

Challenging the Linear Approach: Effective and Efficient Communication of Agricultural Innovations

Authors

Barbara Worley

North Carolina State University

barbara_worley@ncsu.edu

Jason Peake

University of Georgia

jpeake@uga.edu

Nick Fuhrman

University of Georgia

fuhrman@uga.edu

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Abstract

Agricultural innovation information has been traditionally communicated by Extension professionals, with dissemination practices informed by linear theories and models. However, effectively and efficiently communicating agriculture and natural resource (ANR) innovations, as well as those specific to the turfgrass industry, has not been approached in a non-linear fashion. Understanding the role of county-based and university-level Extension professionals is necessary to achieve clarity in communication efforts due to an often-seen overlap in the creation and dissemination of ANR and turfgrass information. Factors associated with the role of communicating agricultural and turfgrass innovations were analyzed using secondary data. Through the integration of multi- and interdisciplinary theories, the creation of a new communications framework – one specific for effectively and efficiently disseminating and communicating turfgrass information - allows for a non-linear, holistic demarcation in, and understanding of, university-level and county-based Extension roles. Findings revealed that the role of the Ag Communicator must be considered for crafting communications to promote clarity and concise information transfer. However, additional research is needed to better understand how the Ag Communicator serves as a bridge between the information disseminator and the information creator.

Introduction

Anyone has the ability to create change (Eversole, 2012). Yet the humanistic desire for change that is embedded in Western culture has resulted in our world reaching the moment where climate crisis is upon us, affecting our access to natural resources (Fuchs, 2016; National Aeronautics and Space Administration [NASA], 2022). In just the last decade, our world has experienced the two warmest years since modern recordkeeping began in 1880, and the irreversible effects of human-caused climate change are forecasted to continually worsen (NASA, 2017; NASA, 2022). Now, civilization has a crisis; our planet is a proverbial greenhouse, and not the type where new, innovative turfgrass cultivars are developed through research initiatives of land-grant universities.

Civilization is also facing another crisis – one where the creation and dissemination of information through ever-advancing communication channels has become limited in peer-review. Ferguson (2004) stated that knowledge produced by scientists, and additionally scientific knowledge, cannot be removed, separated, or disengaged from associated and situated social, political, cultural, and economic contexts. Moreover, the ways in which humans interact with scientific information have been impacted by the advent of social media (Dobbins et al., 2021).

We live in a world with readily available access to information. However, with this increase in information, communication challenges intensify with issues surrounding source credibility (Lazer et al., 2018; Ruth et al., 2018). Messages of misinformation and skewed data can be propagated since “anyone can be a communicator if they have a social media account and smart phone” (Kurtzo, 2016, p. 24). In addition to being open sources of misinformation, Fuchs (2016)

argued that it is a guise that social media is a collaborative means by which to share information, detached from hierarchical communication structures wielding centralized power.

The difference between broadcasting and social media is that in the first kind of medium there are centers that control the dissemination of information. In social media, every consumer of information can be a producer who creates and disseminates information. It is, however, mere semblance and ideological appearance that the emergence of presumption democratizes the media because the ownership of Facebook, Twitter, and YouTube is not collective and there are hierarchies of reputation, visibility and voice on these media. (Fuchs, 2016, p. 136)

Rethinking Change: A Turfgrass Industry Example

Agricultural innovations are at the forefront of land-grant university research development (Wright, 2012). New turfgrass cultivars to mitigate environmental issues such as water scarcity are being developed in the form of drought tolerant and salinity resistant varieties. Additionally, these new cultivars are being developed globally by university researchers to withstand varying recreational and professional uses (Chawla et al., 2018; Santos & Castilho, 2018).

Communicating the benefits effectively and efficiently is therefore necessary to highlight the attributes of the innovative developments coming from university research as well as serving to avert any further detriment to our world.

