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### Recommended Citation

Oskam, Judy B. (1995) "Diffusion of Agricultural Health and Safety Information: A Two Part Study of Oklahoma Farmers and Extension Agricultural Engineers," *Journal of Applied Communications*: Vol. 79: Iss. 1. <https://doi.org/10.4148/1051-0834.1364>

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## Diffusion of Agricultural Health and Safety Information: A Two Part Study of Oklahoma Farmers and Extension Agricultural Engineers

### Abstract

During the summer and fall of 1992, both on-site and mail surveys were conducted to determine: (1) How Oklahoma farmers receive and prefer to receive agricultural health and safety information from selected media and (2) How Extension agricultural engineering departments communicate agricultural health and safety information.

# Diffusion of Agricultural Health and Safety Information: A Two Part Study of Oklahoma Farmers and Extension Agricultural Engineers

Judy B. Oskam

During the summer and fall of 1992, both on-site and mail surveys were conducted to determine: (1) How Oklahoma farmers receive and prefer to receive agricultural health and safety information from selected mass media, and (2) How Extension agricultural engineering departments communicate agricultural health and safety information.

The study revealed that approximately one-half of the farmers identified television as their primary mass media source for general news and information. More farmers identified magazines as their primary source for safety and health information than any other medium. Three-quarters of the farmers in the study received their agricultural information from magazines. More than half of the farmers preferred to receive health and safety information from magazines. Agricultural engineers identified fact sheets, newspapers, workshops, videos, newsletters, radio, television, brochures, and magazines as methods for communicating health and safety information. In this article, recommendations are provided for agricultural health and safety educators.

## Introduction

Agriculture is one of the nation's most dangerous industries. More than 1,400 agricultural workers are killed each year and approximately 140,000 nonfatal injuries result in temporary or permanent

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disability (National Safety Council, 1992). Everyday farm hazards include machinery; chemicals; exposure to sun, heat, and noise; livestock handling; and stress. A lack of understanding and knowledge about risk factors thwarts current efforts to lower agricultural injuries and deaths associated with these injuries (Layde, 1990). Because of the tremendous danger in the farm environment, there is a great need to communicate information about health and safety to farmers and their families through the mass media.

The purpose of this study was to determine how Oklahoma farmers prefer to receive agricultural health and safety information from the mass media. The study also identified how university Extension agricultural engineering departments communicate agricultural health and safety information to their various constituencies. Examining two of these constituencies — farmers and agricultural health and safety educators — should lead to a better understanding of how to effectively communicate safety and health information.

### **Agricultural Health and Safety Hazards**

According to Meyers (1990), although estimates vary, reporting agencies show agriculture has an occupational fatality rate three to five times higher than that of the general private sector. There is also a wide range of agriculturally-related diseases that have been well documented in several epidemiological studies but for which adequate state or national statistics are not available. These increased rates of work-related diseases affect nearly every body system. Farmers and farm workers suffer from increased chronic disease, including chronic lung disease, certain cancers, arthritis, dermatitis, and noise-induced hearing loss.

Tragically, children are also victims of agricultural-related injury and death. Injury and death statistics from the National Safety Council and the National Institute for Occupational Safety and Health do not include the approximately 300 children killed each year while engaged in farm-related activities (National Coalition for Agricultural Safety and Health, 1989).

Data collected by the Oklahoma State Health Department (OSHD) from the State Medical Examiner showed that during the ten-year period 1980-89, a total of 824 farm-related deaths occurred in Oklahoma. Sixty-seven percent (551/824) of the farm-related deaths were considered unintentional (OSDA, 1991).

*Agriculture at Risk - A Report to the Nation*, by the National Coalition for Agricultural Safety and Health, explored the reasons for the continual high incidence of agricultural-related accidents and deaths. The report is a summary of discussions held at the confer-



ence "Agricultural Occupational and Environmental Health: Policy Strategies for the Future" in September 1988, in Iowa. According to the report, there is a general lack of federal and state funding for agriculture, and the gap between federal funding of programs for agricultural safety and programs for other workers is growing (National Coalition for Agricultural Safety and Health, 1989). The report suggests that the general public is unaware of the health and safety problems within agriculture and is, therefore, unconcerned.

