The Final Progress Report

Project Title: Social Marketing of Rollover Protection: A Multistate Expansion

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List of Terms and Abbreviations

AED-Academy for Educational Development
AFF-Agriculture, forestry and fishing
FACE-Fatality Assessment and Control Evaluation
NASS-National agricultural statistics service
NORA-National occupational research agenda
NEC-Northeast Center for Occupational Health and Safety: Agriculture, Forestry and Fishing
NTSC-National Tractor Safety Coalition
ROPS-Rollover protective structures

Abstract

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Overview: Tractor Overturns: The Multi-state Expansion Project goals were to translate the NY ROPS intervention model into PA and VT to reduce tractor fatalities and assess the model's flexibility. Tractor overturns account for the greatest proportion of farm fatalities and a significant proportion of injuries. The associated cost of fatality events is over $100 million annually. The only proven preventative measure is the widespread use of ROPS. ROPS are 99% effective in preventing fatality or serious injury if an overturn occurs. However, the 2011 NASS Farm Safety Survey indicates roughly 41% of US tractors do not have ROPS.

Approach: The following list outlines project activities: 1) assembled a state coalition and hired project staff, 2) conducted formative assessments, audience segmentation, pilot testing, intervention introduction and evaluation in PA and VT, 3) identified state assets and stakeholder resources, 4) adapted NY instruments, techniques messages and marketing plans, 5) re-designed the NY hotline services and website and 6) evaluated implementation activities via the project assessment board (a group of agricultural health and safety researchers from other high-risk states). Through these activities the project team developed a clear understanding of the adaptations required to translate the NY program model to other states.

Key Findings: The program model works: Not only were these programs successfully implemented in PA and VT, ROPS programs were also launched in NH and WI and additional states have indicated interest. *Barriers and motivators to installing ROPS do not differ greatly from state to state:* Cost and perceived need were the most frequently, highly-rated barriers to ROPS installation in PA and VT, while working near hills/ditches and liability concerns were the most frequently highly-rated motivators. These were not markedly different from those identified in NY. *ROPS prevalence in different farm segments varies from state to state:* Surveys of PA and VT farmers indicated that small cash crop farms (PA) and vegetable and cash crop farms (VT) had the lowest proportion of ROPS protection. Small crop and livestock farms had the lowest proportions of ROPS protection in NY. *Partners value the program:* Program implementation in the four states was greatly enhanced by the support of numerous partners. This provided a clear indication that mobilizing stakeholders for ROPS initiatives was indeed possible. *Rebate fundraising requires expertise and experience:* The implementation state that was most successful in raising ROPS rebate funding, had the assistance of a qualified community organizer. This individual leveraged existing connections and experience to build partnerships and raise considerable rebate funding. *Interest increases ROPS pricing*: researchers found that coordination of program activities with ROPS manufacturers and distributers will be necessary to keep ROPS costs down.

Improvements in worker safety: NEC has identified at least 14 cases in which fatalities or serious injuries have been prevented and 123 cases in which tractor operators have had a close call since retrofitting through the program. There have been 4,668 inquiries to the hotline and 1,702 retrofits in NY, PA, VT, NH and WI. Economic analysis demonstrates the programs are clearly cost-effective.

