# Overcoming Barriers to Safe Operation of Agricultural Tractors: Insights from Participatory, Community-based Social Marketing

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**Abstract**

Approaches in the field of public health promotion and risk communication have evolved over the years from top-down dictation of rules and information to strategies that favor listening to and learning from the target audience, and building the program from there. Stakeholder participation in all phases of public health promotion and risk communication programs -- especially in interventions related to agricultural health, safety, and injury prevention -- ensures that such programs are culturally appropriate, relevant to stakeholders' needs, and focused on attitudes, barriers and motivators to behaviors perceived as important by the target audience. In late 2005, under just such an audience-centered approach, a 2-year national formative research project was launched to involve farmers and their service providers in the incremental development of a participatory, community-based social marketing program for promoting selected aspects of the *National Agricultural Tractor Safety Initiative*. Conducted by eight National Institute for Occupational Safety (NIOSH)-funded agricultural health and safety research centers, the research project focuses 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 pretesting a prototype social marketing toolkit for promoting selected aspects of the *Initiative*. In thirty-two (32) focus groups totaling 288 participants in eight geographically diverse states of the nation, farmers and their service providers identified barriers and motivators, message attributes, media, and policy issues they perceive as important to any effort to promote agricultural tractor safety. This paper presents the preliminary findings of the project and discusses their implications for the design, implementation and evaluation of community-based social marketing programs to promote agricultural tractor safety.

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## Project Description

The two-year formative research project is the critical first step for incremental development of a community-based social marketing program for the promotion of selected aspects of the *National Agricultural Tractor Safety Initiativ*e (NATSI, 2004). It is an effort to involve members of farming communities and their grassroots leaders in the development of communication strategies and tactics for promoting rollover protection structures (ROPS) and seat belts and tractor highway safety issues nationally. Thirty-two (32) focus groups totaling 288 participants in eight geographically diverse states were used to interact with farm communities during the project. Focus group participants were selected from principal farm operators, farm managers, farm women, and those who provide business, social, and professional services to farmers (Cooperative Extension agents, equipment dealers, insurers, health care providers, financial advisors, farm suppliers, etc.).

After reviewing the *National Agricultural Tractor Safety Initiative* document and examining the communication messages and strategies included in the *KY ROPS Notebook* (Cole, et al 2007), it became clear that a project team could advance the *National Agricultural Tractor Safety Initiative* by the incremental development and evaluation of a social marketing effort in regions serviced by the NIOSH agricultural safety and health research centers. In addition to the participating eight NIOSH centers[1] and the many county-level farming groups with whom they work, the partners in this collaborative effort also include the Integrated Strategic Communication (ISC) program of the University of Kentucky School of Journalism and Telecommunications and the NIOSH Office of Health Communication (Max Lum and Melissa Van Orman).

Some of the participating centers have previously completed studies on various aspects relevant to this project and all have expertise in one or more of the following disciplines pertinent to the project: agricultural safety, social marketing, health communication, or community-based approaches to intervention design. By combining resources and expertise, and by using findings and methods from past studies, this project is providing more complete and accurate information about the most effective methods of designing a community-based social marking model, which will serve multiple groups and purposes in various parts of the country. Armed with this model, NIOSH agricultural health centers will be able to work with farm communities, their leaders and other partners to design and implement effective

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social marketing and communication strategies and materials for promoting the *Agricultural Tractor Safety Initiative* to protect farmers, their families, and communities from the catastrophic losses frequently associated with overturns or collisions involving unguarded tractors. The project is funded by CDC/NIOSH through Colorado State University and has three specific aims:

1. Present the *National Agricultural Tractor Safety Initiative* to farmers and grassroots farm community leaders in eight geographically diverse states to obtain information about farm community members' perceptions of the *Initiative* and its recommendations. This will be accomplished in a series of four focus groups per region. The purpose is to build grassroots level awareness of the *Initiative and* to engage members of the target audience as active stakeholders in further development of the *Initiative*.

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. The data collected from this study will provide information about commonalities among influential farm community micromedia and communication channels across different regions of the country, as well as the range and type of variation in media venues and communication channels. These data should prove useful to formulating social marketing efforts to promote the *Initiative*.

3. Pretest and evaluate a package of social marketing strategies and messages with focus group members. The materials to be presented are adaptations and improvements of the messages and methods found in the *KY ROPS Notebook* (Cole et al., 2002). Prior to conducting the focus groups, a subset of materials from the *ROPS Notebook* will be selected, improved, and prepared for presentation to the community groups. The purpose is to provide community members with examples of easy to use and attractive multimedia messages, materials, and strategies for possible local use. The participants' reaction to these materials and their interest in using the materials will provide data useful for the development of community-based social marketing programs.

## Project Background and Significance

In his book titled *Looking Beneath the Surface of Agricultural Safety and Health,* Murphy (2003) details the long history of the *farm safety – risk paradox*. The paradox is that for nearly a century researchers have studied farming-related injuries and their prevention. The results of these studies have been distributed to farmers through large numbers of safety education programs. Typically these efforts have had little effect on lowering farm injury rates. It is not that farmers do not understand the safety

research findings. Rather, it is that farmers and farm community members do not buy into the safety practices for a variety of reasons. These include long traditions of independent unregulated farm operation, as well as perceived economic and production costs associated with safety improvements such as placing ROPS on unguarded tractors. Additional barriers are present in the social norms of the communities in which farmers live and work. Social norms barriers are evident in local media and newspapers that report tractor injuries and fatalities as "acts of God" or "freak accidents." Farm community leaders and operators of farm service and agricultural businesses often share these attitudes or at least fail to take a stand on safety issues for fear of alienating farmers (Cole, 2002; Murphy 2003).

