduate programs.

Phyllis Bryden, MSPH, RN (DrPH candidate)

- 1) *DrPH student practicum* — Ms. Bryden completed 240 hours of doctoral field experience at the Southeast Center for Agricultural Health and Injury Prevention with Dr. Robert McKnight as preceptor. Activities participated in and topics addressed included:
 - NIH workshop on investigator-initiated small grants (R03) and exploratory research grants (R21)
 - IRB requirements for Southeast Center projects
 - Procedures for collecting, obtaining, and using data from the UK trauma registry
 - Review of agricultural injury E-codes
 - Presentation and preparation of a manuscript on bystander pesticide exposures
- 2) *DrPH capstone project* — “Surveillance of Pesticide Exposures in the United States Mississippi River Delta Region: Assessing the burden among youth aged 6 to 19 years.” Ms. Bryden is conducting a retrospective study to obtain information on the distribution and determinants of pesticide poisoning exposures by youth and adolescents within this area over a two-year sampling period (2001 and 2002). This study will make use of underutilized poison control center data to make recommendations for community control measures and pesticide exposure prevention strategies specific to this unique population.

Nancy Johnson, MSPH, CIH (DrPH candidate)

- 1) *DrPH student practicum* — Ms. Johnson completed 240 hours of doctoral field experience at the Southeast Center for Agricultural Health and Injury Prevention with Dr. Robert McKnight as preceptor. Activities participated in and topics addressed included:
 - Development of a white paper on university-based graduate education in agricultural health and safety and the potential application of graduate courses as a means of promoting translational research
 - Preparation of a supplemental grant proposal, entitled “Enhancement of Health of Agricultural Populations Curriculum”
- 2) *DrPH capstone project* — “Asthma and Chronic Bronchitis in Older Working Kentucky Farmers: Linking Objective and Subjective Data.” Ms. Johnson is analyzing data collected from 1993 to 1995 by researchers at the University of Kentucky as part of a five-state research project known as the Farm Family Health Hazard Surveillance Study. Ms. Johnson’s study will look at pulmonary function data in relation to reported exposures and reported asthma symptoms in a cohort of actively working Kentucky farmers aged 56 – 90 to make recommendations for asthma control and data collection relative to the “healthy worker” effect.

Maria Gomez, BS (MPH candidate)

- 1) *Conferences attended*
 - 2004 National Symposium on Agricultural Health and Safety, Keystone Resort, Colorado, June 2004
 - 7th World Conference on Injury Prevention and Safety Promotion, Vienna, Austria, June 2004
- 2) *Practicum project* — Field experience involves developing strategies to improve health access among Hispanic migrant workers

Whitney Katirai, BA (MPH candidate)

- 1) *Conferences attended*
 - I-CASH Agricultural Occupational Health Training, Iowa City, May 2004
 - Rural Health Association Annual Conference, San Diego, CA, May 2004
 - 7th World Conference on Injury Prevention and Safety Promotion, Vienna, Austria, June 2004
- 2) *Practicum project* — Field experience involves working with Area Health Education Centers and the *promotoras*, who work with the Hispanic agricultural population in Lexington, KY

F. PROJECT PRODUCTS

1. Presentations

- 1) Presentations on the HAP scholar awards and the HAP curriculum were made at the orientation meetings for incoming University of Kentucky College of Public Health masters- and doctoral-level students. Additional information was presented to current doctoral students at colloquium meetings. At least ten graduate students have taken applications for the HAP scholar award; awards will be made December 1, 2004.
- 2) Bryden, P. (2003). *Poison Control Centers Surveillance of Bystander Pesticide Exposures*. Fifth International Symposium: Future of Rural Peoples, Saskatoon, Saskatchewan, Canada, October 19-23, 2003.
- 3) Johnson, N. (2004). *Expanding the Research to Practice Links in the Health of Agricultural Populations Curriculum Emphasis Area*. Oral presentation. University of Kentucky, College of Public Health Inaugural Research Symposium, Lexington, Kentucky. (Accepted in September 2004.)

2. Publications

a. Peer-reviewed journal: none

b. Trade journals: none

c. Fact sheets, brochures and technical publications: none

d. Other publications: none

3. Education, training and outreach

a. Training seminars (*attended by students*)

- 1) Iowa's Center for Agricultural Safety and Health (I-CASH) Agricultural Occupational Health Training, May 19-21, 2004. (*Phyllis Bryden and Whitney Katirai attended.*)
- 2) University of Kentucky Student Rural Health Association. Assisted in the creation of the association. (*Phyllis Bryden currently serves as vice-president and attends monthly meetings.*)
- 3) Kentucky Farmworker Outreach advisory board member. (*Phyllis Bryden is a member.*)

b. Short courses: none

c. Hazard surveys and consultations: none

d. Newsletters: none

e. CD-ROMs or other computer-based training programs: none

f. Other: none

4. Conferences and meetings sponsored: none

5. Other products: none

G. STATES THE PROJECT WAS ACTIVE IN
Kentucky

Prevention/intervention project — #6 of 6 core projects

A. PROJECT TITLE

Partnering with Stakeholders for Prevention: Regional Outreach and Capacity Building

B. PROJECT OFFICERS

Principal Investigator
(Sept. 29, 2003 to June 30, 2004)
Robert H. McKnight, MPH, ScD
Director
Southeast Center for Agricultural
Health and Injury Prevention
University of Kentucky
1141 Red Mile Road, Suite 102
Lexington, KY 40504-9842
Tel: (859) 323-6836
Fax: 859-254-3760
rmcknig@uky.edu

Principal Investigator
(July 1, 2004 to Sept. 30, 2004)
Henry P. Cole, EdD
Senior Researcher
Southeast Center for Agricultural
Health and Injury Prevention
University of Kentucky
1141 Red Mile Road, Suite 102
Lexington, KY 40504-9842
Tel: (859) 323-5202
Fax: (859) 254-3760
hcole@uky.edu

Because of the departure of the person previously assigned to this role, Dr. McKnight served as the principal investigator for the Stakeholders Project from September 29, 2003 until June 30, 2004. As of July 1, 2004, Dr. Cole assumed responsibility for the project.

C. PROJECT DESCRIPTION

Stakehold-er (*n*) — a person or group with a direct interest, involvement, or investment in something, for example, the employees, shareholders, and customers of a business concern

Part-ner (*n*) — somebody who takes part in an activity or undertaking with somebody else¹

Overview and Perspective

The Southeast Center's Stakeholder Project cultivates local and regional partnerships among a wide array of individuals and groups involved in agricultural production; labor; business; health, human and community services; policy; and research. The focus is on maintaining and improving the health and safety status of the target audience most at risk for agricultural-related illness and injury. Special populations of interest include farm children, farmwomen, older farmers, and both full-time and part-time seasonal farm workers and their family members. The target audience also includes typical farm operations as well as limited resource and minority farmers, who often work under impoverished conditions with limited access to educational, financial, and health services.

The Southeast Center's Stakeholder Project involves making and maintaining contact with

¹ *Encarta World English Dictionary*

members of these groups. It is from these interactions that working partnership relationships develop. The partnerships increase awareness of the plights and needs of the members of these target audiences and available resources to address these problems. This information is shared with members of the target audience as well as with individuals and groups that provide educational, health, and business services to at-risk farm workers and their families. The result is an ongoing dialog among those most at risk of farming-related illness and injury and others whose knowledge and technical and professional services can lower risks and improve health through a variety of community-based preventive intervention efforts.

The business and professional individuals and groups with whom we work also are stakeholders. Farm equipment dealers, farm supply businesses, financial services, farm service agencies, local community health care providers, health departments, local employers, public schools, and similar groups have a direct involvement and interest in maintaining and improving the health of farm community members. The collaborations that develop involve many partners from both ends of the continuum. On one end are the farm workers and family members at risk of work-related injury and illness. On the other end are the farm policy, service, and research professionals who are empowered with resources and knowledge that can be applied to lessen health disparities and improve the wellbeing of those who labor to produce the food and fiber essential to our economy. In the middle are the farm businesses, producer groups, and farm organizations that play a large role in educating and shaping farmers attitudes and knowledge about production, finances, markets, and equipment. Partners in these groups also can be effective advocates for farm safety and health (Brandt et al., 2001; Struttmann et al., 2001; Myers, Cole, and Westneat, 2004).

Throughout its history, the Southeast Center has fostered and nurtured these types of multi-partner collaborative community-based participatory outreach, intervention-prevention research, and capacity-building efforts. These collaborations are the foundation on which the Center's outreach, education, and research projects are grounded. The Stakeholder Project activities during the past year continue this tradition. These Center projects are funded by an array of sources, including CDC/NIOSH, USDA, and the Kentucky Department of Vocational Rehabilitation.

Specific Aims

The specific aims are to combine the cultural knowledge and values of farm populations with the technical, scientific, and professional knowledge and resources of human service providers, academics, and researchers. The aims emerged from well-established prior community-based prevention theory and research (Anyagbunam et al., 1999; Campbell, 1995; Cole, 1997, 2002; Cornwall and Jewkes, 1995; Dewey, 1988, 1993; Gochman, 1997; Green et al., 1995; Isreal et al., 2001; Minkler and Wallerstein, 2003; Privette and Cole, 2003; Richardson, 2004; Wallerstein 1992; Wallerstein and Weinger, 1992).

1. Identify and build relationships with individuals and groups that represent the at-risk farm populations (World 1 knowledge — the practical knowledge farmers apply in the everyday world in which they live and work).
2. Identify and involve researchers, policy makers, and farm and community service agencies and professionals who have the necessary knowledge and resources to

- improve the health and safety of the at-risk target population (World 2 knowledge — the theoretical, conceptual and technical knowledge in which scientists, researchers, and professionals are educated in academic programs across a variety of disciplines).
3. Seek funding from a variety of agencies and foundations to support a variety of surveillance, outreach, and intervention projects that combine World 1 and World 2 knowledge to generate new World 3 knowledge by which to address both long-standing and emergent health threats to agricultural workers and their families.
 4. Develop coalitions across Worlds 1 and 2 that result in community-based collaborative projects and activities that generate World 3 knowledge by which to address high-frequency and high-severity agricultural health and safety problems.
 5. Evaluate the outcomes and impact of these collaborations.
 6. Disseminate the methods, results, and products to various stakeholder groups and serve as a resource/consultation service to interested individuals and groups.

