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## Virtually the Same? Understanding Virtual and F2F Farmer Audiences

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### Cover Page Footnote

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## Virtually the Same? Understanding Virtual and F2F Farmer Audiences

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**Abstract.** Agricultural and extension educators frequently employ a variety of methods to provide farmers with information about conservation practices. The introduction of virtual programming brought on in response to the COVID-19 pandemic set the stage for analysis of farmer outreach preferences with respect to face-to-face (F2F) versus virtual outreach. Using survey data of individuals who participated in field days in Iowa, we segmented participants based on their F2F or virtual attendance. We compared the groups based on key variables such as water quality concerns, communication behaviors, outreach preferences, and demographics. Our work suggests that a broad and dynamic communication strategy, including both in-person and virtual events, offers greater opportunities for dissemination of ideas and increases access to content.

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### INTRODUCTION

Agricultural and Extension educators employ a variety of methods to provide farmers with information about conservation practices. With the rise of the COVID-19 pandemic, most Extension and agricultural educators were forced to shift from traditional face-to-face (F2F) outreach formats—such as field days and farm tours—to virtual outreach via online meetings and webinars. The introduction of a substantial number of virtual outreach events provided researchers with an opportunity to explore the potential for targeting farmer audiences by their learning and outreach preferences, especially regarding F2F methods versus virtual participation. An improved understanding of farmers' preferences for different delivery approaches is critical to program design. To identify and describe farmers' preferences for conservation outreach and assess attitudes toward conservation topics based on those preferences, we conducted a survey of individuals who participated in agricultural conservation outreach events in Iowa.

### BACKGROUND

Effective outreach to farmers can encourage the adoption of practices that reduce nutrient runoff, improve soil health, and reduce erosion. Reducing nutrients in agricultural runoff

can improve watershed health and mitigate environmental problems downstream, such as those seen in the Gulf of Mexico Dead Zone (Porter et al., 2015). Reducing nutrient loss from farm fields means municipalities can spend less on treatments to make water safe to drink (Harmel et al., 2018). On-farm conservation practices can provide ecosystem benefits as well, such as prairie strips that provide habitat for pollinators (Grudens-Schuck et al., 2017).

Past research has considered how farmers' responses to conservation outreach differ and how understanding such individual-level differences can help tailor outreach materials. For example, in a survey of farmers in Indiana, researchers found that farmers who participated in a formal farmer network where they received support and information were significantly more likely to implement vegetated riparian buffers (Pape & Prokopy, 2017). They also found demographic differences among network and non-network farmers, with network farmers being older, having a larger farm size, and receiving more formal education. In a survey of farmers in two watersheds in Illinois, researchers found significant differences in the adoption of stream buffers between the two watersheds (Lemke et al., 2010). In addition, landowners (not necessarily farmers) who adopted riparian buffers in Kansas had more favorable attitudes toward trees,

were less motivated by economic factors, and were more aware of the benefits of riparian buffers (Rhodes et al., 2018).

In a review of survey studies about farmers and conservation, researchers identified many studies that suggest farmers prefer traditional outreach formats (Witzling et al., 2021). Although virtual programming may not appeal to all audiences, the flexibility it offers could increase access for some audiences, such as those with limited ability to travel or family and off-farm work commitments (Witzling et al., 2021), making it worthwhile to investigate differences in perceptions among farmers who prefer a virtual format. Due to the increase in virtual programming offered during the COVID-19 pandemic, there may now be more farmers interested in learning online. Understanding if farmers who prefer virtual outreach formats differ considerably from those who prefer in-person formats will allow educators to tailor the content or delivery of their programming to meet the needs of different audiences.

Farmer outreach remains an important part of conservation education programs across the United States (Prokopy et al., 2019). One such program is Iowa Learning Farms (ILF). This program is a partnership between Iowa State University Extension and Outreach, the Iowa Department of Agriculture and Land Stewardship, the Iowa Department of Natural Resources, the U.S. Department of Agriculture Natural Resources Conservation Service, and multiple departments at Iowa State University (including Agricultural and Biosystems Engineering, Agronomy, Economics, and Sociology). These groups formed ILF in 2004 as a multidisciplinary program focused on encouraging farmers to talk with one another about how to protect soil and water resources and learn about agricultural conservation practices. ILF educational programming includes field days, workshops, listening sessions, one-on-one conversations, and numerous online and printed resources for farmers, with a focus on conservation. ILF staff track progressive impacts of outreach using the “field day success loop” (Comito et al., 2017). In response to COVID-19 restrictions, the ILF team developed a Virtual Field Day program which could be adopted by Extension or other agencies that focus on agricultural education in their attempts to continue and facilitate outreach (Comito et al., 2021). This expansion of delivery methods provided an opportunity to compare individual differences in respondents who self-selected in-person or virtual outreach events and to explore differences in respondents’ concerns about water quality and outreach preferences.