It is clear that translating farm safety research into information that is then disseminated to farmers has not been very effective in reducing farming-related injury rates. Agriculture continues to rank as the highest risk sector for occupational fatalities in the United States (NAS, 2006). The problem is not that the information provided by researchers is irrelevant. In fact such information is important, but not sufficient. Changing farm safety practices requires changes in individual and community attitudes and values, as well as changes in knowledge and risk perception. Factual information about injury risks can be communicated by direct instructional methods, as can procedures and methods for working safely to reduce exposure to hazards and injury. However, attitudes and values cannot be taught by direct instruction. Telling people what their attitudes should be or what values they should adopt is usually ineffective or counterproductive. A more effective way to develop attitudes that support the adoption of safety practices is for researchers and members of the farming community to engage in dialogue, especially dialogue that includes narrative accounts and storytelling about farm injury events as experienced and discussed by members of the farm community (Cole, 1997, 2000; Morgan & Cole, 2002; Struttmann, Brandt, *et al*., 2001; Murphy, 2003; Richardson, 2004).

Thus, this formative research project addresses a highly important objective: how to strengthen the impact of efforts to promote the *National Agricultural Tractor Safety Initiative* by utilizing the principles of community-based participatory research (CBPR) in the design, implementation and evaluation of social marketing programs at the grassroots level. In addition to environmental modification, improved engineering features of products, legislation, policy, and law enforcement, Mock *et al* (2004) also advocate the use of social marketing to strengthen efforts to prevent injuries worldwide. In the same vein, the US Department of Health and Human Services (2003) describes community-based participatory research as a type of information generation methodology that promises to directly benefit the people, and according to Green *et al* (1995), it is a systematic form of inquiry that includes education and social action to elicit change.

Approaches in the field of health education and communication have evolved over the years from top-down dictation of information to strategies that favor listening to and learning from the needs and

desires of the target audience, and building the program from there. This formative research project is based on this shift in perspective. The project has used community-based participatory research (CBPR), defined as a collaborative partnership approach that equitably involves in all aspects of the research process all those who are affected by the issue being studied – community members, organizational representatives and researchers (Israel et al., 2001).

Done properly, CBPR should benefit community participants and practitioners alike. CBPR creates bridges between scientists and communities, allowing both to gain in knowledge and experience. This collaboration assists in developing culturally appropriate interventions, thus making projects more effective and efficient. Finally, CBPR establishes a level of trust that enhances both the quantity and the quality of information generated (Anyaegbunam & Kamlongera, 2002; Anyaegbunam, Mefalopulos, & Moetsabi, 1999; Viswanathan *et al*., 2004; Cornwall & Jewkes, 1995; Wallerstein, 2000).

The project also has been guided by the principles of social marketing, which became a discipline in the 1970s when Philip Kotler and Gerald Zaltman realized that the same marketing principles that were being used to sell products to consumers could be used to "sell" ideas, attitudes and behaviors. Kotler and Andreasen (1991) define social marketing as "differing from other areas of marketing only with respect to the objectives of the marketer and his or her organization. Social marketing seeks to influence social behaviors not to benefit the marketer, but to benefit the target audience and the general society." This technique has been used extensively in international health programs, especially for contraceptives and oral rehydration therapy (ORT), and is being used with more frequency in the United States by organizations such as the Centers for Disease Control and Prevention (CDC), National Cancer Institute (NCI), and the National Institutes of Health (NIH) for topics ranging from drug abuse to heart disease to organ donation (for an example see Wong, *et al*, 2004).

Like commercial marketing, the primary focus of social marketing is on the consumer -- on learning what people want and need rather than trying to persuade them to buy what the business happens to be producing. The planning process takes this consumer focus into account by addressing the elements of the "marketing mix." This refers to decisions about (1) the conception of a product, (2) price, (3) distribution (place), and (4) promotion. These are often called the "Four Ps" of marketing.

Combined with the principles of CBPR, social marketing adds value to health or injury prevention intervention design and implementation by ensuring that community members (including members of the target audience) participate in all steps in the process. This model of intervention design has as its foundation the belief that, working with specialists in the sciences of behavior change and communications, community members themselves are best able to develop their own prevention programs and to manage issues that could otherwise hamper program effectiveness.

Within the framework briefly described above, this project involved multiple groups of farmers and farm community members from multiple states in focus group discussions about tractor overturns and highway collision events. This activity involved sharing with the participants the details of the *Tractor Safety Initiative* and eliciting from farmers and farm community members their experiences and stories about the topics and issues raised therein. The project also worked with these community members to determine which media and communication channels they think are most effective in changing farmers' thinking and behavior, as well as to identify local leaders who are judged to be persuasive communicators of farm safety messages and practices. A toolkit was developed to help the focus group facilitators from the eight NIOSH centers to (a) recruit focus group participants; (b) present the *Initiative* to these groups; (c) engage the group members in dialogue about the issues, and (d) demonstrate multiple methods, tactics, and materials by which to advance portions of the *Initiative* among community members who may choose to support it.

**Formative Research Methods**

The conceptualization and implementation of this formative research project was guided by the principles of social marketing and community-based participatory research (CBPR). The project began with the gathering and analysis of existing information from the scientific literature regarding what is already known about the population of interest and its perceptions of tractor safety issues. Information about best practices and theories appropriate for creating grassroots interventions for tractor safety was also identified and analyzed.

Various published works that emerged from previous tractor safety studies and projects carried out by the Southeast Center and other NIOSH-funded centers provided the project with materials for review. In addition, the project also looked at the international tractor safety and general injury prevention literature for relevant materials.

Results of the secondary research phase informed the selection and revision of messages and materials in the *ROPS Notebook* (Cole et al. 2002) that were not only pretested but also used as problem-posing visual and audio codes for generating discussion during the focus groups (Freire, 1974). A 'code' is any form of communication (for example, posters, skits, pictures, films, dance, stories, magazines, or newspapers, etc.) that reflects on social reality and is used to convey an impression of a problem, issue, or world view. With codes, the social norms that are hidden in everyday life can be identified and analyzed. Codes help groups to express their ideas, thoughts and feelings about particular issues. Through codes, groups also analyze social norms in a way that decodes or demystifies the world that they live in. Decoding is the process of collectively rendering an abstract problem, issue or question into a concrete representation that is workable and relevant. Codes are more than just visual aids used to illustrate a point. They raise questions; they do not provide answers.

