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USER MOTIVATION: LIKABILITY AND USABILITY OF AN
AGRICULTURAL WEB SITE

by

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A THESIS

Presented to the Faculty of
The Graduate College at the University of Nebraska
In Partial Fulfillment of Requirements
For the Degree of Master of Arts

Major: Journalism and Mass Communications

Under the Supervision of Professor Linda J. Shipley

Lincoln, Nebraska

April, 2010

CHAPTER I

Introduction

The Internet is an electronically connected global communication system. In the 1960's, Marshall McLuhan predicted that we would move away from individual nation states and become a global village because of an "electric technology" (McLuhan, 1964 p. 317). He was speaking in reference to television. But Byrnjolfsson & Van Alstyne (2005, p. 851) suggest that the concept of a global village may be closer to being realized with the development of the World Wide Web.

In 1990 while working at the European Organization for Nuclear Research (CERN 2008), Tim Berners-Lee and Robert Cailliau wrote a proposal for what would become the "WorldWideWeb" (CERN, 2008). They defined this as a "web" of "hypertext" documents that could be viewed in "browsers" (CERN, 2008). CERN announced in 1993 the World Wide Web was free for anyone to use (Gillies, 2008).

Web communications has become a critical component of mass communications and media today. Businesses and organizations spend large sums of money to ensure they're well represented on the Internet (Wireless News, 2008). Web sites are used for broadcasting messages via the Internet and many types of resources are used to be certain that the visual designs of web sites are likable. This is important since web sites are often the first consumer contact point (Loyd, Schlosser & White, 2006, p. 135). Dr. Jacob Nielsen (2000, p. 14), a recognized expert on web usability, says, "in the network economy, the web site becomes a company's primary interface to the customer."

Web sites must also be user-friendly if they are to communicate effectively (Snell 2009). In a study about successful web site design, Gehrke and Turban (1999, p. 4) also

recommend user-friendly navigation on a web site so users don't leave in frustration. A study about effective web-based learning by Cook & Dupras (2004, p. 703) encourages making web sites accessible and user-friendly as key components in developing effective educational web sites.

This study examines the relationship between user motivation and the likability and usability of web sites. Behavioral design is pitted against visceral design (Norman, 2004, p. 37). Norman (2004, p. 37) explains that "visceral design is about the initial impact of a product, about its appearance, touch, and feel." He defines that the behavioral level of design as that which is about actually using a product.

CHAPTER II

Literature Review

“While many factors contribute to a web site’s power to influence, one key factor is credibility” (Fogg, 2003, p. 148). Fogg’s research shows that if the visual design of a web site is found to be likable, then this favorably affects the credibility of the web site. This is very important because users will abandon web sites if they feel they lack credibility (Fogg, 2003, p. 722).

User Motivation

User motivation is a key part of Fogg’s (2003, p. 722) Prominence-Interpretation Theory. This theory is based on users of web sites noticing something and then making a judgment about it. “When a user goes to a web site with a high level of motivation (e.g., seeking an answer to a critical health problem), he or she will notice more things about the web site. When user motivation and ability are both high, more web site elements will cross the cognitive threshold of being unnoticed to being noticed” (Fogg, 2003, p. 723). Fogg also discovered that “people make initial assessments of the credibility of computing technology based on first hand inspection of surface traits like layout...” (Fogg, 2003, p.138).

In a study about the influence of information and communication technology on the motivation for knowledge sharing, Hendriks (1999, p. 96) indicates that one reason people are motivated to share knowledge is because they expect or hope for reciprocity. Hendriks (1999, p. 92) states the following:

Knowledge sharing presumes a relation between at least two parties, one that possesses knowledge and the other that acquires knowledge. The first party

should communicate its knowledge consciously and willingly or not, in some form or other (either by acts, by speech, or in writing, etc.). The other party should be able to perceive these expressions of knowledge, and make sense of them (by imitating the acts, by listening, by reading the book, etc.).

Likability and Credibility

Likability of a web site is a key component of surface credibility (Fogg, 2003, p. 168). Surface credibility is an initial judgment about credibility based on first impressions of surface traits (Fogg, 2003, p. 132). A deeper level of credibility is earned credibility that is developed from interactions over an extended period of time (Fogg, 2003, p. 163). A web site must perform consistently with the user's expectations over time to achieve earned credibility. This is much more difficult to attain than surface credibility and can be much more likely to persuade users of a web site towards its goals.

In his book about persuasive technology, Fogg (2003, p. 171) writes that ease-of-use is very important in earned credibility. Fogg (2003, p. 170) also indicates that earned credibility is the type of credibility that is most likely to lead to attitude and behavior changes.

In reference to web site design, usability is how easy it is for the users of the web site to find information (Nielsen, 2000, p. 11). Nielsen (2000, p. 13) also states "most web designers blatantly ignore usability and design for their own pleasure or worse, the boss's pleasure, instead of trying to satisfy users' needs. In their book about usability testing, Rubin and Chisnell (2008) indicate that making web sites usable helps eliminate user frustration and improves profitability. "Usability has become one of the main ways to separate one's product from a competitor's product in the customer's mind" (Rubin &

Chisnell, 2008, p. 23).

In a study by Roscovius (2006) about how University web sites are perceived, marketing and communications experts at higher learning institutions were asked about the importance of web site usability in terms of user perception. Roscovius examined if the image that is portrayed of a university via the web site matches what that university wishes to portray. The study also examined whether the visual elements of a university web site play a significant role in how students perceive a university via its web site. The students indicated that while content and functionality are important characteristics, visuals are what they would change most about the schools' web sites. (Roscovius, 2006, p. 98). The study also found that students who were satisfied with one of the university web sites seemed more likely to consider attending or visiting that university than those who were less satisfied with the site (Roscovius, 2006, p. 132). "More than 87 comments indicated that students do notice when ease-of-use and navigation is considered in web site design as well as when it isn't" (Roscovius, 2006, p. 135).

