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Author manuscript

*J Agromedicine*. Author manuscript; available in PMC 2024 January 01.

Published in final edited form as:

*J Agromedicine*. 2023 January ; 28(1): 86–89. doi:10.1080/1059924X.2022.2140733.

## Infographics enhance agricultural health and safety programs for young adults

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### Keywords

infographic; motion graphic; agriculture; safety; outreach; youth

Although infographics have been used by health educators and professionals for a long time, less is known about their application in agricultural health and safety programs. Infographics present evidence-based information using vivid data visualization, text, pictures; and in the case of motion graphics, audio, and animation. The increased popularity of infographics in the last few decades may be attributed to the rise of social media and the fact that we process visual content much faster than text and numbers [1]. The purpose of this commentary is to describe three infographic formats used in our programs and to share best practices for agricultural health and safety outreach with young adults.

Traditional agricultural health and safety programs may include lengthy presentations, text, or guidebooks--especially when considering topics such as pesticide application safety and respiratory protection. It may be more effective to break some of this complex information up into smaller pieces. The inclusion of more infographics for both in-person and online agricultural health and safety programs is appealing because it has potential to strengthen learning, participation, and content memory [2]. Infographics appeal to a broader range of learning styles since they incorporate the use of visual, writing, and auditory components. Although longer training manuals are useful for reference purposes, safety educators are interested in strategies to effectively condense the information during in-person discussions to enhance material retention.

In the years to come, we expect greater transition to online agricultural safety and health learning (e.g., yearly recertification training requirements for pesticide applicators), particularly as “e-leaning” became a useful strategy during the COVID-19 pandemic. Infographics can easily fit into self-paced online modules or shared via social media. A previous study found that social media posts about livestock agriculture containing infographics tended to elicit more reactions, comments, shares, and reach compared to

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Disclosure statement

No potential conflict of interest is reported by the authors.

posts containing webpage links or photos alone [3]. Currently, there are three types of infographics commonly used for outreach purposes, including the *static* (print) *infographic*, the *motion graphic*, and the *interactive infographic*.

## Static infographics

*Static infographics* were circulated among public health statistical enthusiasts as far back as the early 1800s to show spread and control of common infectious illnesses. A static infographic is typically a visual image (such as a photo or chart) used to represent information or data in a shortened manner. More recent infographics combine quantitative data, explanatory text or quotes, branded colors, and aesthetically pleasing icons. Static graphics are easy to incorporate into outreach programs, since they are designed for print materials (e.g., posters, brochures) or to display on screens. They can also easily be circulated through social media photo sharing applications.

## Motion graphics

*Motion graphics* have become more regularly applied in educational settings since the 1970s. Motion graphics are videos that use animation to create the illusion of motion (typically combined with audio) for use in educational multimedia [4]. Like infographics, they rely strongly on visual imagery but allow additional content to be displayed through music, sound, or voice. Motion graphics have been more frequently applied in primary and secondary education situations, where they have demonstrated improvement of student knowledge in STEM subjects [5]. Motion graphics may be more appealing to multiple learning styles, since they use visual, text, and auditory components. They can also easily be circulated through social media using YouTube, TikTok, and Reels (using Facebook and Instagram).

## Interactive infographics

*Interactive infographics* are presentations of data (often online) that allow the learner to interact with a story or data using a computer or handheld device. In comparison to static graphics, they use a webpage design to allow the learner to scroll, hover, click, or zoom. Interactive infographics are useful because they are more participatory. They allow the safety trainer or participant to advance at their own pace, allows for ‘redirection’ (to other resources, videos, or webpages). A previous study found that users “enjoy the experience” more as compared to a static visual display [6]. As compared to other methods, this technology is relatively new.

Over the last four years, we have utilized all three infographic formats in agricultural health and safety outreach programs with over 5,000 young adults (ages 18–24), in five countries. Approximately 85% of these young adults are working in agriculture and most plan on returning to their family farm. We use static infographics for topics such as hearing conservation and manure gas safety; motion graphics for mental health in agriculture, all-terrain vehicle (ATV) safety design, and respirator care; and an interactive infographic for describing common types of respirators used in agriculture. In addition to in-person

programming, we share infographics in an online learning platform that participants may access afterward. An important aspect of our outreach evaluation includes an analysis of young adult's reported "biggest takeaways" following the program. These responses are categorized by agricultural health and safety topic. Overall, we have found that 71% of young adult participants report that their biggest takeaway was related to a topic covered with the use of an infographic. In fact, 27% of participants write down a specific quote or statistic directly from the infographic text. Even though other topics in our programs involve a great deal of interaction (through storytelling, demonstration, and video), we have observed that they are mentioned less by participants.

## Best practices for infographic use

### Development

Our infographic development process begins with a primary draft including descriptions of visual imagery, text to be displayed on screen, and voice-over script. This draft is reviewed by relevant scientific experts before being shared with a design team (e.g., graphic designer, video editor, and voice actor). Throughout the infographic development process, there are multiple opportunities to provide feedback and make revisions. Voice-over and language translation are completed at the end of the process. It has been particularly challenging to identify photos or animation showing appropriate prevention methods in agricultural workplace situations. This was especially challenging during the COVID-19 pandemic, when online image searches for respirators often resulted in images of cloth face coverings. There is a need for more images displaying agricultural workers in safe environments using appropriate control methods to facilitate more infographic development.