The Injury Epidemiology Division of the Oklahoma State Department of Health (1991) identified three major barriers to the prevention of farm-related injuries and deaths. The first barrier is the lack of accurate and reliable data. Researchers are unable to identify nonfatal farm-related injuries and causes, and they lack the specific circumstances detailing an accident. A second barrier is the difficulty in targeting prevention programs to the broad and diverse range of injuries and age groups. The third, and possibly most important, barrier to preventing farm-related injuries is the lack of effective information dissemination (OSDH, 1991).

## **Methodology**

Two separate surveys were conducted to generate data about farmers and how they receive and prefer to receive agricultural health and safety information from the mass media. This study was done in coordination with the Oklahoma State University agricultural health and safety program. The on-site farm survey was administered from May to August 1992 throughout Oklahoma. A total of 170 Oklahoma farmers completed the questionnaire, farming an average of 27 years; the average farm was 1500 acres.

In October 1992, a second questionnaire was developed and distributed to all Extension agricultural engineering departments at land-grant universities throughout the U.S. Forty-five departments responded to the survey and completed the questionnaire for a response rate of 88 percent. The questionnaire was designed to identify the various methods used to communicate agricultural safety and health information to the farming community. Of the agricultural engineering departments that participated, almost all (44) responded that their program received approximately \$18,000 in state funding for safety programs. One-half of the departments (22) reported an average of \$87,000 in grant funding for safety (from various sources).

## **Study Limitations and Assumptions**

The results of the on-site farm survey are limited by the fact that farmers were initially selected as potential participants by their county Extension director. These farmers were then invited to participate in

the survey. The study included farmers from 68 of the 77 counties in Oklahoma. Some county Extension directors chose not to participate in the project. Because the farmers volunteered to participate in the survey, it is possible that they were more knowledgeable about Oklahoma State University and thus, more receptive to agricultural safety and health information than the general farming populace.

## **Oklahoma and Farming**

Farming is one of Oklahoma's most important industries. Because of this, the Oklahoma media might give agriculture more attention than more urban states. Oklahoma farmers have the unique opportunity to receive agricultural information from Oklahoma State University and the state public broadcast system. The Oklahoma Cooperative Extension Service and Oklahoma State University produce a live, 15-minute television program targeting the agricultural audience. *SUNUP* features agricultural news and information and airs each weekday morning on the Oklahoma Educational Television Authority (OETA).

Oklahoma farmers, like rural and urban residents across the country, also have access to the statewide network of Cooperative Extension Service offices that provide a wealth of agricultural information. From 1990-94, the Department of Biosystems and Agricultural Engineering at Oklahoma State University produced a number of educational video and print materials on agricultural safety and health with funding from the National Institute for Occupational Safety and Health. These educational videotapes and fact sheets are available through the Oklahoma Cooperative Extension Service.

## **Findings**

This study asked a number of research questions and produced the following results.

### **Research Question #1**

**From which mass media sources do Oklahoma farmers receive most of their general news and information?**

Table 1 shows which medium respondents ranked first for receiving their general news and information. Survey participants were asked to rank the following media sources: Television, newspaper, radio, and magazines.

According to the results of the survey, 46 percent of the farmers in the study identified television as their primary mass media source for general news and information. A quarter of the farmers listed maga-

**TABLE 1:***Oklahoma Farmers' Rank Order for Receiving News and Information - 1<sup>st</sup> Choice*

	Rank Order	Frequency N=170	Percent
Television	1	79	46
Magazines	2	42	25
Newspapers	3	26	15
Radio	4	23	14
No Response	—	0	0
<b>Total</b>		170	100%

**1=top source for news and information.**

zines as their main source for news and information, followed by newspapers, and radio. Simple chi square analysis showed a significant difference between most sources of news and information and identified a genuine difference between all media sources except newspaper and radio.