Usability

Usability testing is one method that can be used to test the effectiveness of web sites in conveying information. This method actually tests the way people interact with the elements of a web site by observing how effectively and efficiently they are able to complete tasks using the web site. "Usability has become one of the main ways to separate one's product from a competitor's product in the customer's mind," according to Rubin & Chisnell (2008, p. 23). Nielsen (2000, p. 388) indicates that, "Usability has grown dramatically in importance for web based companies because of an inversion in the relationship between user experience and the ability to separate customers from their

money.”

“In a usability test, one user at a time is shown something and asked to either (a) figure out what it is, or (b) try to use it to do a typical task” (Krug, 2005, p. 141). This task-based approach is central to usability studies. Participants are asked to find specific information on the web site being tested. The tasks are worded in terminology that would be relevant to the users of the web site but yet avoid words or cues that serve as giveaways of correct results. Not all participants complete the tasks and when they do, they experience varying degrees of difficulty. Patterns in difficulty or inability to complete a task can be strong indicators of problems in a web site’s usability.

Preliminary Study

In the summer of 2008, preliminary usability studies were conducted on three University of Nebraska-Lincoln web sites. These web sites are www.unl.edu, casnr.unl.edu, and water.unl.edu. Content owners, or stakeholders, of these web sites indentified key information they wanted their target audience to be able to find on their web site. This was done to ensure usability study tasks were targeting the type of content that the stakeholders think the target audience of each web site wants. If this had not been done then it could have been likely that usability tasks were not suitable for the target audience of the web site. This is a standard task-based approach of usability testing.

The sample in this preliminary study consisted of a convenience sample of fifteen participants per web site tested for a total of 45. A usability-testing table was set up at major events, and participants were recruited as they walked by the booths. Participants were asked to complete a questionnaire that established how much computer and Internet

experience they had. Also this questionnaire was used to obtain some basic demographic information about the participants. Participants were seated before a laptop computer with a web camera attached and a small microphone was clipped to their shirt. Rubin and Chisnell (2008, p. 100) describe this as the "minimalist portable" test lab. Before the participants began the usability study, it was stressed that their competence in the use of the computer was not being tested but rather they were helping evaluate web sites for their effectiveness. The moderator of the session remained in the same physical location as the participants.

Participants received the tasks in written form, one at a time. All participants were given the same tasks in the same sequence. As they completed tasks, their movements and clicks were being recorded. If the participants got stuck, help was not provided and they were encouraged to complete the tasks as they saw fit. Once the participants completed the usability study, they were asked to complete a satisfaction survey. The survey focused on the participants' personal preferences about visual characteristics of the web sites being evaluated.

The recordings from the participant sessions were then evaluated. The time it took for each task and whether the participant was successful in completing the task was coded from the video recordings. One surprising finding was that participants who couldn't complete a task or took a long time completing it still responded positively about the web site in the satisfaction survey. This finding was unexpected because the satisfaction survey was completed after the usability study. Perhaps a clue to understanding this finding comes from the comment of one participant after completing the study. The participant expressed much concern that her negative experience with the

web site would jeopardize the study moderator's position with the University. The consent form does state, "...information obtained during this study will be summarized and provided to UNL administrators." For a follow-up study with the same design, the consent form contained a statement that the positive or negative results will not affect the moderators of the study.

The review of the literature indicates that likability and usability of a web site have been found to be key elements of web site credibility. Also, since usability has been found to build more robust levels of credibility than likability (Fogg 2003, p. 167), it could be hypothesized that likability and usability would be dependent on each other. However the preliminary study suggested that web site likability is not reflective of usability results. This study was conducted to further test the relationship between likability and usability.

CHAPTER III

Methodology

According to the studies cited in the review of the literature, web sites inherently offer many variations in presentation of information with a myriad of layouts, colors, links, etc. However, users of web sites must filter the information to get to what they want. For the purpose of this study, it will be necessary to measure how much users of a web site like its characteristics such as look and feel.

“Consumer sensory analysis” is used in determining whether a product is liked based on its characteristics (Heymann & Lawless, 1999, p. 430). Dr. Beebe-Center, a psychologist at Harvard University, described his measurements of pleasantness and unpleasantness using hedonic scaling.

Hedonic scaling, also known as a degree-of-liking scale, is often used as measurement instrument for likability (Heymann & Lawless, 1999, p. 450). “The hedonic scale assumes that consumer preferences exist on a continuum and that preference can be categorized by responses based on likes and dislikes” (Heymann & Lawless, 1999, p. 450).

In a study about targeting and media planning, Vernet (2004, p. 93) used a 5-point scale in a survey to measure opinion leadership. In that survey, participants were asked how often they share information with others and how often others ask for their opinion.

The next study was carried out with some refinements. Since the focal point of the next study was the discrepancy between likability of a web site and its usability, it was essential to also utilize established methods of measuring likability. Likability

testing in the new study was carried out via “consumer sensory analysis” (Heymann & Lawless, 1999, p. 430) since one goal is to determine whether participants like the product. In this case the product is the web site being evaluated. There are two main approaches to consumer sensory analysis. One is the measurement of preference but this requires there be a choice of multiple products. The other approach is the measurement of acceptance or liking and can be done on a single product. In this study just one web site was tested. Since there was not more than one web site or variations of the same web site to compare, the approach used was the “measurement of acceptance or liking” (Heymann & Lawless, 1999, p. 431).