The integration of World 1, World 2, and World 3 knowledge is commonly referred to as translating theory and research into practice (TRTP)². Karl Popper (1972) originated the three-world conceptualization that underlies the evolution of new knowledge through the interaction of practical and theoretical knowledge. Berierter (1994) and other scholars (Barab and Plucker, 2002) describe why educational interventions that attempt to present World 2 knowledge to members of World 1 populations have limited effectiveness. Effective community education interventions require collaboration between those workers equipped with World 1 practical knowledge and academics and professionals equipped with formal organized systems of World 2 knowledge. When individuals from these two worlds (the practical and the theoretical) collaborate, the result is new World 3 knowledge with potential to improve both theory and practice.

Although he does not reference Popper or Berierter, Murphy, (2003) makes the same points in his recent book *Looking Beneath the Surface of Agricultural Safety and Health*. He notes that for more than 60 years researchers have known how to prevent farming-related injuries and have developed engineering and policy controls that are very effective in doing so. He notes that health and safety educational efforts directed to farm populations mainly have been information giving. In most cases, farm workers already knew this information. Those who plan and conduct farm safety education often ignore the social, economic, and cultural constraints that cause farmers to routinely engage in unsafe work practices. The planning and the delivery of farm safety and health educational interventions have rarely involved collaborations between at-risk agricultural workers and researchers. In the last two chapters of his book Murphy describes the need for new approaches to translate existing knowledge about farm health and safety to practice. What he suggests are collaborative efforts similar to those outlined above.

During the last year, the specific Stakeholder Project objectives were pursued through six Center activities. These included:

- 1) Playing key roles in conceptualizing and writing the *National Agricultural Tractor Safety Initiative* (2004).

² NIOSH currently refers to “translating theory and research into practice” or “TRTP” as “r2p” — “research to practice.”

- 2) Conceptualizing and spearheading the development of a multi-Center, multi-partner social marketing program to take the *National Agricultural Tractor Safety Initiative* document and plans to target audience stakeholders in multiple states.
- 3) Conceptualizing and spearheading a multi-Center empirical study that will provide detailed data about the frequency and costs of fatal and non-fatal injuries to operators during tractor overturns, the costs of these injuries, and how these costs are distributed across farm workers, owners, medical and health insurers, lenders, farm-service and supply businesses, communities, and society at large.
- 4) Conceptualizing a public health community partners educational intervention program to reduce the frequency and severity of farming-related injuries to rural youth in four Kentucky counties.
- 5) Continuing to assist and empower local county coalitions in Kentucky and Tennessee to deliver and evaluate preventive outreach education and health care services to Hispanic farm workers and other Hispanic immigrant populations.
- 6) Continuing to provide consultation and information dissemination services to a wide range of individuals and groups, including other Center researchers; health professionals and organizations; agricultural Extension Agents and farm organizations; CDC and NIOSH researchers and program administrators; college and university students; faculty and administrators in public health, nursing, medicine, agriculture and biosystems, engineering; and academic and professional disciplines; among others.

The outcomes and products related to each of these six activities are described in the *Project Activities and Accomplishment* section. Three of the activities led to the development of new proposals, one of which was funded as of October 2004 and the other two are pending funding.

D. PROJECT START AND END DATES

September 29, 2001 to September 30, 2006

E. PROJECT ACTIVITIES AND ACCOMPLISHMENTS

Each of the six accomplishments related to Stakeholder Project activities during September 29, 2003 to September 30, 2004 are described briefly.

The National Agricultural Tractor Safety Initiative

Throughout the year, Drs. McKnight and Cole worked with the other Center Directors and the Tractor Initiative Document Committee to conceptualize, plan, debate, and write the Centers' *National Agricultural Tractor Safety Initiative*. Cole and McKnight headed the epidemiology writing team.

A Social Marketing Campaign to Promote Tractor Safety

Because of our work on the tractor initiative, the Southeast Center spearheaded the development of a multi-Center, multi-stage social marketing proposal that was submitted to CDC/NIOSH at the end of September 2004. During the current year, developing the proposal required collaboration with colleagues at four other Centers over an eight-month period.

The goal of the proposed 24-month project is to initiate the incremental development of a community-based social marketing program for the promotion of selected aspects of the *National Agricultural Tractor Safety Initiative*. The project will focus on involving grassroots farm community members in the refinement of the *Initiative* and its recommendations, in identifying the most influential local media and communication channels for promoting the *Initiative*, and in developing and pre-testing a prototype social marketing toolkit for promoting selected aspects of the *Initiative*. Thirty-six focus groups totaling 324 participants in at least nine geographically diverse states will be used to interact with farm community members during the project. Focus group participants will be selected from principal farm operators, farm managers, farm women, and those who provide business, social, and professional services to farmers (Cooperative Extension, equipment dealers, and those who work in insurance, health care, financial services, farm supply, etc.). The project represents an extension of the extensive and successful work already done by the Southeast Center under the KY ROPS 1 and ROPS 2 projects that developed, field tested, and evaluated several messages and strategies for promoting roll-over protective structures (ROPS) for farm tractors (Myers, Cole, and Westneat, 2004a). The objectives of the proposed pilot project are: 1) Present the *National Agricultural Safety Initiative* to farmers and grassroots farm community leaders during focus groups to obtain information about farm community members' perceptions of the *Initiative* and its recommendations; 2) Collaborate with participants in each focus group to identify local community media and communication channels that the participants believe influence farmers' and farm community leaders' decisions related to ROPS and seat belts and tractor highway safety issues; 3) Pretest and evaluate a package of social marketing strategies and messages with the members of these focus groups.

The project partners and performance sites are listed below.

- Southeast Center for Agricultural Health and Injury Prevention, University of Kentucky, (Principal Investigator Dr. Chike Anyaegbunam, Co-Investigators Dr. Robert McKnight, Dr. Henry Cole)
- NIOSH Office of Health Communication, Washington DC
- Northeast Center for Agricultural Health, Cooperstown, NY
- National Children's Center for Rural and Agricultural Health and Safety, Marshfield, WI
- High Plains Intermountain Center, Fort Collins, CO
- Southern Coastal Agromedicine Center, Greenville, NC
- Southwest Center for Agricultural Health, Tyler, TX
- Western Center for Agricultural Health, University of California, Davis
- Great Plains Center for Agricultural Health, University of Iowa, IA
- Pacific Northwest Agricultural Safety and Health Center, University of Washington

Calculating the Multiple Costs of Tractor Overturn Injuries

This project also resulted from several months of collaborative interactions with Directors and researchers at the other Agricultural Centers. The proposal was submitted to NIOSH in late September 2004.

This project focuses on two activities for advancing the *National Agricultural Tractor Safety Initiative*. The first is to determine the cost of fatal and non-fatal injuries to operators when farm tractors without roll bars (also known as rollover protective structures or ROPS) overturn and when tractors are involved in collisions on public roadways. The second is to determine the costs of intervention efforts to prevent these types of tractor-related injuries. The primary and most effective intervention method is to equip all farm tractors with ROPS and seatbelts. In combination, these two simple devices keep tractor operators in a protected zone during overturns and collisions. When tractors without ROPS are involved in overturns or collisions operators frequently are severely injured or killed from being crushed by the tractor or ejected from the tractor seat. This proposal addresses the costs of these injuries and the costs of their prevention. The project team consists of accomplished researchers from five universities affiliated with five of the 10 Agricultural Health and Safety Centers and two NIOSH researchers. All the researchers have completed studies on various aspects of these two topics. By combining resources, and by using the findings and methods from these past studies, this project will provide more complete and accurate information about the cost of these injury events and the cost of their prevention. The study is unique in that the costs of these tractor-related injuries is based on three large independent population-based databases that report not only tractor fatalities but also the frequency, severity, and costs of non-fatal injuries. The study findings and products will serve multiple groups. Armed with this information, farmers, farm insurance companies, public health policy makers and others will better understand that the relatively small cost of equipping farm tractors with ROPS and seat belts is an effective risk management strategy that protects farmers, their families, and communities from the catastrophic loss frequently associated with injuries that occur when unguarded tractors overturn or are involved in highway collisions.

The project team members are listed below.

- Henry Cole, EdD, Educational Psychologist, Professor Preventive Medicine, University of Kentucky, Principal Investigator
- Melvin Myers, BS, MPA, Agricultural Engineer/Cost Engineer, University of Kentucky, Co-Principal Investigator
- Susan Westneat, MS, Epidemiologist, Data Analyst, University of Kentucky
- Michael Schulman, PhD, Professor of Sociology, NCSU, researcher South Coastal Center
- Paul Leigh, PhD, Professor of Health Economics, UC Davis, researcher
- John Myers, MS, Health Statistician, NIOSH Division of Safety Research
- John Etherton, Senior Research Safety Engineer, NIOSH Division of Safety Research
- John Rosecrance, PhD, Assistant Professor, Colorado State University, HI-CAHS
- Risto Rautiainen, PhD, Assistant Professor, Deputy Director Great Plains Center for Agricultural Health, University of Iowa

Preventing Farming-related Injuries to Rural Youth

This project was planned and the proposal submitted during the 2003–04 Stakeholder Project year. The project was funded beginning October 1, 2004 and is currently underway. A summary of the project is included here because it is an outcome of months of collaboration with many stakeholders.

This project has three long-term objectives.

- 1) Lower injury rates from tractor overturns, run-overs, and collisions with motor vehicles — three major contributors to Kentucky’s 80/100,000 farm-workers deaths/year.
- 2) Target rural high school students age 16–19 years, the group at greatest risk of farming-related injuries and the next generation of farmers and community leaders whose attitudes and behavior are key to improved safety and lower injury rates.
- 3) Work with rural high school teachers and students and partners from other rural farm community groups to build a sustainable and replicable coalition that promotes farm and community safety as critical to community economic and public health well-being.