The results of the secondary research were also used for the development of a standardized focus group discussion guide and instructions for interacting with and gathering information from farm communities. The discussion guide and instructions were field tested with a group of farmers in Idaho and revised during several phone conferences and a two-day training workshop at the University of Kentucky attended by focus group facilitators from all participating NIOSH centers.

With the revised discussion guide and instructions, facilitators and note takers conducted focus groups with selected farm communities in eight diverse regions of the country. As a naturalistic method of information gathering, focus groups help capture some of the socially constructed and situated nature of human behavior. Because of the group interaction inherent in this method, it produces insights that are less likely to be discovered through the use of questionnaires. For example, values and cultural norms related to tractor safety may surface with less time and money invested than in individual interviews. Focus groups offer the opportunity of a large amount of interaction on a topic in a limited period of time.

Developed during World War II to assess the effectiveness of morale-boosting radio programs, the focus group method is described as an interview style designed for small groups to discuss particular topics of interest or relevance to the group and the researcher (Berg, 1995). In focus groups, a moderator or facilitator asks key questions which generate group discussions that reveal group sentiments and the reasons for the views. This is a method of choice for knowing *why* people feel as they do. Focus groups can be very helpful in field settings. The most prominent uses have been in marketing, advertising, mass media, political campaigns, health care research, health communication and education, intercultural studies, and legislation. Focus groups are also frequently used for pretesting program themes, messages, and products with members of intended audiences (Basch, 1987; Libresco, 1983; Merton, 1987).

Another advantage of focus groups is their flexibility; moderators have the ability to ask additional questions beyond those contained in the guide, especially when unanticipated issues arise during a discussion. Focus groups are very helpful in pilot studies because it is possible to get feedback regarding areas of possible misunderstanding. Finally, focus groups promote frank and honest sharing of ideas that might not occur in other settings; not only does probing for reasons behind answers promote insight, but also people are often willing to “open up” when they are in small groups.

Each of the eight participating agricultural safety and health centers selected 2 to 4 contiguous farming counties in states in their regions and conducted four focus group meetings. This produced a national sample from locations in California, Kentucky, North Carolina, New York, Texas, Wisconsin, Colorado, and the Pacific Northwest. The sample included participants drawn from African American, Native American and Latino/Latina farmers.

Each focus group was attended by 4-13 participants purposively sampled from the following segments or strata: principal farm operators, farm managers, farm women, and those who provide

business, social, and professional services to farmers (extension agents, equipment dealers, insurers, health care providers, financial advisors, farm suppliers, etc.). Focus group sessions were conducted at sites in the counties that are convenient to the participants and each included a meal. A moderator conducted each focus group session with a note taker in attendance. Each session lasted 90-120 minutes. All focus group discussions were audio recorded with the knowledge and consent of participants.

At the beginning of each session participants completed a one-page demographic form to provide information about their age, gender, primary job/profession, and their connection to farming. Sets of public service announcements (PSAs) and photos of fatal and nonfatal tractor overturns adapted from the *ROPS Notebook* were then presented to the focus participants for their review and comments. Each focus group reviewed four PSAs and six photos of fatal and nonfatal tractor overturns.

Participants were also presented with the *Initiative's* goals and recommendations for discussion. The participants' perceptions and comments were collected and summarized for each area of the *Initiative*. For example, participants' comments and ideas were solicited about the role and size of financial incentives for farmers and equipment dealers to increase the numbers of tractors equipped with ROPS and seat belts.

Data from the focus groups were obtained from the audio recordings, which were transcribed to produce a verbatim script of each session. Names of participants were removed after initial transcription, and replaced with pseudonyms. Three co-investigators read all the transcripts and developed common themes that were used for coding the data into category properties (Glaser, 1978). Data was analyzed based on the congruency between the data bit and the identified category properties using the qualitative data analysis software, NVivo 7. After analysis, the results were compared to extant farm tractor safety literature and information about the populations of interest collected during the secondary information-gathering phase of the project.

Before field implementation of this research project, all participating NIOSH centers obtained approvals from their affiliated university Institutional Review Boards (IRBs).

## Results

Data transcription and analysis for this research-in-progress continues as of this writing. Thus, the preliminary results presented here reflect data from 24 out of 32 focus groups. This section describes some of the major barriers and motivators, message attributes, and policy issues perceived as important by focus group participants to any efforts to promote agricultural tractor safety. These communication and policy issues were elicited through participants' interactions with the various audio and visual trigger codes presented to them as part of the problem-posing process during the focus groups.

**Feedback on most effective PSA content**

Interviewees preferred PSAs with a direct message that went beyond the risk of injuries and death and delved into the consequences of tractor rollovers, especially, the emotional and financial burdens placed on families and the loss of production that occurs following injuries or fatalities. Many farmers asked for yet more detail in the messages, especially information about the cost of retrofits and specific locations where farmers can buy and have tractors outfitted with safety equipment. One Texas farmer said, "If I was driving down the road and heard that [a PSA that talks of costs], on the radio it would get my attention because it talks about saving money."

Very few respondents expressed difficulty in understanding the terms used in the PSAs. However, several farmers preferred the use of the term 'roll bars' instead of 'ROPS'. According to a Boise, Idaho, farmer, "This is the first time I've heard them called ROPS – this is a roll bar – call it what it is. Use the right terminology."

PSAs that touched on family resonated with several of the focus groups. "I like the first one because it involved family members. It told you what it's like to put your family members in danger, and the risks you are taking. And if that doesn't wake you up, nothing will," said a farmer in Hardin County, Kentucky. Many interviewees said that the family aspect made the PSAs relevant and that "making it personal" makes a difference in getting a message across. According to a male farmer in Fleming County, Kentucky, "All of us would spend money to keep our kids safe, but wouldn't spend a dime to keep ourselves safe."