In this study, hedonic scaling was used as the measurement instrument for likability. More specifically, a 5-point hedonic scale was used which is also known as a degree-of-liking scale.

CropWatch.unl.edu is the web site used in this study (see Appendix N). It has an in-state primary audience of agricultural producers and agribusiness. Secondary audiences are out-of-state government agencies and those involved in education. Historically, CropWatch.unl.edu audiences are 40% producers, 40% agribusiness, 20% in education at universities. Agribusiness is a broad term and it could include anyone from major organizations to seed salesman that self identifies as being involved in agribusiness.

This study was conducted during Husker Harvest Days, a large and well-known event in the agricultural industry. Attendance numbers for the event are not published; however, it is estimated that attendance for 2009 was over 100,000. The exhibit field was filled with more than 600 exhibitors (www.grit.com) “Husker Harvest Days has become

one of the nation's premier working farm shows, with exhibitors and field demonstrations geared to Nebraska and Western Corn Belt agriculture. It is the nation's largest farm show in which all field crops and plots are irrigated" (Farm Progress Companies 2009). This was the 32nd annual event and took place on September 15, 16, and 17, 2009. The reason for using the CropWatch.unl.edu web site at Husker Harvest Days is because the primary audiences for this web site are those who are in attendance at Husker Harvest Days.

The event ground covers several hundred thousand square feet in a rural location near the city of Grand Island, Nebraska. The grounds are not used for any other purpose other than Husker Harvest Days. So for the rest of the year nothing else happens there. Yet the companies displaying at the event spend the money to keep the grounds maintained with manicured lawns just to prepare for this 3-day event. It's clear that this event is every important to these agriculture-related companies. Obviously they find it necessary to spend the resources to take part in the event because they know they have the right audience for their goods and services. This reinforces the idea that the CropWatch.unl.edu study was conducted in the right place at the right time and to the right audience.

The University of Nebraska-Lincoln (UNL) has a large metal building on the grounds at Husker Harvest Days. Space is limited at the event. Conversations with those with booths set up in the same area of the grounds revealed just how valuable space is at the event. Outdoor booth spaces cost several thousand dollars per day to rent (Events in America).

Those in charge of the UNL space requested that the usability table not be setup

directly in front of the building. Adjacent to the UNL building is a small lot where the Market Journal television program occurs. On the morning of the September 16, a table was erected for the usability study in the Market Journal booth area. This allowed for the table to be setup near the UNL building and still remain easily visible to passersby. The passerby's ages varied from small children to elderly adults. Since this study only included those who were 19 years of age or older, passersby who showed interest in the study were asked if they were 19 or older.

Participants were recruited in two ways. One was to actively seek them out by asking passersby if they would like to participate in the study. Another method was when passersby asked about the study because of their own curiosity. T-shirts had been provided for use as giveaways to participants in this study. Participants were told if they completed the study, they would receive a free T-shirt. These proved to adequately motivate participants to complete the study.

The first step was to seat the participant in front of a usability station. Each station was located at the large table used for the study. There was ample room for three usability stations at the table. Each station consisted of a laptop computer with a built in camera and a wired lavalier microphone. Participants were thanked for participating in the study and told the reason why the study was being conducted. They were told the purpose of it is "to understand how we can make our web sites easier to use". The emphasis here is that they are evaluating the web site and the study is in no way a test of their ability. They were also told that participation was voluntary and they may stop at any time.

The moderators also explained to participants how their session would be video

recorded and the resulting video would be used: “The data from your session will be used solely for evaluating the web site and used for internal design purposes and for possible presentation at professional meetings. It will not show up on YouTube or Facebook. Your name will not be reported with the data from your session.” IRB approval was obtained for the study on September 14, 2009 (see Appendix B).

Next, they were given a consent form for review. They were allowed ample time to read the consent form and then sign and date the form. These forms were kept with the principal investigator, and participants were given a copy of the form.

For tracking purposes usability study videos and survey responses were assigned a unique id number for each participant. The numbering began with 6101 and continued consecutively.

With the consent form signed, session moderators moved on to telling them what they would be doing in the study. They were seated before a laptop computer with a built in web camera and a lavalier microphone was clipped to their shirt. They were also told that their cursor movements on the computer screen would be recorded as well as their audio and video of their facial expressions. The software used to capture all this is Silverback, a usability testing software. It records movements on the computer screen and also captures video and audio. The video of the facial expressions from the participant is overlaid in the lower right corner on top of the computer screen capture.

Participants in the study were given four sheets of paper. Each had a different task printed on it. This was done so participants focused on only one task at a time. The participants were asked to read the task on the paper aloud. Also, they were told that they could move on to the next task any time they felt they completed the given task or if they

simply wished to skip to the next task. Lastly, we requested that they let us know when they've completed a task by saying, "I'm done" or "I would stop here." They were asked if they had any questions before beginning.

As participants evaluated the web site, the moderator of the session remained in the same physical location as the participants. This is a standard laboratory-based testing method of conducting usability studies. A minimalist portable test lab as described by Rubin and Chisnell (2008) is the chosen method of testing. Participants are seated before a laptop computer with a web camera attached and a small microphone clipped to their shirt. Krug (2005) also recommends a similar approach. The moderator of the session remains in the same physical location as the participants. The U.S. Department of Health and Human Services usability web site (www.usability.gov) calls this laboratory-based testing. These are current and established methods of conducting usability studies.

