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states who use tractors for which a CROPS prototype has been developed and tested by NIOSH. New York and Virginia were selected because of on-going ROPS retrofit programs within their states and because of their high number of tractor roll over fatalities, well established relationships with NIOSH and its partners, and their states' farm population. The project employs approaches from multiple disciplines and is aimed at different populations to identify the complex set of barriers to the adoption of CROPS. In Phase I - Demonstration, a subset of farmers from the study population will be selected to receive a CROPS at no charge. Each farmer will be asked to demonstrate how to install the CROPS and provide an initial assessment of their perception of the utility and value of the device along with any installation problems/issues. This aspect of the study will provide end-user (customer) feedback to NIOSH and partner researchers on assembly issues for a CROPS design in field conditions. Farmers, potential manufacturers, and local influential community leaders will be invited to observe installation in the field and queried for their perception of the utility and value of the design after the demonstration and one year later.

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National Safe Tractor and Machinery Operation Program

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The National Safe Tractor and Machinery Operation Program (NSTMOP) was developed with funding from a USDA-CSREES Youth Safety Grant. The objective of the NSTMOP project was to design an effective, efficient and accountable youth farm machinery operation certification program with national uniformity and a single set of economically reproducible instructional materials. The format for the NSTMOP material was guided by input from focus groups, a national steering committee and selected agricultural safety educators. Primary curriculum materials were developed in a task sheet format with student objectives and activities listed and new skill and driving evaluations. Student and instructor evaluations have documented content validity of instructional materials and the program plan. A second USDA-CSREES project developed a national data base to register NSTMOP instructors and students. The data base has been maintained at The Pennsylvania State University and shows 512 registered NSTMOP instructors in 40 US states and two Canadian Provinces. A third USDA-CSREES Youth Safety Grant focused on the development of an on-line training and registration program for new NSTMOP instructors. Registration involved completing a series of on-line training modules orienting instructors to the NSTMOP materials and testing procedures. While the original intent of the NSTMOP project was to provide materials on-line and in a CD, demand for printed material was extremely high. NSTMOP materials remain available on-line at http://www.nstmop.psu.edu. They are also available in color print from http://www.finneyhobar.com. Data base management records and publisher sales records indicate the use of NSTMOP materials in states and by instructors not represented in the PSU data base, which is an instructor option. This poster indicates the use of NSTMOP materials by registered instructors by state and province and also indicates areas which are underserved. Future efforts will be made to better serve these areas with NSTMOP materials and programs.

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Youth Risky Behavior Around Tractors – Influence of Significant Others (Father, Mother and Friends)

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Injury and death rates of youth in farms in the US are particularly high. Operating a tractor on the farm is one of the most basic, yet extremely risky practices. Machinery (tractors) is the leading cause of fatal farm injuries to youth less than 20 years of age. This study explores whether youth's adoption of on farm safety practices is related to perceived support for engaging in those behaviors from significant others including parents and friends. This paper presents preliminary data from a youth farm injury prevention research study funded by NIOSH. Sixty farm families participated. Youth ages ranged from 10 through 19 years. Regression analysis revealed youth who thought their friends would think less of them if they practiced certain safety behaviors related to tractors; were more likely to engage in unsafe (risky) behaviors while working around tractors on farms. Unsafe tractor behaviors included operating ROPS tractor without a seatbelt, dismounting a tractor with tractor running or with key in ignition, giving someone a ride on tractor, starting a tractor while not in an operator's seat and, doing work on tractor without doing a safety check. The results further revealed that for youth whose parents (fathers and mothers) placed a high premium on practicing safe tractor-related behaviors on the farm, the youth had lesser intentions, and were far less likely to indulge in risky behaviors around tractors. Regression was significant for the hypothesis that importance placed by parents on safety behaviors negatively affected youth risky behaviors related to tractors. The study reconfirms the role of parents as role models for youth. Results highlight the notion that parents need to give proper guidance to youth, model safe behaviors themselves and set family rules around safe practices related to tractor operations. Further implications of results will be discussed.

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Trends in Tractor Overturn Fatalities and the Prevalence of Roll-Over Protective Structures (ROPS) in the U.S.