Cases depicting high frequency injury events will be presented as interactive multimedia simulations in 11th and 12th grade high school social studies classes as part of the state-specified curriculum content in economics and practical living. Using two Excel computer programs, teachers and students will analyze the cases with a farm financial planning tool and an injury cost-analysis program. As part of class assignments students will present the cases to adult farmers in their community to demonstrate the huge economic and social costs of these preventable injury events and the cost effectiveness of investing in safety equipment and practices. The goal is to illustrate how investing in ROPS and seat belts, machine guarding, defensive driving, a no-extra-riders-on-tractors policy, and other safety behaviors are cost-effective from an individual farmer perspective and from a larger social perspective. Three key questions will guide the teachers’ and students’ inquiry and their interactions with farm community members: (1) Who in this community is at risk of these types of injuries? (2) What are the costs of these injuries and who bears these costs? (3) In what ways can these injuries be prevented and why is it cost effective to do so? The coalition partners include high school teachers, state education department content specialists, a UK research team, two private corporations, and the Kentucky Farm Bureau among others. The study design includes a pre and post repeated-measures ANOVA on intervention county students’ scores on economics and practical living concepts as measured by annual KY statewide competency tests as well as scores on three other tests that measure changes in thinking, behavior, and critical reasoning.

Project Researchers and Community partners involved in this project include

- PI Henry Cole, EdD, Preventive Medicine, University of Kentucky
- Co-PI Joan Mazur, PhD, Curriculum and Instruction, University of Kentucky
- Co-PI Steve Isaacs, PhD, Agricultural Economics, University of Kentucky
- Melvin Myers, MPA, Cost Engineer, University of Kentucky

- Susan Westneat, MS, Data Analyst, University of Kentucky
- Laura Blanctifori, PhD, Agricultural Economist, NIOSH Morgantown
- Ted Scharf, PhD, Research Psychologist, NIOSH Cincinnati, Taft Laboratory
- Southeast Center for Agricultural Health and Injury Prevention, Lexington, KY
- University of Kentucky, Colleges of Agriculture, Education and Public Health
- Kentucky Department of Education, Frankfort, KY
- Kentucky Council of Social Studies Teachers
- Springfield Sun Times newspaper
- Anderson Circle Farm, Harrodsburg, KY (Belcan Partners LLC)
- Kentucky Farm Bureau
- Administrators, technology coordinators, teachers, and students from
 - Anderson County High School, Lawrenceburg, KY
 - Marion County High School, Lebanon, KY
 - Mercer County High School, Harrodsburg, KY
 - Woodford County High School, Versailles, KY

A High School-based Agriculture Media Project

Using funds from the Stakeholder Project, a new outreach feasibility study was funded to assist the Kentucky Partnership for Farm Family Health and Safety. This non-profit organization in Bowling Green, Kentucky, will conduct outreach activities among high school students in a 10-county area of southern Kentucky. The project, titled “Addressing Agriculture Health and Safety Issues Through a High School Applied Learning Project,” is described in Section IV on feasibility projects.

Coalitions that Provide Outreach and Health Care to Hispanic Workers

Funds in the Stakeholder Project have been used to expand the capacity of a four-year, USDA Fund for Rural America project housed in the Center. This project is developing community-based coalitions that seek to improve health care access for migrant farmworkers and other recent Hispanic immigrants. The sites include Shelby and Montgomery Counties in Kentucky and Bedford and Shelby Counties in Tennessee. The project is conducted in partnership with the University of Tennessee, Kentucky State University, the University of Kentucky Cooperative Extension Service, and numerous local community agencies in the four counties. The Southeast Center was instrumental in helping the Montgomery County Health Department revise and resubmit a \$600,000 rural health access grant to HRSA in September 2004. If funded in May 2005, this grant will provide primary medical and dental services for migrant farmworkers and other recent immigrants in Montgomery County, Kentucky. The Center has provided technical expertise of Dr. McKnight and others, as well as expertise of an MPH student (Maria Gomez) to the Kentucky coalitions. Additionally, the Center sponsored two meetings in the past year related to the project, a three-day meeting of the Tennessee and Kentucky coalitions on October 1, 2, and 3, 2003, and a joint meeting of the two Kentucky coalitions on July 13, 2004. Both Kentucky coalitions were assisted in January 2004 to write \$5,000 grants to the Foundation for Healthy Kentuckians, for increasing health outreach and access to farmworkers and other Hispanic immigrants and their populations. Both of these mini grants were funded by the Foundation.

The community partners involved in this project include:

- Kentucky State University — Frankfort, Kentucky
- Centro Latino — Shelbyville, Kentucky
- Montgomery County Health Department — Mt. Sterling, Kentucky
- Cooperative Extension Office — Shelby County, Kentucky
- Cooperative Extension Office — Montgomery County, Kentucky
- Cooperative Extension Office — Bedford County, Tennessee
- Cooperative Extension Office — Coffee County, Tennessee
- Montgomery County Fire Department
- Montgomery County Police Department
- Mary Chiles Hospital — Mt. Sterling, Kentucky

Additionally, an advisory committee for the project includes stakeholders affiliated with the Tennessee Office of Rural Health, Tennessee Office of Primary Care, Kentucky Primary Health Association, and other agencies.

Consultation and Information Dissemination

Throughout the year the Southeast Center has provided information and consultation assistance to many individuals and organizations. Some of these are listed below.

- Researchers, faculty, and graduate students at many Centers and universities within and outside our region. These interactions typically involve providing information, assistance in planning and developing research proposals and projects, and putting people in touch with others who can assist them in specific ways.
- Serving as professional journal editorial and peer-review manuscript reviewer.
- Serving on CDC and other agencies as members of proposal review teams.
- Providing expert advice and consultation to CDC program administrators and researchers.
- Providing leadership and expertise in the development of the University of Kentucky College of Public Health application for National Accreditation, and especially in developing the Health of Agricultural Populations emphasis within the overall MPH and DRPH program.
- Serving as keynote speakers at national and international research symposia and meetings concerned with the health and safety of agricultural populations.
- Serving as member of national study groups concerned with safety and public health.
- Assisting other colleagues and organizations in planning regional and national conferences concerned with the health of agricultural populations.

Some examples of these activities are listed in *Project Products*.

References cited for this section

The citations listed below are articles and studies that describe the concepts and methods upon which the Stakeholders Project is based.

Anyaegbunam, C. and Kamlongera, C. (2002). Writing with the people: An empowering communication approach to sustainable rural development. *Journal of Development Communication*, 13, 1-14.

Anyaegbunam, C., Mefalopulos, P., and Moetsabi, T. (1999). Facilitating grassroots participation in development: New training models and techniques. In White Shirley (ed.). *The art of facilitating participation: Releasing the power of grassroots communication*. New Delhi: Cornell University and Sage.

Barab, S.A. and Plucker, J.A. (2002). Smart people or smart contexts? Cognition, ability and talent development in an age of situated approaches. *Educational Psychologist*, 37, 165-182.

Bereiter, C. (1994). Constructivism, socioculturalism, and Popper's World 3. *Educational Researcher*, 23(7), 21-23.

Brandt, V.A., Struttmann, T.W., Cole, H.P., and Piercy L.R. (2001). Delivering health and safety education messages for part-time farmers through local businesses and employers. *Journal of Agromedicine*, 7, 23-30.

Campbell, J. (1995). *Understanding John Dewey. Nature and co-operative intelligence*. Chicago: Open Court.

Centers for Disease Control and Prevention (CDC) National Center for HIV, STD, and TB Prevention. (2002). *The Prevention Marketing Initiative*. Available at: <http://www.cdc.gov/hiv/projects/pmi/>

Cole, H.P. (2004). *Epidemiology, embedded testing and multi-method approaches to measuring outcomes and impact of community safety education materials and programs*. Invited paper presented at the NIOSH Great Lakes Center for Agricultural Safety and Health, Improving Agricultural Health and Safety Programs Through Evaluation: Rigorous and Practical Strategies. The Ohio State University, Columbus, OH, March 15–16, 2004.

Cole, H.P. (2002). Cognitive-behavioral approaches to farm community safety education: A conceptual analysis. *Journal of Agricultural Safety and Health*, 8, 145-159.

Cole, H. P. (1997). Stories to live by: A narrative approach to health-behavior research and injury prevention. In D. S. Gochman (Ed.), *Handbook of health behavior research methods: Vol. 4*. (pp. 325-349). New York: Plenum.

Cornwall A. and Jewkes R. (1995). What is participatory research? *Social Science Medicine* 41, 1667-76.

Dewey, J. (1933). *Democracy and education. An introduction to the philosophy of education* (1966 edition). New York: Free Press.

Dewey, J. (1938). *Experience and nature* (1963 edition). New York: Collier Books.

Green, L.W., George, A., Daniel, M., Frankish, C.J., Herbert, C.P., Bowie, W.R., and O'Neil, M. (1995). *Study of participatory research in health promotion: Review and recommendations for the development of participatory research in health promotion in Canada*. Institute of Health Promotion Research, the University of British Columbia and the BC Consortium for Health Promotion Research for the Royal Society of Canada.

Gochman, D. S., Ed. (1997). *Handbook of health behavior research methods: Vol. 1 Personal and social determinants, and Vol. 4 Relevance for professionals and issues for the future*. New York: Plenum.

Isreal, B.A., Schulz, A.J., Parker, E.A., and Becker, A.B. (2001). Community-based participatory research: Policy recommendations for promoting a partnership approach in health research. *Education for Health, 14*(2), 182–197.

Minkler, M. and Wallerstein, N. (Eds). (2003). *Community-based participatory research for health*. San Francisco: Jossey-Bass.

Myers, M.L. (2004). *Cost-effectiveness of public health interventions*. Health and Safety Summit. Mississippi State University and the Mississippi Farm Bureau, Jackson MS, March 23, 2004.

Myers, M.L. (2004). *The evaluation of tractor safety interventions*. Invited paper presented at the NIOSH Great Lakes Center for Agricultural Safety and Health, Improving Agricultural Health and Safety Programs Through Evaluation: Rigorous and Practical Strategies. The Ohio State University, Columbus, OH, March 15–16, 2004.

Myers, M.L., Cole, H.P., and Westneat, S.C. (2004a). Cost-effectiveness of a dealer's intervention for retrofitting rollover protective structures. Accepted for publication in *Injury Prevention*, October 12, 2004.

Myers, M.L., Cole, H.P., and Westneat, S.C. (2004b). Cost-effectiveness of a ROPS retrofit education campaign. *Journal of Agricultural Safety and Health, 10*:77-90.

National Agricultural Tractor Safety Initiative. (2004). Seattle, WA: University of Washington, School of Public Health.

Popper, K.R. (1972). *Objective knowledge: An evolutionary approach*. Oxford: Clarendon Press.

Privette, C.V. III and Cole H.P. (2003). Tractor safety using the SC ROPS Program. *Journal of Extension, 41*(6), 1-14.