All participants were given the same tasks in the same sequence. As they completed tasks, their movements and clicks were recorded. If the participants got stuck, help was not provided and they were encouraged to complete the tasks as they saw fit. Once the participants completed the usability study, the video recording was stopped and they were asked to remove the clip on microphone. The moderator of the session saved the file from the recording on the computer hard drive. The file named with the participant id number. This was done to ensure the proper survey responses could be associated with the usability recording.

The same id number was entered at the beginning of the survey. The participants were then allowed to take the online survey. This survey was built using Zoomerang, a popular online survey tool. The survey consisted of two portions with a total of twenty-

two questions (see Appendix A). The first portion covered demographics and media usage while the second portion measured likability in relation to the web site in this study. While the first portion contained survey questions in relation to demographics and media usage, not all questions were used for this study. Some questions in the survey were input for the use of stakeholders of the web site and not for this study.

The first question asked about how often the participant has gone to the CropWatch.unl.edu web site. This was utilized to see if participants had previous experience with the CropWatch.unl.edu web site.

Participants were asked if they are involved in crop production. This was included in the survey to see if it affected participants' usability and likability results.

There was an array of questions included about how often participants sought information about crop production and pest management from different sources. This would ascertain participants' media usage. This information is useful in this study to see if usability and likability is affected by usage of different types of media. The type of media relevant to this study is Internet web sites.

In order to examine if there is any relationship between opinion leadership in relation to crop production and the participants' usability results, questions were included in the survey that dealt with this. In a study about targeting and media planning, Vernetto (2004, p. 93) used a 5-point scale in a survey to measure opinion leadership. In that survey, participants were asked how often they share information with others and how often others ask for their opinion. "When a user goes to a web site with a high level of motivation (e.g., seeking an answer to a critical health problem), he or she will notice more things about the web site. When user motivation and ability are both high, more

web site elements will cross the cognitive threshold of being unnoticed to being noticed” (Fogg, 2003, p. 723). Whether participants intend to pass information they find on to others may affect how they perceive the web site’s usability since according to Fogg’s findings, they should notice more about it. This study investigates whether this affects their usability results.

Participants were asked about ownership of a home computer and cell phone or smart phone. Participants were also asked if they access crop production information on the Internet from cell phones. These questions were useful for stakeholders in knowing how their target audience access electronic information and to gauge their adoption of devices. Gender, age, county and state, and years in crop production were asked as background demographic information.

The second portion of the survey measured participants’ likability of the web site. They rated their responses on a 5-point scale. The likability scale included 1 for like, 3 for neutral response, and 5 for dislike. Overall web site, look and feel of the web site, headings on pages, and photographs were measured using the scale. Another 5-point scale was used for measuring ease/difficulty which included 1 for easy, 3 for neutral, and 5 for difficult. This scale was used in measuring ease/difficulty in finding information, ease/difficulty of completing the tasks, and the search feature if used.

Once the survey was completed, they were once again thanked for their participation and given a t-shirt as promised at the beginning of the study. At this time the participants would take their t-shirt and move on from the usability study area to other areas of the Husker Harvest Days event.

Session moderators would take this opportunity to clear the browser history on the

computer. This was done to ensure that each new participant wouldn't have clues as to how previous participants completed tasks.

At the end of Husker Harvest Days three days worth of participant session recordings were transferred from each laptop to an external hard drive. Once all the recordings were in place on the external hard drive, the recordings were permanently deleted from each laptop. The primary investigator kept the external hard drive so that the participant session recordings could be evaluated.

The recordings from each participant were evaluated at a later time. This was necessary in order to code each recording for the time it took for each task and whether the participant was successful in the completing the task. Success was dependent on the participant finding the actual correct information for each task and also acknowledging they had completed the task. Even if the participants found the actual correct information but felt they hadn't found the correct information, they were coded as incomplete. If they felt that they had completed the task and yet hadn't found the actual correct information, this was also counted as incomplete. The reason for this is because when the session moderators orienting participants to the study, the participants were told they should move on to the next task once they felt they had completed the current task. They were also told they could simply skip the task and move on to the next one if they felt the need to do so. If a participant skipped a task then the result for that particular task was coded as incomplete. It was important to know that the participants feel they had found or not found the correct information for the tasks in order to compare their survey results of how well they liked the look and feel of the web site. The results were coded into an Excel spreadsheet. The task times were separated between two minutes or less and more than

two minutes. This separation point was determined by a naturally occurring span of a few seconds where no respondents fell. This blank space provided sizable amounts of respondents on either side of the cut-off.

This study involved a total of four people to be session moderators. On the first day there were two session moderators conducted the study. Shortly after set up, our first two participants started the study. Unfortunately, after these two participants had already begun and were well into the study, the wireless Internet connection stopped working. The participants were unable to continue. Therefore these first two participants were excluded from the study results since their participation was incomplete.

The Internet providers for the event were contacted and they attempted to fix the connection for the entire UNL area. Unfortunately, there was no reliable signal until afternoon. At this time we discovered that we would receive a stronger wireless signal if we moved our table closer to the main building, which housed the wireless router. Therefore, the usability study table was moved and placed right at the entrance of the UNL building. This gave our usability table added visibility and also gave us a stronger Internet connection.

We again attempted to do some usability studies. This time we were able to complete some but the signal again went out. The participants who were able to complete the usability study and the survey before the signal went out were included in the results. Those who were not able to complete the study were excluded from the results. There were more repair attempts by the Internet provider technicians, which resulted in a few more completed studies before the end of the day.

