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Marketing Farm Safety: Using Principles of Influence to Increase PTO Shielding

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Abstract

Background: Despite much work to reduce the frequency and severity of agricultural injuries, these events still occur. Power take-off entanglements are one example of agricultural events that can lead to death or permanent disability. This manuscript considers the use of marketing techniques to reduce agricultural injuries. Specifically, the “principles of influence” (liking, social proof, authority, consistency, reciprocity, and scarcity) are explored as methods of promoting power take-off shielding among New York farmers.

Methods: Focus group discussions were held with farmers and agricultural service providers in seven agricultural counties in New York. Participants were provided with background information about power take-off injuries, as well as information on one principle of influence. Facilitators then guided the groups through a brainstorming discussion to formulate intervention strategies.

Results: Thirty-nine individuals participated in the discussions. Participants provided feedback on individuals and organizations that could serve as influencers, potential incentives for participants, and beliefs about what would not work in their community.

Discussion: Overall, participants were enthusiastic about using principles of influence to promote PTO shielding. These methods appear to be promising for improving safety on farms, and have the potential to save both time and money compared to other intervention strategies.

Introduction

In agriculture, the risk of occupational injuries, illnesses, and fatalities is high, and the consequences of these events can be devastating to farmers, their families, and their communities. Safety and health researchers have worked for decades to reduce the frequency and severity of these events, most often employing approaches like the three E’s: engineering (e.g. developing hazard reduction technology), education (e.g., training on worksite safety best practices), and enforcement (e.g., worksite safety regulations, protocols and penalties).¹

Despite long-standing efforts, injuries and fatalities in the agricultural setting continue to occur. In 2016, the fatal injury rate among US farmers was 23.1 per 100,000 workers – more

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than six times that of the all-worker fatality rate.² Although the three E's have led to promising improvements in worksite safety, there are barriers to using them in the farm population, including cost (both monetary and time), logistical challenges, social norms, OSHA jurisdiction, the ubiquitous use of older machinery in some agricultural regions and denial of personal risk, among others.³

To further combat agricultural injuries and fatalities, it is imperative that we understand the limitations of three E approaches and try new, innovative methods for promoting behavior change. In the search for promising alternatives, we need only look to the world of marketing, which specializes in developing strategies to direct human behavior toward pre-determined goals. Although agricultural safety and health professionals "sell" health or safety vs. products, the principles can easily be transferred.

In his book, "Influence: The Psychology of Persuasion," Dr. Robert Cialdini, a psychologist and professor, outlines six principles of influence (POIs) commonly used to influence behavior and sell products. These include: liking, social proof, authority, consistency, reciprocity, and scarcity.⁴ These techniques, described below, are considered a form of nudging, in which target populations are gently guided toward desired behaviors either consciously or subconsciously.⁵ Such techniques rely on basic human behavioral and cognitive processing, and require comparatively little investment to put into place.⁴

Liking:

The principle of liking relies on the assumption that individuals are more likely to take action if individuals whom they like and admire promote that action to them. These "influencers" could be friends, or could simply be personable strangers.

Social Proof:

As its name suggests, the principle of social proof states that individuals are likely to "move with the crowd," or participate in actions deemed acceptable by the masses. In public health, this principle is promoted in social norming campaigns, where healthy behaviors are promoted as the norm.

Authority:

Similar to liking and social proof, the principle of authority relies on influence by others – in this case, authority figures. The principle indicates that humans are more willing to take action if it is suggested, supported, or directed by an individual who is respected as an authority figure.

Consistency:

The principle of consistency relates to the desire to be consistent with your own thoughts, beliefs, and actions; thus avoiding a state of cognitive dissonance, where actions and beliefs are misaligned. By demonstrating how a particular action is aligned with an individual's previous actions or statements, it is easier for the individual to respond favorably.

Reciprocity:

Reciprocity focuses on the concept of “returning the favor.” This principle indicates that individuals are more likely to respond positively to requests if the influencer has previously done something for the individual, such as doing a favor or providing a small gift.

