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The Internet is a growing source of information for consumers. Website design and development become important factors in website usability as consumers' Internet access increases and they seek home horticulture and gardening resources. The University of Nebraska–Lincoln developed a website in the 1990s to supplement its Backyard Farmer television program. Consumers' expectations of websites changed as technology changed, which resulted in the site no longer meeting visitors' needs. Two focus groups evaluating the website's usefulness as an information source were conducted with home and professional horticulturalists. Participants were most interested in locating concise information about horticulture and gardening on a website that was easy to navigate; had many links to additional information; and contained timely and current information. Overall, content quality, usability and aesthetics were highly ranked as important for a "perfect" website.

Keywords

Website testing, Horticulture, Gardening, Usability, Design, Focus Groups, Television

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The Internet is a growing source of information for consumers. Website design and development become important factors in website usability as consumers' Internet access increases and they seek home horticulture and gardening resources. The University of Nebraska–Lincoln developed a website in the 1990s to supplement its *Backyard Farmer* television program. Consumers' expectations of websites changed as technology changed, which resulted in the site no longer meeting visitors' needs. Two focus groups evaluating the website's usefulness as an information source were conducted with home and professional horticulturalists. Participants were most interested in locating concise information about horticulture and gardening on a website that was easy to navigate; had many links to additional information; and contained timely and current information. Overall, content quality, usability and aesthetics were highly ranked as important for a "perfect" website.

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Introduction

Rogers (1976) studied the adoption and diffusion of new products and defines such practice as "the innovation, defined as an idea, practice or object perceived as new by an individual or other relevant unit of adoption, which is communicated through certain channels over time, among the members of a social system," (p. 292). The Internet as an information source has been one of society's major new innovations in the last decade. The development of information flow through websites is constantly changing and the Internet is probably one of the most influential new technologies society has faced (Wolcott, Press, McHenry, & Goodman, 2001). The Internet is now a common tool for facilitating business transactions, aiding in communication, and providing opportunities for profit and non-profit companies and organizations to compete more effectively (Kallioranta, Vlosky & Leavengood, 2006).

Computer and Internet use continues to grow rapidly. In 1984, only 8% of households had a computer, increasing to 62% of American households (70 million) in 2003 (Day, Janus, & Davis, 2005). These households utilize the Internet in many ways; however, its major use is for disseminating news. Internet use for obtaining information about "news, weather or sports" increased from 7%

to 40% between 1997 and 2003. In 2003, nearly 54.5% of Internet users utilized the Internet for e-mail purposes and 46.5% were seeking product- or service-related information (Day, Janus, & Davis).

The Pew Research Center (2009) found similar increases in the growth of Internet use. More than 70% of American adults have used the Internet (Pew Research Center, 2009). The top five Internet uses were sending or reading e-mail; using a search engine; researching a product or service; checking the weather; and buying a product. A study of 330 Agricultural Extension Service clients on the Big Island of Hawaii yielded similar results. Their primary Internet uses were for e-mail (96%), business-related research (92%) and the purchase of goods or services (90%) (Burke and Sewake, 2008).

The ever-growing use of the Internet presents a challenge of consumers locating a website with the needed information that also maintains their interest enough to return later for additional information. Melgares (2005) wrote, "A well-built Web page is like a well-adorned entryway…open 24 hours a day and seven days a week…" (p. 9). Usability is key to an acceptable website (Yates, Akers, & Irlbeck, 2008).

Consumers determine if a site is credible based on a professional design; the source of content; comprehendible text; and a picture of the site author or owner (Sutherland, Wildemuth, Campbell, & Haines, 2005). Sutherland, et al., (2005) concluded that websites located using popular search engines were aesthetically appealing and easy to use, but often contained inaccurate information. Therefore, site developers should create sites that provide web users user-friendly gateways to accurate and reliable information and education materials.

Web usage is not limited to browsing and shopping by general consumers, but is also done by enthusiasts of various types. One such group is home horticulturists, who enjoy gardening or working with lawns and are often interested in learning about new practices and gardening tips (Meyers, Irani, & Eckhardt, 2006). This information is not always easy to locate, but the Internet can be a valuable tool for reaching stakeholders and target audiences (Ruth, Bortree, Ford, Braun, & Flowers, 2005).