Real-life, common stories left a lasting impression on the focus groups. If farmers saw the action described as realistic, then they said the PSAs worked. Personal testimonials, especially from rollover survivors, and from wives and children of farmers who died as a result of tractor rollovers would only add to the realism of the PSAs. According to a service provider in Ashe County, North Carolina, "Have somebody who actually lost somebody by a rollover because their tractor didn't have ROPS tell their story and then it would make me stand up and listen a whole lot better than anything else you can do." Another farmer in Ashe County affirmed this and added, "It would be good to get a farmer that has been hurt tell the story from their personal experience. I would think that would be more convincing. It wouldn't have to be from that county, it could be from another. It probably wouldn't sound as good but it would hit home with farmers because they will relate to the story coming from a fellow farmer talking to them instead of someone talking down to them."

In at least four different focus groups, interviewees said they preferred a woman's voice over a man's voice in the PSAs, especially those talking emotionally about consequences of tractor rollovers on their families. "There are too many women involved in farming now that it is no longer proper to have all males talking about it all the time," said a farmer in Fleming County, Kentucky. A Wisconsin farmer

echoed what several other interviewees said about men speaking in the PSAs: “He seemed too casual. It didn't jump out like he wasn't too concerned or whatever.”

Other farmers suggested the use of emotional children. “Parents will listen to the younger kids more than you think,” observed a female farmer from Montgomery County, Kentucky. She added, “include a child talking about what happened, and then what their dad did for their mommy, and play on the whole family, because farming is a family business. I think they need to play on the whole family.”

On whether focus group participants think other farmers will find the PSAs convincing, many of the participants observed that to spur farmers to purchase and use ROPS, “visualization” in the form of pictures and displays of actual tractors that had turned over would be necessary in addition to the audio PSAs. According to one of the farmers, “I remember when I was in the Cub Scouts in Indiana and we had a trip to the local sheriff's department, and they brought us out pictures of farm accidents. That stuck on me more than anything else because it was a tractor that had turned over. It didn't have ROPs on it and it was a little bit more graphic for a young kid to see but it impressed me. It was real gory. You can say tone it down or you can't say that or show that, but sometimes you might have to be more graphic because we got to get it through it. Visualization plays a big part in it. In high school in hydraulics they showed us pictures of man getting his arms caught in a belt and it amputated one of his arms, and today we still remember that story and know the man.”

Several farmers confirmed the perception above. A Boise farmer said, “It doesn’t grab Americans’ attention unless something tragic happens. We don’t care; if it all goes good, we don’t care. What we want to hear about it is if somebody didn’t come home and their tractor is in a ditch, and their wife is looking forward, supper never got ate, and they call the family members and everybody goes out with flashlights and finds him dead under the tractor. That’s what we want to hear.” According to a farmer in New York, “ I almost think you got to keep tragedy at home, drive it home, at home and then like in Western New York, regrettably a tragedy there that’s where you drive that home.”

Some of the farmers, however, pointed out that they do not like PSAs and TV commercials. As a reaction to one of the PSAs, a farmer said “it sounded just like a public service announcement where I would change the station. I hate commercials on TV so I know I would not listen to these.” Another farmer asked, “Is this going to be a radio story?” Upon receiving an affirmative answer, he continued, “Farmers don't listen to the radio. A true farmer -- small farmers -- they work an 8-hour day somewhere and then they come home and in the summertime they farm from 4 o'clock until dark, and they never have the radio on because the tractor is not equipped. Most of the time if they had a radio on the tractor they don't listen to it. It will be hard to get this message out by radio and even TV.” Other farmers suggested broadcasting the PSAs early in the morning, during lunch breaks or late at night, especially during radio or TV program segments dealing with the weather.

Finally, for most of the farmers, the only thing that reportedly would make them change their behavior is if they or someone in their family experienced a fatal or highly injurious rollover incident while riding a tractor without protection. According to one Kentucky farmer, "Farmers won't buy ROPS until somebody you love is hurt."

**Information sources**

In addition to county agriculture extension agents, many respondents cited respected people in the community and in the media as credible sources of agricultural safety and health information. For example, insurance agents, farm equipment dealers and Farm Bureau officials were often mentioned as reliable sources of agricultural information. Media personalities mentioned include Paul Harvey and other popular journalists who present farm reports or write about agriculture. Many farmers however, advised against the use of celebrities or political figures as spokespersons.

Farming publications were also mentioned as a popular information source. Such publications address safety issues with both stories and pictures. A visual element is an important part of any safety message, since many farmers said images capture their attention and provide a clear message. Farmers often spoke about the convenience of getting safety information through publications available at places they frequent, such as tractor dealerships and extension offices.

A Wisconsin farmer felt that doctors might be credible partners for tractor safety. According to her, "Maybe having your family pediatrician asking if you have ROPS, because they ask if we have all of our chemicals for the farm locked up. She is aware of the dangers and they asked about bike helmets and now my kids use guns for hunting, and she is asking about that. Have the medical doctors ask if we have safety ROPS on our tractors. If I'm in there and the kids come out and [say] 'the doctor asked if we have ROPS,' that kind of hits home when they tell you that."

Overwhelmingly, the farmers agreed that they often acted on information they received through word of mouth or farmer-to-farmer communication. A South Carolina farmer put it this way: "I think we get a lot of information from the county extension office, but I think farmer-to-farmer is probably the way a lot of us are doing it." A Kentucky farmer strongly recommended farmer-to-farmer communication because farmers are role models to other farmers: "My neighbor has bought a roll bar, I want one too!"

Another South Carolina farmer summed up the information sources nicely when she said, "You have a multi-media society, why don't you use them. You can use billboards, TVs, you have so many outlets to do things with that people can pay attention to, but you know, you have to use it all, even the Internet." A Kentucky farmer, however, pointed out that messages get lost at the national level. "Keep it local," he advised.