Scarcity:

Finally, the principle of scarcity relates to our own fear of missing out. Limited time offers and limited quantities or products are common tools used to encourage individuals to take quick action.

In a current and ongoing study being conducted at the Northeast Center for Occupational Safety and Health, researchers are exploring the feasibility of applying these six POIs as a booster to an existing power take-off (PTO) shielding campaign. PTOs, which transfer power from the tractor to an implement, are a leading source of debilitating injury on farms. Though only 40% of PTO entanglements result in fatalities,⁶ another 40% lead to amputations and permanent disabilities.⁷ PTO shielding research demonstrates this technology can effectively prevent entanglements, however, a plethora of barriers to installing and maintaining these shields have been cited by farmers.⁸ In a prior study, several barriers (cost, logistics finding and installing shields, time, and durability of shielding) were addressed; however, little change in shielding behaviors was reported.⁹ Project researchers suspect that a long, negative history with shields has stalled progress on this issue. The following study seeks to explore the use of POIs to promote routine installation or replacement of missing or broken PTO shields.

Methods

In 2016, seven agricultural counties in upstate New York were selected to receive six POI interventions (see Figure 1). Focus group discussions (FGDs) were organized in each intervention county to brainstorm POI strategies. Invitations were extended to agricultural service providers, community leaders, based on the services provided in each county. In addition, farmers and farm spouses that had previously worked with either the Northeast Center for Occupational Safety and Health or the organization hosting the meeting and lived in close proximity to the meeting locations, were invited to attend. Attendees offered suggestions on appealing options, essential partners, and key promotional channels for POI approaches.

The FGDs lasted approximately three hours each. Six of the counties were assigned a specific POI (e.g., liking, reciprocity, scarcity,...), and session moderators followed guides (appendix 1) to elicit information and ideas that would be applicable to POI strategies. The seventh intervention county wasn't given a specific POI, but was instead given the creative freedom to brainstorm other initiatives that could be used in concert with the PTO campaign.

FGDs were audio recorded and transcribed verbatim. Using the transcriptions, potential strategies for each POI, as well as partners, intervention timing, and opposed ideas were summarized.

Results

Each FGD was attended by four to seven participants for a total of 39 respondents. Table 1 highlights participants' primary affiliation. Though not formally assessed, many participants with a primary affiliation other than farming, also reported being part-time farmers.

Overall, FGD participants responded positively to their assigned POI and offered suggestions for incorporating these strategies into a PTO initiative. Several farm service providers, including Cooperative Extension and Farm Bureau were referenced as possible influencers for the liking campaign, while agricultural equipment dealerships, farm wives, insurers, and emergency service departments were suggested as potential authority figures in the farm community that could influence change. In addition, many participants suggested involving farm children, as potential influencers. Gift cards for frequented shops (such as gas stations and farm supply stores) were offered as suggestions for incentives. In the unassigned county, participants suggested modeling the intervention after the popular ROPS Rebate Program¹⁰ by providing rebates to those who send in before-and-after photos of the shielded driveline. Additionally, this group made several suggestions that were in line with one or more of the POIs, which they had not been asked to discuss. The feedback provided during FGDs has since been compiled, and the study team is currently finalizing POI booster campaigns.

Discussion

Though primarily used in corporate marketing, public health practitioners and clinicians have increasingly demonstrated success in improving patient and client health through the use of POIs and similar nudging techniques.^{4, 11, 12} Successes in areas of smoking cessation, sexual health, and general wellness, among others^{5, 11} suggest that framing occupational safety and health initiatives around POIs may be a viable solution.

FGD participants in this study were highly receptive to the principles presented to them, and often made suggestions related to the principals that were not the central focus of the brainstorming discussion, which suggests participants are aware of the power of POI principles in their role as consumers. In addition to community receptivity, final interventions are anticipated to be lower cost and less labor intensive than more traditional interventions. Three of the POIs, in particular (liking, social proof, and authority), also have the potential to enhance and strengthen advice networks, which can then be mobilized for use with other agricultural safety initiatives. While the participant feedback was largely positive, the authors acknowledge that this may be due to participants' inherent propensity for safety. Further work on this study is ongoing, and pilot tests of the POI strategies will be conducted to determine if these strategies are more generally accepted in the NY farm population.