The Internet provides access to a lot of horticulture and gardening information. However, consumers may have difficulty locating websites they consider reliable, that have quality information, and that are easy to navigate.

Providing horticultural information through various communications channels is not a new practice. The University of Nebraska–Lincoln developed a website to correspond with its home horticultural television show *Backyard Farmer* that has existed since 1953. The television show, which still airs from April through mid-September, consists of a panel of university specialists and gardening experts who share gardening tips and answer questions about topics from insects and pests to fruits and vegetables; and from turf to landscape design. The corresponding website was developed in the late 1990s to meet information demands as consumers gained Internet access and began seeking educational resources on horticultural topics. The site has remained fundamentally the same since its inception. This site is the focus of the present research study.

The horticultural program is a successful, long-running television show that airs weekly on Nebraska Educational Television and has a web presence on iTunesU and YouTube besides the traditional website. However, the growth of the Internet in created a need and expectation for a credible and user-friendly website to benefit television viewers and Internet users. This research project sought to gather information from current and prospective users of the horticultural website to aid in developing a more useful Internet-based resource for the target audience.

Research

Purpose and Objectives

If home horticulturists are seeking information on gardening topics and have access to the Internet, what should a website offer them? What is the purpose of the website? What features should the site contain? These questions are addressed in this research project. The goal of this research project was to identify the components of an effective, interactive and valued home horticultural website per the input of both home and professional horticulturists.

Agricultural communicators need to understand the demands and expectations of their target audience when developing effective websites (Emery, 1999). To this end, the research objectives of this project were as follows:

1. Quantify user expectations for a home horticultural website.
2. Determine what home and professional horticulturists would include in a "perfect" website.
3. Analyze the current *Backyard Farmer* website and develop a list of key features for a revised site.

Methods/Procedure

The present study used a qualitative research design of semi-structured focus groups to collect data. Focus group research includes a small group discussion among carefully selected participants who share common characteristics. The interaction among the focus group participants is more likely than individual interviews or surveys to yield useful information for the researchers and allows for efficient gathering of information (Krueger, 1994; Melgares, 2005). The focus group discussion for this project centered on participants' information needs and what they considered essential elements of a "perfect" horticultural website. This method allowed researchers to develop a detailed understanding of the issue by talking directly to the prospective users (home and professional horticulturalists) who would access the horticultural website (Creswell, 2007).

Web usability testing should be conducted with the target audience because the site is intended to meet their specific needs and interests. Developing and designing a website specifically to meet the target audience's preferences is critical as people become more dependent on the Internet as an information source. (Yates, Akers & Irlbeck, 2008). *Backyard Farmer* program personnel provided a list of target audience members for this study. Potential research participants 1) had provided their contact information to Backyard Farmer when interacting with the television program or website, or 2) were identified by the state Master Gardener director as a potential participant. Potential participants were invited via telephone call or e-mail to participate in one of the two focus groups. Eight to 10 participants were recruited for each of the sessions with a goal of having six to eight participants at each session (Krueger, 1994). Each session was scheduled to last approximately one hour.

The focus groups were led by a primary moderator (secondary reviewer) and then confirmatory review was conducted by the secondary moderator. The focus group moderator led the sessions by asking questions of the group to guide the discussion. More than one focus group session was conducted with similar participants to determine the trends and patterns of the target group (Krueger, 1994). The sessions were audio recorded to assist in the reliability and comprehensiveness of the findings. The secondary moderator also recorded written notes during each session.

Questions for the semi-structured focus groups were oriented on how or where participants sought gardening information; how they determined information quality; how often they sought the information; what they liked or disliked about gardening websites; and how they located useful websites. Demographic information about the participants and their horticultural experience was

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collected using a pre-session questionnaire. *Backyard Farmer* staff and Extension horticultural specialists reviewed the survey and focus group questions for thoroughness and clarity prior to university human subjects approval and the focus group sessions.