Section 1 of the Final Progress Report

Significant Key Findings-In the original Multi-state grant application our *First Specific Aim* was to implement and evaluate programs similar to the Social Marketing of Rollover Protection in New York State project, in both VT and PA. The first step in this process was to select the target population for the social marketing campaign in each state. Data for target selection was gathered using a telephone survey. Data on ROPS prevalence, farm demographics, and farmer's stage of change relative to installing ROPS on older tractors were collected. In PA the selected target populations were smaller cash crop farms, while the target populations for VT were vegetable and cash crop farms. In an effort to identify key motivators and barriers for retrofitting older tractors in VT and PA, another phone survey was conducted with a random sample of farmers (n=327) in each state. Results indicated cost and perceived need were the most frequently highly-rated barriers to ROPS installation in both PA and VT, while working near hills or ditches and concerns regarding liability were the most frequently highly rated motivators to installing ROPS. A social marketing campaign was developed based on these results. Message testing activities demonstrated that popular ad concepts were fairly similar in these states. *The Second Specific Aim* of the research was to assess the costs/benefits of the PA and VT campaigns. However, in year two of the program, the NH agricultural commissioner contacted study researchers and asked if it would be possible to launch a ROPS program for NH farmers, as well. Consequently the study team focused on launching a third ROPS program instead of investing limited project resources on the cost-benefit analysis (a similar analysis had already been conducted in NY, where savings as a result of the program were found to outweigh program investments). Subsequently a fourth program was launched in WI in year four, based on interest from the Marshfield Children's Center. In addition to this Aim 2 revision, researchers identified the need to assess program impacts on ROPS pricing. This research indicated that since the inception of the NY ROPS rebate program, the cost of aftermarket ROPS has steadily increased, while original equipment manufactured ROPS costs have remained relatively even. As a result programs were forced to adjust the financial incentives offered, to accommodate these increases. Although disappointing, this research indicates the potential need to coordinate with manufacturers and dealerships to insure manufacturing and distribution are streamlined to reduce costs to the end-user. *The Third Specific Aim* was to systematically assess the intervention implementation process to define the elements of a successful campaign. With the offer of financial incentives and hotline assistance, many farmers in both PA and VT demonstrated interested in contacting the ROPS program hotline. Because these states were not able to secure funding from state legislatures, each state was responsible for raising funds from private industry. Based on these implementation efforts, it is clear that having a dedicated individual who is familiar with community development and fundraising can be an important component of success. Fundraising efforts in PA also provided key lessons in the dangers of accepting private industry donations that have stipulations. Staffers in PA were able to raise funds for the rebates, but many donor organizations restricted the funding so that it could only be used by their members. This made it difficult to promote the program widely, which in turn impacted demand. Programs in WI and NH have also demonstrated that mobilizing local stakeholders or champions in fundraising efforts can greatly facilitate fundraising efforts. To date a total of $378,623.67 has been raised through private sources in NH, PA, VT and WI.

Translation of findings-Based on the information gathered over the last four years of the project, we are confident that it is possible to stimulate ROPS retrofitting activity in states beyond NY (PA, VT, NH and WI). However, to do this successfully, it is important to target specific populations, to provide rebates for the ROPS installation process, to tailor promotional materials to farmers stated concerns and to coordinate the marketing plan so that promotional dollars go farther. Researchers have also demonstrated the importance of providing assistance with finding and pricing ROPS parts. Not only do

farmers appreciate access to someone who can answer questions and help navigate interactions with dealerships, the ROPS hotline has become a valuable source of retrofitting activity data and farmer ROPS preferences. These data have been shared with other researchers, manufacturers and ROPS dealers to improve supply and distribution channels. In addition, researchers have learned that interest in the program is directly related to promotional activity. By tracking promotional efforts and hotline activities, researchers have been able to demonstrate spikes in interest that directly coincide with promotional events. The multi-state ROPS program has also been successful at increasing general knowledge regarding overturns and ROPS in the general public. In 2010, USA Today and the Wall Street Journal highlighted the launch of the program in NY, PA and NH. In addition, the program has been featured in local state papers and on local radio and television stations. Numerous types of promotional materials have also been developed and include high impact sheets, advertisements, fundraising packets for private industry, buttons, magnets, keychains, stickers, etc…. These materials have been shared with other researchers, private industry, program partners and the farm community. Public speaking events have also been highly utilized opportunities for sharing information about the project. Researchers have presented at 50 farm meetings and scientific conferences. To date, there have been a total of 31 research presentations and five publications in scientific journals, highlighting the findings of the research.

Outcomes and Impact

Potential outcomes: In NY, the project has continued to benefit from support by the NY legislature. With continued fundraising efforts and support from private industry, the multi-state ROPS rebate program will continue to grow.

Intermediate outcomes: It has become clear that many agricultural service providers are also interested in collaborating with the rebate programs. Through fundraising efforts, relationships have been built with insurance compaies, local economic development corporations, local tractor dealerships and other agricultural service agencies. A total of 47 companies have donated to the multi-state ROPS program over the past four years. Though the program is only currently active in NY, PA, VT, NH and WI, there is active interest in establishing ROPS programs in other states, as well. Thanks to a separate, two year grant (also provided through NIOSH) a Whole System in the Room (WSR) collaborative action planning workshop has been organized to mobilize a total of 50 organizations to build on the successes of the Multi-state ROPS Project and launch a National ROPS Initiative.