The Internet is growing as an information source, especially for the most recent information on

safety equipment. At least one farmer in each focus group said he/she goes on the Internet for information. Challenges include making farmers aware that such information exists on the Internet and where it is located. A farmer in Pasquotank, North Carolina, said, “I'm a big user of the Internet and there are Web sites that have been generated by people who have had accidents in the past, I think I have heard of those, and I think I have stumbled on one or two of those. And some of those can be found and made more publicly known so that people can see them ... can be a possibility.” The level of detail available on the Internet makes it a preferred information source for some farmers: “You can go on the Internet and get information -- extensive -- about anything,” said a Robeson County farmer. One Idaho farmer suggested the Internet might be particularly suited for getting messages across to young farmers.

Other credible information sources mentioned by participants in all the focus groups were as follows:

- Tractor dealerships
- Manufacturer hotline
- Farm Bureau
- 4-H and FFA
- Schools
- Television, especially RFD TV.
- Posters
- Cattle and other farm magazines
- Newspapers
- Radio
- US Farm Report
- Hospitals and doctors offices, including nurses
- Churches
- Meetings and conventions
- County fairs
- Printed materials, such as brochures, although Ashe County farmers pointed out “There's too much junk mail that comes in the mail ... it would trash.”

**Barriers to ROPS and seatbelt installation and use**

The primary barriers to the *Tractor Safety Initiative*, according to focus group participants, are the relatively high cost of ROPS and a feeling that the farmer is not really at risk of rolling over or that he or she can control a rollover situation. In several cases, farmers are using old tractors and do not wish to spend money on an aging machine. One Texas farmer said, “If a guy has an old tractor and maybe it's only worth $2,000 and that ROPS costs $1000 to install, then it's hard to convince someone to put one on. And they are not easy to install on the tractors. One size doesn't fit all.”

According to a Taylor County farmer, “For me it’s money. Some people say I’m tight but I don’t know. Part of it is money and the other part you think you are going to be careful and it’s not going to happen to you at all. And I’m sitting here and I need to know. I know better. That little 135 Ferguson

has got a seatbelt but it doesn't have rollover protection. I personally would rather not have a seatbelt on. I don't wear the seatbelt." One major reason for not wearing seatbelts was aptly described by a South Carolina farmer when he said "… and my biggest fear is rolling over and catching fire and I am not being able to get out. So, I am bad about seatbelts. That's something that I should be doing."

Another major barrier is the fact that many farmers refuse to use seatbelts, let alone ROPS, even when they are already installed. A female farmer in Montgomery County likened the problem with farmers and seatbelts to the fact that some people still drive cars without wearing seatbelts: "It's like in cars, people just don't wear them. Even if it's the law they're still not going to wear them." A Boise farmer also pointed out that seatbelts are not convenient: "They're not practical when you have to get back on and off." According to an Oregon farmer, "Seatbelts are inconvenient. You have to take it off and on. I'm driving my pickup down the road and I know I'm driving it to town, and I will always put it on. But driving around the farm I don't." A New York farmer admitted, "I had a Case International and took off the ROPS because I couldn't get it in the barn. I wasn't going to remodel the farm".

Many farmers claimed that even when a farmer finally gets convinced to retrofit an old tractor, he might not find the ROPS. A story from a Kentucky farmer illustrates this barrier: "We had a program 2 years ago working for the young farmers program and we had grant money to purchase ROPS for tractors, and we had different events and we gave away – tried to give away -- 3 ROPs. And we were going to give $800 for each one. And we tried 3 or 4 different times and gave away each one, drew someone's name, and gave away, and nobody took them. The money was never claimed. Free ROPs for your tractor and we couldn't get anybody to take them. At the end we stopped drawing names, because we couldn't get any farmers to take them. I know one of the farmers. When he went to get it for his tractor, he couldn't find one for his model tractor."

A California farmer hit on a unique barrier – lack of on-farm communication – rarely mentioned in other focus groups: "One of the other barriers is communication between employees and the employer." The farmer said Hispanics and older employees might fear the loss of their jobs as a response to voicing safety concerns. "Those barriers are somewhat being broke down, but it's still out there quite a bit. They just want to shut up, go to work, do their job, and come back and have a job tomorrow. They don't want to say, 'Hey, you need to fix this, or this needs to be done, or we need to do this.'"

Again in California, several farmer managers/owners said they lack simple information materials they can use with their farm workers. One participant complained, "…but it is tough to find materials that we can utilize for education that pertain to Ag." According to another participant, "What we find in trying to disseminate information to the growers that we work with is most of the time from the universities and they are a little academic and difficult for me and my limited time frame to translate and scale down."

**How to increase use of ROPS and prevent injuries and fatalities**

Constantly educating and reminding farmers of the risk and consequences of tractor rollovers came up in nearly every focus group as the first step toward increasing ROPS use and preventing fatalities and injuries. A Kentucky farmer urged the project to "Make information available more than once a year. Provide safety tips all the time." Some farmers therefore suggested stickers that go on the tractors as one way of constantly reminding farmers of the need for safety. No matter what, one California farmer said, a good safety program "is not rocket science and for the most part is basic stuff."

Many interviewees said that education should consist of multiple teaching materials such as videos and photographs of "accidents" and details about the consequences that resulted from tractors being used with and without ROPS or seatbelts. Visual proof that ROPS work might be necessary for convincing older farmers who possess "it can't happen to me" attitudes about safety. The biggest hurdle in the way of educating farmers might be getting them to attend safety meetings. An Ashe County farmer suggested using food: "If there is a meal provided you will have more people -- and we joke about it, but if there is food they will come. If there is a meal provided more people will come out for it." Other farmers suggested tagging tractor safety education on to mandatory safety courses; for example, pesticide safety training. In the same vein, another Kentucky farmer suggested, "Sell something they want to get them to buy what they need. Sell ROPS as roofs to keep the sun out of your heads."

Another avenue for preventing injuries and increasing ROPS use might be the public school system: "If we have more education for farm safety within the school systems, then the kids would go home and say, 'Dad look - what I learned.' And Dad would gain something from what the child learned in an indirect way. You would be teaching the future generation and also inadvertently teaching the small farmers. It would get to them through their family because the family is coming home and saying 'Hey, look what I learned,'" said an Ashe County farmer.