## PURPOSE AND OBJECTIVES

The purpose of our research was to describe differences in groups of farmers based on their virtual or in-person learning preferences so that educators can tailor their outreach

strategies or content to these defined groups. Specifically, the objectives were to explore differences regarding:

- Demographics
- Water quality concerns
- Communication behaviors, and
- Outreach preferences.

## METHODS

In spring of 2021, we administered a survey by mail and email to individuals who had participated in programming through the ILF.

The paper mail survey was sent to all individuals who attended at least one in-person ILF field day between 2017 and 2019, totaling 1,143 individuals. Of those individuals, 411 responded, a 36% response rate for the paper mail survey. Because email addresses were not available for most in-person participants, only a paper mail survey was distributed to these participants to maintain consistency in how they were contacted.

An additional 329 individuals who participated in field days in 2020 (all of which were virtual due to COVID-19), and for whom only an email address was available, were sent an identical online version of the survey. Of them, 76 responded for a 23% response rate for the online survey. We also note that there were 12 individuals who were on both the paper mail and email list, and they were only sent the paper mail version of the survey.

To compare people who attend virtual and in-person events, we divided our sample into four groups using the survey question, “In the last two years, how often did you attend the following events hosted by the Iowa Learning Farms?” with items including in-person field days, virtual field days, and webinars (another option for virtual participation). We issued the survey in the spring of 2021, so the surveyed period (“the last two years”) refers to the time between spring of 2019 and spring 2021.

The first group was Virtual Only ( $n = 67$ ). People in this group indicated that they attended a virtual webinar or field day in the surveyed period but did not attend any in-person events during that time. The second group was labeled Virtual Flexible. These individuals attended at least one in-person in the surveyed period and at least one virtual field day or virtual webinar ( $n = 157$ ). The third group, F2F Active, included people who indicated that they attended at least one in-person field day in the surveyed period but never attended a virtual field day or virtual webinar ( $n = 172$ ). It is not possible that they would have attended a virtual ILF event prior to 2019, as these events were not offered. The last group was labeled F2F Inactive. This group was composed of individuals who did not attend any ILF field days or webinars,

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in-person or virtual, in the surveyed period ( $n = 86$ ). We know that people in this group must have attended an in-person field day prior to the spring of 2019, but not before 2017, as the paper mail survey list was generated from people who attended field day events between 2017 and 2019. Five individuals did not answer the question about if or how they attended events and were removed from analysis ( $N = 482$ ).

To analyze the data, we compared the means to survey questions about demographics, water quality concerns, and communication behaviors between the four groups. We ran ANOVA tests, with Tukey post hoc analyses when the ANOVA tests determined variables were significant. We also examined the proportion of individuals in each group likely to attend different kinds of outreach events in the future.

## RESULTS

### DEMOGRAPHICS

There were statistically significant differences between groups regarding age. The Virtual Only and Virtual Flexible groups were significantly younger overall than the other two groups. The average age of participants in the Virtual Only group was 59, and the average age of participants in the Virtual Flexible group was 60; the F2F Inactive group participants had an average age of 65, and the F2F Active group had an average age of 67.

There were proportionally more women in the Virtual Only (19%) and Virtual Flexible (11%) groups compared to the F2F Inactive (7%) and F2F Active (5%) groups.

There were also significant differences based on education. The Virtual Only and Virtual Flexible groups averaged closest to the survey response choice of “Completed a 4-year degree,” while the other two groups averaged closest to the choice of “Completed a 2-year degree.” The groups did not differ significantly based on income, with all four groups having an average household income between \$75,000 and

\$149,999 (before taxes) in 2020. They also did not differ significantly in terms of row crop acres owned or operated, with all four groups averaging between 465 and 640 acres.

### WATER QUALITY CONCERNS

Responses to the multi-item question “How concerned do you feel about the following?” are shown in Table 1. Items included five issues related to nitrate levels in water. For almost all items, the averages for each group were closest to “Moderately concerned,” or a 4 on the 7-point scale. Using Tukey’s HSD tests, we examined whether means between groups were significantly different at the 95% confidence level. The one significant difference was that the Virtual Flexible group was significantly more concerned about excess nitrate in their county’s waterways than was the F2F Active group.