End outcomes: To date the number of retrofits installed through the NY ROPS program came just short of 1,300, insuring the safety of as many, previously at-risk farm families. Follow up survey data has enabled NEC to identify at least 14 cases in which fatalities or serious injuries have been prevented, and 123 cases in which tractor operators had a close call. Programs in VT, PA and NH have been well received. In addition, in March of 2013, the NEC also assisted with the launch of the Wisconsin ROPS program. Since these programs were launched approximately 1,485 calls from VT, PA, NH and WI have been processed through the hotline. In total 4,668 calls to the hotline have been made from all 5 states. Of those 4,668 calls, 1,702 tractors have been retrofitted with these lifesaving structures. In addition, 233 farmers have applied on the ROPS rebate website. Though fundraising in each state has been challenging, there have also been many successes. To date $1,347,623.67 has been raised in total for the programs in all five states. Customer satisfaction surveys have also revealed that 99% of participants would recommend this programs to others and 94% think the program is affordable. Feedback from one NY farmer: “It’s a great program and we need to keep it going!”.

Section 2 of the Final Progress Report

Scientific Report

Background

In 2013, the fatal injury rate for the agriculture, fishing, and forestry (AFF) sector, was listed as 22.2 per 1,000 workers; the highest of all sectors (BLS, 2014). Agriculture accounts for more than 70% of the fatalities in the AFF sector and year after year, it is widely recognized as one of the most hazardous occupations in the United States (Murphy et al., 2010). Approximately 37% of the fatal injuries in agriculture result from farm tractors (NORA AgFF, 2008); while nearly half of those incidents involve tractor rollovers (NIOSH, 2009).

Rollover protection structures (ROPS) are the only proven devices to protect a tractor operator in the event of an overturn. These devices are 99% effective when used with a seatbealt (NIOSH, 2004). Fortunately, since 1985, the industry has required that ROPS be standard equipment on all new tractors (ASABE Standards, 2009). Despite the benefit of installing ROPS, only 51-59% of U.S. tractors are equipped with this safety device (Loringer and Myers, 2008; Murphy et al., 2010). Increasing the number of ROPS-equipped tractors can help eliminate fatal farm injuries from tractor overturns, and significantly reduce the total number of farm fatalities and major injuries. In a 2006 study of ROPS prevalence and fatality trends, Myers and Hendrick (2009) reported a nearly 20% increase in ROPS protection between 1993 and 2006. In roughly that same time period, there was a 28.5% decline in overturn fatality rates. In countries such as Sweden, Denmark, and West Germany, where ROPS installation is mandatory, tractor overturn fatalities have been reduced to as few as 0.3 deaths per 100,000 tractors (Springfeldt 1996; Thelin, 1998). These studies highlight the importance of increasing ROPS installation activity in the farm community.

Interventions such as social marketing (Sorensen et al., 2008), community awareness campaigns (Struttman et al, 2001), and financial incentives (Hallman, 2005) have been directed at encouraging farmers to install ROPS. Social marketing is defined as an intervention development framework that is based on the concepts of exchange (Andreasen, 1995), i.e. instead of telling people this is what you should do, researchers work to decrease the costs and increase the benefits of healthy behaviors. This strategy alters the choice environment and makes healthy decisions the more appealing option. Following this blueprint for behavior change, NEC researchers launched a social marketing campaign in NY State, called the NY ROPS Rebate Program in 2006. To prepare for this campaign, researchers identified segments of the population that were at increased risk and also characterized the motivators and barriers of this group in relation to ROPS retrofitting (May et al., 2006, Sorensen et al, 2006). The NY State ROPS program was developed based on the findings of this research. Within the first six months of the launch of this program, researchers demonstrated a significant increase in ROPS sales (Sorensen et al., 2008). Surveys with the farm population also demonstrated that there was a significant shift in farmers' readiness to change (Jenkins et al., 2012). Based on the success of the NY ROPS Rebate Program, researchers decided to assess the potential for expanding the program into additional states.

Specific Aims

The **long-term goal** of the multi-state expansion project was to export a cost-effective social marketing campaign model and related products that would increase the rate of installing ROPS on unprotected farm tractors in other states. The Specific Aims were listed as follows: 1) To implement and evaluate

similar campaigns in VT and PA, 2) To assess the cost/benefits of the VT and PA campaigns, and 3) To systematically assess the intervention implementation process to define the elements of a successful campaign.