Second-order change can be described as disruptive or dramatic shifts in thinking or behavior; it is predicated on the need for transformation due to a “crisis” that has unraveled (Bartunek & Moch, 1987, p. 495). This has a direct link with innovations in the turfgrass industry. From the basis of disseminating information related to innovative drought tolerant and salinity resistant turfgrass cultivars, second-order change is needed to challenge the organizational structures in place that dictate the traditional communications processes used for disseminating research-based agriculture and natural resources (ANR) and turfgrass information (Knickel et al., 2009). In doing so, the authors present a case for understanding the pretext for efficient and effective communications in introducing a framework to disrupt the processes rooted in traditional linear models for disseminating information by university-level and county-based Extension professionals.

Theoretical perspectives including the diffusion of innovations (Rogers, 2003), the decision-making model for agriculture and natural resources (Ruth et al., 2018), the Forrester’s social technographics ladder (Li & Bernoff, 2007), Mintzberg’s (1990) management model, and knowledge management and agricultural knowledge management systems (Rivera et al., 2005), are congruently and critically examined in this paper. We must understand the overlap in these five theories that offer promise in being effective and efficient in communicating turfgrass innovations. The authors also made recommendations to become more effective and efficient communicators of turfgrass and broader agricultural innovations moving forward.

Theoretical Foundations

Evans (2006) stated a need existed to draw on various theories not typically utilized in agricultural communications to enhance scholarship. Additionally, Rhoades and Booth (1982) contest that interdisciplinary approaches are necessary for advancing agricultural technologies and solving complex research problems. For the purposes of this study, an integration of interdisciplinary theories, from marketing, management, science communications, and rural sociology, serve as the foundation for the creation of a new communications framework; one specific for effectively and efficiently disseminating and communicating turfgrass information, allowing for a non-linear, holistic demarcation in, and understanding of, university-level and county-based Extension roles.

Diffusion of Innovations

Rogers' (2003) theory of diffusion of innovations is one of the most utilized yet contested frameworks in understanding and analyzing the dissemination of information and adoption process of new innovations in agricultural communications (Lamm et al., 2019). However, despite the contestation, the multifaceted and complex nature of the framework provides elements that support understanding factors affecting innovativeness, down to an individual's sense of autonomy within an organization. Therefore, internal characteristics of organizational structures must be considered as they can have a myriad of effects on the "innovativeness of organizations" in relation to communications (Rogers, 2003, p. 411).

In examining organizational factors contributing to the creation and dissemination of turfgrass communications, formalization and interconnectedness are considered. Rogers (2003) defined formalization as "the degree to which an organization emphasizes its members' following rules and procedures" (p. 412). Million et al. (2018) interpreted formalization in organizational structure as having uniformity in practices to include job position responsibilities. Interconnectedness is described as the exchange and flow of ideas within interpersonal networks (Rogers, 2003). Interconnectedness allows for increased visibility of an innovation through collaborative and coordinated communication efforts. Later detailed as a key component of knowledge management, this flow of information through collaborative non-linear processes results in innovation (Knickel et al., 2009). In the context of the turfgrass industry, this is important because as new innovations are developed at land-grant universities through the efforts of turfgrass Specialists, the effective sharing of information through collaborative, consistent means leads to more efficient and clear messages to be disseminated to end-users. In the broader arena of agricultural innovations such as artificial intelligence, an understanding would allow for the bridging of knowledge for creating enhanced systems. Those systems include those used for measuring water absorption, allowing for efficiency rather than duplication and replication (and potentially competing technologies).