### COMMUNICATION BEHAVIORS AND OUTREACH PREFERENCES

Table 2 contains responses to the multi-item question “How often are these statements true for you?” Members of the Virtual Flexible group indicated that they are more likely to share their views and information about water quality with other farmers than are the other groups. Regarding how often they share their views or information about water quality with other farmers, their average was closest to the response choice of “Usually true,” while the other groups averaged closest to the response choice of “Sometimes true.” This group is also seeking and searching for information and asking questions of farmers significantly more than some of the other groups. Though they reported only infrequently posting about water quality on social media, they did so significantly more frequently than did the other groups.

We also asked respondents about their attention to particular media sources, including specific outlets popular

**Table 1.** Group Averages for Survey Question “How Concerned Do You Feel About the Following?”

Concern	Virtual Only	Virtual Flexible	F2F Active	F2F Inactive
Excess nitrate in the Gulf of Mexico	4.0 <sup>a</sup>	3.9 <sup>a</sup>	3.6 <sup>a</sup>	3.6 <sup>a</sup>
Excess nitrate in Iowa’s waterways	3.9 <sup>a</sup>	3.9 <sup>a</sup>	3.6 <sup>a</sup>	3.6 <sup>a</sup>
Excess nitrate in Iowa’s drinking water	3.9 <sup>a</sup>	3.7 <sup>a</sup>	3.5 <sup>a</sup>	3.6 <sup>a</sup>
Excess nitrate in my county’s waterways	3.8 <sup>a,b</sup>	3.8 <sup>a</sup>	3.5 <sup>b</sup>	3.5 <sup>a,b</sup>
Excess nitrate in my county’s drinking water	3.7 <sup>a</sup>	3.5 <sup>a</sup>	3.4 <sup>a</sup>	3.5 <sup>a</sup>

*Note.* These questions were asked on a 7-point scale where 1=Not at all concerned and 7=Extremely concerned. The letters differentiate whether there is a significant mean difference between the four groups for each water quality concern at the 95% confidence level, as identified by Tukey’s HSD tests. Means showing the same superscript letter across a row are not statistically different for that survey item.

**Table 2.** Group Averages for Survey Question “How often are these statements true for you?”

Communication Behavior	Virtual Only	Virtual Flexible	F2F Active	F2F Inactive
Share my views about water quality with farmers	3.0 <sup>b,c</sup>	3.6 <sup>a</sup>	3.2 <sup>b</sup>	2.8 <sup>c</sup>
Share information about water quality with farmers	3.0 <sup>b</sup>	3.5 <sup>a</sup>	3.1 <sup>b</sup>	2.8 <sup>b</sup>
Search for information about water quality	3.4 <sup>a,b</sup>	3.6 <sup>a</sup>	3.0 <sup>b,c</sup>	2.8 <sup>c</sup>
Ask farmers questions about water quality	2.6 <sup>a,b</sup>	3.0 <sup>a</sup>	2.6 <sup>b</sup>	2.4 <sup>b</sup>
Post on social media about water quality	1.8 <sup>a,b</sup>	2.0 <sup>a</sup>	1.4 <sup>c</sup>	1.5 <sup>b,c</sup>

*Note.* These questions were asked on a 5-point scale where 1=Never true and 5=Always true. The letters differentiate whether there is a significant mean difference between the four groups for each information seeking and sharing item at the 95% confidence level, as identified by Tukey’s HSD tests. Means showing the same superscript letter across a row are not statistically different for that information item.

**Table 3.** Group Averages for the Question “How much attention do you pay to information about agriculture from the following?”

Information Source	Virtual Only	Virtual Flexible	F2F Active	F2F Inactive
Iowa Farmer Today	2.8b	3.2ab	3.4a	3.2ab
News on Radio	3.0bc	3.4a	3.2ab	2.9c
Wallace’s Farmer	2.7b	3.2ab	3.3a	2.9ab
The Spokesman	2.3c	3.1ab	3.3a	2.7bc
News on TV	2.7ab	2.9ab	3.0a	2.6b
Social media	2.4a	2.4a	1.7b	1.7b
Podcast	2.4a	2.7a	1.6b	1.7b
YouTube	2.3a	2.6a	1.7b	1.7b

*Note.* These questions were asked on a 5-point scale where 1=None and 5=A great deal. The letters differentiate whether there is a significant mean difference between the four groups for each information source at the 95% confidence level, as identified by Tukey’s HSD tests. Means showing the same superscript letter across a row are not statistically different for that source.

with farmers in the Midwest and more general categories such as “News on TV” and “social media”. Table 3 shows averages for each group responding to the question “How much attention do you pay to information about agriculture from the following?”. All groups averaged closest to “Some” attention to the newspaper, radio, and TV options. In terms of significant differences, the F2F Active group paid more attention to traditional sources (e.g., news on TV, news on radio) and agricultural media outlets (i.e., *Iowa Farmer Today*, *Wallace’s Farmer* and *the Spokesman*) than most of the other groups. In contrast, the Virtual Only and Virtual Flexible groups pay significantly more attention to digital

sources like YouTube, podcasts, and social media than do the F2F Active or F2F Inactive groups.