Though promising, utilization of POIs for behavior change also introduces new challenges. In some instances, opponents of such marketing strategies, which are designed to "nudge" individuals to make a particular decision, have argued that they are unethical, in that they involve trickery or deceit of the recipient.^{12, 13} In other words, the person may be unaware

they are being influenced, and thus may not be able to make an informed, autonomous decision.¹² While valid, using such methods to encourage the uptake of proven safety behaviors is generally accepted by the public health and medical communities when the intended outcome is beneficial to health and wellbeing.¹² Most importantly, however, by changing the decision making environment, either through the approval of others, the receipt of a gift or the benefit of doing something that is in line with one's own beliefs, individuals obtain immediate rewards for safe and healthy decisions, which is typically one of the biggest challenges in prevention initiatives (e.g. getting benefits in the distant future in exchange for immediate sacrifices).

Though POI interventions have not been fully developed or tested among farmers at this point, they hold promise for motivating farmers to make safe decisions in the workplace. Future manuscripts will assess the comparative efficacy of each POI, as well as the application of this marketing technique in agricultural injury prevention, in order to determine which is the best fit for improving PTO shielding behaviors.

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Community Brainstorm Discussion Guide

- Thank you everyone for taking the time to come here today and participate. A bit of background on this project—we are from two organizations that are working together to gather feedback from people like you. We are going to use this feedback to help design communication materials and interventions to try and increase the use of PTO shields on NY farms.
- We are doing several of these community brainstorm sessions across upstate NY this week.
- We would like everyone in the group to participate. You have been invited to this session because we value your input and consider you an important audience to reach out to. We want to keep this informal and encourage you to do the talking. We are here to listen. Please be as honest as possible. There are no right or wrong answers. We just want to know your thoughts and suggestions about how best to achieve our goal of improving farm safety.
- We are planning to audio record these discussions, but only for the purposes of note taking. The audio recordings will not be shared with anyone outside the FHI 360 and NYCAHM research teams. If you're not comfortable with being recorded, you are welcome to not participate. We've passed around forms that we will need everyone participating to sign. The forms have the information that we've just given, and also explain who you can contact if you have questions about the project or this session. If you'd like a copy to keep for yourself, we can give you one.

- Before we start, we'd like to have everyone introduce themselves and what organization they are with.

We'll start the session by asking some questions about familiarity with PTO shields, and then we'll move on to a discussion about how best to engage with farmers about increasing PTO shield use.

BACKGROUND INFORMATION ABOUT PTO SHIELDS AND INFORMATION SOURCES

Now we will start the session by asking some questions about familiarity with PTO shields. Then we'll briefly overview the PTO shield program, and then we will move on to a discussion about how best to engage with farmers about increasing PTO shield use.

1. What have you heard about PTO shields?
 - a. Where have you heard this information?
 - i. Did you find the source trustworthy? Why or why not?
2. What have you heard about the dangers associated with PTO shafts?
3. Where have you heard this information?
 - i. Did you find the source trustworthy? Why or why not?

[probe about posters, flyers, social media, newspapers, ads in magazines, online, PSAs, tv networks, peers, etc.]
4. What experiences do you have with PTO shields? Have you ever used them? Know people that use them?
5. OPTIONAL: Have you ever conducted or received any training or education related to PTO shields?
6. OPTIONAL: Does your organization provide any information, education or training on farm safety or PTO shields specifically?
7. What do you think about PTO shields? Do you think they are useful? Important? Why or why not?
8. What is your sense of how many farmers use PTO shields on their equipment? Most? Half? Some? Why do you think they use them or don't use them?
9. Are there any rules or guidelines that you know of related to PTO shields? What is the source of these guidelines? Do you think these are effective? Why or why not?