Methodology

Selecting target populations for the ROPS Programs in VT and PA: In an effort to select the target population for the social marketing campaign in each state, a telephone survey was used to collect data on ROPS prevalence, farm demographics, and farmer's stage of change relative to installing ROPS on older tractors. To collect this data, researchers from PA and VT adapted the survey that had been used to compare and select a target segment in the NY State study. The questionnaire was administered in an approximately five minute telephone call by the NY Agricultural Statistics Service (NY-NASS). Calls were made to a variety of farm commodities, including dairy, livestock, fruit, vegetable, cash crop and maple. It became apparent that maple farms were likely to represent a distinct segment within the VT farm community. Due to this finding, maple farms were included in the study sample. Potential study participants were randomly drawn from each of the specified commodity groups in PA and VT. Information was collected on the number of acres worked by cash crop, fruit, vegetable, and maple farmers and the total number of animals for livestock and dairy farmers in order to segment the population into large and small strata. The respondents were farm owners, farm wives or farm partners. The questionnaire responses allowed investigators to identify where each participant was on the Stages of Change continuum.

Identifying key motivators and barriers: In an effort to identify key motivators and barriers for retrofitting older tractors in VT and PA, a phone survey was conducted with a random sample of farmers (n=327) in each state. A total of 126 eligible small crop farmers out of 516 contacted in PA (24.4%) agreed to participate in the survey. In VT, 201 of 528 farmers contacted (38.1%) participated, giving a total of 327 completed surveys. These farms were drawn at random from the databases of the USDA National Agricultural Statistics Services for each state. To be eligible for the survey, the farmer needed to have at least one unprotected tractor and more than $1,000 in annual agricultural sales. Many of the variables used in the survey had been previously identified in a similar quantitative study with NY farmers. The survey was piloted at outreach events in both PA and VT to ensure that all potential motivators and barriers were represented. The first section of the final survey was aimed at identifying the number of tractors they possessed, whether those tractors were ROPS-protected, and whether they had ever retrofitted a tractor with ROPS. In the following section, participants were asked to rate the importance of each item in a list of barriers to retrofitting. Next, a list of motivators was rated for importance. Lastly, farmers were asked where they were most likely to obtain information on farm management, machinery upgrades and health and safety information. This survey was administered by telephone by the NY-NASS.

Message testing/development: The Northeast Center worked with AED, a social marketing organization, to develop message prototypes for the VT and PA campaigns. Some of these message prototypes were based on concepts developed in NY, while others were created based on the new information gathered in formative research activities with VT and PA farmers and local researcher's knowledge of farm practices and farm culture in these states. Concepts were then tested in small farmer focus groups, where participants were asked to give feedback on what they liked and did not like about each ad, to select two favorites and to discuss the message channels they look to for information on machinery upgrades. The focus groups were recorded, transcribed, summarized and analyzed. The prototypes were then tailored to reflect the comments and suggestions given by focus groups participants. This same process was used to develop messages for the NH ROPS campaign.

Website design and construction: With the help of AED designers and web consultants, the design of the NY ROPS Rebate website was altered to include additional states and to reflect each states distinctive program. The website also allows web-users to move easily between each of the state programs and each site is linked to the ROPS hot line. This design readily accommodated the addition of NH and WI several years later. Further efforts in the redesign of the website construction have simplified the transfer of data to the ROPS hotline database.

Intervention Launch: ROPS Retrofit programs were consecutively launched in VT, PA, NH and WI from 2010-2013. These programs have continuted to engage in ongoing fund-raising efforts to gather financing for ROPS rebates, and have continuted to promote their retrofit programs through earned media, paid advertising, outreach events and project partners such as insurance companies and dealerships. Hotline assistance continues to be made available to farmers who are assisted with the process of identifying parts, ROPS kit price comparisons and dealer interactions. Evaluation of the programs efficacy continues via customer satisfaction surveys and retrofitters surveys that are conducted to identify close-calls and potentially fatal events. In addition to these activities, project researchers have tested new and innovative forms of fund-raising, such as crowd-funding.