Decision-Making Model for Agriculture and Natural Resources (DMM for ANR)

The decision-making model for ANR (Ruth et al., 2018) was developed to "break the cycle of decisions made with incomplete information and equip practitioners with the foundation needed to efficiently and effectively disseminate information through educational practice and informed communication efforts" (p. 224). The DMM for ANR models how formative theories of communication combined, including Rogers' (2003) theory of diffusion of innovations, "guide

the dissemination of information about complex ANR issues” (Ruth et al., 2018, p. 225). The DMM for ANR has helped researchers to better understand efficient and effective ways for disseminating information about ANR issues. Additionally, the model has been used as the theoretical framework for studying communications applicable to the turfgrass industry by Worley et al. (2022, 2023). Data from these previous studies reveal the role of those creating knowledge, and subsequently crafting and disseminating communications, is often not clear to anyone engaged in the diffusion process due to organizational formality characteristics including administrative expectations. In essence, knowledge creators and disseminators (the communications professionals) are often misaligned in their roles.

Creator or Disseminator: Forrester's Social Technographics Ladder and the Mintzberg Management Model

The turfgrass industry is a \$40 billion industry across the United States (National Turfgrass Federation, 2017). Moreover, as a global ANR commodity, turfgrass industry professionals including Extension, golf course superintendents, landscapers, turfgrass producers, and landscapers have been studied in relation to their use of communications channels. Due to the dual nature and positionality that the turfgrass industry holds in educational research and business contexts, this research is focused on understanding communications related to ANR and turfgrass innovations, and as such, these innovations are developed, and subsequently marketed, for commercial use.

The use of technology in ANR and the turfgrass industry is changing the way engagement occurs with consumers (Li et al., 2007). Forrester, a company devoted to technology and market research, refers to this technological change as social computing, “a social structure in which technology puts power in communities, not institutions” (Charron et al., 2006, p. 6). Li et al. (2007) further examined social computing engagement behavior, outlining how consumers approach technology. Consumers were grouped according to participation behaviors to develop the social technographics ladder.

Each of the six rungs of Forrester's social technographics ladder is a representation of the level in which someone is invested in their personal online presence. The top rung of the ladder is occupied by the *creator*, defined by Li et al. (2007) as “online consumers who publish blogs, maintain Web pages, or upload videos to sites like YouTube at least once per month” (p. 3). While these online consumers or participants are described as young and evenly split among males and females, engagement in activity varies, and few are engaged in the three categories outlined. Thus, Li et al. (2007) did not explicitly operationalize the manner in which information is created and communications are developed by this group. Although the ladder figuratively shows an increase in the level of one’s participation in the online ecosystem, participation at one level does not prevent participation anywhere else on the ladder.

The Mintzberg management model (1973) was developed to convey the theory that managerial roles within organizations can be contextualized as 10 roles within three domains: interpersonal, informational, and decisional (Chareanpunsirakula & Wood, 2002). The role of *disseminator* is defined as an informational role for transferring information to other individuals. While another informational role of *spokesperson* exists in this model, the *disseminator* is different due to the

context of the information and the relationship with those to whom the information is being passed. Due to it being a managerial framework, the *disseminator* shares vital information from within and outside the organization, thus implying a true *messenger* relationship associated with the transfer of information rather than the hierarchical and linear role of the spokesperson (Altamony et al., 2007).

Congruent to these models, previous work by Worley et al. (2023) examined how county-based Extension professionals identified their role as a *creator* or *disseminator*, in relation to the behavioral intent to use social media communication channels for disseminating turfgrass innovation information. Thus, within the turfgrass industry and broader agricultural innovations arena, the Forrester and Mintzberg models offer promise due to their explicit framing and operationalization of organizational roles that can be applied to agriculture and Extension communications.

Knowledge Management and Agricultural Knowledge Systems

Agricultural knowledge systems, first constructed in the 1990s, and presented in agricultural knowledge information systems (AKIS) models such as that presented by Rivera et al. (2005), illustrate the bidirectional relationship between research, extension, support, and education. Despite these modeled systems, the construction of agricultural knowledge by universities and research institutions through top-down, linear-based approaches can lead to a disconnect in communication; the dissemination of information, adoption of innovations, and, moreover, the development of knowledge are challenged when multiple perspectives are not considered (Eversole, 2012; Knickel et al., 2009; Masambuka-Kanchewa et al., 2020).