Richardson, C. (2004). Community Partners for Healthy Farming Project/The Kentucky ROPS Project. In R. Volpe and J. Lewko, (Eds.) *Preventing neurotrauma: A casebook of evidence based practices*, pp. 184–221. Toronto: Ontario Neurotrauma Foundation.

Struttman, T.W., Brandt V.A., Morgan S.E., Piercy L.R., and Cole H.P. (2001). Equipment dealers' perceptions of a community-based ROPS campaign. *Journal of Rural Health*, 17, 131-140.

Wallerstein, N. (1992). Powerlessness, empowerment, and health: Implications for health promotion programs. *American Journal of Health Promotion*, 6: 197-205.

Wallerstein, N. and Weinger, M. (1992). Health and safety education for worker empowerment. *American Journal of Industrial Medicine*, 22, 619-635.

F. PROJECT PRODUCTS

1. Presentations

Cole, H.P. (2003). *Applications of narrative psychology and injury epidemiology to prevent occupational injuries*. Invited keynote address to the Fifth International Symposium, Future of Rural Peoples, Saskatoon, sponsored by Institute of Agricultural Rural and Environmental Health, Saskatchewan, Canada, October 19–23, 2003.

Cole, H.P. (2003). *Effectiveness of narrative approaches to occupational injury prevention interventions*. Paper presented at the National Occupational Injury Research Symposium, Pittsburgh, PA, October 28, 2003.

McKnight, R.H. (2003). *Defining Agromedicine: What it is—What it Should Be*, presented at Agromedicine Pre-Summit Workshop, Jackson, Mississippi, November 7, 2003.

Myers, M.L., Cole, H.P., and Westneat, S.C. (2003). *Cost-effectiveness of a dealer's ROPS retrofit program*. Paper presented at the National Occupational Injury Research Symposium, Pittsburgh, PA, October 28, 2003.

Claunch, D.T. and Reed, D.B. (2004). *How children Learn About Farm Safety*, International Seminar on Occupational health and Safety in Agriculture, University College Dublin, July 27, 2004. Invited presentation.

Cole, H.P. (2004). *Epidemiology, embedded testing and multi-method approaches to measuring outcomes and impact of community safety education materials and programs*. Invited paper presented at the NIOSH Great Lakes Center for Agricultural Safety and Health, Improving Agricultural Health and Safety Programs Through Evaluation: Rigorous and Practical Strategies, The Ohio State University, Columbus, OH, March 15–16, 2004.

McKnight, R.H. (2004). *Finding and Securing Funding for Agricultural Health and*

Safety. Invited seminar, School of Public Health and School of Nursing, Georgia Southern University, Statesboro, Georgia, April 15, 2004.

McKnight, R.H. (2004). *Promoting Safe Agricultural Communities: Activities of the North American Agromedicine Consortium*, 13th International Conference on Safe Communities, Prague, Czech Republic, May 31–June 3, 2004.

McKnight, R.H. (2004). *Identifying and Securing Funding to Address Issues Affecting Rural Workers and Industries*, Health and Safety Summit sponsored by Mississippi State University Extension Service, March 23-24, 2004.

McKnight, R.H. (2004). *Tips for Successful Grant Writing* presented at Kentucky and Tennessee Latino Health Access Coalition 3rd Multi-State Annual Conference, Fall Creek Falls State Park, Tennessee, October 27-29, 2004.

McKnight, R.H. (2004). Lunch seminar/discussion on Agricultural Health with Rural Medical Scholars Program students, University of Alabama, Tuscaloosa, September 10, 2004.

McKnight, R.H. (2004). *NIOSH Agricultural Centers Tractor Safety Initiative*, presented at Southern Region Farm Safety Symposium #2, Tennessee Cooperative Extension Service, September 20, 2004.

McKnight, R.H. (2004). *Overview of NIOSH Initiatives in Agricultural Health and Safety*, Southern Regional Farm Safety Symposium #1, Tennessee Cooperative Extension Service, Tennessee May 10, 2004.

McKnight, R.H. (2004). *Projects and Activities of the Southeast Center for Agricultural Health and Injury Prevention*, Southern Regional Farm Safety Symposium #1, Tennessee Cooperative Extension Service Nashville, Tennessee May 11, 2004.

McKnight, R.H. (2004). *Activities at the Southeast Center for Agricultural Health and Injury Prevention*, presented to faculty at Georgia Southern University, Statesboro, Georgia, April 15, 2004.

Myers, M.L. (2004). *The evaluation of tractor safety interventions*. Invited paper presented at the NIOSH Great Lakes Center for Agricultural Safety and Health, Improving Agricultural Health and Safety Programs Through Evaluation: Rigorous and Practical Strategies. The Ohio State University, Columbus, OH, March 15–16, 2004.

Myers, M.L. (2004). *Cost-effectiveness of public health interventions*. Health and Safety Summit, Mississippi State University and the Mississippi Farm Bureau, Jackson MS, March 23, 2004.

Myers, M.L. (2004). *Cost of ROPS retrofits*. Georgia Section ASAE Conference, Macon, GA, June 5, 2004.

Reed, DB. (2004) — *In response to inquiry and continued e-mail communication with John MacNamara of Teagasc (Kilkeeny, Ireland) and with the University Industry Centre (Dublin, Ireland), a one-day seminar on agricultural Health and Safety was developed. The conference was attended by well over 100 participants and discussion was lively. Presentations are listed below. Because of this program the Irish Safety Board is developing a plan to pilot test farm safety daycamps next year. Electronic communication is ongoing.*

Reed, D.B. (2004) *Current Perspective on Research on Health and Safety in the USA*, International Seminar on Occupational Health and Safety in Agriculture, University College Dublin, July 27, 2004. Invited presentation.

Reed, D.B. (2004). *Health and Safety Profiles of farmers over 50 years old*, International Seminar on Occupational Health and Safety in Agriculture, University College Dublin, July 27, 2004. Invited presentation.

Reed, D.B. (2004). *Mental health of Rural Teenagers*, International Seminar on Occupational Health and Safety in Agriculture, University College Dublin, July 27, 2004. Invited presentation.

Reed, D.B., Claunch, D., Rayens, M.K., and Slusher, D. (2004). *Evaluation of Community-based Farm Safety Education for Children*, Sigma Theta Tau International Research Conference, Dublin, Ireland. July, 24-26, 2004.

Rennekamp, R. and McKnight, R.H. (2004). *Improving Health Care Access for Rural Hispanic Populations*, USDA Children, Youth, and Families at Risk Conference (CYAFR) Seattle, Washington, May 11-14, 2004.

2. Publications

a. Peer-reviewed journal

Privette, C.V. III and Cole H.P. (2003). Tractor safety using the SC ROPS Program. *Journal of Extension*. 41(6), 1-14.

Frank, A.L., McKnight, R.H., Kirkhorn, S.R., and Gunderson, P. (2004). Issues of agricultural safety and health. *Annual Review of Public Health*. 25:225-45.

Myers, M. L., H. P. Cole, and S. C. Westneat. (2004). Cost-effectiveness of a dealer's intervention for retrofitting rollover protective structures. Accepted for publication in *Injury Prevention*, October 12, 2004.

Spengler, S.E., Browning, S.R., and Reed, D.B. (2004). Sleep deprivation and injuries in part-time Kentucky farmers. *AAOHN Journal*. 52(9):373-82.

b. Trade journals: none

c. Fact sheets, brochures and technical publications

Projects of the Southeast Center for Agricultural Health and Injury Prevention

NIOSH Agricultural Health and Safety Centers National Agricultural Tractor Safety Initiative, prepared for USDA Southern Regional Agricultural Safety Meeting, Nashville, Tennessee, September 2004.

d. Newsletters

Article published in *Ag Connections*, NIOSH Agricultural Research Centers Update, “Working Together to Deliver Services,” Volume 2, number 1.

Article Submitted to *Ag Connections*, NIOSH Agricultural Research Centers Update in September 2004, “*Agricultural Education and Outreach at the Southeast Center*” (publication planned October 04); Volume 2, number 3.

e. Other publications

Richardson, C. (2004). Community Partners for Healthy Farming Project/The Kentucky ROPS Project. In R. Volpe and J. Lewko, (Eds.) *Preventing neurotrauma: A casebook of evidence-based practices*, pp. 184–221. Toronto: Ontario Neurotrauma Foundation.

3. Education, training and outreach

a. Training seminars: none

b. Short courses: none

c. Hazard surveys and consultations: none

d. Newsletters: none

e. CD-ROMs or other computer-based training programs

Tractors, Farm Safety and Economics (revised February 2004) — This CD contains the *Kayles’ Difficult Decisions* farm safety simulation exercise and the bilingual Spanish and English *Preventing Tractor Overturns*. The purpose of the CD is to educate users about the cost of tractor overturn injuries and effectiveness of ROPS and seat belts for preventing these costly injuries. It is a key part of the Preventing Farm Injury to Rural Youth community intervention and outreach project.

Preventing neurotrauma: A casebook of evidence-based practices — This book, published by the University of Toronto and the Ontario Neurotrauma Foundation, is also available on CD. The seven cases included in the book were selected as among the best worldwide community-based interventions to reduce neurotrauma injury. The cases are model approaches that can be adapted by

other researchers in health and safety intervention efforts. The studies included in the casebook already have had a positive international impact. Details about the search and selection procedures for studies included in the Casebook are found in its first chapter. Cynthia Richardson authored Chapter 7 titled *Community Partners for Healthy Farming Project/The Kentucky ROPS Project*. Her chapter describes in detail the project outreach and intervention theory and methods as well as how the program was evaluated.

f. Other: none

4. Conferences and meetings sponsored

Southern Regional Farm Safety Symposium # 1, in cooperation with USDA – CSRESS, and the University of Tennessee Cooperative Extension Service, Nashville, Tennessee, May 10–12, 2004.

Southern Regional Farm Safety Symposium #2, in cooperation with USDA – CSRESS, and the University of Tennessee Cooperative Extension Service, Nashville, Tennessee, September 20–21, 2004.

5. Other products: none

G. STATES THE PROJECT WAS ACTIVE IN

Alabama, Colorado, Florida, Georgia, Illinois, Iowa, Kentucky, Mississippi, New York, North Carolina, Ohio, South Carolina, Texas, Tennessee, and Virginia

IV. PROGRESS REPORT ON FEASIBILITY PROJECTS

During the past year, the Center had six feasibility projects. Four projects were initiated and two other projects were completed this year. Of the six feasibility projects, three were research, two were prevention/intervention, and one was educational. These feasibility projects are described in the following section.