A farmer's age played a notable role in the opinions expressed in focus groups. Many participants suggested that the younger the farmer, the easier it might be to change his or her attitude about safety. Convincing young farmers might produce an upward effect, since they could then play a role in educating older farmers. In the same vein, many focus group participants called for special programs targeted at hobby farmers, often referred to as "Weekend or mini farmers" and older farmers.

Tying ROPS use into insurance premiums was considered another good way to prevent injuries and increase ROPS use. Since farming is an industry saddled with myriad financial challenges, it is apparent that any program without cash incentives faces an uphill battle. "Provide incentives for those tractors to be equipped with ROPS and seatbelts," said a Taylor County farmer. "I think that would be the first step."

**Who is responsible for tractor safety**?

The person who owns the farm or the tractor was identified often as the person responsible for handling tractor safety. One Oregon farmer said in the case of an "accident" the blame would be placed on the owner and not the driver: "It comes down to the person who owns the tractor. Not necessarily who's operating it. Because if you are hiring that 13-year-old kid, and he gets hurt, it's obviously not his fault – it's the person who owns that tractor."

Very few interviewees held manufacturers or insurance companies responsible. Instead, drivers or operators were mentioned frequently. One farmer held the view that the operator is the only person capable of preventing "accidents" and therefore the only person responsible for safety.

**Photo interpretations**

In nearly every one of the 24 focus groups, farmers said they could relate to the tractor rollovers portrayed in photographs provided at the beginning of each session. Photos that showed consequences of lack of seatbelt use produced similar community stories across the eight states in this study. An Ashe County farmer reviewed the photographs and then spoke about how they tell a story that could potentially affect every farmer: "Anyone could be in that situation. I know most of the farmers that I work with don't wear their seatbelts. They bring their tractors in for repairs and they don't have seatbelts in them anymore. They cut them out because they get in the way."

The photographs spurred discussions on how the lack of time affects farmers and the fact that many of them work at night when low visibility impacts safety: "The farmers now don't have as much time," said a Fleming County farmer. "They're in too big of a rush. We have a lot of people now that are nighttime farmers. Farming without sufficient lights on their tractors and that type of thing and you have accidents that way." "In our community bi-vocational farming is probably really big," said a Taylor County farmer. "They work a public job and then they go home and do their farming chores, and get it done before dark and maybe after dark and do with a flash light." A New York farmer also summed up what comprises the "lack of time" mentality: "People in a hurry and not thinking, thinking about something else and taking shortcuts. Trying to make things as neat as possible and not thinking about what they are doing. Trying to beat that weather, and trying to get things done." In many cases, interviewees confirmed that they know more than one person in their community who was killed as result of a tractor rolling over without ROPS.

**Feedback on the *National Tractor Safety Initiative* recommendations**

One message prevailed across several of the 24 focus groups: farmers do not need any more regulations. Some saw the recommendation as an impossible idea. "How can you enforce these policies?"

asked a farmer in Ashe County. According to the farmer, “It's not possible for small farmers and all farmers. It can't be regulated. The government doesn't have the labor force to enforce such policies. People would be more apt to do it if recommended but not if they are required.”

Some farmers called regulations impractical and they predicted resistance from the agriculture community. A Kentucky farmer said, “If you really want to get the county farmers worked up about this program and talking about it put OSHA on them. Start to regulate them with OSHA and you will hear a lot about it. They may be interested in coming.” A farmer in Hardin County, Kentucky summed up that resistance: “Part of the culture of being a farmer is kind of like the cowboy culture. Part of it is being out by yourself and not having a bunch of rules and a bunch of constraints, and it’s hard for us to – I’ll take off to a farm and decide that I want to go to another farm, and it’s hard for me – it’s not my culture to call in and check in – if I wanted to do that I would have a city job, if I want to check. So, it is our culture to be kind of independent.”

Instead of regulation, education and financial incentives ranked as popular recommendations. Interviewees cited county agriculture extension agents as positive choices for educating farmers, and many said that education opportunities should be provided for young people interested in farming “all the way up to” industry veterans. A farmer in LeGrande also suggested expanding the initiative to include more than tractors: “Should say more than just tractors, it should include equipment, ATVs.”

In all focus group, the primary concern of farmers proved to be the costs of retrofitting tractors with ROPS. Accordingly, cost-share recommendations drew favorable comments from several interviewees. The idea of offsetting safety upgrades with cash garnered support from farmers in many of the eight states used in the focus groups. In supporting the recommendation for tax incentives, one Taylor County farmer said, “I don’t think you are going to find a farmer who will do this without getting something in return.” Insurance premium reduction was another incentive suggested by participants. A Wisconsin farmer put it this way: “Now if I get the ROPS and there is an incentive -- cost sharing -- that would help; and if I can get it or insurance gives me a deduction instead of an increase.” A Colorado farmer suggested that if there is money, the Federal Government should give Farm Bureaus enough grants to fund the retrofitting of older tractors.

## Discussion

It is interesting to note the similarities and differences between the findings of this formative research project and the results of previous studies that assessed perceived barriers and motivators to retrofitting tractors with ROPS. It is also interesting to examine the findings of the current project in relation to a number of theories and models that could provide conceptual frameworks for the design of a community-based social marketing program. The specific theories referenced in this section include

theories of narrative representation (Cole, 1997, 2002), discourse theory (Foucault, 1972, 1980), the extended parallel process model (Witte, 1992, 1994, 2003), horizontal communication (Beltrán, 1980), peer-to-peer and 3-Dimensional communication approaches (Edelman, 2007a, 2007b).

On the one hand, results from this formative research project do not appear to be very different from what other studies have discovered as barriers and motivators to safe tractor operation in agriculture. Like previous studies, this research project discovered that most of the farmers are aware of the risks of using tractors without rollover protective structures but have very low perception of personal susceptibility and do not plan to retrofit their older tractors with ROPS. In addition, the present study, like several previous studies, also found that financial concerns and lack of time make ROPS a low priority. Various technical design and ergonomic issues, farmers in this study reiterate, reduce the practicality of ROPS and seatbelts in daily use.