Paving the Way for Projects in High-Risk States, the Project Assessment Team: In addition to these activities, project researchers have collaborated with a group of experienced agricultural health and safety researchers who were charged with assessing the intervention implementation process in VT, PA, NH and WI. These researchers, who work in the states with the highest risk of tractor overturn:

1) attended all biannual process review meetings
2) reviewed each of the model translation steps carried out by the state teams
3) discussed the process/outcomes and recommended alternative changes/expansions to the NY model
4) used their knowledge of the process to pave the way for ROPS programs in these high-risk states

Results and Discussion

Selecting a target audience: Results from the telephone survey indicated cash crop, fruit, vegetable dairy, livestock and maple farms collectively account for 162,072 tractors in PA and VT. Of those tractors, 85,927 (53%) did not have ROPS. Broken down by state, 77,203 of the unprotected tractors identified were from PA farms and 8,724 were from VT. Results also demonstrated that 29% of all unprotected tractors in PA can be found on cash crops farms, with smaller farms accounting for a higher proportion of unprotected tractors than larger farms. This led to the selection of smaller cash crop farms as the target audience for a social marketing campaign in PA. In VT, vegetable and cash crop farms were the least likely to have ROPS on older tractors. Although the results indicate that PA and VT farms have a larger percentage of ROPS protected tractors than farms in NY, there were still an estimated 85,927 unprotected tractors on PA and VT farms. Survey data on farmer's stage of change indicated most PA and VT farmers were not contemplating ROPS retrofitting in the near future. There was no significant difference in the stages of change for each of the different commodity groups. These results were generally consistent with what was found in NY State.

Identifying motivators/barriers to retrofitting: There was a general consensus between the two states on the major barriers to ROPS installation, with "Costs too much money", "Don't have hills", and "Have enough experience" being the top three barriers in both states. The correlation between the proportion of subjects rating the barriers as "very important" between the two states was .79 ($p=.001$). In addition, there was a general agreement in the relative ranking of motivators between the two states with "Have hills", "Concerned about liability" and "Have ditches" being the top three motivators in both. The

overall correlation between the proportion of subjects rating the motivators as "very important" between the two states was .84 (p=.002). Additionally, a highly rated barrier identified for female operators was 'the difficulty of installing ROPS', while older farmers identified 'the limited use of a tractor' as a highly rated barrier. Results from this survey also mirror results from previous surveys conducted in NY regarding concerns about worker injury and liability as prominent motivators for retrofitting.

Message testing: Analysis of focus group discussions indicated that peers were an important source of information. Participants also discussed a preference for ads that were eye-catching, thought provoking, to the point, convincing and accurate. Eye-catching and thought provoking ads tended to be ones that engendered emotional reactions to the material. Ads also needed to emphasize and address farmer's needs or concerns. Ads that addressed presently held concerns or beliefs appeared more likely to be successful than ads that tried to change these beliefs. To be convincing and personally relevant, farmers needed to see subjects and environments in the ads that reminded them of themselves and that looked like their farms. As a result, the ads were tailored to address the preferences discussed by focus group participants. Message testing feedback was fairly consistent between all of the states (PA, VT, NH and W). For example, ads that featured a testimonial of a farmer involved in a rollover, or a family were among the most popular ads. These ads were used to launch programs in PA, VT, NH and WI.

The launch of the VT program occurred in September of 2010 at a local farm, while the PA program was launched in January 2011 at the Keystone Farm Show in York. In addition to these programs, a ROPS program was launched in New Hampshire in November of 2010 at the request of the NH Agricultural Commissioner. This launch occurred simultaneously at several NH dealerships and research staff assisted the Commissioner with promotions and organization of the program launch. The WI ROPS program was launched by the Marshfield Children's Center in February of 2013. Ongoing efforts have been directed at raising funds for rebates in these states.

Examining ROPS pricing increases: In addition to these studies, research data taken from the ROPS Hotline indicates as ROPS demand has increased, ROPS pricing has increased, particularly for aftermarket ROPS models. To assess this phenomenon, researchers gathered ROPS hotline data from 2006 – 2012. Pricing data was obtained for all rigid ROPS kits available in the US since 2006. The average price increase for a ROPS kit (including shipping) over the six years of the study was 29% for original equipment manufacturers (OEMs) versus 47% for aftermarket (AM) (p=.0005). Out of pocket expenses held steady for OEM versus a six-year increase of $203 in AM (p=.098). The probability of a person retrofitting dropped monotonically from 66.9% in the lowest ROPS cost quintile to 23% in the highest. This research highlights the importance of coordinating with manufacturers and distributors to keep ROPS prices down. Anecdotal comments from some WI farmers suggest that the decision in WI to require dealer installation (thus increasing total cost by roughly $200) has dampened the enthusiasm of some potential participants – again suggesting that as the cost to farmers substantially exceeds $300, participation falls.