Knowledge management refers to “identifying and leveraging the collective knowledge in an organization,” while knowledge management systems (KMS) provide organizations with the ability to store, access, and transfer knowledge (Alavi & Leidner, 2001, p. 113). Doerfert et al. (2007) noted that the sharing of knowledge is vital to sustainable development and thus proposed a framework using knowledge management as a basis for outlining a strategy that could be applied in agricultural communication contexts. Four priority areas and 18 research questions addressing information dissemination (and exchange) of knowledge were presented. The framework proposed by Doerfert et al. (2007) offered a logical approach through the prioritized areas and corresponding questions for understanding that the sharing of agricultural information should be approached holistically. However, gaps still exist in implementing a collaborative agricultural communications approach to understanding the basis of creating (and subsequently crafting) information, knowledge, and communications, as well as the formative paths for dissemination.

While such agricultural knowledge systems aim for collaborative communication thereby mitigating the dissemination of misinformation, an inherent hegemonic structure exists in application. This top-down approach is nonexistent in the traditional knowledge management paradigm offered by Nonaka et al. (1994). Nonaka et al. (1994) noted that hierarchical sequences for providing solutions and creating change must be altered to dynamic processes through a “shift in our thinking about the nature and functioning of organizations as knowledge-creating systems” (p. 337). In describing how *knowledge* must be *managed*, Doerfert et al. (2007)

conveyed a dialectical tone that opposes the foundations of knowledge management (Nonaka et al., 1994; Tietze & Dick, 2013).

We do not know what the final picture of our future will look like. However, we must move into this new information era and begin to manage knowledge like never before. This can become a golden age in our shared field of interest if we both embrace and lead this change. The agricultural well-being of society may depend on our ability to communicate effectively in a dynamic knowledge era. (Doerfert et al., 2007, p. 19)

From both *object* and *access to information* perspectives as outlined by Alavi and Leidner (2001), for knowledge to be managed it must be objectified – it must be tangible (p. 112). Therefore, empirical analysis of the four key elements that Evans (2006) and Doerfert et al. (2007) acknowledge as central to knowledge management systems – information, knowledge, agents, and tools – is needed. Within the turfgrass and broader agricultural innovations arena, such a pursuit will provide an understanding of how knowledge is created and information is subsequently disseminated, by whom, and through what messages and channels for effective and efficient communications.

Purpose and Objectives

In previous work by Worley et al. (2021, 2022, 2023), the authors identified key individuals and specified media channels for the diffusion of emerging turfgrass innovations, factors influencing communications for sharing information about turfgrass innovations, and the behavioral intent to use social media communication channels for disseminating turfgrass innovations in relation to one's identified role as a *creator* or *disseminator*. Results of these studies revealed that the communication roles of ANR and turfgrass university-level and county-based Extension professionals are not clearly defined, and therefore, a duplication in communications and job duties often occurs. Moreover, organizational structure indicators of formalization and interconnectedness were determined to affect the dissemination of turfgrass information due to administrative expectations (Rogers, 2003). For example, specific communication channels were used over others because of annual evaluation incentives for sharing information through one channel over another (Worley et al., 2021).

A need existed for a more succinct model of communicating ANR and turfgrass information that considers an interconnectedness of ideas and synthesis of knowledge while simultaneously establishing a framework for understanding how the creation, crafting, and dissemination of communications is operationalized. The objectives for a establishing such a communications framework are as follows:

1. Perform an analysis of secondary data of turfgrass research revealing internal and external variables contributing to an overlap in the creation of communications materials, and the felt or perceived need to subsequently communicate that information.
2. Perform an analysis of secondary data of turfgrass research revealing the expectations placed by administrators on both university-level and county-based Extension professionals to create communications.

Additionally, the following research questions were developed to guide the formation and application of the framework:

1. Who is responsible for the creation of information? (i.e., Who are the knowledge producers?)
2. Who is responsible for crafting the communications?
3. Who is responsible for disseminating communications?
4. What expectations are placed on university-level and county-based Extension professionals to create, craft, and disseminate turfgrass communications?