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Tractor overturns remain the leading cause of occupational death on US farms. Roll-over Protective Structures (ROPS) have been recommended as an engineering control to prevent these deaths. This work examines trends in overturn fatality rates and ROPS prevalence rates on US farms since the early 1990's, and approaches for targeting ROPS promotion activities. Trends in tractor overturn fatalities were assessed with data from the Bureau of Labor Statistics Census of Fatal Occupational Injuries using Poisson regression. ROPS prevalence rate trends were assessed with data from national farm operator surveys using logistic regression. The farm operator surveys were collected for the National Institute for Occupational Safety and Health by the National Agricultural Statistics Service. Associations between state ROPS prevalence data and Census of Agriculture data were used to develop a model to predict counties with low ROPS prevalence rates. The rate of tractor overturn deaths decreased an estimated 28.5% between 1992 and 2007, with the largest deceases occurring since 2004. Between 1993 and 2006, the prevalence of ROPS-equipped tractors on farms increased from 38% to 59%. The regions of the US that had the largest decrease in tractor overturn fatality rates also had the largest increase in ROPS prevalence rates. States with the lowest prevalence of ROPS-equipped tractors had a 5-fold increased risk for tractor overturn deaths. Logistic regression models fitting state ROPS prevalence rates against Census of Agriculture data show promise in identifying counties with low ROPS prevalence rates. These results support the position that ROPS are effective in preventing tractor overturn deaths. In addition, results show how well the effort to increase the use of ROPS has progressed in the US and identify areas of the US where ROPS prevalence rates are not adequate. This information is useful for targeting ROPS promotion activities.

Disclaimer: The findings and conclusions in this abstract have not been formally disseminated by the National Institute for Occupational Safety and Health and should not be construed to represent any agency determination or policy.

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Cost Analysis of ATV-Related Head Injuries

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All-terrain vehicles (ATVs) were the energy agent associated with 555 fatalities and 146,600 hospitalized injuries in 2006, one-third of which were head injuries. This poster presents a cost analysis that was used in a high school economics curriculum regarding ATV riders wearing a safety helmet as an intervention to reduce the frequency and severity of head injuries. In this curriculum, an interactive narrative simulation exercise informed youth of the injury hazards of *not* wearing a helmet while riding on an ATV. A companion Excel™ cost tool was created to demonstrate for students the catastrophic costs associated with low-probability injury events (an expected value analysis). Metaphorically, these companion approaches linked the narrative's "pull at the heart strings" to the cost tool's "pull at the purse strings." The cost analysis included three steps regarding the use of helmets when riding ATVs: (1) a cost analysis of the case as expressed in the narrative; (2) a decision analysis to determine injuries averted among the population-at-risk by the intervention; (3) several cost analyses including a cost-effectiveness analysis of the intervention. The decision analysis showed a reduction of 240 head injuries per 100,000 riders per year with two of these injuries resulting in death, and for each injury averted (fatal and nonfatal), a saving of $364,306 to society with a 5% discount rate over a 50-year period. When adjusted to full-time use of an ATV (2000 hours per year), 3,276 injuries, including 240 deaths, per 100,000 riders would be averted at a savings to society of $509,172.

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And What About Tractors that Can't Be Retrofitted? Piloting a Tractor Trade-in Approach

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Tractor overturns are the most frequent cause of occupational death on U.S. farms. Rollover Protective Structures (ROPS) and seatbelts are 99% effective in protecting the tractor operator, however, many tractors manufactured before 1965 (approximately 806,000) cannot accommodate ROPS. Anecdotal evidence indicates these tractors are responsible for a large proportion of tractor deaths. Study objectives were to explore the potential for a tractor trade-in program with tractor dealers and individuals unable to retrofit and to review this data with agricultural stakeholders, to develop a framework for a tractor trade-in pilot program. Focus group participants were recruited via the NY State ROPS Rebate Program hotline. Farmers contacting the hotline who could not retrofit were invited to participate in focus group discussions. Tractor dealers were also invited to participate. Potential barriers and motivators to participating in a trade-in program were discussed. Transcripts were reviewed and major themes extracted. These were discussed at a workgroup session attended by safety experts and industry representatives. Major barriers include investments in and familiarity with the old tractor, lack of money for a newer tractor and frustrations regarding the fact that ROPS have not been built for older tractors. Potential motivators included adequate financial compensation, tax credits, zero-percent financing, insurance reductions, extras (such as power steering, air-conditioning, sun-shade) and an emphasis on the risks of overturn and safety of ROPS. Participant's demonstrated preference for installing fabricated ROPS on older tractors reveals a potentially widespread ignorance regarding the strength of axle-housings on these tractors. This information was reviewed by work-group attendees who outlined recommendations for a trade-in pilot program. A trade-in program designed for tractor owners who lack ROPS protection for their tractors would have to provide