Communication and Education to Promote Soil Sustainability in Texas, Oklahoma, and Louisiana

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Introduction

The uncertainties of climate change and related implications for row crop agriculture prompt a need for connection between scientific findings and agricultural producers (Ingram et al., 2016). Region-specific analyses of soil health and yield provide an opportunity for a transdisciplinary approach to appropriately communicating and educating farmers (Young, 2020) about the benefits of soil health management practices (SHMPs). Soil sustainability involves the implementation of SHMPs such as reduced tillage, cover cropping, or double cropping. The discovery of the types of adopters, the information reception habits, and educational preferences of wheat producers will aid researchers in the development of engaging and persuasive scientific communication programs (Delaroche, 2020; Upadhaya et al., 2021).

Rogers (2003) diffusion of innovation theory served as the framework for the categorization of wheat producers into adopter categories and the five adopter categories in his diffusion of innovation theory—innovators, early adopters, early majority, late majority, and laggards—to guide the study.

The purpose of this study was to investigate preferred information sources and communication channels of wheat producers in Texas, Oklahoma, and Louisiana according to each of Rogers (2003) five adopter categories. The following research question guided our study: What information sources and communication channels do wheat producers prefer based on their classification within each of Rogers' (2003) five adopter categories?

Methodology

Our study is part of a larger qualitative research study. Therefore, similar methods may appear elsewhere. We conducted interviews with wheat producers (n = 32) in Texas, Oklahoma, and Louisiana throughout the 2019–2020 wheat production seasons. The semi-structured interviews were designed to assess producers' current knowledge surrounding SHMPs, their motivations and barriers to adopting SHMPs, and the communication and education sources they find the most beneficial for receiving information regarding crop and soil health. Certified Crop Consultants and County Extension Agents helped us identify the sample through purposive sampling (Patton, 2002). We developed interview questions that aligned with resource conservation adoption literature and Rogers' (2003) diffusion of innovation theory. Prior to analysis, we recorded and transcribed the interviews for unitization. The five adopter categories in Rogers (2003) diffusion of innovation served as the theoretical framework for analytic induction (Patton, 2002). Subsequent to the initial analysis, we reviewed each of the five categories to ensure the data were analyzed correctly. We accomplished trustworthiness through triangulation (Patton, 2002).

Findings

Wheat producers preferred university soil science faculty and/or specialists (n = 20) as their most trusted sources of information and least preferred Natural Resource Conservation Service specialists (n = 1), local farmer groups (n = 1), and equipment dealers (n = 1). Producers preferred to receive information through the following communications channels: field days and

demonstrations (n = 21); Extension based e-mails (n = 6); on farm visits with a specialist, consultant, or agent (n = 5); Extension based mailouts (n = 5); grower specific meetings (n = 2); and Extension based web articles (n = 2).

Although producers across Rogers five adopter categories have similar preferred sources of information and preferred communications channels, they prefer those sources and channels for different reasons. Rogers (2003) suggests individuals who classify as early adopters (i.e., innovators, early adopters, and early majority) interact more with change agents (university soil science faculty and specialists). Early adopters are also connected with individuals in their social system (Rogers, 2003). This is consistent with the large number of participants in our study who preferred the field days and demonstrations. Specifically, innovators were more apt to attend soil and crop conferences for the latest scientific findings and information to improve their soil health. Early adopters indicated that communication habits including field days were more useful because they could "ask questions" and "touch and see the demonstration." Rogers (2003) classifies early majority adopters as individuals who are rarely opinion leaders. In our study, early majority adopters preferred interpersonal communication mediums such as field days and demonstrations because they "can also visit with your neighbor or someone you trust for their opinion."

Late majority adopters require uncertainty and risk to be mitigated prior to adopting an innovation (Rogers, 2003). Individuals who classify as late majority adopters in our study preferred on farm visits because they "can learn from and discuss concerns with someone who really listens." Rogers (2003) characterizes laggards as individuals who are nearly isolated from their local social groups. Our results were consistent with Roger's characterizations—laggards in our study preferred e-mail, mail, and web articles because of the feasibility of "sitting in the tractor and reading" and the lack of "time to get away from the field".

Conclusions/Implications/Recommendations/Impact on Profession

According to Rogers (2003), the degree to which an individual engages in communication amongst members in their interest group the more powerful the communication. The most preferred information sources (university faculty and specialists) and mediums (specialists and field days and demonstrations) indicate the success and potential these programs have in the dissemination of scientific conservation information to a great number of producers. Timely and beneficial information could help producers to comprehend the urgency for soil health management practices and techniques. The reliance on university faculty and specialists can be alleviated and reach more local audiences by Extension agents prepared with the latest scientific information and educational curriculum to disseminate to producers. To reach later adopters, strategic Extension outreach and engagement focused on producers' beliefs and behaviors regarding soil sustainability is critical (Upadhaya et al., 2021).

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