Conceptual Framework

Results of previous research and future recommendations by Worley et al. (2022, 2023) pointed to the development of a conceptual framework for information to efficiently and effectively be communicated, with university-level and county-based Extension professionals having a clear understanding of their role in the development and dissemination of communications. Defining communication roles as it relates to the creation, crafting, and dissemination of turfgrass innovation information also mitigates the diffusion of misinformation (Ruth et al., 2018). Additionally, expectations of the responsibility for the creation and dissemination of communications placed on university-level and county-based Extension professionals by university administrators must be revealed to outline why dualisms (leading to inefficient and ineffective communication of turfgrass information) occur in roles.

While the authors present a conceptual framework to present the importance of effective and efficient communication of turfgrass innovations through an understanding of Extension roles supported by theoretical frameworks, Ravitch and Riggan (2017) noted that the visual representation of a framework is not necessary when narrative, text-based presentations can suffice. Visual depictions can lead researchers to become more focused on a modeled product rather than the inquiry process. Frameworks in narrative form can be offered in the absence of concept maps (Ravitch & Riggan, 2017). Therefore, a visual model of the framework is not offered as such; instead, the framework is outlined narratively and figuratively through the operationalization of terms, accompanied by a figure and table as they relate to theoretical bases and findings from analyses of secondary data.

Application of the Framework

The authors performed an analysis of secondary data from previous studies by Worley et al. (2022, 2023) to determine internal and external variables contributing to an overlap in the crafting of turfgrass communications materials, and the felt or perceived need of university-level and county-based Extension professionals to communicate the related information. These internal and external variables included how information is communicated (the message and channel), knowledge (including content or explicit), who is communicating (university-level or county-based Extension professionals), resources (time, money, media access and prowess), and organizational culture (expectations).

Factors contributing to the need expressed by university-level Specialists working with the turfgrass industry to maintain a presence across roles defined as *creator* or *disseminator* in the creation of information (and the development of communications materials) and the dissemination of the information were analyzed. In an analysis of responses from county-based Extension professionals, the authors examined factors contributing to a similar need to act in the role of both *creator* and *disseminator*, particularly in which the *creator* included crafting communications materials rather than solely disseminating information based on materials already developed by university-level Specialists. Expectations of university-level and county-based Extension professionals to create, craft, and disseminate turfgrass communications were also analyzed.

Central to agricultural communications were four key concepts of knowledge management: information flow and function (e.g., creation, retention, transfer, and use); types of knowledge (explicit, implicit, tacit); agents (e.g., whose role is it? – individuals, organizations); and tools (knowledge/content repositories, communications) (Evans, 2006; Doerfert, 2007). Considering these four knowledge management concepts coupled with terms defined by Li et al. (2007), Rogers (2003), Mintzberg (1990), and Eversole (2012), the authors operationalize the role of *Ag Communicator* as being one who drafts and/or crafts communications from information that is provided by the *creator* (see Table 1).

Table 1

Operationalization of the Role of Ag Communicator in relation to other Communications Roles

Creator	Ag Communicator	Disseminator
Opinion Leader (Rogers, 2003)	One who is charged with drafting/crafting communications	- Change Agent (Rogers, 2003) - Translation Agent (Eversole, 2012)

Note. Li et al. (2007) introduced the term *creator* in the social technographics ladder. The authors operationalize *Ag Communicator* in this manuscript. The use of the term *disseminator* is in accordance with the Mintzberg management model.

In a traditional linear-approach, the one constructing, drafting, and/or crafting communications is often undefined and unclear. The “waters become muddied” when roles of creating and disseminating information overlap, including the crafting of communications materials such as social media posts and factsheets. In a holistic approach to turfgrass communication, the role of the *Ag Communicator* can be defined and designated through the understanding of structural factors and expectations. This is not to say that one individual cannot occupy all three roles, as shown in the social technographic ladder. Instead, the designation of roles is presented to provide for effective and efficient communication of turfgrass information.