Overview of the PTO Shield Program

PTO Shielding Rates

- Telephone surveys with 3,211 farms: 97% shielding rate reported
- On-farm audits with 211 farms: 57% shielding rate

- Consistent across different commodities
- Stationary implements more likely to be properly shielded than moved/pulled implements

Barriers to Shielding

- Cost
- Time to identify the correct shield (to match the driveline)
- Time required to perform maintenance
- Durability issues
- Previously survived risk exposure – risk normalized
- Favor alternative safety strategies

BareCo Shield

- Universal fit (two diameters fit about 95% of all drivelines)
- Inexpensive (\$60 compared to \$300)
- Replacement parts are available and inexpensive (around \$5 each for the cuffs, clips, and bearing kits)
- Installation is simple and quick
- Shield can be pulled back for easy maintenance
- Farmers who try the BareCo shield often become repeat buyers

Social Marketing Campaign

- Worked with farmers to develop social marketing advertisements to encourage shielding
- Three messages developed:
 - “Try out the new, affordable PTO shield. It’s easier than farming without limbs.”
 - “It took three generations to build this farm and one broken shield to lose it.”
 - “Losing your arms in a PTO accident is tough, but the toughest thing is not being able to hug your granddaughter again.”
- Overall, the campaign was unsuccessful.
- HYPOTHESIS: Prior history with shielding has prevented farmers from wanting to try newer styles, despite improvements that eliminate most other barriers. This is why we are looking for new ways to encourage farmers to try the shield.

RECIPROCATION (Chautauqua County)

Thank you your input so far. Like we mentioned earlier, we're interested in exploring ways to more effectively increase use of PTO shields, and we would like to brainstorm with you around how to do this.

We want to focus this section on a principle called reciprocity. You know when you go to Wegman's or a similar grocery store, and they give you free samples? People who receive a free, unexpected gift are more likely to listen to a product's features and perhaps try out or begin using that product. The gifts do not have to be expensive or even material; information and favors can work. We want to explore ways we could apply this to PTO shields.

1. Are there any programs that you're aware of that provide benefits or incentives to farmers for implementing safety upgrades generally or PTO shields specifically?
2. How do you feel about a program or initiative that gave something to farmers in exchange for them purchasing and using PTO shields?
 - a. Do you think such a program would be effective at increasing PTO shield use?
 - b. Would you want to be involved in such an initiative or program?
 - c. If you were to help design such an initiative or program, how would you go about it?
 - i. What are some key elements that you think are important to consider?
 - d. Do you think such a program would have to reach out to farmers, or can you think of a natural place where they could be exposed or introduced to it?
3. What kinds of small gifts/incentives do you think farmers in the area would appreciate?
4. Would farmers be more likely to purchase and use PTOs if they know that a portion of the proceeds went to a good cause?
 - a. If so, what cause?
5. Do you think farmers would be open to receiving a free orientation around PTO shield use or one-on-one guidance on why they should be used? Do think this would make them more likely to buy one?
6. Do you think farmers would be more likely to buy a PTO shield if they were given a discount?
7. Do you think farmers would be more likely to buy a PTO shield if they were given a small gift along with it?
 - a. What if it was something that they typically must buy anyway?
 - b. What kinds of gifts do you think would work?

8. Do you think farmers typically receive help or guidance from experts or companies related to farm safety or about PTO shields?
9. Is there anything you can think of that would be effective in getting more farmers to install and use PTO shields on their equipment?
10. Where do you think farmers typically look for information related to farm safety? Where would they expect to find information about PTO shields?
11. What would you consider an authoritative source of information about farm safety?
12. If farmers were to receive more information about PTO shields, how do you think it should be delivered?
13. Who do you think should deliver information about PTO shields?

SOCIAL PROOF (Otsego County)

Thank you your input so far. Like we mentioned earlier, we're interested in exploring ways to more effectively increase use of PTO shields, and we would like to brainstorm with you around how to do this.

We want to focus this section on a principle called social proof. This basically says that people tend to have more trust in things that are popular or endorsed by people they trust. When they're uncertain about a course of action, they tend to look to those around them to guide their decisions. They especially want to know what everyone else is doing—especially their peers. We want to explore ways we could apply this to PTO shields.

