

**How Extension Can Use Videos to Encourage Homeowner Adoption of Fertilizer Best Management Practices**

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## How Extension Can Use Videos to Encourage Homeowner Adoption of Fertilizer Best Management Practices

### Introduction

According to Nielson and Smith (2005), landscape maintenance is influenced by homeowner associations and neighborhood aesthetics. As a result, homeowners are inclined to over-irrigate and over-fertilize their lawns to uphold landscape appearances. Such practices affect water quantity and quality (Nielson & Smith, 2005), however water quality is most impacted by fertilizer runoff (Toor et al., 2017). According to a report by the Florida Department of Agriculture and Consumer Services, “excess nitrogen and phosphorus are the most common causes of water quality impairments in Florida” (FDACS, 2014, p. 4). The report additionally stated that proper management of nutrient sources, and pollutant discharge was crucial for safeguarding clean water resources (FDACS, 2014). Hence, supporting water programs and engagement in fertilizer best management practices (BMPs) can have positive impacts on water quality. The purpose of this research was to determine if video messages about fertilizer BMPs influenced high water users’ perceptions of fertilizer use.

### Theoretical Framework

The diffusion of innovations (DOI) theory (Rogers, 2003) explains how an idea or product considered new by a population is accepted and adopted over time. According to Rogers (2003), there are five attributes that influence the diffusion of an innovation – relative advantage, compatibility, complexity, observability, and trialability. Relative advantage is described as the degree to which fertilizer BMPs are perceived as better than current fertilizer practices; compatibility is described as the degree to which fertilizer BMPs are perceived as consistent with existing needs of high water users; complexity is the degree to which fertilizer BMPs are perceived as difficult to understand and use; observability speaks to whether the results of using fertilizer BMPs are visible to others; and trialability is the degree to which fertilizer BMPs can be experimented with before committing to adoption. With favorable perceptions of the attributes, adoption of fertilizer BMPs is likely, which helps inform educational water quality programs. For example, a study by Lamm et al. (2017) applied the DOI theory to determine adoption of water conservation technologies.

### Methods

The target population for this research were homeowners in Florida who owned a lawn or landscape and engaged in fertilizer practices. An online researcher-developed questionnaire was administered to 2,000 residents by an online survey company. Respondents were screened to ensure they resided in Florida, were 18 years of age or older, and had a lawn or landscape they fertilized. An expert panel qualified in the fields of urban water engineering and water conservation reviewed the questionnaire. A pilot study confirmed there were no issues with question construction. Video messages were developed around social and personal engagement in fertilizer BMPs. There were two non-goal orientation treatment groups: those who received a social video non-goal orientation message (SVNGO,  $n = 400$ ), those who received a personal video non-goal orientation message (PVNGO,  $n = 401$ ), and a control group that received no video message ( $n = 398$ ). Both non-goal orientation videos showed the importance of fertilizer BMPs in protecting water quality. However, respondents were not primed with messages about good fertilizer practices prior to viewing these videos. Constructs created for the compatibility ( $\alpha = 0.88$ ) and complexity ( $\alpha = 0.89$ ) diffusion attributes averaged all items under each construct, and each construct had acceptable internal consistency (Field, 2006). Chi-square tests determined

the association between the treatment and control groups for relative advantage, observability, and trialability. ANOVA analysis tested differences in video treatment and control groups for compatibility and complexity. Then, Tukey's post-hoc test determined where significant differences occurred between group means. Also, partial eta squared was used to determine the strength of the association between variables.

### Results

The ANOVA indicated there were statistically significant differences between the treatment and control groups in residents' perceptions of compatibility ( $p < .01$ ) and complexity ( $p < .01$ ). However, the Tukey post-hoc test indicated that the statistically significant difference was only between the control group and the PVNGO ( $p < .01$ ) and SVNGO ( $p < .01$ ) groups for the compatibility and complexity attributes. Chi-square tests determined if the expected versus observed response between the groups and the categorical response to the relative advantage, observability, and trialability attributes were statistically different. Respondents were asked to indicate their level of agreement or disagreement with the following statement: Good fertilizer practices are better than the fertilizer practices I have used in the past. The Chi-square test indicated a statistically significant difference ( $X^2(8) = 45.48, p < .01, \eta^2 = .15$ ) between the relative advantage of the groups in which the respondents were assigned. There was also a statistically significant difference ( $X^2(2) = 15.75, p < .01, \eta^2 = .11$ ) between the response to the question "Have you had the opportunity to observe others using or demonstrating good fertilizer practices you are not currently using?" and the groups in which the respondents were placed. However, there was no statistically significant difference ( $X^2(8) = 7.50, p = .48, \eta^2 = .07$ ) between the answers to the question "How likely are you to adopt good fertilizer practices you observed someone else using?" and the groups in which the respondents were placed. The respondents were asked to indicate on a five-point Likert-type scale if good fertilizer practices can be tested before they commit to changing their lawn/landscape management routine to determine their perceived trialability of BMPs. There was a statistically significant difference ( $X^2(8) = 27.60, p < .01, \eta^2 = .13$ ) in perceptions of the trialability of fertilizer BMPs.

### Conclusion, Implications and Recommendations

It is evident that videos influenced homeowners' perceptions of fertilizer BMPs. However, the type of video (social or personal) did not matter. Rogers' (2003) notion is that a new idea, in this case best management practices, will be adopted and accepted over time by homeowners. Videos (both social and personal frames) can be used over time to help homeowners understand the relative advantage, compatibility, complexity, observability, and trialability of adopting fertilizer BMPs. Extension agents can develop videos messages and disseminate them to their local communities to encourage adoption of BMPs. When discussing the relative advantage of the fertilizer BMPs through video, cost saving, and positive environmental and health impacts can be topics of discussion. Extension agents can highlight the ways in which fertilizer BMPs can fit seamlessly within the systems the homeowners already have to express the compatibility of the BMPs. To address complexity, Extension agents can address lack of knowledge or homeowner misinformation about fertilizer BMPs. Extension agents can make fertilizer BMPs more observable to consumers by showcasing home landscapes that have already implemented BMPs, and interviewing homeowners about their experiences with BMPs. Lastly, Extension agents can provide opportunities for homeowners to learn about fertilizer BMPs through videos highlighting differences in a non-fertilizer BMP lawn, and a fertilizer BMP lawn. In addition, discussing ways that homeowners can still have aesthetically-pleasing lawns with the use of fertilizer BMPs can promote adoption of fertilizer BMPs.

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