Is this the Role or are these (Un)Realistic Expectations?

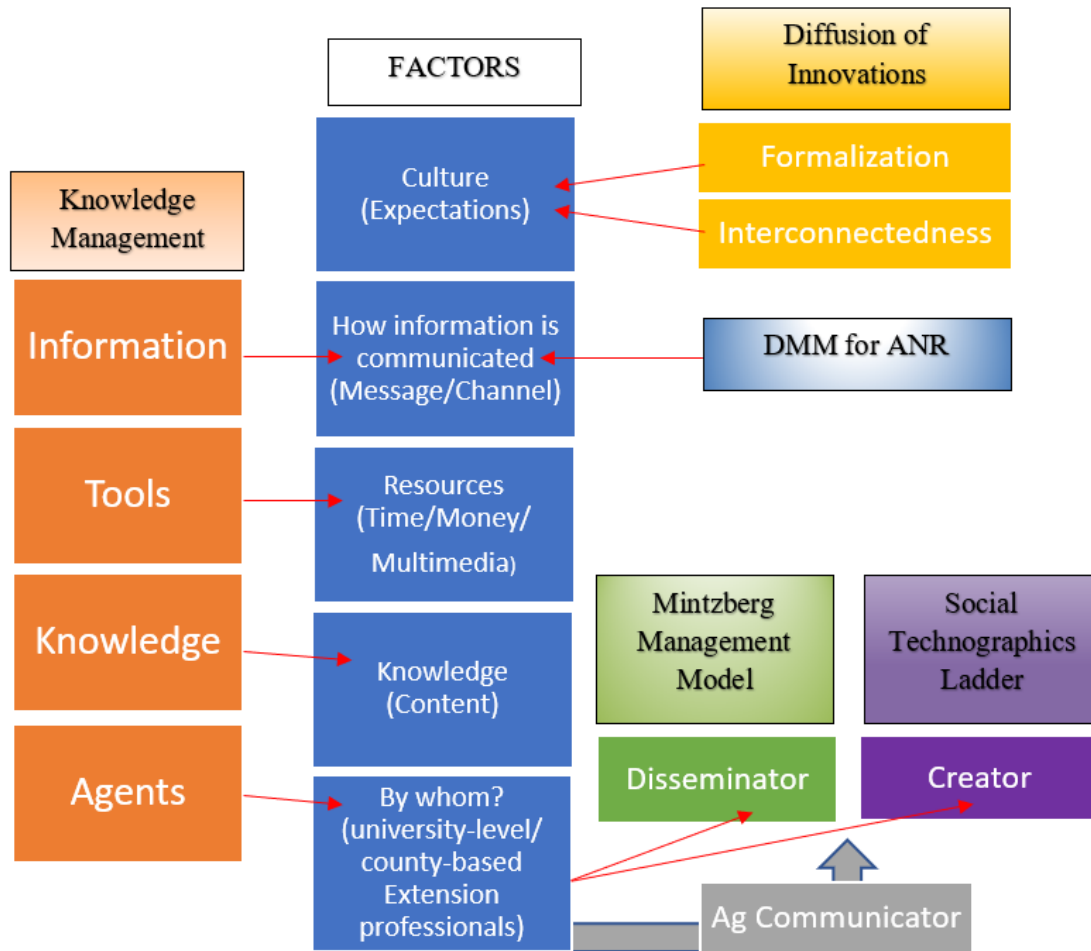
In the analysis of the secondary turfgrass data, the authors determined several factors as important to communicating agricultural information. As shown in Figure 1, factors revealed from the data are illustrated as related to knowledge management concepts (and knowledge taxonomies), internal characteristics of organizational structures, and the roles of *creator* and

disseminator as outlined by Worley et al. (2023). These factors, internal characteristics, and designated roles of creator and disseminator are presented relative to the diffusion of innovations (Rogers, 2003), the decision-making model for agriculture and natural resources (Ruth et al., 2018), the Forrester's social technographics ladder (Li & Bernoff, 2007), Mintzberg's (1990) management model, and knowledge management and agricultural knowledge management systems (Rivera et al., 2005).