The present study also confirms what other studies have identified as motivators to behaviors that promote agricultural tractor safety. Although farmers appear not to perceive themselves at risk, they do report concern for their family members and hired workers who use unprotected tractors. The farmers are highly impressionable by what their peers say and do about agricultural safety and might be more likely to practice safer tractor operating behaviors if constantly reminded. Most of the farmers, as in previous studies, also pointed out that their chances of retrofitting their old tractors with ROPS and seatbelts would be greatly enhanced if the high cost of retrofits were eased with a flexible financial assistance program.

Most importantly, overall, findings of the current study validate the use of a socio-ecological framework for conceptualizing the *National Tractor Safety Initiative.* According to such a framework, the *Initiative* would address the issues systemically, from the individual, socio-cultural, economic, technological, and policy levels.

On the other hand, however, the findings from the current study, especially when viewed through various relevant theories, differ in several ways from what many previous studies have discovered. In general, the current findings highlight specific theoretical issues to be taken into consideration in the design of strategies and messages for effective community-based social marketing programs for promoting tractor safety. These theoretical issues and how they relate to the findings of this project are described below.

**The extended parallel process model**

In several focus groups, farmers said that to be effective messages should to be realistic and show the consequences of actual rollovers, especially those involving tractors without ROPS. According to the respondents, tragic and gory messages would get their attention and hopefully propel them to action. From all indications, the farmers seem to be describing the elements of message design and treatment as

postulated by the extended parallel process model.

Developed by Kim Witte (1992, 1994, 2003), the extended parallel process model deals with the design of health risk messages (also known as 'fear appeals' or 'scare tactics'). These messages imply some risk and are fear inducing because of the implied risks. According to Cole (2002) this model conceptualizes people's reaction to a safety message, particularly messages that describe a loss (injury, death, or economic loss) that could result from not adopting safety behaviors such as installing and using ROPS and seatbelts on tractors. The model states that when people hear or see such messages that are relevant to their circumstances, they will respond by either accepting the message and acting to control the danger or by rejecting the message to control (subdue) their fear of the event described in the message. In other words, when people are confronted with messages that arouse fear in them, they will take one of two courses of action to dispel those unpleasant feelings: They either (1) take preventive action to deal with the threat or (2) stifle the fear through denial or avoidance of the issue. Thus, fear appeals can be tricky and are often ineffective in bringing about behavior change. But this is not to say that they should never be used, especially if research shows that the target audience responds to such appeals.

To ensure that health risk messages are effective and generate the desired response, a social marketing expert, Nedra Weinreich (2007), offers five suggestions:

1. Ensure that the portrayed consequence of not taking action is severe, but not exaggerated.
2. Make the audience feel that the problem is relevant to them.
3. Provide a specific action that the audience can take to prevent the portrayed consequence from happening.
4. Ensure that the audience believes that the proposed solution is effective in preventing the consequence.
5. Portray the solution as something that the audience can easily do.

**Culture tales, theories of narrative representation and discourse**

Farmers in this study preferred messages that contained stories or narratives from fellow farmers, especially those who have experienced tractor rollovers or the loss of a loved one in a rollover involving a tractor without ROPS. Focus group participants said that such stories should be used as means of conveying the message of tractor safety, especially the consequences, costs and anguish of injury or death resulting from rolling over a tractor without ROPS, as well as the benefits of installing ROPS on tractors. More importantly, these stories should position tractor injuries and deaths as preventable incidents.

These stories of preventable tractor injuries and deaths should become part of the cultural tales of the community that affect farmers' attitudes (feelings and emotions) and help propel their knowledge of

tractor overturn risks toward behavior change (Cole, 1997, 2002; Murphy, 1992). According to the socio-cultural view of learning (Cole, 2002), attitudes, knowledge, and problem-solving strategies are learned in the social interactions of groups of people as they work together on the ordinary tasks important in their daily lives and work.

Currently, fueled by media stories and other authoritative sources, the culture tale or discourse in most farming communities still positions tractor injuries and deaths as "unavoidable" or "unfortunate" or as "acts of God." In many farm communities, the culture tale is that overturns "just happen," that often they are deadly but sometimes a person can jump free and escape injury, and that by being skilled and careful a farmer can avoid overturns, thus there is no need to spend money and time to install ROPS and seatbelts (Cole, 2002). Moreover, this study found that in various farming communities, retrofitting old tractors with ROPS and seatbelts is not yet perceived as part of the moneymaking or profit side of the farming equation.

According to Foucault (1972, 1980), a 'discourse' is considered to be an institutionalized or accepted way of thinking, a social boundary defining what can be said about a specific topic, or as possible truth. Discourses are seen to affect people's views on all things; discourses govern what can be said, thought and done within specific circumstances; it is not possible to escape discourse. Thus, discourse provides the context for the stories and narratives farmers tell each other about tractors, safety and farming. In other words, under currently the prevailing community discourse, culture tales or farming narratives, farmers do not see the return on investment of ROPS and seatbelts.

**Peer-to-peer and 3-D communication approaches**

In almost all of the focus groups, farmers in this study perceived a "person like me" to be one of the most credible information sources on agriculture, tractors and safety issues. They said farmer-to-farmer communication is one of the most frequent and trusted means through which they get information they use for making decisions that affect their daily work and life on the farm.

This phenomenon is closely related to the currently prevailing culture tales and discourse in farm communities, as discussed above. It is also in line with what was recently discovered by researchers working with Edelman Public Relations (Edelman, 2007a, 2007b). In their report titled *Edelman Trust Barometer*, the researchers found that the information source now perceived to be most credible in both developing and developed countries alike is a "person like me," followed closely by doctors and health care specialists. According to the Edelman report, perceived similarity is defined by sharing common interests, holding similar political beliefs, or coming from the same community, as opposed to having the same nationality, gender, or race/ethnicity.