Project Assessment Team: Several members of the Project Assessment Team continue to be actively involved in existing ROPS programs and efforts to launch a National ROPS Initiative. For example, PA has continued to raise funds for existing ROPS project and Project Assessment Team members from OH, WV and KY are members of the NTSC and assisting with initiatives to launch programs in their home states. Members of the TN Department of Health and Department of Agriculture are also actively involved in the NTSC. In addition, to these promising events, the TX NIOSH Extramural AFF Center has recently submitted a funding proposal to launch a ROPS rebate program in this state and the Agricultural Commissioner in MA is currently raising funds to launch a ROPS program for MA farmers.

Conclusions

To summarize, much has been learned about the viability of translating the NY ROPS Social Marketing Intervention Model to other states and great strides have been made in applying these lessons to the expansion of ROPS program to other areas of the US. Most importantly, programs in VT, NH, PA and WI have been well received. Since these programs were launched in 2010, approximately 1,485 calls have been processed through the hotline for PA, VT, NH and WI and 4,668 calls have been processed in all five states. A total of 1,702 tractors have been retrofitted with ROPS in PA, VT, NH, WI and NY. Over 60 message prototypes have been created that emphasize the importance of ROPS retrofitting and considerable upgrades have been made to both the ROPS hotline and the program website, which know allows farmers to sign up for the program online. Numerous back-end revisions to the website have also increased the efficiency with which farmer requests and data summary requests can be processed. Discussions regarding the launch of additional ROPS Programs are underway for the states with highest risk of overturn in the US, TX and MA. Finally it should be observed that the success of this program and its popularity in the farm community has been noted by legislators at both the state and federal level. It is frequently cited in conversations regarding the impact of NIOSH's AFF program.

Over $1.3 million has been raised for ROPS rebates in the five states with ROPS programs. Fundraising materials, such as case-statements, information packets and recognition level incentive menus have been developed for use by partners in PA, VT, NH, WI and NTSC partners. Members of the research team have also been involved in the organization of several national ROPS plenary sessions, and have conducted professional improvement sessions for other researchers on conducting social marketing campaigns to address agricultural health and safety issues. Much of the work conducted in this project has led to the success of a separate NIOSH two year exploratory grant that has endeavored to mobilize stakeholders to launch a National ROPS Initiative. These efforts have led to the development of the NTSC, which boasts a steering committee of roughly 12 high-profile, agricultural service organizations and nearly 60 additional organizational partners. The NTSC has developed both three month and three year action steps for launching a National ROPS Program. Presentations have been made at numerous national and international conferences, such as ISASH, the annual Canadian Agricultural Safety Association, the World Social Marketing Conference and for the 2012 NIOSH Agriculture, Forestry and Fishing Review. The project was also awarded the 2011 NIOSH NORA Partnering Award for it's work relating to gathering and mobilizing project partners. The project is also featured as an R2P success story on the NIOSH website.

Literature Cited

Andreasen AR:[1995] Marketing social change. Jossey-Bass.

ASABE Standards:[2009] ASAE SAE J1194: Rollover Protective Structures (ROPS) for Wheeled Agricultural Tractors. St. Joseph, Mich.: ASABE.

Hallman EM. [2005] ROPS retrofitting: measuring effectiveness of incentives and uncovering inherent barriers to success. Journal of Agricultural Safety and Health Feb;11(1):75-84.

Jenkins PL, Sorensen JA, Yoder A, Myers M, Murphy D, Cook G, Wright F, Bayes, B, May, JJ: [2012] Prominent Barriers and Key Motivators to Installing ROPS: An Analysis of Survey Responses from Pennsylvania and Vermont. Journal of Agricultural Safety and Health 17:157-172.

Loringer KA, Myers JR: [2008] Prevalence of ROPS-Equipped Tractors on U.S. farms, 2001 and 2004. Journal of Safety Research 39:509-517.

May JJ, Sorensen JA, Burdick PA, Earle-Richardson GB, Jenkins PL: [2006] Rollover Protection on New York Tractors and Farmer's Readiness to Change. Journal of Agricultural Safety and Health 12:199-213.

Murphy DJ, Cavaletto R, May J, McKenzie EA, Myers J, Sorensen J:[2010] Tractors and Rollover Protection in the United States. Journal of Agromedicine 15:249-263.

Myers JR, Hendricks KL: [2009] Agricultural Tractor Overturn Deaths: Assessment of Trends and Risk Factors. American Journal of Industrial Medicine 53:662-672.