The appropriate message and subsequent channel for communicating that information was noted to be vitally important to both university-level and county-based Extension professionals. Content knowledge as it relates to the individual, whether the university-level Specialist or county-based Extension professional, was also regarded as being relevant to an Extension professional's perceived need to act in the role as a *creator* and/or *disseminator*. Expressed barriers to creating and disseminating information included access to fiscal, schedule, and multimedia resources. Further, the culture of Extension and its organizational expectations was influential to both university-level and county-based Extension professionals for creating and disseminating information. In the analysis of the secondary data, several of the factors revealed overlaps, showing an interconnectivity in the aspects presented in the framework.

Figure 1

Factors relevant to Communicating Turfgrass Innovations, as related to Theoretical Bases



Note. Each of the theoretical models and/or theories depicted inform the conceptual framework of introducing and operationalizing the role of *Ag Communicator*.

Knowledge

Whereas some university-level Specialists felt they possessed explicit knowledge to an extent beyond county-based Extension professionals due to academic specialization or advancement in degree field, Extension professionals directly engaged with the community possess inherent and experienced tacit and implicit knowledge due to relationships built with community members, as well as access to explicit university-level knowledge (Knickel et al., 2009). County-based Extension professionals often participate in a “paradox of dual embeddedness” that includes one’s formal work organization coupled with the community within which they live and work (Eversole, 2012, p. 38). This combination of professional and local or indigenous knowledge allows for agricultural communicators to “connect such knowledge with knowledge generated through scientific agricultural research (Evans, 2006, pp. 22–23). This implies two things: (1) university-level and county-based Extension professionals must be trained to better understand each other’s role, and (2) community level knowledge must be considered, acknowledged, and applied in the communications processes regarding ANR and turfgrass innovations.

How Information is Communicated

The participatory relationship that a county-based Extension professional has with their community members provides them with access to not only local knowledge but also the advantage of using those relationships to garner a better understanding of the types of communications needed and desired by their clientele (Evans, 2006; Eversole, 2012). County-based Extension professionals noted the importance of effective and efficient information transfer to clientele and how diverse forms of communication must be utilized to increase impact. However, this flow of information is only effective and efficient if clientele value their own local knowledge, have an ability to express their local knowledge, and feel that the information that is being communicated is accurate and meets their needs (Masambuka-Kanchewa et al., 2020). This also implies that university-level Specialists must provide county-based Extension professionals with information in a way that is transferable to local clientele. It is imperative that agricultural knowledge and innovations become more effective in the convergence of public and private interests (Knickel et al., 2009).

By Whom?

The perception that one's role within Extension is to both create and disseminate information was prevalent among university-level and county-based Extension professionals. Data show that university-level Specialists felt it necessary to create and disseminate information, even when culture and resource barriers were expressed, due to perceptions of their personal content (explicit) knowledge being more implicit in nature. County-based Extension professionals expressed dualism in both roles due to a need for content (communications materials) not available or provided for by their respective universities; thus, these materials often were *crafted* from information *created* by county-based Extension professionals. Without university-level Specialist oversight, what does this mean about information accuracy and consistency in messaging?

Resources

Organizations use knowledge management systems to organize information in databases and other infrastructures (physically and digitally) so that communications can be readily accessed. For example, this is demonstrated by North Carolina State University which has a repository of turfgrass information available online. County-based Extension professionals expressed this need for interconnectedness in the sharing of resources to connect university and community members to enhance communication. Apart from tools for knowledge storage, access, and transfer, lack of time, money, and the knowledge of using technology related to social media and multimedia for communication were revealed as being barriers to creating and disseminating turfgrass information (Worley et al., 2022, 2023).