The morning of September 16 proved to be our busiest day. This is not surprising since in the previous years of the event, the second day is usually the busiest. To accommodate the increased traffic, four moderators conducted the usability study. These moderators conducted the study on three laptops and one extra person helped recruit participants. However things did not go smoothly since right away there was no Internet connection in the entire UNL area. So, the Internet technicians were called, and they began troubleshooting. Within an hour they had solved the issue and we had a reliable signal for the rest of the day. The usability study table was extremely busy the remainder of the day and often we had people waiting in line to do the study. The t-shirt giveaway helped motivate passersby to participate. By the end of the day we had gone through most of the t-shirts and only had a few left.

The next day, September 17, the last day of the event, attracted fewer attendees. This day two session moderators conducted the studies with two laptops. Over the course of the three days, fifty-one participants completed the usability study and the survey.

Typically, a low number of participants are used in this type of study. Krug (2005) suggests that a minimum of three or four participants is required in order for this method to be valid. Chodil, Irani, and Rhoades (2007) used a minimum of three participants in their task-based approach. Nielsen (2000) recommends five users for usability testing. Rubin and Chisnell (2008, p. 72) recommend that ten to twelve participants be tested but also state that, “research has shown that four to five participants who represent one audience cell will expose about 80 percent of the usability deficiencies of a product for that audience, and that this 80 percent will represent most of the major problems.” Gootzit and Valdes (2007, p. 7) reference Jacob Nielsen, “as a general rule,

that only five or six users are needed for a round of usability testing, as long as the contingent of users represents a cohesive segment. If the system under construction will target different segments (for example, young people and senior adults), then additional groups of test subjects are needed.”

The next step in the study was to watch and evaluate each participant’s video. Each participant was provided with four tasks to be completed on the web site. Each participant’s video, audio, and computer screen capture was stored for each of the four tasks. The primary investigator reviewed each of the participant recordings. This was necessary in order to code each recording for the time it took to complete each task and the number of clicks involved. The results were coded in an Excel spreadsheet and analyzed using the Statistical Package for the Social Sciences (SPSS).

CHAPTER IV

Findings

The primary investigator reviewed participant recordings. This process involved watching the video for each participant for all four tasks. The length of time it took to complete each task and the number of tasks that were completed were coded into an Excel spreadsheet. This spreadsheet included each participant's identification number so the usability recording results could be associated with the correct survey result. Comparisons with frequencies and chi-square tests were analyzed using the Statistical Package for the Social Sciences (SPSS).

A research question for this study asks what is the relationship between web site likability and usability. The results of this study will help gain insight into the relationship between web site usability and likability. The hypotheses of this study focus on investigating whether there will be a positive significant relationship between likability and usability. This study repeated the preliminary study but with established consumer testing research methods for likability as well as usability. The main goal for this study was to test the possibility of a relationship between liking the look and feel of the web site and being able to complete tasks on it. Behavioral design was pitted against visceral design (Norman, 2004, p. 37). This study is also designed to examine user motivation in relation to usability of a web site.

In the survey, participants were asked about their involvement in crop production. They were also asked how frequently they pass on information they find on web sites to others involved in crop production and how frequently others involved in crop production ask for their opinion. This is useful in measuring the impact of motivation toward

content on usability and likability. In a study about the influence of information and communication technology on the motivation for knowledge sharing, Hendriks (1999, p. 96) indicated that one reason people are motivated to share knowledge is because they expect or hope for reciprocity.

Hypotheses

1. Participants who identify as being involved in crop production will be more likely to be asked for their opinion by others involved in crop production than those not involved in crop production.
2. Participants who identify as being involved in crop production will be more likely to pass on information they find on web sites to others involved in crop production than those not involved in crop production.
3. Participants who seek information about crop production and pest management from Internet web sites will be more likely to pass on information they find on web sites to others involved in crop production than those who don't seek information about crop production and pest management from Internet web sites.
4. Participants who are asked for their opinion by others involved in crop production will be more likely to respond in the survey that tasks were easy to complete on the web site than those who are not asked for their opinion by others involved in crop production.
5. Participants who pass on information they find on web site to others involved in crop production will be more likely to respond in the survey that tasks were easy to complete on the web site than those that don't pass on information they find on web site to others involved in crop production.

6. Participants who complete tasks in 2 minutes or less will be more likely to respond in the survey that finding information was easy on the web site than those who complete tasks in more than 2 minutes.
7. Participants who complete tasks in 2 minutes or less will be more likely to respond in the survey that tasks were easy to complete on the web site than those who complete tasks in more than 2 minutes.
8. Participants who successfully complete tasks will be more likely to like the look and feel of the web site than those that don't complete tasks.

Demographics

Fifty-one participants completed both the usability study and the survey. Of these, 1 (2%) said he/she “frequently” went to the CropWatch.unl.edu web site, 9 (18%) responded that they “sometimes” went to the CropWatch.unl.edu web site, 11 (22%) said they “almost never” go to the CropWatch.unl.edu web site, and 30 (59%) said they “never” go to the CropWatch.unl.edu web site (see Figure 1).