### Length

Previous research has found that the most successful static infographics are brief—with most participants remembering content from infographics with 400 words or less [6]. Brevity is an important component for motion graphic video development since a recent analysis of an agricultural health and safety YouTube channel indicated an average viewing time of 2 minutes or less [7]. Our two highest performing infographics have been the interactive infographic describing the common types of respirators used in agriculture and a 2-minute ATV safety motion graphic highlighting engineering controls. It is interesting that we found both long and short formats performed well (the interactive infographic contained ~1,500 words). There appears to be potential for the use of interactive infographics to address more complex agricultural health and safety topics. The more participatory nature of the interactive infographic display kept participants engaged with the content.

### Presentation

A "describe and discuss method" works well when incorporating infographics in training or education. We use the infographic to introduce each topic. Next, we engage in a discussion about the infographic—such as sharing a personal story, discussing the latest research findings, or a safety equipment demonstration. For example, after displaying a "Mental Health in Agriculture" infographic, we ask the participants to reflect on stressors present in their own life. After viewing the interactive infographic showing common types

of respirators used in agriculture and their assigned protection factors, we pass out the respirators for participants to practice donning and doffing. We have observed that in programs where time constraints limited our ability to appropriately use the “describe and discuss method”, fewer participants report a biggest takeaway related to the use of infographics. Infographics should not be considered a “stand alone” product—they are more likely to be remembered if paired with another activity.

## Evaluation

The use of qualitative information from program participants, such as “biggest takeaways” provides some useful information but is not ideal. Other useful evaluation methods may include utilizing a pre- and post-survey model to test infographic-specific knowledge shifts or planned changes in safety behaviors linked to the infographic. Previous studies have involved partnering with young adult producers to examine one to two specific infographics in depth and get qualitative feedback about their interpretation [8].

In summary, infographics are a useful tool to be used in agricultural health and safety programs—especially with young adult audiences. We have found that young adult participants were more likely to remember health and safety topics that were presented with the use of infographics—particularly if they were paired with discussion or demonstration. We look forward to the use of more interactive infographics in agricultural health and safety since they may be useful for addressing more complex topics, such as grain handling or pesticide application. The application of interactive and inclusive media styles can be used to enhance agricultural health and safety overall.

## Acknowledgements.

This publication was supported by NIOSH/CDC under Grant Number 5 U54 OH007548 through the Great Plains Center for Agricultural Health. Thanks to David Sullivan and Alex Beach at the Ag Health and Safety Alliance™ for assisting with development of motion graphics and interactive infographics for use in Gear Up for Ag Health and Safety™ programs mentioned in this publication. The Upper Midwest Agricultural Safety and Health Center (UMASH), the Southwest Center for Agricultural Health, Injury Prevention, and Education (SWAG) and the Central States Center for Agricultural Safety (CS-CASH) and Health also funded motion graphics used in evaluation for this publication.

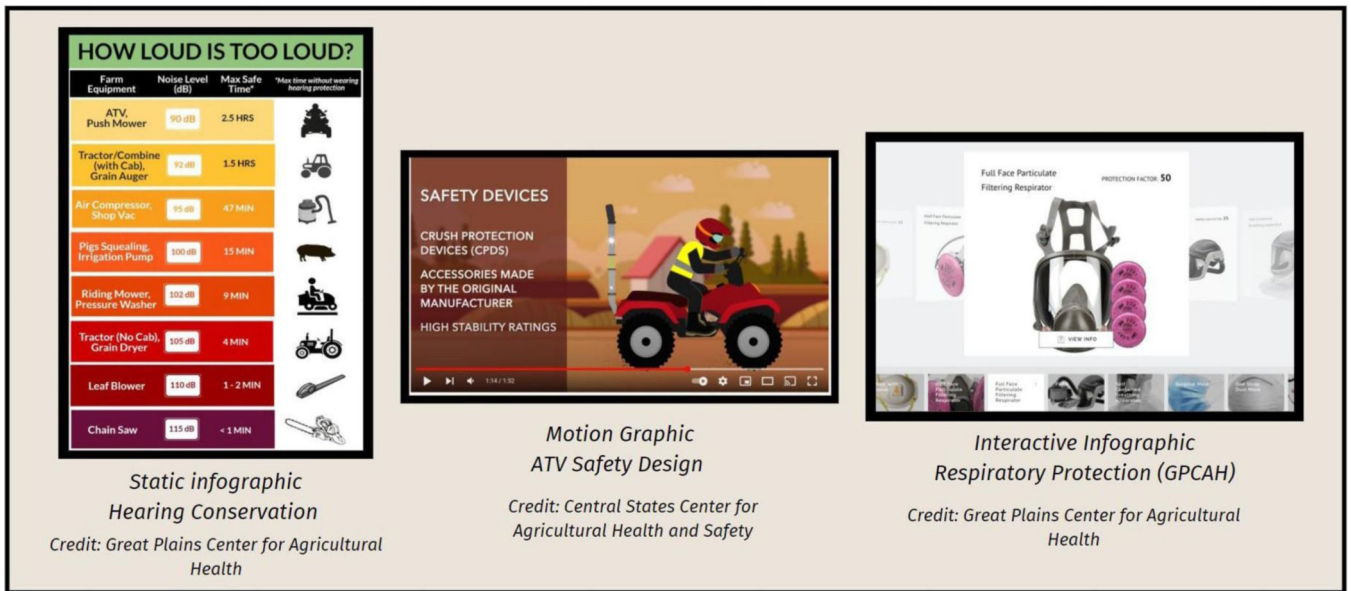
## Funding

This publication was supported by the National Institute for Occupational Safety and Health (NIOSH/CDC) under Grant Number [U54 OH007548] through the Great Plains Center for Agricultural Health.

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**Figure 1.** Three infographic examples used in agricultural health and safety programs.