When it comes to outreach options in the future, the Virtual Flexible group reported that they want to continue participation through both in-person and virtual programming post-COVID-19 (Table 4). Regarding online options, 74% of this group responded that they are likely to attend a webinar in the future. Among the Virtual Only group, virtual options in the future—especially webinars—appear to be more appealing than in-person field days. The F2F Active and F2F Inactive groups were uninterested in trying virtual events in the future.



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**Table 4.** Proportions of Each Group Likely to Attend Events Post-COVID-19

Event	Virtual Flexible	Virtual Only	F2F Active	F2F Inactive
In-person field day	87	46	80	44
Virtual field day	53	58	7	16
Webinar	74	82	6	13

*Note.* All figures represent the percent of the group that indicated they are “Likely” to attend these events post COVID-19.

## CONCLUSION AND IMPLICATIONS

The purpose of this study was to assess and describe differences and preferences among farmers choosing to attend F2F and virtual outreach events. Our data suggests that younger, female farmers are more likely to attend virtual events. For agricultural educators interested in making content more accessible to these audiences, virtual options appear to be an appealing outreach tool. Our data show that men were more likely than women to attend in-person field days, so the possibility for the addition of virtual formats to expand accessibility for women and younger audiences is promising. However, understanding why female farmers and landowners do and do not attend in-person or virtual field days will require further research. Since ILF first started hosting field days, the number of women attending field days has consistently increased, as have the number of women serving as Extension educators, agronomists, and government employees in agriculture.

Regarding water quality concerns, group averages did not differ significantly. This is not surprising, given the nature of the sample. However, the results do have implications for educators: although farmers attending ILF events likely feel similarly about the risks of nutrient pollution and likely do not require outreach messages to be tailored based on their outreach preferences, there is an ongoing need to reinforce the importance of implementation of conservation practices. Interest is not equivalent to action, and frequent contact and messaging can improve adoption (as indicated by the field day success loop outcomes) (Comito et.al., 2017). There was a significant difference between the Virtual Flexible group and the F2F Active group regarding concern over nitrate in their county’s waterways, with the Virtual Flexible group reporting more concern. This may indicate that the Virtual Flexible group is more invested in addressing water quality issues, because they have a greater local concern.

We saw the most significant differences between groups regarding communication behaviors and outreach preferences. The Virtual Flexible group were the most engaged in seeking and sharing information. It is possible

that the Virtual Flexible group sees virtual events as a way to pick up *extra* content as they seek information, as they are also committed to attending F2F. As active information seekers and sharers, the Virtual Flexible group may act as opinion leaders. Moreover, the Virtual Flexible group may play an important role as a bridge between the Virtual Only and the F2F Active groups. These two groups may not otherwise interact; each group attends only one type of event. The Virtual Flexible participants have the potential to carry information that may be unique to one delivery format to peers who do not cross over formats. This could be facilitated through opportunities for open networking and discussion during online events that are similar to the social interactions that typically take place during in-person field days.

In contrast to the Virtual Flexible group, the Virtual Only group was less active in seeking or sharing information. For these participants, attending virtual events may be preferable because it is less of a commitment. Consequently, virtual programming may be an important way to engage with individuals who are just testing the waters or who are slower to adopt conservation practices. Our results suggest that both the Virtual groups are likely to continue accessing virtual content in the future, particularly if it continues to appeal to their needs and interests.

In reviewing preferred information sources, we also saw evidence that the farmers who only attend in-person field days rely on more traditional sources for information, such as agricultural newspapers both in print and online. In contrast, the groups attending virtually appear to prefer using less-traditional digital platforms. This underscores the importance of using diverse media outlets to promote agri-environmental educational events.

Another potential issue that was not directly addressed in this study is the availability of reliable internet access at bandwidth performance sufficient to support live streaming and other virtual services. The lack of access to the internet is still a concern for many who live in rural Iowa. This technology deficit could also be a barrier for some, preventing successful attendance and participation in virtual activities and making the continued availability of F2F programming important.

Our work suggests that a broad and dynamic communication strategy including both in-person and virtual events offers greater opportunities for dissemination of ideas and increases access to content. The combination of both F2F and virtual outreach is an important part of reaching a more diverse audience. Virtual events, especially those attended by individuals who fit the Virtual Flexible profile, may provide an important space for a heterogeneous mix of farmers to meet and learn from each other.

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