**Research Question #2**

**From which mass media sources do Oklahoma farmers receive most of their health and safety information?**

Table 2 illustrates the medium Oklahoma farmers ranked first for receiving their health and safety health information. Survey participants were asked to rank the following media sources: Television, newspaper, radio, and magazines.

**TABLE 2:***Medium Oklahoma Farmers Ranked 1<sup>st</sup> for Receiving Health and Safety Information*

	Rank Order	Frequency	Percent
Magazines	1	73	43
Television	2	65	38
Newspapers	3	25	15
Radio	4	6	4
<b>Total</b>		170	100%

**1=top source for health and safety information.**



More farmers (43 percent) identified magazines as their primary source for safety and health information than any other form of mass media. Television was listed as the primary source for health and safety information by 38 percent of the farmers, followed by newspapers, and radio. Simple chi square analysis showed no genuine difference between magazines and television as sources of media for safety and health information. However, analysis did identify a genuine difference between magazines and newspapers, magazines and radio, television and newspapers, television and radio, and newspaper and radio.

**Research Question #3**

**From which mass media sources do Oklahoma farmers receive most of their agricultural information?**

Table 3 shows the medium farmers identified as their first source for receiving agricultural information. Once again, survey participants were asked to rank the following media sources: Television, newspaper, radio, and magazines. Findings showed that 75 percent of the farmers in the study received their agricultural information from magazines, 9 percent identified newspapers, 8 percent chose television, and 7 percent listed radio.

Simple chi square analysis found no significant differences between television, newspaper, and radio as sources of agricultural information. Chi square analysis did, however, find a genuine difference between magazines and television, newspaper, and radio as agricultural information sources.

**TABLE 3:**  
*Comparison of Oklahoma Farmers' 1<sup>st</sup> Choice for Source of Agricultural Information*

	Rank Order	Frequency (N=170)	Percent
Magazines	1	128	75
Newspapers	2	16	9
Television	3	13	8
Radio	4	12	7
No Response	—	1	1
<b>Total</b>		<b>170</b>	<b>100%</b>

**1=top source for agricultural information.**



**Research Question #4**

**From which mass media sources do Oklahoma farmers PREFER to receive information about agricultural safety and health?**

How do Oklahoma farmers *prefer* to receive their information? Table 4 illustrates farmers' preference for receiving information about agricultural safety and health. Survey participants were asked to rank the following sources: Television, newspaper, radio, magazines, and videos. Video was added as a media source to determine farmers' interest in receiving educational video material in the future.

According to the study, 54 percent of the Oklahoma farmers who participated in the survey prefer to receive information about agricultural safety and health from magazines, 18 percent prefer videos, followed by television (15 percent), newspapers (6 percent), and radio (5 percent). Simple chi square analysis showed that, overall, there is a genuine difference in media sources for safety and health information. However, according to simple chi square analysis, there is no difference between television and radio nor between newspaper and radio. A genuine difference was found between television and newspapers, magazines and television, magazines and newspapers, magazines and radio, and magazines and video.

**Safety Areas of Interest**

The farmers in the survey were also asked to identify the safety areas (from a list provided) they would like to receive more information. Table 5 identifies farmers' interest by topic area, in receiving information from mass media. Participants could choose more than one topic, consequently the total is more than 100 percent.

**TABLE 4:**

*Oklahoma Farmers' 1<sup>st</sup> Preference for Agricultural Safety and Health Information*

	Rank Order	Frequency (N=170)	Percent
Magazines	1	92	54
Videos	2	30	18
Television	3	26	15
Newspapers	4	10	6
Radio	5	9	5
No Response	—	3	2
<b>Total</b>		<b>170</b>	<b>100%</b>

1=top choice for agricultural safety & health information.

**TABLE 5:**

*Farmers' Interest, by Topic Area in Receiving Information from Mass Media*

Topic area	Frequency	Percent
Farm Chemicals	102	60
Farm Machinery	88	52
Animal Handling	49	29
Children on Farm	47	28
Sun Exposure	41	24
Noise Exposure	41	24
Other	4	2
<b>Total</b>	<b>372</b>	<b>219%</b>

Note: Farmers could choose more than one topic area.