1. Who are considered “experts” in the agriculture industry?
 - a. Do you see these people as credible sources of information?
 - b. Where do you hear “expert information,” if at all? How is this information delivered? (PSAs, posters, articles, websites, etc.)
2. Have you seen or heard any public endorsements for the use of PTO shields?
 - a. From who? Where did you hear them?
3. Who else do you see as a credible source of information about PTO safety?
4. Do you think a farmer would be more likely to use a PTO shield if he or she knew that other farmers were using them?
5. Is there anyone you can think of who's recommendation or endorsement of PTO shields would make it more likely that farmers use them? Peers? Experts? Celebrities?
6. How would hearing user reviews of specific PTO shields influence farmers plans to use them?
 - a. What about seeing comparative ratings of different types/brands of PTO shields?

7. Do you think that testimonials from farmers that use PTO shields would be an effective way to convince other farmers to use them?
 - a. What if these testimonies were from farmers who suffered a PTO-shaft injury and then started using a shield? What if they were from farmers who had avoided injuries by using a PTO shield?
8. Can you think of any messages that would encourage farmers to purchase and use/endorse PTO shields?
9. Where do you think farmers typically look for information related to farm safety? Where would they expect to find information about PTO shields?
10. What would you consider an authoritative source of information about farm safety?
11. If farmers were to receive more information about PTO shields, how do you think it should be delivered?
12. Who do you think should deliver information about PTO shields?

COMMITMENT AND CONSISTENCY (Oneida County)

Thank you your input so far. Like we mentioned earlier, we're interested in exploring ways to more effectively increase use of PTO shields, and we would like to brainstorm with you around how to do this.

We want to focus this section on a principle called commitment and consistency. This says that people do not like to back out of deals. We're more likely to do something after we've agreed to it verbally or in writing. People strive for consistency in their commitments. They also prefer to follow pre-existing attitudes, values, and actions. We want to explore ways we could apply this to PTO shields.

1. How do you think most farmers would respond to the following statements?
 - a. I'm the kind of person that is committed to farm safety.
 - b. I'm the kind of person that thinks it is important to use PTO shields.
2. If there was a local program or initiative that tried to get farmers to pledge to install and use PTO shields, do you think this would work? Why or why not?
 - a. What would this program like this look like?
 - b. Who would farmers make the pledge to (and be most likely to keep the commitment)?
 - c. What would inspire/incentivize farmers to join the pledge?
3. Do you know of any initiatives or programs that encourage farm safety or safety upgrades of any kind?
 - a. Is anyone in the group involved in any of these initiatives or programs? Why or why not?

- b.** Do you think any of these initiatives or programs are effective? Why or why not?
- 4.** What actions are currently taken by farmers in the community to keep their farms safe?
- 5.** Do you think it would be effective if farmers received public recognition for using PTO shields? Why or why not?
- 6.** Do you think it would be effective to get farmers to somehow make a public commitment to use PTO shields? Why or why not?
- 7.** Where do you think farmers typically look for information related to farm safety? Where would they expect to find information about PTO shields?
- 8.** What would you consider a trusted source of information about farm safety?
- 9.** If farmers were to receive more information about PTO shields, how do you think it should be delivered?
- 10.** Who do you think should deliver information about PTO shields?

LIKING (Washington County)

Thank you your input so far. Like we mentioned earlier, we're interested in exploring ways to more effectively increase use of PTO shields, and we would like to brainstorm with you around how to do this.

We want to focus this section on a principle called liking. This says that people prefer to say "yes" to those they know and like. People are also more likely to favor those who are similar to themselves, physically attractive, or who give them compliments. Even something as random as having the same name can potentially increase the chances of the person saying, "yes." We want to explore ways we could apply this to PTO shields.

- 1.** Describe the typical farmer in your community. How big is their farm? How many people work on their farm? Give me a profile. Describe them to me.
- 2.** Who do you think farmers look to for information about farm practices generally? Other farmers? Local agencies or organizations? Internet groups?
 - a.** Who do you think farmers look to for information about farm safety?
- 3.** Do you think farmers communicate with each other about farm practices and farm safety? If so, in what ways?
- 4.** Do you think farmers would be more likely to purchase and use PTO shields if they knew other farmers were using them?
- 5.** Who is using PTO shields in the area? Do you personally know anyone who is using them? Tell me more about these people.
- 6.** How do you feel about a communication campaign or intervention that tried to get farmers to purchase and use PTO shields?