Research project — #1 of 6 feasibility projects

A. PROJECT TITLE

The Epidemiology of *Helicobacter pylori* in a Selected Population of Southeast Georgia Farmworkers

B. PROJECT OFFICER

Catherine Reavis, EdD, APRN, BC
Family Nurse Practitioner
Associate Professor
Georgia Southern University
PO Box 8158
Statesboro, Georgia 30458
Tel: (912) 681-5739
creavis@georgiasouthern.edu

C. PROJECT DESCRIPTION

Helicobacter pylori is a destructive pathogenic microbe that causes painful and dangerous disease in humans. However, the pathogenesis of *H. pylori* is poorly understood. This exploratory research project is an epidemiological study to determine the prevalence of *H. pylori*, its relative risk, and related co-factors that contribute to gastritis (with and without a positive diagnosis of *H. pylori*) in a population of Hispanic farmworkers in Southeast Georgia.

This study surveyed 150 southeast Georgia farmworkers and sampled water from five wells serving these workers to:

- 1) Determine the prevalence of gastritis in the region, with or without a diagnosis of *H. pylori* gastritis.
- 2) Report co-factors associated with gastritis and *H. pylori* gastritis.
- 3) Determine the relationship between contaminated water and the prevalence of gastritis and *H. pylori* gastritis.
- 4) Report the relative risk of *H. pylori* gastritis from well water contaminated with *H. pylori*.

D. PROJECT START AND END DATES

October 30, 2002 to October 29, 2003

E. PROJECT ACTIVITIES AND ACCOMPLISHMENTS

Survey data were collected from a selected population of 150 Hispanic farmworkers, who were 18 years or older, lived in their present housing for at least the past month, and who understood Spanish or English.

Methods

1. Informed consent from farmworkers was obtained before administering the survey, with \$20 incentives given to each participant.
2. Five wells were randomly selected from three counties in Georgia.
3. One-hundred and fifty farmworkers from counties clustered around the selected five common water sources were asked to volunteer for the study. (A cluster was defined as farmworkers who live around a common water source in similar housing and similar working conditions.)
4. Farmworkers were assisted in filling out the survey, with help as needed from Spanish-speaking interpreters from Southeast Georgia Communities Project.
5. Ten water samples were sent to the Wisconsin State Laboratory of Hygiene to determine if they were contaminated with *H. pylori*.

The response variable in the analysis was symptoms of gastritis with or without a positive diagnosis of *H. pylori* gastritis. Data were analyzed using nonparametric regression with the following variables: well-water analysis, response variable (symptoms of gastritis with or without a positive diagnosis of *H. pylori*), selected demographics, living conditions, past medical history, dietary habits, hygiene, and crops worked.

Data analysis determined that

1. The prevalence of gastritis with a positive diagnosis of *H. pylori* was 14.6%.
2. There was a statistically weak positive association between well water contaminated with *H. pylori* and a positive diagnosis of *H. pylori* ($p=0.07$).
3. Farmworkers who drank well water contaminated with *H. pylori* had a higher risk ($OR=2.6$, $p=0.07$) of clinical symptoms of gastritis.
4. There is a weak relationship between contaminated drinking water and the co-factor of eating hop peppers each day to symptoms of *H. pylori* gastritis.

F. PROJECT PRODUCTS

1. Presentations

“The epidemiology of *Helicobacter pylori* in a population of southeast Georgia farmworkers.” October 2003, University of Kentucky, Southeast Center for Agricultural Health and Injury Prevention Annual Meeting.

2. Publications – Manuscripts are being prepared. Grants have been submitted to the EPA, USDA CSREES, NIH/NIOSH Small Grants Award, and Georgia Southern University for further research on *H. pylori*.

3. Education, training and outreach

The research results of this feasibility study have been translated to clinical practice in the following ways:

- We recommended that patients who test positive for *H. pylori* gastritis treat their wells.

- We collaborated with the Endoscopy Center for Southeast Georgia in planning future research and making similar recommendations for patients with *H. pylori* gastritis.

4. Conferences and meetings sponsored

Conference, April 2004. Georgia Southern University. “Agromedicine in Southeast Georgia.” Guest Speaker: Dr. Robert McKnight.

G. STATES THE PROJECT WAS ACTIVE IN

Georgia

Research project — #2 of 6 feasibility projects

A. PROJECT TITLE

Asthma in Kentucky and North Carolina Farm Children: A Pilot Proposal

B. PROJECT OFFICERS

Steven R. Browning, PhD

Co-Principal Investigator
549 College of Nursing
University of Kentucky
Lexington, Kentucky 40536-0232
Tel: (859) 323-6354
srbrown@uky.edu

Patricia V. Burkhart, PhD, RN
Co-Principal Investigator
517 College of Nursing
University of Kentucky
Lexington, Kentucky 40536-0232
Tel: (859) 323-6253
pvburk2@pop.uky.edu

C. PROJECT DESCRIPTION

Studies have reported the reduced risk of asthma and allergy for children from farming families compared with their peers from non-farming families. However, in the United States, very limited work has addressed the issue of asthma and allergic diseases among farm children. The environmental determinants of and the triggers for asthma and allergies among children living and working on U.S. farms have been given limited attention. In Kentucky, more than half of farm youth under 18 years of age are involved in farm work at least six months a year. The influence of this work on their occupational exposures and respiratory health is a research area of increasing concern.

We proposed to:

1. Develop and pilot test a questionnaire focused on asthma symptoms, developmental risk factors, triggers for asthma, symptom management, and quality of life issues in children who reside on farms in the southeastern United States.
2. Enumerate a sample frame of farm households with asthmatic children (cases) and non-asthmatic children (controls) using a household enumeration survey that will provide a sufficient sample size for a case-control study of the developmental risk factors for asthma and triggers of asthma in children.
3. Develop the research infrastructure needed for a population-based case-control study that potentially will encompass children from farms in diverse geographic locations and different farm commodities in the southeastern United States.

The proposed study will be one of the few investigations to explore the prevalence of and risk factors for childhood asthma in a population-based sample of rural children in the United States. The data to be obtained from this feasibility study will be used to develop an R01 application for the prevalence-based, case-control study.

D. PROJECT START AND END DATES

August 2004 to September 2005

E. PROJECT ACTIVITIES AND ACCOMPLISHMENTS

The “Farm Asthma Project” received funding from the Southeast Center for Agricultural Health and Injury Prevention in August 2004 for the pilot project. The pilot project received substantive peer review of the proposal with a recommendation for funding. The primary critique of the original proposal was the investigator’s decision to use the Kentucky Cattleman’s Association membership roster as the primary sampling frame for the study. The reviewers thought that this unnecessarily limited the study to a select group of beef cattle farms in the state. Since receiving the critiques of the reviewers, we have made substantial changes to the study design, which we discuss below.

To date, we have worked on the development of a questionnaire to address the risk factors for developing asthma and the triggers for asthma in a population of children residing on farms. We are using the funding from the pilot study to develop and test the questionnaire as a telephone survey. The pilot sample is being obtained from the membership roster of participants in 4-H in four counties in Kentucky. The access to this population is being arranged through the College of Agriculture at the University of Kentucky. A screening form with a letter explaining the study will be mailed to the members in these four counties in late 2004. Currently, the IRB application is awaiting approval before we can begin data collection.

In tandem, we are working on the development of an R01 application to look at these issues in the state of Kentucky and North Carolina. The sampling frame being developed for the larger application will make use of the sample of farms in the Agricultural Statistics database in these two states. We are working collaboratively with statisticians at the University of Kentucky and the National Ag Statistics Service in developing the sampling plan for the study. The final study is intended to yield 300 asthmatic children in each state with a 2:1 matched control group for the prevalence-based case-control study.

F. PROJECT PRODUCTS

To date, we have developed a survey on risk factors, self-management, and quality of life for children with asthma who live on farms.

G. STATES THE PROJECT WAS ACTIVE IN

Kentucky and North Carolina

Research project — #3 of 6 feasibility projects

A. PROJECT TITLE

Airborne Exposure to Pathogens and Endotoxins During Farmland Application of Class “B” Biosolids

B. PROJECT OFFICERS

Kevin G. Robinson, PhD

Dept. of Civil & Environmental Engineering
219A Perkins Hall
University of Tennessee
Knoxville, TN 37996
Tel: (865) 974-0722
kgr@utk.edu

Carolyn H. Robinson, PhD, MPH, RN
College of Nursing
243 Nursing Building
University of Tennessee
Knoxville, TN 37996
Tel: (865) 974-7616
crobins1@utk.edu

C. PROJECT DESCRIPTION

Farmland application of biosolids is a widely used, practical option for managing the large volume of sewage sludge generated at municipal wastewater treatment plants. Because airborne organic particles originating from Class B biosolids (sewage sludge) can potentially transmit enteric microorganisms and their irritants, there is growing concern within occupational and agricultural settings about exposure to these agents. Although a limited number of population studies have indicated some association between sludge exposure and health response, such associations were inconsistent among the many comparisons made and sometimes confounded with other variables. A complete understanding of exposure to airborne biological materials generated during farmland application of Class B biosolids is currently unrealized partly because of a lack of reliable quantitative information. Because of the limited data available, it is difficult to adequately address many of the contaminant exposure concerns expressed regarding farmland application of biosolids.

This work will attempt to fill the data gap by providing preliminary scientific information to address occupational exposure issues concerning biosolids that have been recently raised. Specifically, this study will assess occupational exposure by quantifying airborne release of particles containing pathogens and endotoxins during Class B biosolids farmland application. The experimental work will involve field-scale research that will focus on critical control points (transfer, storage and spreading) for potential release and dispersal of the target biological agents. Personal and area samplers will be used to gauge respirable particle exposure at multiple locations. A number of biosolids application sites will be monitored to assess the impact of different agricultural operations and environmental conditions on particle/bioagent exposure

levels.