Results/Findings

Horticultural information sources

To determine a baseline and gain a greater understanding of where the focus group participants sought information about horticulture and gardening, they were asked, "When you have a question about gardening or landscaping, where do you go to find information?" Respondents commonly identified university or Extension publications; county Extension offices; or continuing education from the Extension service's Master Gardener program as key information sources. However, not all information sources were university or Extension related. Respondents also looked to books; newspaper articles or regular columns; gardening and horticultural magazines; and seed catalogs for gardening and landscaping information in the media or press. In addition, some respondents also received information via personal discussion with experts at their local garden center or nursery, or botanical gardens or nurseries.

Participants were asked their opinion about the quality of information from the previously identified sources. Participants value the university or Extension service information. They indicated university/Extension service information is science based rather than opinion based. In many cases, this information about gardening or landscaping has been tested in the state and therefore is highly specific and relevant to their needs and situation. "I appreciate the research-based information as I know it has been tested in our area," said one participant.

Educational sites such as the Extension service or university are more reliable than seed catalogs, retail stores or chemical company sites, based on participants' responses. Participants were not confident that commercial gardening or landscape sites were objective enough. The participants also hesitatingly placed value on information provided by blogs. "They are interesting, but take them with a grain of salt," said one focus group member.

A "Perfect" horticultural website

Focus group participants were asked a number of questions about their opinion of gardening, landscaping and other horticultural websites. Questions targeted how often they sought information on these sites; what they preferred or did not prefer about these sites; and what was missing or should be included to make these sites more useful.

Participant use of the Internet for seeking home horticultural information varied in frequency from daily to weekly. Some participants indicated an increased Internet use for horticultural information. "I am trying to get more Internet savvy, but it needs to be simple as I am not knowledgeable and comfortable with computers," said a respondent.

Overall many of the participants emphasized the importance of a website that is current, easy to navigate and contains concise information. "An updated, timely website will cause the reader to go back and see what new, current or timely information may now be added to that site," said one gardening enthusiast.

The focus group participants were complimentary about websites with easily accessible information; that could be easily scanned to see new information and were updated continually. More specifically, the participants stressed the importance of sites including a calendar feature. This calendar

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could contain information about horticultural or gardening activities to conduct that week or season (spring, summer, fall); updates for certain weeks or times of the year; problems or situations to be aware of during different times of the year; and specific plans of action for preventing and treating such issues.

Focus group participants highly regarded access to research-based information. Many believed links or access to complete, detailed information such as step-by-step action items would be most helpful. Participants also stressed that a "perfect" website should contain both local and regional information. Some participants valued having access to information specific to a region, such as the eastern part of the state, versus generalized statewide information. Information localized by zone, such as soil temperatures and weather forecasts, was considered very beneficial to participants. Research-based information for gardening or horticultural topics is not always available for specific locations; therefore, these potential website viewers stressed the importance of at least providing regionalized information as the next best option to local information.

An ideal or "perfect" website should make locating answers easy. For example, participants indicated that a site should include a question/answer section and/or a relevant search engine to help users locate information. Some participants suggested an index of items to more quickly find the desired resources or information. "I don't have a lot of time to read a lot of content, so a search engine would be most helpful," said one participant. In addition, several other participants emphasized the need for photos on horticultural websites. "Gardeners tend to be visual people, so don't forget the photos," said a second participant, and many others agreed. Seeing photos of the plants, trees, insects, and other items helps reinforce the information presented on the site.

The panelists emphasized that timely updates should be linked to Extension materials; other, more detailed information; or research. This allows gardeners or horticulturalists seeking detailed or technical information to access it while not overloading the site with in-depth information. "I particularly like the 'What to do this week' sections as I am a maintenance gardener and thus I am always looking to see what I should be doing that week for my garden in order to stay on track," said one participant.

The existing horticultural website

Focus group members were asked about their level of familiarity with the existing horticultural website; if they had ever visited the site; their reaction to the site; what they liked and disliked; and their expectations of the website. A screen capture of the existing site's Home page was provided to all participants as a reminder or in case they were not familiar with the site.

In addition, the live site was available via projector if participants had questions about aspects of the site.

The focus group members disappointed with the existing website. They said the site was not concise and was too cluttered and busy, making navigation and finding needed information very challenging. They indicated the site was frustrating to visit because it was wordy and did not contain photos that were helpful in the learning and education process. Some respondents spoke positively about the site's video segments and said the segments were beneficial. However, others indicated the videos did not contain added written information (verbatim scripts) that one could skim for content or print for future reference.