- a. How would it be delivered?
 - b. Who should be the face of the campaign?
 - c. Is there an organization you trust that should be behind it?
 - d. If you were to be involved in campaign or intervention to try and get farmers to purchase and use PTO shields, how would you go about it?
 - e. What is the main message you would want to communicate?
7. Where do you think farmers typically look for information related to farm safety? Where would they expect to find information about PTO shields?
 8. What would you consider an authoritative source of information about farm safety?
 9. If farmers were to receive more information about PTO shields, how do you think it should be delivered?
 10. Who do you think should deliver information about PTO shields?

AUTHORITY (Cayuga County)

Thank you your input so far. Like we mentioned earlier, we're interested in exploring ways to more effectively increase use of PTO shields, and we would like to brainstorm with you around how to do this.

We want to focus this section on a principle called authority. This says that people typically respect authority and want to follow the lead of real experts. We want to explore ways we could apply this to PTO shields.

1. Have you even seen or heard any public endorsements of the use of PTO shields?
2. Are you aware of any credible sources of information about PTO safety?
3. Are there leading businesses/government entities/organizations who endorse or recommend the use of PTO shields?
4. Who would you consider to be an authority figure or an authoritative organization among farmers?
 - a. Do you think that recommendations or endorsements from these figures or organizations carry any weight with farmers?
 - b. Do you think that a recommendation or endorsement would be effective at persuading farmers to use PTO shields?
5. Are you aware of any efforts made by authoritative figures or organizations to improve farm safety?
 - a. Do you think any of those efforts are/were effective? Why or why not?
6. How do you feel about using farm leaders to try and persuade other farmers to use PTO shields? How would you describe a farm leader?

7. Do you think testimonials from farm leaders about PTO shield use would be effective? Why or why not?
8. How do you think testimonials or other types of recommendations could be delivered to farmers?
9. Where do you think farmers typically look for information related to farm safety? Where would they expect to find information about PTO shields?
10. What would you consider an authoritative source of information about farm safety?
11. If farmers were to receive more information about PTO shields, how do you think it should be delivered?
12. Who do you think should deliver information about PTO shields?

SCARCITY (Steuben County)

Thank you your input so far. Like we mentioned earlier, we're interested in exploring ways to more effectively increase use of PTO shields, and we would like to brainstorm with you around how to do this.

We want to focus this section on a principle called scarcity. This says that people are more likely to engage with a product or listen to its features if they know there is a limited supply of it. We want to explore ways we could apply this to PTO shields.

1. Do you think if someone offered a limited time gift with a PTO purchase, that farmers would be more likely to buy them? Why or why not?
2. If so, what kind of gift do you think would work?
 - a. What if it was something that a farmer would typically have to buy anyway?
3. Do you think if there was a limited time discount offered on PTO shields, would farmers be more likely to buy them? Why or why not?
4. Do you think there is a preferred brand of PTO shields?

Do you think if there was a limited supply of PTO shields available that farmers would be more likely to buy them? Why or why not?

Do you think that farmers would be more likely to purchase PTO shields if they were only available for a limited time? Why or why not?

Are you aware of any "exclusive offers" made to farmers to encourage them to purchase farming equipment or products?
5. Do you feel this strategy was effective? Why or why not? If you were to create an intervention based on exclusive offers, what would it look like?
6. Where do you think farmers typically look for information related to farm safety? Where would they expect to find information about PTO shields?

7. What would you consider an authoritative source of information about farm safety?
8. If farmers were to receive more information about PTO shields, how do you think it should be delivered?
9. Who do you think should deliver information about PTO shields?