The safety area receiving the most interest was "farm chemicals," with 60 percent of the participants indicating they would like to receive more information on this topic. "Farm chemicals" was closely followed by "farm machinery," at more than 50 percent. In addition to the choices given, "falls," "all-terrain vehicles," "the elderly," and "respiratory hazards" were also listed.

Farmers identified chemicals as the safety area they would like to receive more information about; agricultural engineers identified machinery as the safety area most important to their clients. Of the engineers involved in the study, 71 percent chose machinery as the 1<sup>st</sup> and most important hazardous area for their clients, and nine percent identified chemicals. As shown in Table 6, the questionnaire also asked farmers if they would like to receive more health and safety information. Approximately 90 percent of the farmers answered "yes" — they would like to receive more from the media.

#### Research Question #5

According to the extension agricultural engineering departments across the country, which mass media methods are used to communicate safety and health information?

Agricultural Engineering respondents were asked to identify the various methods they use to communicate agricultural health and safety information (Table 7). Survey participants were given the following choices: Fact sheets, newspaper, workshops, videos, newsletters, radio, television, brochures, and magazines.

**TABLE 6:***Farmers' Interest in Receiving More Health & Safety Information from Mass Media*

	Frequency	Percent
Want more health and safety information from the media	151	89
Do not want more health and safety information from the media	15	9
No Response	4	2
<b>Total</b>	<b>170</b>	<b>100%</b>

Of the agricultural engineering faculty members who responded, more than 90 percent use fact sheets to communicate safety information; 82 percent identified newspapers and workshops, 80 percent chose videos, and 76 percent listed newsletters. Radio was listed by 71 percent of the population, and 62 percent were said to use television. Brochures were used by 53 percent, and 49 percent said they used magazines. Participants could choose more than one communication method, so the total adds to more than 100 percent.

**TABLE 7:***Various Methods Used to Communicate Health and Safety Information*

	Frequency	Percent
Fact Sheet	41	91
Newspaper	37	82
Workshops	37	82
Videos	36	80
Newsletters	34	76
Radio	32	71
Television	28	62
Brochures	24	53
Magazines	22	49
<b>Total</b>	<b>291</b>	<b>646%</b>

**NOTE:** Respondents could list more than one method.



The agricultural engineering questionnaire also asked participants to choose one method of information dissemination they would like to use more often. (Table 8)

Because some educators listed more than one method, this data is listed in frequency and percentage. The majority of the engineers, 25 percent, listed workshops; 20 percent identified videos; and 12 percent listed television as the methods of information dissemination they would like to increase. Fact sheets were identified by 11 percent of the respondents; 10 percent listed newsletters; 6 percent checked radio, newspaper, and brochures. Of the engineers who responded to this question, only 4 percent indicated they would like to increase their use of magazines to disseminate information.

### Conclusions

In general, the Oklahoma farmers surveyed receive their *agricultural information* from magazines. By a large margin, three-quarters of the farmers in the study listed magazines as their top source for agricultural information. More than one-half of the participants also said they *prefer* to receive information about *agricultural health and safety* from magazines. Agricultural health and safety educators should recognize this form of mass media as an important communication source for farmers.

In addition to magazines, educators should recognize television as an effective mass media method for communicating health and safety information to the rural population. This research showed that Okla-

**Table 8:**  
*The Methods of Information Dissemination Agricultural Engineers Would Like to Increase*

	Frequency	Percent
Workshops	21	25
Videos	17	20
Television	10	12
Fact Sheets	9	11
Newsletters	8	10
Radio	5	6
Newspaper	5	6
Brochures	5	6
Magazines	3	4
<b>Total</b>	<b>83</b>	<b>100%</b>

**NOTE:** In some cases, respondents listed more than one method.



homa farmers identified magazines and television, respectively, as their primary sources for *health and safety information*.