Participants said the existing website lacked an easy way to interact with the television program's panelists and experts. Participants wanted to easily send e-mail to the television show's experts. Re-

spondents agreed the panelists were easily accessible on the television program, which should also be possible through the site.

Conclusions

Internet use is growing rapidly as more adults gain access to and develop interest in obtaining information electronically. However, the continued growth of websites does not mean they all are effectively designed to meet the target audience members' needs or preferences. Time is important, which is one reason why home horticulturalists seek resources via the Internet. However, a poorly designed website that is hard to navigate, wordy, confusing and not appealing will result in diminishing traffic user traffic.

This research characterized users' expectations for horticultural websites. The identified qualities of a "perfect" website included timely and current information that is updated and refreshed often; information that is localized as much as possible; color photos demonstrating the topics; access to contact persons; links or search engines for additional information; and easy navigation. Users' demands seem simple, yet are complex when considering how to meet them via the Internet without overwhelming content providers and site developers. Study participants indicated they wanted research-based information, but they did not want to read a lot of technical jargon or verbose text. They wanted access to experts from the television show because the participants are searching for the needed information immediately. They preferred visuals to help illustrate or explain techniques or procedures but preferred not to watch an entire video segment to discover that it did not address their specific situation. Participants also valued print media, but timeliness also was critical as often they were searching for information to address an immediate problem.

Managing the continuity of content between a television show, where viewers prefer a longer format explanation of topics not necessarily of immediate concern, and a website, where uses want concise information for their specific needs, provides content managers a sometimes paradoxical situation that must be addressed to meet the needs of both audience segments. The present study indicates that a *Backyard Farmer* website overhaul is necessary to meet user needs. Few, if any, aspects of the existing site were included on the participants' list of preferred items of a "perfect" site. The differences between television and Internet media provide opportunities to serve horticulturalists' information needs in a variety of ways. The Internet has allowed university experts to reach a new and different audience, but efforts must be made to maximize the benefit to the clientele reached.

Implications/Recommendations

Focus group results indicate the need to redesign the existing horticultural website to address issues with content, navigation, aesthetics, search capabilities and Internet-based horticultural resource access. One recommendation is to redesign the site not only from an aesthetic standpoint, but also for function and content. The redesigned website would more effectively meet audience needs. The new website should be formatted better for easier navigation; more appropriately designed to include visuals in the design and the content; intentionally populated with relevant content; and applicable to the information needs of today's home horticulturalists.

Agricultural communicators and Extension educators can benefit from this study as it demonstrates the importance of connecting with the target audience when providing educational information and resources in a format and style that is appealing to the target audience. Unfortunately, this is not a new issue for agricultural communicators (Emery, 1999). When the website was first launched

it was advanced in its method for delivering video to audiences via the Internet. However, the website failed to evolve with advancements in Internet technology and capabilities and user preferences. Sites are no longer considered successful if they simply disseminate information in the same format but through a different medium. A site will be successful if the target users can locate answers to their questions and find value in the site; enough so to warrant return visits and engagement with the site. Website developers and managers should refer to this study specifically regarding horticulturalist preferences, but also should consult the Checklist for Internet Operations (Emery) as its ten items are still tenets of effective strategic communications.

As the Internet continues to increase in use as an information source, competition for visitors among horticultural websites also will increase. A website needs to maintain a visitor base to meet its purpose as an information source. To do this, site developers must anticipate information needs of visitors rather than react to them. Horticultural website managers should continue measuring their site's acceptability and usability as an information source. The rapidly advancing capabilities in technology and changes in user needs and preferences demand frequent monitoring of the site's relevance to its clients.

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Assistant professor and ACE member Jason Ellis teaches agricultural communications and journalism at Kansas State University. B. Lynn Gordon works as a Cow/Calf Extension Field Specialist at the South Dakota State University Extension Regional Center in Sioux Falls. ACE member Lana Johnson serves as web program manager and instructor for the Educational Media unit at the University of Nebraska-Lincoln.

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