Cultural Expectations

Extension's culture was influential in the messages and communication channels used by both university-level and county-based Extension professionals for creating and disseminating information. Data reveal that expectations by administration for university-level and county-

based Extension professionals to craft certain types of communications over others, or use certain communication channels, limited the scope for disseminating information. Incentives for using a particular channel influenced the likelihood of using that channel if a university-level Extension Specialist was being evaluated against it. Due to these formalization and interconnectedness factors, the messages and channels used to disseminate information in the turfgrass industry differed among university-level and county-based Extension professionals.

Conclusion

Innovations are created as solutions to existing and emerging challenges to bring about impactful and lasting outcomes (Militello et al., 2016). Technological innovations in agricultural sectors, coupled with ever rapid advancements in communications, have created a global transition in the way ANR information is shared and knowledge is produced (Doerfert et al., 2007). Communicating agricultural innovations have often been done through reactionary measures due to a variety of confounding factors including funding challenges. The environmental and social crises that challenge our planet justify the need for a framework that aligns with agricultural needs and provides (as opposed to responds) research-based information at such a critical global juncture. Communication of turfgrass innovations is vital, particularly as these innovations are those that are being developed to help mitigate and resolve the very issues that contributed to the crisis that has assailed our planet. Diffusing information regarding innovations, and subsequently the adoption of those innovations, can no longer be approached through traditional linear processes for facilitating change (Knickel et al., 2009). More targeted and coordinated research and communications delivery can ensure that stakeholders receive research-based information and solutions (Doerfert et al., 2007). Therefore, the relevancy that agricultural communications as a field, and the space agricultural communication plays in *culture* and all things *ag*, must be acknowledged.

It may seem that the authors are presenting a framework based on a dialectic by stating that communications should be holistic yet targeted and coordinated, but not necessarily through all aboard the social media bandwagon just because use of such channels are innovative. The basic concept of the framework is for turfgrass professionals and the entirety of the agricultural industry to consider the importance of the role of the *Ag Communicator* in Extension. Thus, communicating innovations efficiently and effectively to proactively address critical and emerging issues must be done so through this considered, non-hegemonic approach; one that allows for an understanding of whose role it is to create information, craft communications, and disseminate and communicate research-based information when we live in an era where most Extension professionals seem to be inundated with multiple *other duties as assigned*.

Implications and Future Research

While the Smith-Lever Act of 1914 established the Cooperative Extension service, more than 100 years later, the phrase *best kept secret* is often associated with the organization due to a public lack of awareness. A review of data by Worley et al. (2022, 2023) showed that turfgrass information needs to be effectively and efficiently communicated, but often knowing whose role it is to do so is unclear. Therefore, implications of the framework include a need for an increase in agricultural science communications professionals to work with *creators* and *disseminators* as

Ag Communicators to effectively and efficiently craft and design turfgrass innovation information.

Whereas the framework and theoretical foundations provide for (yet neither suggest nor exclude) university-level and county-based Extension professionals to create, craft, and disseminate communications, future research points to determining if the *responsibility* for creation, crafting, and dissemination of communications materials and information transferred *solely* through *new technologies* (i.e., social media) lie within both roles. Considerations for this research could further examine the effects of organizational formalization on communications and potentially account for variables that measure the level of engagement with social media technologies, as well as demographics (i.e., age) of university-level and county-based Extension professionals.

Recommendations for future research also include a review of annual Extension performance expectations via a meta-evaluation of university-level and county-based Extension professionals (Stufflebeam, 2001). This would determine if the current evaluation models are congruent with practices and techniques relevant to agricultural communications. Promotion and tenure criteria (and Extension performance appraisal guidelines) within different academic units across universities should be reviewed to examine explicitly outlined metrics as expectations for communications creation and dissemination. Thus, analysis of how and by what metrics are those communications performance measures (if in existence and based on an individual's role) being evaluated and rewarded is warranted.

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