D. PROJECT START AND END DATES

July 1, 2003 to July 31, 2004

E. PROJECT ACTIVITIES AND ACCOMPLISHMENTS

All field sampling and analysis have been completed. Results indicate potentially high endotoxin exposure levels to agricultural workers applying biosolids to farmlands. These results have been reported in 2004 as podium presentations at an agricultural health conference and an engineering seminar series. The results will be presented as a poster at a national public health conference in November 2004. Additionally, results from this research were used in a proposal submitted in response to a request by the U.S. EPA. The proposal entitled “Airborne Dispersal and Health Impacts of Endotoxins Released from Land Application of Biosolids” is currently under consideration for funding. Last, this research will form the foundation for an environmental engineering Master of Science degree thesis. The thesis will be completed in December 2004.

F. PROJECT PRODUCTS

1. Presentations

Robinson, KG and Robinson, CH. 2003. “Airborne Exposure to Pathogens and Endotoxins During Farmland Application of Class B Biosolids.” Podium presentation, Southeast Center for Agricultural Health and Injury Prevention, University of Kentucky, Lexington, KY (October 2003).

Robinson, KG, Rahman, M and Robinson, CH. 2004. “Endotoxin and Pathogen Exposure During Farmland Application of Class B Biosolids.” Podium presentation, 2004 National Symposium on Agricultural Health and Safety, Keystone, Colorado (June 2004).

Rahman, M, Robinson, KG and Robinson, CH. 2004. “Airborne Release of Endotoxin and Pathogens During Farmland Application of Class B Biosolids.” Podium presentation, 2004 Environmental Engineering Seminar Series, University of Tennessee, Knoxville, TN (September 2004).

Robinson, CH, Robinson, KG and Rahman, M. 2004. “Occupational Exposure to Respirable Particles Released During Environmental Recycling of Class B Biosolids.” Poster presentation. (*Accepted for presentation at the 132nd Annual Meeting of the American Public Health Association, Washington, DC in November 2004*).

Proposals Pending

“Airborne Dispersal and Health Impacts of Endotoxins Released from Land Application of Biosolids.” U.S. Environmental Protection Agency, \$419,683, Kevin G. Robinson, Carolyn H. Robinson, Joshua Fu, Mary R. English, Gary S. Saylor, 2004-07 (submitted).

G. STATES THE PROJECT WAS ACTIVE IN

Tennessee

Prevention/intervention project — #4 of 6 feasibility projects

A. PROJECT TITLE

Addressing Agriculture Health and Safety Issues Through a High School Applied Learning Project

B. PROJECT OFFICERS

J. David Dunn, MPH, DrSc

Board Chairman

Kentucky Partnership for Farm Family Health and Safety

Western Kentucky University

1 Big Red Way

Bowling Green, KY 42101

Tel: (270) 745-6395

david.dunn@wku.edu

Staci Simpson

Project Director

WKU Institute for Rural Health and Safety

Western Kentucky University

1 Big Red Way

Bowling Green, KY 42101

Tel: (270) 745-8815

staci.simpson@wku.edu

C. PROJECT DESCRIPTION

The Kentucky Partnership for Farm Family Health and Safety is sponsoring a media contest open to all high school students in the ten-county Barren River Area Development District. Students will develop 30-second Public Service Announcements for radio and/or television. The Public Service Announcements will address agricultural/rural health and safety issues. A panel of three to five individuals who have expertise in agricultural health and safety, marketing, and broadcasting will judge the contest. Cash prizes will be awarded to first place winners in each of the four categories, as well as prizes for the sponsoring teacher. In addition, honorable mention cash prizes will be awarded for each of the four categories. The first place winners in each category will have their public service announcements professionally produced and distributed to media outlets throughout the region and state.

Project goals

- Provide high school students with an opportunity to participate in a community service project, which has the potential to reduce morbidity and mortality in rural communities, while providing applied learning opportunities
- Use creative methods to develop health and safety messages
- Disseminate agricultural health and safety messages to a wide audience
- Increase the visibility of the Kentucky Partnership for Farm Family Health and Safety in other counties

D. PROJECT START AND END DATES

July 1, 2004 to June 30, 2005

E. PROJECT ACTIVITIES AND ACCOMPLISHMENTS

A graduate student at Western Kentucky University was employed as a graduate assistant for the 2004-05 academic year. This grant provides one-half of the stipend for this graduate assistant and she assists the project director in carrying out the activities associated with this project.

On August 15, 2004 a meeting of the planning committee was held to begin formulating criteria and guidelines for the media contest, and a plan for carrying out the activities of the project. Those present at this initial meeting were Staci Simpson, Project Director; J. David Dunn, Partnership Board Chairman; Susan Jones, Partnership Board Member; Lucy Juett, Partnership Board Member; and a representative of public radio.

On August 25, 2004 a follow-up meeting of the planning committee was held to finalize the criteria and implementation plan. In addition to the committee members, Alan Palmer, Drive Time radio host, and Dan Modlin, WKU Public Radio Associate Manager and News Director, were in attendance to provide technical expertise.

In early September 2004 e-mails were sent to 25 principals and over 50 teachers at 25 schools in the 10-county Barren River Area Development District to inform them of the contest. The purpose of this e-mail was to alert the principals and teachers of the event, allow them to e-mail questions or concerns, and inform them that more information would follow.

The kick-off of the contest was set to coincide with National Farm Safety Week, beginning September 20, 2004. Letters and flyers containing information about the purpose of contest, criteria, deadlines, topics and awards were mailed to each school. Separate packets of materials were sent to each school principal, Health Occupations Students of America (HOSA) director, Future Farmers of America (FFA) teacher and media or yearbook coordinator. Additional local media promotion is planned for the month of November.

The due date for submission of contest material is December 15, 2004. During January 2005, the judging panel will be convened and winners selected. The remaining activities associated with the grant will be completed during February and March 2005.

F. PROJECT PRODUCTS

The project is in progress; therefore, it is too early to report on its outcomes.

G. STATES THE PROJECT WAS ACTIVE IN

Kentucky

Education project — #5 of 6 feasibility projects

A. PROJECT TITLE

The Nurse Practitioner Agricultural Study

B. PROJECT OFFICER

Sharon E. Lock, PhD, ARNP

University of Kentucky

College of Nursing

Lexington, KY 40536

Tel: (859) 257-2366

selock0@uky.edu

C. PROJECT DESCRIPTION

Nurse practitioners deliver first-line health care services to farm families across America. Agriculture poses unique health hazards that cause it to rank in the top four most hazardous industries each year (National Safety Council, 2002). Nurse practitioners may not be aware of the health risks to their clients who reside or work farms. As front-line health care providers, it is essential that nurse practitioners understand the agriculturally related health risks faced by their clients in order to deliver appropriate care. The purpose of this project is to examine nurse practitioners' knowledge about and practice of farm health and safety issues. Its specific aims are to

- 1) Determine nurse practitioners' perceptions about agricultural health and safety
- 2) Determine how nurse practitioners use an agricultural health context within their clinical practice
- 3) Determine methods of education that nurse practitioners would use to learn more about agricultural health and safety issues.

D. PROJECT START AND END DATES

August 1, 2004 to September 29, 2005

E. PROJECT ACTIVITIES AND ACCOMPLISHMENTS

This project is in its early stages. What follows is a description of expected activities over the coming year.

A 17-item survey modified for Prince's (2001) farm health study will be used to collect data. States will be stratified based on rural population, number of farms, and number of nurse practitioners. Mailing lists of licensed nurse practitioners will be obtained from the Boards of Nursing of states that meet the stratification criteria. Subjects will be randomly selected (n=175) from each strata (state) for a total sample size of 2,200. Surveys will be mailed to each nurse practitioner selected for the study. Simple descriptive statistics, bivariate correlational analysis and multiple regression analysis will be used to produce the model that best predicts the nurse practitioners' knowledge and perception of farm health. Findings from this study will help

identify both the content and method of delivery that nurse practitioners might find useful for learning about agricultural health topics.

To date, the survey has been completed and an IRB application submitted. We are awaiting approval of minor revision to a cover letter. State boards of nursing have been contacted for information on ordering mailing lists.

F. PROJECT PRODUCTS

1. Presentations

A poster presentation has been accepted for the University of Kentucky College of Public Health Research Day, October 25, 2004.

A poster was submitted to the National Organization of Nurse Practitioner Faculties for a 2005 conference.

G. STATES THE PROJECT WAS ACTIVE IN

Surveys will be sent to nurse practitioners in California, Georgia, Illinois, Indiana, Kentucky, Michigan, Minnesota, Missouri, North Carolina, Ohio, Pennsylvania, Texas, and Wisconsin.

Prevention/intervention project — #6 of 6 feasibility projects

A. PROJECT TITLE

Mercer County Farm and Family Practice Demonstration Project

B. PROJECT OFFICER

Deborah B. Reed, PhD

553 College of Nursing/HSLC

University of Kentucky

Lexington, KY 40536-0232

Tel: (859) 257-9636

dbreed01@uky.edu

C. PROJECT DESCRIPTION

This project is a small educational demonstration project to design and test an office-based farm injury/illness prevention program that can be delivered by staff in a rural family practice setting without adding time or financial burden on staff or clients.

D. PROJECT START AND END DATES

July 1, 2004 to March 31, 2005

E. PROJECT ACTIVITIES AND ACCOMPLISHMENTS

- Pre-test on farm safety knowledge administered to office staff
- Staff training conducted
- Patient chart labels addressing farm exposure advisement have been developed and are being used by medical staff
- Farm safety packets containing personal protective equipment, magazine articles, resource list, safety brochures, and safety-related activities booklets have been assembled and are being distributed to farm families by the office staff
- Weekly farm safety messages are being posted throughout the office
- TV/VCR with farm safety messages have been placed in the waiting room for patients/visitors to watch while waiting
- A notebook with farm safety articles has been placed in the waiting room for patients/visitors to examine while waiting
- Monthly meetings with office staff are on-going to ensure smooth flow of project
- Local media coverage of farm safety events and issues are being tracked weekly
- Patient surveys developed
- First wave of surveys to be mailed to patients October 11, 2004

F. PROJECT PRODUCTS

None to date; the project is in its initial stages.