Bandura (1986) posits that perceived source similarity is a major mediator of social and

observational learning. Similarly, Petty, Cacioppo, et al (1983) in their study of how persuasive messages are processed, argue that source perceptions matter most when receivers are least engaged, and that the level of receiver engagement is affected by perceived message relevance, external distractions, and numerous other audience characteristics and situational factors. Thus, as Bernhardt (2007) writes,

> "credible and trusted sources are more important than ever for effective health interventions. In today's health marketing milieu, overflowing with terabytes of ever changing and contradictory health messages created and shared by experts and users 24/7/365 through every channel, the new reality is that almost all health information processing is peripheral. Only the most trusted sources can be heard through the noise."

The message from the Trust Barometer is that effective social or health marketing must now embrace 3-Dimensional communication -- or, as Bernhardt continues, "the 'sweet spot' at the nexus of vertical (or top-down and bottom-up) communication from respected experts and from horizontal or peer-to-peer or user-generated communication from 'people like me.'" (Beltrán 1980; Bernhardt, 2007; Edelman 2007b). This means that any social marketing program that hopes to succeed must not only use traditional top-down/bottom-up communication channels but also devise means of participating in the culture tales or discourse arenas of communities where farmers are having unscripted conversations about their occupation, tools they use hazards they face, and how they keep themselves safe.

## Recommendations

This paper presents preliminary findings from the two-year study *Designing Community-based Social Marketing Programs for Tractor Safety* (Principal Investigator: Chike Anyaegbunam, PhD). Nevertheless, while data analysis continues, a number of recommendations have already emerged as a result of this project and a review of results from previous studies, interventions and social marketing programs for farm safety.[2] Ideally, for maximum efficiency and effectiveness, the recommendations

[2] The Social Marketing of ROPS in New York Sate: A program of the Northeast Center for Agricultural and Occupational Health.

"Keep Kids off Tractors." A Childhood Agricultural Safety Network's public awareness campaign. A program of the National Children's Center for Rural and Agricultural Health and Safety, Marshfield, WI.

The Kentucky Community Partners for Healthy Farming: ROPS Project Notebook. A Project of the Southeast Center for Agricultural Health and Injury Prevention, University of Kentucky.

Safe Operation of Tractors: A Social Marketing Campaign. A program of the Farm and Ranch Safety and Health Association, Canada

outlined below should be reviewed by a professional marketing agency before they are used for the design and implementation of specific social marketing programs. These recommendations are as follows:

- Combine a national communication campaign to position tractor safety as an important public health issue with community-based social marketing programs targeted at specific segments of farmers in high-risk states or regions.
- Combine individual attitude and behavior change strategies with continuous communication aimed at social change, in particular, processes that encourage community problem identification, group decision making, action planning, and collective action and implementation, which are critical to how a community grapples with a serious issue such as tractor safety.
- Use participatory communication approaches to help farming communities own the program.
    - Involve communities in the development of communication materials, messages and other tools and tactics for their social marketing programs. For instance, schools and farm organizations could participate in a competition to create logos and slogans for their local programs. This is in addition to pretesting of all materials with groups of farmers in the targeted communities.
- Reflect formative research findings in both message content and treatment. For instance, farmers in this study prefer messages that contain fear appeals, show the economic and safety benefits of retrofitting old tractors with ROPS and seatbelts, and provide useful information about incentives, costs and availability of ROPS.
- Use a 3-Dimensional multi-media communication approach that ensures that messages and information are constantly flowing vertically to and from, and horizontally among, the farmers through both traditional and new media. Influential channels, media and sources identified by farmers in this study include opinion leaders (e.g., doctors, extension agents, farm inspectors), "people like me," churches, radio/TV, newspapers, farm publications, posters, stickers, the Internet, etc.
    - Use paid media/advertising -- aim for a variety of media channels preferred by farmers and try to maximize frequency.
    - Use "earned media/public relations" -- a cost-effective way to increase the reach and frequency of your message.
    - Pitch the intervention to journalists using press releases or ready-made articles.
    - Focus on print news and radio talk shows that are popular with your target farmers.
    - Build partnerships with

      - tractor dealerships

      - equipment dealer associations

- veterinarians
- Farm Bureaus
- insurance companies
- cooperative extensions

Each can assist in getting the message to the farm community.

  - Harness the emerging power of new communication technologies in the traditional and viral marketing of tractor safety. Farmers in this study want to be directed to specific Web sites that contain useful information, messages and/or stories about tractors and farming safety.
  - Following Roger's diffusion of innovations model, treat retrofitting of old tractors as an innovation and target innovators and opinion leaders in the farming communities with messages through various channels including the internet. Remember many of the farmers stated that fellow farmers are their most influential role models.
  - Establish regional ROPS hotlines for farmers.
- Aim for a long-lasting campaign. Farmers in this study stated that short-lived, sporadic campaigns that come and go are a waste of resources because they rarely influence their attitudes and behavior toward tractor safety.
  - Use redundancy. Communications research tells us people need to hear new information approximately 11 times before it starts to sink in!
- Secure public and/or private funding and cooperation for the provision of financial incentives / rebates /cost-sharing for ROPS installation and retrofits. Ensure that farmers know where and how to obtain such tangible help.

## Conclusion

For all their benefits, according to Reinard (2001), focus groups have some drawbacks, which limit their application rather than negate the method as a whole. The major disadvantage of the method is that its results are not generalizable since the participants are not selected at random. Moreover, in focus groups, group interaction may produce extreme shifts in opinion that may mislead researchers about true feelings. It is therefore suggested that the findings of this formative research be triangulated with other research methods.

The drawbacks notwithstanding, this study provides a knowledge backdrop for the design, implementation and evaluation of community-based social marketing programs in the various agricultural regions of the United States. Numerous authors argue that one of the most effective ways to cultivate attitudes that support the adoption of farm safety practices is for researchers and members of the farming

community to engage in dialogue -- especially dialogue that includes narrative accounts of injury events as recounted and discussed by members of the farming community. This formative research project has started such a dialogue by utilizing the principles of community-based participatory research (CBPR) in the design, implementation, and evaluation of social marketing programs for tractor safety at the national and grassroots levels.

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