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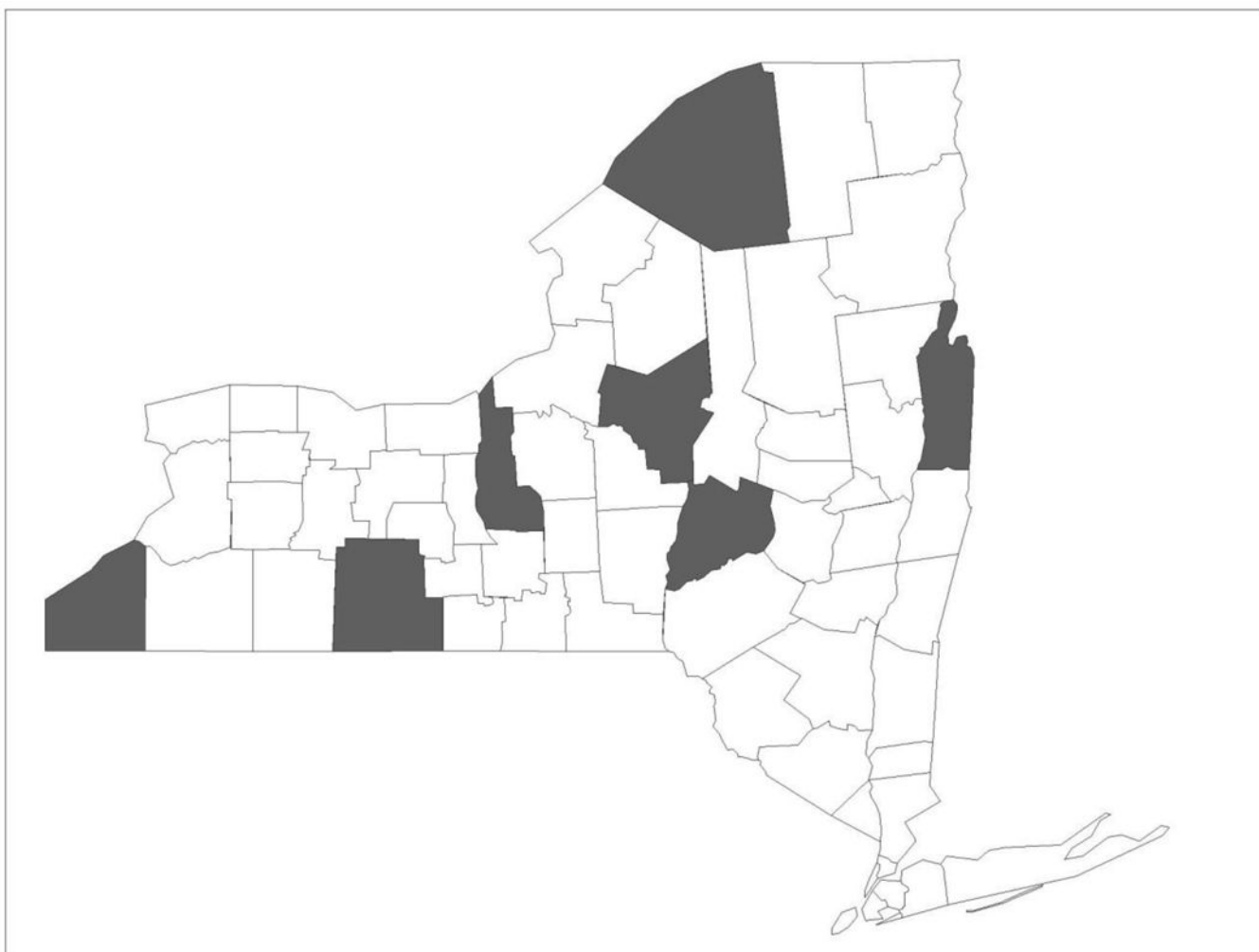


Figure 1:
Study intervention counties (shown in grey).

Table 1:

FGD participants, by primary affiliation.

Primary Affiliation	# of Participants
Cooperative Extension	11
Farmer	10
Farm Bureau	5
Insurance Providers	3
Emergency Services	3
Farm Services Agency/Soil and Water	2
Agricultural Equipment Dealerships	2
Other Agricultural Organizations	2
Public Health Department	1