G. STATES THE PROJECT IS ACTIVE IN

Kentucky

V. SPECIFIC IMPROVEMENTS IN AGRICULTURE SAFETY AND HEALTH THAT RESULTED FROM CENTER ACTIVITIES (R2P ACTIVITIES)

During the current year, the Southeast Center has engaged in many activities that involve translating research to practice. These agricultural health and safety activities include:

- A multi-state program to help nursing schools prepare their graduates as occupational health nurses for rural and agricultural populations in the south and southeast United States
- Community-based coalitions that increase health education and access among Hispanic farm workers and their families
- Planning and implementing a community-based agricultural safety and health program in rural Kentucky high schools that is integrated with the required economics and practical living content within the social studies curriculum
- Developing and institutionalizing a graduate-level *Health of Agricultural Populations* three-semester hour credit course within the UK College of Public Health curriculum
- Planning and proposing a regional and national social marketing project that promotes farm tractor safety among farmers as well as the business and community organizations that serve them
- Completing a multidisciplinary study to determine the frequency, severity, and cost of tractor-related injuries and using the data from that study to plan and propose a multi-Center, multi-state detailed examination of the costs and consequences of these injuries, including how costs are distributed across individuals, communities, businesses, and society at large

These and other outreach and intervention projects at the University of Kentucky's Southeast Center have common elements. First, all are based on earlier research conducted at the Southeast Center and elsewhere. Second, all involve translation of this research into practice. Third, all have or will have a direct impact on the target population of persons at risk of agricultural health and injury problems.

When planning, implementing, and evaluating Center programs and activities it is wise to keep three criteria in mind.

- 1) Federal funding agencies and private foundations initiate prevention programs for serious public health problems. It takes much effort to put in place the funds and agencies that can conduct these interventions. However, the federal and foundation funding directed toward studying and alleviating a problem usually will not continue indefinitely.
- 2) The expectation is that funds awarded through competitive requests for applications (RFAs) to address such problems will be used to conduct research and to construct intervention systems that will alleviate the problems. In addition, it is the expectation that the research findings and the intervention and prevention methods developed will be institutionalized by universities, state agencies, and communities. Thus, long after the

“federally funded” program ends, the impact of informed research and the effective education and prevention programs and services that result from the research should continue. This is sometimes referred to as *institutionalizing research to practice*.

- 3) To achieve the goal listed in item 2, research must be methodologically sound and ecologically valid. It must be capable of practical application as well as integration into social policy and the education and practices of health professionals and other community leaders. In addition, research findings and results must be captured, then presented to and comprehended by those most at risk in the target population. This last step requires collaboration among researchers, professionals, and the members of at-risk populations. It is within these collaborative arrangements that research is translated to practice. Such collaborations also call attention to new problems, issues and omissions in research and policy. Thus, research to practice is not only a top-down process; it is also very much a bottom-up awareness and problem-finding activity. In combination, the two promote new and improved practice as well as new and improved research.

Examples of these criteria in action are illustrated by Center activities that are underway or were planned during the current year.

The Southeast Center’s Kentucky tractor safety initiatives, directed by Henry Cole, EdD, involve farm community groups in experimental trials to promote and evaluate the use of ROPS and seatbelts on tractors, measures that would eliminate nearly all tractor-related injuries and fatalities. With help of community participants in intervention counties in Kentucky, Dr. Cole and his colleagues developed an array of tractor and farm safety messages and materials. By involving community members in the development, implementation, and evaluation of program materials, the projects had greater legitimacy and resulted in a statistically significant increase in the number of ROPS-equipped tractors. The program materials and methods have been disseminated to other counties in Kentucky as well as to other states across the nation to educate farmers and agricultural communities about the risks of tractor-related injuries and their prevention. These materials are also being incorporated into high school, college, and university classrooms as part of outreach efforts to educate students and professionals about agricultural health. They are also having a national and international impact.

In January 2004 the Kentucky ROPS intervention project was included in *Preventing neurotrauma: A casebook of evidence-based practices*. This book, published by the University of Toronto and the Ontario Neurotrauma Foundation, is also available on CD. The seven cases in the book were selected as among the best worldwide community-based interventions to reduce neurotrauma injury. The cases presented are model approaches that can be adapted by other researchers involved in health and safety intervention efforts. The studies in the casebook already have had a positive international impact (*see letter from Dr. Richard Volpe in the Appendix*). Cynthia Richardson authored Chapter 7 titled “Community Partners for Healthy Farming Project/The Kentucky ROPS Project,” which describes the project outreach and intervention theory and methods as well as how the program was evaluated. (The full bibliographic citation for Richardson’s chapter and the casebook is listed in the references section of the Stakeholder Project report.) Richardson’s chapter deals with translating the CDC-funded 1999 to 2001 and 2000 to 2003 Kentucky Community Partners for Healthy Farming

Intervention ROPS project as one of seven exemplary evidence-based practice models. It and the other programs are presented for adaptation by those who wish to implement community-based prevention programs.

Another Center project, directed by Deborah Reed, PhD, educates nurses throughout the south and southeast United States about agricultural occupational health issues. The program provides nurses with a better understanding of agriculture and the needs of rural and farming populations. Dr. Reed has also worked to incorporate education on the health and care of agricultural populations into the curricula of nursing colleges across the country. Her work and the project activities are instrumental in preparing a cadre of occupational health nurses for rural and agricultural communities. In these communities nurses are often the only readily available primary care health providers. Before Dr. Reed's study, only a handful of nurses were knowledgeable of the health and injury problems of agricultural workers and family members, and even fewer nurses had received training to work with this underserved population.

Dr. Reed's Mercer County Demonstration Project is a prime example of how the Center puts research into practice. All of the messages and interventions used in this intervention study are based on empirical evidence generated by previous Southeast Center projects. Dr. Reed is using various media to deliver messages and the messages are, in turn, based on results from the Farm Family Health and Hazard Surveillance Study project, Dr. Cole's ROPS work, and other research conducted by Dr. Reed.

Results from Dr. Steve Browning's study on farmer suicides have been shared with mental health educators in the College of Agriculture Health Education through Extension Leadership (HEEL) program. HEEL is a formalized research-to-practice program that seeks to improve the health of Kentuckians via the Cooperative Extension Service.

Robert McKnight, MPH, ScD, Director and PI, conceptualized and implemented Southeast Center outreach programs to increase access to health care and health education by Hispanic farm workers and their families. Much of the funding for these efforts was from sources other than NIOSH, the grant from the Fund for Rural America being just one example. Its educational outreach efforts are directed toward this special, underserved population as well as toward the county health department workers and other health providers in Kentucky and Tennessee who provide health care to this population. The professionals collaborating on this outreach effort include staff at rural county public health departments, along with county agricultural extension agents, local farmwomen and other concerned community groups. Outreach and educational activities for these community leaders, health professionals, social workers and others focus on Hispanic culture, workers' rights to health care, and special needs that affect the health of migrant and resident Hispanic farm workers.

Under McKnight's leadership and with the help of researchers, community health officials and members of the target populations, much of the knowledge and experience gained from these outreach and educational activities have been synthesized into a new graduate/professional-level course — *Health of Agricultural Populations* — offered by University of Kentucky College of Public Health. Students enrolled in the MPH, DrPH, and PhD programs can enroll in this course as part of trans-departmental studies in agricultural health and safety. In 2005, the College will

begin offering a graduate-level certificate program that focuses on agricultural populations, their culture, history, lifestyles, health and injury risks, as well as on health promotion and injury prevention. By incorporating these educational efforts into advanced studies at the College of Public Health, the Southeast Center is helping ensure that the next generation of agricultural health professionals has the training to serve farmers, farm families, farm workers and their communities. This is another example of translating research to practice in a long-term and institutionalized way within an academic setting.

The Southeast Center's early and continued rural and agricultural occupational health and injury surveillance and epidemiology projects are among its most important accomplishments. This work produced new population-based knowledge about agricultural health and injury rates across a wide range of work activities and exposures. Before the Southeast Center's work in this area empirical data for these issues did not exist. These epidemiological data, both population and case-based, became the basis for a series of subsequent intervention studies that could not otherwise have been undertaken as well or as wisely. The intervention studies that grew out of these early efforts used these data to target interventions that, in turn, generated more high-quality population-based and case-based data about farm injuries and illness. Examples of this include the Beef Cattle and Children project, the AgDare project, the Kayles' project, and the various ROPS projects.

The current ROPS Cost Effectiveness Analysis project, with its random sample of some 6,000 Kentucky farmers to obtain population-based data on the frequency of several classes of injury severity outcomes and costs for tractor overturns, is the basis for the proposed national study on the same topic as well as key to the Center's proposed social marketing project. Another example of how subsequent projects build on the Center prior research and surveillance efforts is Dr. Reed's in-depth case study of farmers with disabilities, research efforts that won a national award as a case-study surveillance project. Yet another example is Dr. McKnight's eight-state Mississippi Delta pesticide surveillance project. This project collects agricultural poisoning cases among farmers and rural residents. The surveillance data from this project will form the basis for informed prevention intervention efforts in the future.

Research to practice is what the Southeast Center routinely does. A discussion of the theoretical and conceptual basis for this approach is found in the Stakeholder Project section of this annual report. Many references that support research-to-practice approaches are also found in that section of the report.