Because farmers identified magazines, videos, and television as important sources for receiving *agricultural safety and health information*, educators should target their messages to these media. Educators should design health and safety programs with broad-based appeal to encourage diffusion by the mass media.

An overwhelming majority of Oklahoma farmers in the study were interested in receiving more safety and health information. Educators should develop and implement agricultural health and safety programs designed for use by the mass media. Mass media organizations should recognize the farming community as an important audience for their news and information messages. Because in this study agricultural engineers and farmers identified different safety areas of interest, it may be beneficial for educators to conduct research to determine the concerns of their clients.

## **Recommendations**

### **Agricultural Health and Safety Educators**

- 1) Educators should develop and implement agricultural health and safety programs in coordination with media/communication specialists and farmers.
- 2) Educators should conduct research to determine how their rural constituents prefer to receive information about agricultural safety and health and identify their areas of interest.
- 3) Educators should utilize the mass media to communicate news and information to their target population.
- 4) Educators should increase their use of magazines as a method of communicating agricultural health and safety information.
- 5) Educators should increase their use of videos and television as methods of communicating agricultural health and safety information.
- 6) More funding should be devoted to the production and development of effective agricultural health and safety communication.

### **The Mass Media**

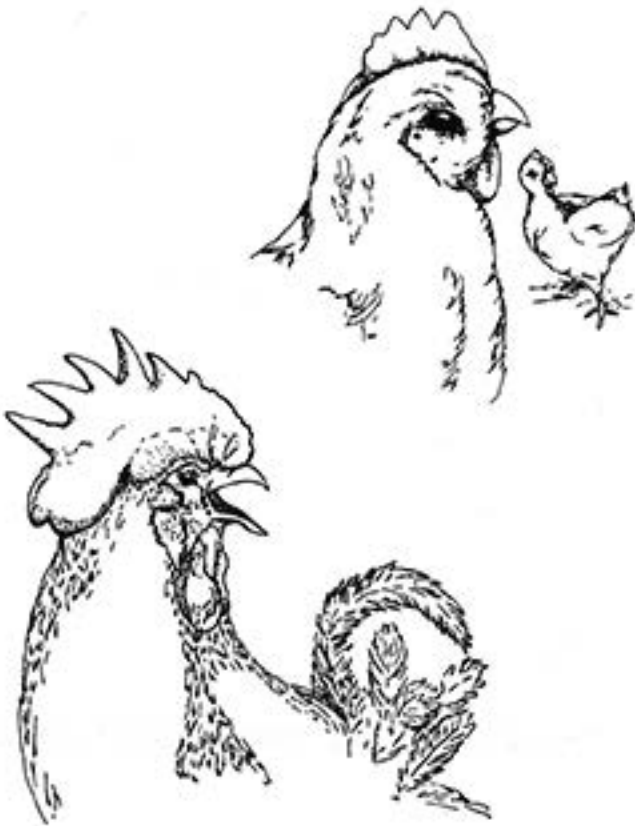
- 1) The mass media should recognize the farming population as an important audience.
- 2) The news media should communicate more information about agricultural health and safety issues.
- 3) Agricultural-oriented magazines should recognize the interests of farmers and, consequently, increase coverage of farm safety and health issues.

4) Additional research is needed in the area of mass media and agricultural health and safety communications to develop effective materials and programs.

Many education, health, agriculture, and safety organizations develop and promote agricultural health and safety programs. The programs are as varied as the geographic locations and the leadership of the project directors. Successful programming efforts by land-grant universities across the country continue to promote agricultural safety and health in new and innovative ways. Although this study was limited in scope, it does demonstrate the need for further research by communication scholars. Educators, mass communication specialists, and farmers must work together to develop and implement effective agricultural health and safety programs.

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**Illustrations by Melanie Eirich**

Melanie states, "The producers asked me to illustrate the main segments [of this video series] by using similar techniques that I used in another project....I was to create a separate illustration for each segment and use marbled textured backgrounds in the video graphics. Each marble background was to be of a different color. Then I was to create a collage of the six illustrations for an open and close background for the video." (see page 33).