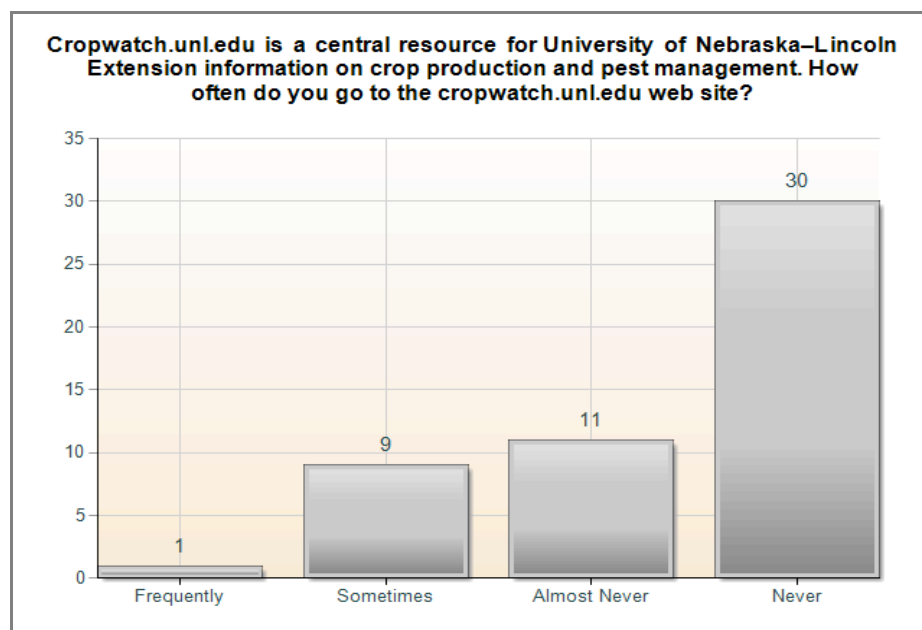


Figure 1. How often do you go to the CropWatch.unl.edu web site?

Thirty (71 %) participants identified as being involved with crop production. While 15 or 29% responded that they are not involved with crop production (see Figure 2).

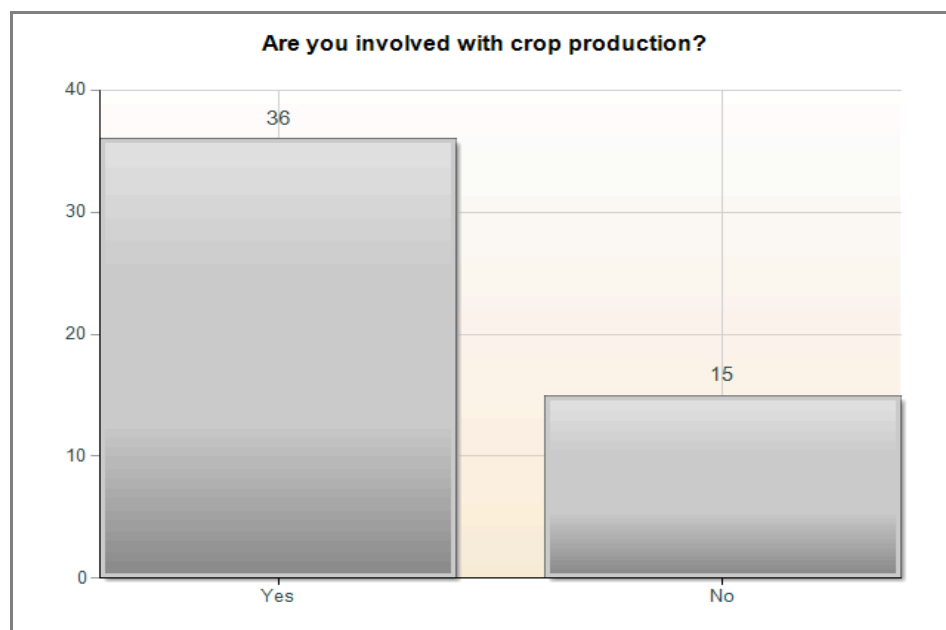


Figure 2. Are you involved with crop production?

Twenty-nine (57%) of the participants in this study were male. Twenty-two (43%) of the participants were females (see Figure 3).

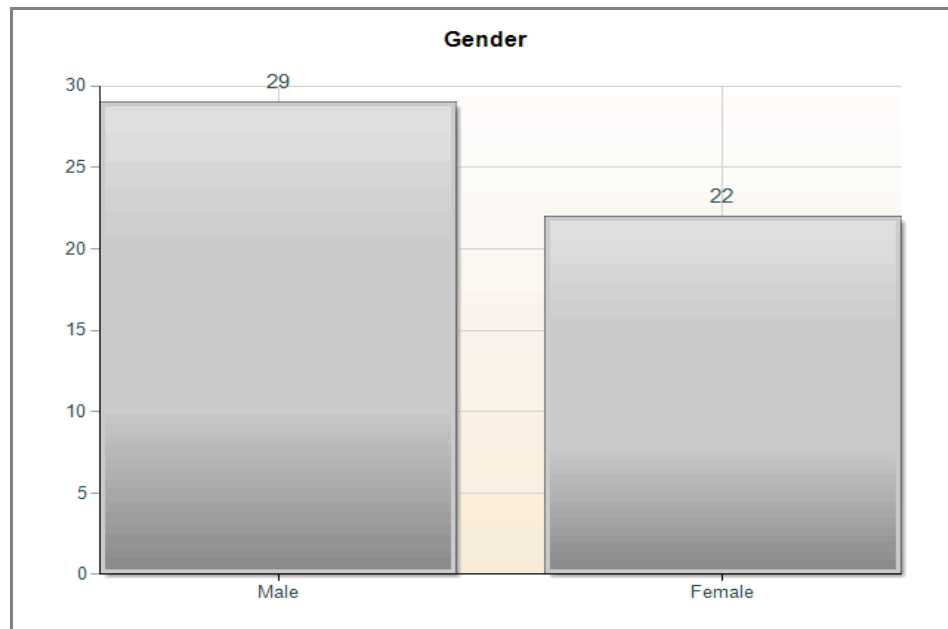


Figure 3. Gender

Participants ages 19-29 were 35%, which is the second largest group. The largest group was participants ages 30-49 at 41%. The smallest group consisted of those 50 or older at 23% (see Figure 4).