VI. COLLABORATION

Individuals at NIOSH

- John Etherton, Senior Research Safety Engineer, NIOSH Division of Safety Research
- Max Lum and Melissa VanOrman, CDC/NIOSH Office of Health Communication
- John Myers, MS, Health Statistician, NIOSH Division of Safety Research
- Ted Scharf, PhD, Research Psychologist, NIOSH Cincinnati, Taft Laboratory

Organizations, Agencies and Centers

- Administrators, technology coordinators, teachers, and students from four Kentucky high schools
- Alabama Poison Center — Tuscaloosa, AL
- Anderson Circle Farm, Harrodsburg, KY (Belcan Partners LLC)
- Arkansas Poison & Drug Information Center — University of Arkansas, Little Rock, AK
- Barren River Area Development District, Kentucky
- Centro Latino — Shelbyville, Kentucky
- Farm Safety 4 Just Kids
- Great Plains Center for Agricultural Health, University of Iowa, IA
- High Plains Intermountain Center, Fort Collins, CO
- Illinois Poison Center — Chicago, IL
- Kentucky Council of Social Studies Teachers
- Kentucky Department of Education, Frankfort, KY
- Kentucky Department of Vocational Rehabilitation
- Kentucky Farm Bureau
- Kentucky Partnership for Farm Family Health and Safety
- Kentucky State University
- Kentucky Regional Poison Center — Louisville, KY
- Louisiana Drug and Poison Information Center — University of Louisiana-Monroe
- Mary Chiles Hospital — Mt. Sterling, Kentucky
- Montgomery County Health Department — Mt. Sterling, Kentucky
- National Agricultural Statistics Service
- National Children's Center for Rural and Agricultural Health and Safety, Marshfield, WI
- Northeast Center for Agricultural Health, Cooperstown, NY
- Ontario Neurotrauma Foundation
- Pacific Northwest Agricultural Safety and Health Center, University of Washington
- Regional Poison Center, Cardinal Glennon Children's Hospital — St. Louis, MO
- Regional Poison Control Center, Children's Hospital — Birmingham, AL
- Southern Poison Center — Memphis, TN
- Regional Poison Control Facility — University of Mississippi Medical Center, Jackson
- Southern Coastal Agromedicine Center, Greenville, NC
- Southwest Center for Agricultural Health, Injury, and Education — Tyler, TX
- Springfield Sun Times newspaper
- Tennessee Cooperative Extension Service
- Virginia Farm Bureau

- Western Center for Agricultural Health, University of California, Davis

Other Universities and Colleges

- Eastern Kentucky University
- Eastern Mennonite University School of Nursing
- Georgia Southern University
- Medical University of South Carolina
- Mississippi State University
- University College Dublin
- University Industry Centre (Dublin, Ireland)
- University of Kentucky — The Colleges of Agriculture, Education, Nursing, Communication, and Public Health
- University of Kentucky Cooperative Extension Service
- University of Oklahoma
- University of Tennessee
- University of Toronto
- Western Kentucky University

APPENDIX

I. TOTAL CENTER BUDGET FOR FY 2004

1. **Total NIOSH expenditures:** \$711,889 (includes carry forward from previous year)
2. **In-kind contributions:** \$13,642 (University of Kentucky)
3. **Other outside funding:** \$344,579 (USDA, US Department of Education/RSA, Commonwealth of Kentucky)

II. CENTER PROJECTS / ACTIVITIES FOR FY 2004

1. **Ongoing projects:** 12 in total —six core and six feasibility projects

Core projects

- Cost Effectiveness of Promoting Roll-Over Protective Structures (ROPS) and Seat Belts on Family Farm Tractors (*research*)
- Improving Surveillance of Pesticide and Other Agricultural-Related Poisonings (*research*)
- Farmer Suicides: A Nine-Year Analysis in Three Southeastern States, 1990–98: KY, NC, & SC (*research*)
- Nurse Agriculture Education Project (*education*)
- Health of Agricultural Populations Emphasis Area (*education*)
- Partnering with Stakeholders for Prevention: Regional Outreach and Capacity Building (*prevention/intervention*)

Feasibility projects

- The Epidemiology of *Helicobacter pylori* in a Selected Population of Southeast Georgia Farmworkers (*research*)
- Asthma in Kentucky and North Carolina Farm Children: A Pilot Proposal (*research*)
- Airborne Exposure to Pathogens and Endotoxins During Farmland Application of Class “B” Biosolids (*research*)
- Addressing Agriculture Health and Safety Issues Through a High School Applied Learning Project (*prevention/intervention*)
- The Nurse Practitioner Agricultural Study (*education*)
- Mercer County Farm and Family Practice Demonstration Project (*prevention/intervention*)

2. **Projects completed**

- Cost Effectiveness of Promoting Roll-Over Protective Structures (ROPS) and Seat Belts on Family Farm Tractors
- Farmer Suicides: A Nine-Year Analysis in Three Southeastern States, 1990–98: KY, NC, & SC

- The Epidemiology of *Helicobacter pylori* in a Selected Population of Southeast Georgia Farmworkers (*feasibility project*)
- Airborne Exposure to Pathogens and Endotoxins During Farmland Application of Class “B” Biosolids (*feasibility project*)

3. New projects

- Asthma in Kentucky and North Carolina Farm Children: A Pilot Proposal (*feasibility project*)
- Addressing Agriculture Health and Safety Issues Through a High School Applied Learning Project (*feasibility project*)
- The Nurse Practitioner Agricultural Study (*feasibility project*)
- Mercer County Farm and Family Practice Demonstration Project (*feasibility project*)

No new “core” projects were initiated this year.

4. Feasibility projects

- The Epidemiology of *Helicobacter pylori* in a Selected Population of Southeast Georgia Farmworkers (*completed this year*)
- Asthma in Kentucky and North Carolina Farm Children: A Pilot Proposal (*new this year*)
- Airborne Exposure to Pathogens and Endotoxins During Farmland Application of Class “B” Biosolids (*completed this year*)
- Addressing Agriculture Health and Safety Issues Through a High School Applied Learning Project (*new this year*)
- The Nurse Practitioner Agricultural Study (*new this year*)
- Mercer County Farm and Family Practice Demonstration Project (*new this year*)

III. CENTER INVESTIGATORS

1. Scientific investigators: 8
2. Program support staff: 5

IV. CENTER PRODUCTS

1. Presentations: 42
(All presentations made by Southeast Center faculty, staff, graduate students and associates are listed in Sections III and IV of this report.)
2. Publications
 - a. Peer-reviewed journal: 9
 - b. Trade journals: 0

c. **Fact sheets, brochures and technical publications:** 3

d. **Other publications:** 1

3. Education, training and outreach

a. **Training seminars:** 5 seminars with 2 for CE credit

b. **Short courses:** none

c. **Hazard surveys and consultations:** 8

d. Academic training

Five graduate students in the College of Public Health supported by the Health of Agricultural Populations Curriculum Project (2 MPH students, 3 DrPH students). No persons graduated this year.

Two undergraduate nursing students at University of Kentucky received scholarship support through the Nurse Agriculture Education Project.

e. **Newsletters:** 3

f. **CD-ROMs or other computer-based training programs:** 3

g. Other

- Display/exhibit Southern Nursing Research Society Annual Conference, Louisville, KY February, 2004.
- Richardson, C. (2004). Community Partners for Healthy Farming Project/The Kentucky ROPS Project. In R. Volpe and J. Lewko, (Eds.) *Preventing neurotrauma: A casebook of evidence-based practices*, pp. 184–221. Toronto: Ontario Neurotrauma Foundation.

4. Conferences and meetings sponsored

- *Agromedicine in Southeast Georgia*, Georgia Southern University, April 2004.
- *Southern Regional Farm Safety Symposium # 1*, in cooperation with USDA – CSRESS, and the University of Tennessee Cooperative Extension Service, Nashville, Tennessee May 10–12, 2004.
- *Southern Regional Farm Safety Symposium #2*, in cooperation with USDA – CSRESS, and the University of Tennessee Cooperative Extension Service, Nashville, Tennessee September 20–21, 2004.

5. Other products

Dr. Debra Reed's consultation with Dr. Sharon Lock, UK College of Nursing, resulted in a feasibility study awarded through the Southeast Center in August 2004. This is Dr. Lock's first endeavor in the agricultural health area. The intended outcome of the survey of rural nurse practitioners is to develop appropriate and desired agricultural health continuing education.

V. ADMINISTRATIVE REPORT

Personnel changes

Ming Morgan, MPH, Center Publications Coordinator, resigned in November, 2003.

In September 2004 Joseph Petrik, MSc, MA, was hired as the Southeast Center's Publications Editor. Mr. Petrik has more than 10 years of experience in research and communication and will assist the Center in developing manuscripts for submission to peer-reviewed journals, as well as help Center faculty and staff with communications pieces such as posters, PowerPoint presentations, brochures, newsletters and other published materials.

Kiyoung Lee, MPH, ScD, previously with the University of California, Davis Western Center for Agricultural Health, joined the faculty of the University of Kentucky College of Public Health as an Industrial Hygienist in summer 2004. Dr. Lee is expected to boost the Industrial Hygiene capacity of the Agricultural Health Center and develop additional projects in agricultural and environmental health.

Administrative changes

In May 2004 the University of Kentucky created a College of Public Health, a college that is on the same level as other Colleges within the University. As a result, the Southeast Center, which was previously in the Department of Preventive Medicine in the College of Medicine, was administratively moved to the College of Public Health and became a separate administrative unit from the Department of Preventive Medicine, which also moved to the College of Public Health. For administrative reporting, the Center now reports to the Associate Dean for Research in the College of Public Health, rather than the Chairman of the Department of Preventive Medicine. This move has elevated the Southeast Center to a College of Public Health center-wide Center, boosting its visibility and resources.

The Center also acquired an additional 1,450 square of office space at its headquarters at 1141 Red Mile Road, Lexington. This additional space houses the office of Dr. Henry Cole as well as other staff and conference space.

The Center's fax number changed to (859) 257-3760.

Letter from Richard Volpe, PhD, praising work on the Kentucky ROPS project.



University of Toronto

LIFE SPAN ADAPTATION PROJECTS
Institute of Child Study, Dr. R.G.N. Laidlaw Research Centre
Department of Human Development and Applied Psychology

March 22, 2004

Professor Henry Cole, Principal Investigator
University of Kentucky
Southeast Center for Agricultural Health and Injury Prevention
College of Medicine, Dept of Preventive Medicine & Environmental Health
1141 Red Mile Road, Suite 102
Lexington, KY, 40504-9842
U.S.A.

Dear Professor Cole:

Enclosed please find a complimentary CD of *Preventing Neurotrauma: A Casebook of Evidence Based Practices (2004)*, a compilation identifying seven best practices in the prevention of neurotrauma. The *Casebook* has been prepared through support from the Ontario Neurotrauma Foundation, Laurentian University's Centre for Research in Human Development, and the Life Span Adaptation Projects of the University of Toronto. It is an in-depth continuation to the *Compendium of Effective, Evidence-Based Practices in the Prevention of Neurotrauma*, published in 2002.

The programs reviewed in this *Casebook* are among the best in the world, and are offered as opportunities for adaptation and improvement in the field of injury prevention. Already the material has made a global impact – with project expansion and implementation in many urban and rural communities. The Community Partners for Healthy Farming (CPHF) Project/The Kentucky ROPS Project, for which you provided information as Key Informant, is highlighted in Chapter 7.

I hope you find this an interesting and useful source for programs that are currently helping to shape neurotrauma injury prevention.

Sincerely,

A handwritten signature in black ink, appearing to read 'Richard Volpe'.

Richard Volpe, PhD
Professor

45 Walmer Road Toronto M5R 2X2 Direct 416-934-4511 Office 416-934-4524 Fax 416-978-6485 richard.volpe@utorontc

— end —