NIOSH [2004] National Agricultural Tractor Safety Initiative. (ed. E Swenson), Seattle, Washington, University of Washington, Pacific Northwest Agricultural Safety and Health Center.

NIOSH Science Blog [2009] Preventing Death and Injury in Tractor Overturns with Roll-over Protective Structures. Atlanta, Georgia: Centers for Disease Control and Prevention. Retrieved from http://blogs.cdc.gov/niosh-science-blog/2009/01/05/rops/. Accessed 11 April 2014.

NORA AgFF Sector Council. 2008. National Agriculture, Forestry, and Fishing Agenda. Washington,D.C.: National Institute for Occupational Safety and Health.

Sorensen J, May J, Jenkins P, Jones A, Earle-Richardson G.:[2006] Risk Perceptions, Barriers and Motivators to Tractor ROPS Retrofitting in New York State Farmers. Journal of Agricultural Safety and Health 12: 215-226

Sorensen JA, May J, Ostby-Malling R, Lehmen T, Strand J, Stenlund H, Weinhall L, Emmelin M: [2008] Encouraging the installation of rollover protective structures in New York State:The design of a social marketing intervention. Scandinavian Journal of Public Health 36: 859-869.

Springfeldt B: . [1996] Rollover of Tractors-International Experiences. Safety Science 24:95-110.

Struttmann TW, Brandt VA, Morgan SE, Piercy LR, Cole HP. [2001] Equipment dealers' perceptions of a community-based rollover protective structures promotion campaign. Journal of Rural Health Spring; 17(2):131-9.

Thelin A: [1998] Rollover Fatalities-Nordic Perspectives. Journal of Agricultural Safety and Health 4:157-60.

UPDATE BLS. [2013] Census of Fatal Occupational Injury Charts, 1992-2012: Preliminary Data. Washington, D.C.: U.S. Department of Labor. Available at: http://stats.bls.gov/iif/oshwc/cfoi/cfch0011.pdf. Accessed 17 March 2014.

Publications

Yoder A, Murphy D: [2012] Using Social Marketing to Address Barriers and Motivators to Agricultural Safety and Health Best Practices. Journal of Agromedicine. 17:240-6.

Jenkins PL, Sorensen JA, Yoder A, Meyers M, Murphy D, Cook C, Wright F, Bayes B, May JJ [2012] Prominent Barriers and Motivators to Installing ROPS: An Analysis of Survey Responses from Vermont and Connecticut. Journal of Agricultural Safety and Health, 18:103-12.

Sorensen JA Jenkins PL, Bayes B, Purschwitz MA, May JJ: [2013] Increases in ROPS pricing from 2006-2012 and the impact on ROPS demand. Journal of Agricultural Safety and Health. 19:115-124.

Yoder AM, Sorensen JA, Foster F, Myers M, Murphy D, Cook G, May JJ: [2013] Selecting target populations for ROPS Retrofit Programs in Pennsylvania and Vermont. Journal of Agricultural Safety and Health. 19: 175-190.

Inclusion Enrollment Table

Please find inclusion enrollment table attached

Inclusion of gender and minority study subjects

Refer to inclusion enrollment report

Inclusion of Children

No children were recruited for the research activities that were undertaken in this research project.

Materials available for other investigators

A website which features information on the NY, VT, PA, NH and WI ROPS intervention programs has been completed. This website features information on overturns, program sponsors, researchers and provides links to other important tractor safety websites. It also offers a data form which can be used by farmers to sign up for the rebate program. In addition, 60 message prototypes have been developed, which incorporate a wide range of message concepts. A ROPS Romps calendar has been created which provides an entertaining remainder for farmers to use ROPS protected tractors when performing dangerous tasks. Several videos have also been created, which feature tractor overturn testimonials from farmers. Fundraising materials have been developed to facilitate private industry investments in funding for ROPS rebates. A database with the most comprehensive list of farmer ROPS preferences and information on media channels, self-install preferences and seatbelt usage can also generate de-identified data summaries. Information from this database has been used frequently by other researchers and manufacturers to address ROPS supply issues. A list of suggestions and cautionary notes has been developed for farmers choosing to self-install ROPS. Lastly, various survey instruments have been designed and tested, which facilitate the measurement and identification of ROPS protected tractors in different segments of the farm community, farmer's stage of change relative to ROPS installation, ROPS installation motivators and barriers, participant satisfaction with ROPS programs and tractor overturn events.