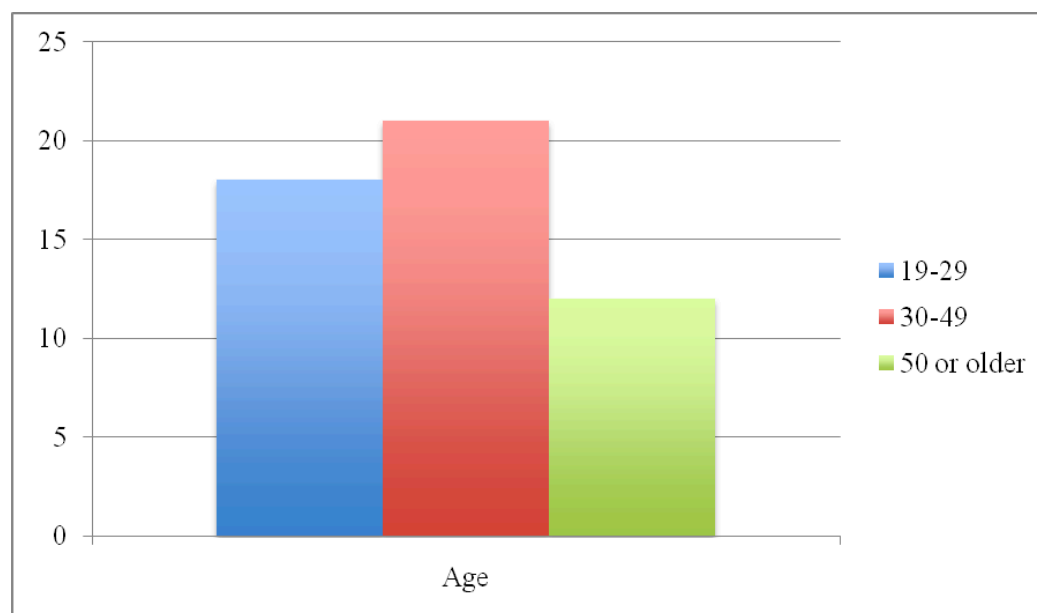


Figure 4. Age in years

Motivation; Usability Versus Likability

The first hypothesis states that participants who identify as being involved in crop production will be more likely to be asked for their opinion by others than those not involved in crop production. Differences between those involved in crop production and those not involved were statistically significant (see Appendix K). Two thirds (67%) of those who responded as being “involved” in crop production said that others involved in crop production sometimes ask for their opinion. More than half (53%) of participants who responded as “not involved” in crop production are “never asked” for their opinion by others involved in crop production.

		asked_for opinion				
		Frequently	Sometimes	Almost Never	Never	Total
production	Yes	2	24	7	3	36
	% within production	5.6%	66.7%	19.4%	8.3%	100.0%
	No	0	3	4	8	15
	% within production	.0%	20.0%	26.7%	53.3%	100.0%
Total	Count	2	27	11	11	51
	% within production	3.9%	52.9%	21.6%	21.6%	100.0%

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.386 ^a	3	.002
N of Valid Cases	51		

The second hypothesis stated that participants who identify as being involved in crop production will be more likely to pass on information they find on web sites to others involved in crop production than those who not involved in crop production. The results for this were statistically significant (see Appendix L).

Two thirds (67%) of those who responded as being involved in crop production said they sometimes pass on information they find on web sites to others involved in crop

production. Over half (53%) of participants who responded as not involved in crop production never pass on information they find on web sites to others involved in crop production.

		pass_on_info				
		Frequentl y	Sometime s	Almost Never	Never	Total
production Yes	Count	3	24	6	3	36
	% within production	8.3%	66.7%	16.7%	8.3%	100.0%
No	Count	0	5	2	8	15
	% within production	.0%	33.3%	13.3%	53.3%	100.0%
Total	Count	3	29	8	11	51
	% within production	5.9%	56.9%	15.7%	21.6%	100.0%

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.335 ^a	3	.004
N of Valid Cases	51		

The third hypothesis was: Participants who seek information about crop production and pest management from Internet web sites will be more likely to pass on information they find on web sites to others involved in crop production than those who

don't seek information about crop production and pest management from Internet web sites. The data show the differences were statistically significant (see Appendix M). Sixty two percent (62%) of participants who "frequently" seek information about crop production and pest management from web sites "sometimes" pass on information they find on web sites to others involved in crop production. More than three quarters (78%) of those who "sometimes" seek information about crop production and pest management from web sites also "sometimes" pass on information they find on web sites to others involved in crop production. Over half (55%) of those who "almost never" seek information about crop production and pest management from web sites "sometimes" pass on information they find on web sites to others involved in crop production. Two thirds (67%) of those who "never" seek information about crop production and pest management from web sites "never" pass on information they find on web sites to others involved in crop production.

		pass_on_info				
		Frequentl y	Sometimes	Almost Never	Never	Total
seek_web sites	Frequentl y	2	8	1	2	13
	% within seek_web sites	15.4%	61.5%	7.7%	15.4%	100.0%
	Sometim es	1	14	2	1	18
	% within seek_web sites	5.6%	77.8%	11.1%	5.6%	100.0%
	Almost Never	0	6	3	2	11
	% within seek_web sites	.0%	54.5%	27.3%	18.2%	100.0%
	Never	0	1	2	6	9
	% within seek_web sites	.0%	11.1%	22.2%	66.7%	100.0%
Total		3	29	8	11	51
		5.9%	56.9%	15.7%	21.6%	100.0%

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.805 ^a	9	.014
N of Valid Cases	51		

The fourth and fifth hypotheses were not supported. The difference between groups was not statistically significant at the .05 level or less.

