Cover Crop Creators: An examination of sustainable agriculture diffusion via TikTok

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Introduction

Farmers look to other farmers as highly trusted sources when considering new applications and technologies due to strong perceptions of competency and integrity (Dilleen et al., 2023). Farmers, especially those engaging in sustainable agriculture activities, are using social media professionally for self-training, reassurance, extending networks, and transmission of knowledge within these peer groups (Prost et al., 2024). Further, the exchange of information has been demonstrated as a form of social currency within such local peer groups (Wood et al., 2014). Here, social media may act as a catalyst for diffusion as local peer-to-peer networks are powerful, but largely homogenous and, as such, allow for only limited perpetuation of new ideas (Dilleen et al., 2023). Yet social media allows farmers to build networks that greater geographic and cultural bounds (Riley & Robertson, 2021). Social media then allows for a diversification of ideas to enter the local peer sharing network (Dilleen et al., 2023). This study seeks to explore the characteristics of social media content on TikTok related to the use and implementation of the cover crops, a sustainable farming technique, as created by farmers and largely directed at farmers.

Sustainable agriculture may be defined as a collection of food and animal production practices which satisfy societal needs for food, feed, and fiber; enhance environmental quality as well as the resource base; sustain economic viability for agricultural producers; and enhance the quality of life for farmers, farm workers, and larger society (National Research Council, 2010). Sustainable farming techniques identified within agricultural trade publications include fertilizer technologies, improved crop varieties, microbial inoculants, precision agriculture, reduced/no tillage, and crop rotation including the use of cover crops (Rust et al., 2021).

Theoretical Framework

Farmer communications, whether peer-to-peer or those targeted to consumers, may contain frames. To frame is to focus a piece of communication on a specific aspect of the item(s) discussed, and in doing so to direct the attention of the audience to a specific perspective that may define a problem, diagnose the cause, make a moral judgment, or suggest a remedy (Entman, 1993). Farmer perceptions of message trustworthiness and their desire to seek out additional information may be influenced by message frames (Steede et al., 2020). Previously identified message frames related to cover crops include Agronomic, Economic, Environmental Policy, Resilience, Social, and Technical (Rust et al., 2021) though these were identified within consumer-oriented communication.

Efforts to share and spread new ideas, technologies and methods are the subjects of the academic study of the diffusion of innovation (Rogers, 2010). Lillie (2008) reasoned that there is an evolving role of diffusion of innovation in the digital media of today. Where Roger's model argues that communication occurs either through mass media or interpersonal channels, Lillie (2008) suggested the online media may perceived as both mass media and interpersonal. Though a complex model with many facets, Diffusion of Innovation offers one particularly salient perspective on the focus of this study: innovation attributes. Rogers (2003) tells us that the variance in the rate of adoption of an innovation across a community may be attributed to five traits: relative advantage, compatibility, complexity, trialability, and observability. Rogers (2003) further indicates that the type of innovation-decision, the nature of the communication channel,

the nature of the social system, and the efforts of change agents all further effect the adoption rate. This descriptive study sought to examine common frames applied to TikTok videos related to cover crop adoption and to further characterize the innovation traits utilized within these frames.

Methodology

Researchers entered the search term "Cover Crop" in TikTok's search bar on Oct. 5, 2024, and identified the first 100 videos presented. Data collected in building this frame included numbers of Likes, Comments, and Saves along with video links including creator account identification. Working with undergraduate coders to refine and clarify codes, the lead researcher collected data on all videos within the frame related to crops utilized, additional techniques discussed, primary frames applied, and primary innovation traits highlighted. Data was analyzed using IBM's SPSS software. Videos within the frame received mean Likes of 3261.10 (SD = 11076.95), mean Comments of 45.87 (SD = 88.27), and mean Saves of 180.82 (SD = 382.98).

Results

The most common primary frame applied was Technical (n = 37, 37%), and Agronomic a close second (n = 36, 36%). Low count frames included: Economic (n = 10, 10%), Resilience (n = 7, 7%), Environmental (n = 6, 6%), Social (n = 3, 3%). One additional video (1%) was unable to be classified within these frames and was classified as "Other." The primary identified innovation trait most recorded was Relative Advantage (n = 30, 30%), followed by Observability (n = 26, 26%), Complexity (n = 23, 23%), Compatibility (n = 17, 17%), and Trialability (n = 4, 4%).

Analysis of Variance by frame category was calculated for Likes, as well as for Comments and Saves. Neither Likes ($F(5,44) = 1.90$, $p = .11$) nor Comments ($F(5,44) = 1.94$, $p = .11$) revealed any significant effect. However, within a comparison of video Saves, a significant difference ($F(5,44) = 3.27$, $p = .02$) was found. Post Hoc tests revealed significant differences between the frames of Agronomic and Social ($p = .01$), and Technical and Social ($p = .01$). Similar analysis consider Likes, Comments, and Saves against Innovation Traits and found no significant relationship ($F(6,93) = 1.23$, $p = .30$). Further, cross tabulation of the two categorical variables was examined with a Chi-square test with no significant relationship found (X^2 (24,100) = 19.71, $p = .71$).

Discussion

This study was limited by the decision to focus on only *primary* frames and innovation attributes for each post, rather than including all possible frames. Indeed, many videos could be found to include multiple minor frames and, to a lesser extent, multiple innovation traits. Future study should allow for deeper statistical analysis with multiple variables included.

This study offers confirmation of the Prost et al. (2024) finding that farmers are utilizing social media to communicate with other farmers. All but one video examined within this study included frames and innovation traits which strongly point at the videos being created for peer-discussion. Further evidence can be found in the prevalence of the Technical and Agronomic frames. The prominence of the Technical frames contrasts with that found by Rust et al. (2021), likely due to the focus on peers rather than consumers. This implies thoughtful framing of the content with a mind on the differing needs of these audiences. Further study should include an analysis of comments for evidence of social currency as suggested by Wood et al. (2014).

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