The sixth hypothesis was partially supported. The differences between groups for task 1 were not statistically significant at the .05 level or less. The data for tasks 2, 3, 4 indicate that there were statistically significant differences between the groups being compared (see Appendix D, E, and F).

Task 2 on the crop watch web site dealt with finding information about recommended insecticides for cleaning and treating grain bins (see Appendix C). The survey question for ease of information asked for responses that were on a 5-point scale. The scale started with “like” and ended with “dislike.” Neutral was in the middle of the scale. Two-thirds (66%) of participants who responded on the survey that information was easy to find on the web site took two minutes or less for task 2 (see Appendix D). Almost 82% of those who responded on the scale with “2”, which is between easy and neutral, took two minutes or less. More than three-fourths (77%) of the participants who responded with “neutral” took more than two minutes finding information on the web site. Eighty-seven percent of participants who responded on the scale as “4” took more than two minutes to complete the task. All participants (100%) who said that information was difficult to find on the web site took more than 2 minutes on the second task.

			tsk2_time		
			2 minutes or less	More than 2 minutes	Total
ease_info	1.00	Count	2	1	3
		% within ease_info	66.7%	33.3%	100.0%
	2.00	Count	9	2	11
		% within ease_info	81.8%	18.2%	100.0%
	3.00	Count	4	13	17
		% within ease_info	23.5%	76.5%	100.0%
	4.00	Count	2	13	15
		% within ease_info	13.3%	86.7%	100.0%
	5.00	Count	0	4	4
		% within ease_info	.0%	100.0%	100.0%

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	18.382 ^a	4	.001
N of Valid Cases	50		

Cost savings from the elimination of one trip through the field was the focus of task 3 in the survey (see Appendix C). All (100%) of the participants who said finding information on the web site was easy took two minutes or less for the third task (see Appendix E). Nearly three-quarters (73%) of participants who responded with “2”, which is between easy and neutral, on the 5-point scale took two minutes or less. Over seventy-percent (71%) of participants who responded with neutral took more than two minutes on this task. Sixty-seven percent of participants who responded on the scale as “4”, which is between neutral and difficult, took more than two minutes. Three-fourths (75%) of participants who said that information was difficult to find on the web site took more than two minutes on the second task.

			tsk3_time		
			2 minutes or less	More than 2 minutes	Total
ease_info	1.00	Count	3	0	3
		% within ease_info	100.0%	.0%	100.0%
	2.00	Count	8	3	11
		% within ease_info	72.7%	27.3%	100.0%
	3.00	Count	5	12	17
		% within ease_info	29.4%	70.6%	100.0%
	4.00	Count	5	10	15
		% within ease_info	33.3%	66.7%	100.0%
	5.00	Count	1	3	4
		% within ease_info	25.0%	75.0%	100.0%
Total			22	28	50
			44.0%	56.0%	100.0%

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.249 ^a	4	.036
N of Valid Cases	50		

Task 4 in the survey dealt with finding the top producing wheat variety for Scotts Bluff County (see Appendix C). All (100%) of the participants that said finding information on the web site was easy took two minutes or less for the third task (see Appendix F). Eighty-two percent of participants who responded with “2”, which is between easy and neutral, on the scale took two minutes or less. Over half (53%) of participants who responded with neutral took more than two minutes on this task. More than half (53 %) of participants who responded on the scale as “4”, which is between neutral and difficult, took more than two minutes. All (100%) of participants who said that information was difficult to find on the web site took more than two minutes on the second task.

			tsk4_time		
			2 minutes or less	More than 2 minutes	Total
ease_info	1.00	Count	3	0	3
		% within ease_info	100.0%	.0%	100.0%
	2.00	Count	9	2	11
		% within ease_info	81.8%	18.2%	100.0%
	3.00	Count	8	9	17
		% within ease_info	47.1%	52.9%	100.0%
	4.00	Count	7	8	15
		% within ease_info	46.7%	53.3%	100.0%
	5.00	Count	0	4	4
		% within ease_info	.0%	100.0%	100.0%

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.333 ^a	4	.023
N of Valid Cases	50		

For all three tasks, those taking more than 2 minutes were more likely to rate the tasks as “difficult” while those completing the task in less time were more likely to indicate the task was “easy”.

The seventh hypothesis was partially supported. The results for task 1 were not statistically significant. The differences between the groups for task 2, 3, and 4 in this study were statistically significant at the .05 level or less (see Appendix G, H, and I).

The second task on the crop watch web site involved locating information about recommended insecticides for cleaning and treating grain bins (see Appendix C). The survey question for ease or difficulty of completing tasks had responses that were on a 5-point scale. The scale started with like and ended with dislike. Neutral was in the middle of the scale. Half (50%) of participants who responded on the survey that tasks were “easy” to complete on the web site took two minutes or less for task 2 (see Appendix G). Eighty percent of those who responded on the scale with “2” took two minutes or less. Nearly three-fourths (72%) of participants who responded with “neutral” for ease of completing tasks on the web site took more than two minutes to complete the task. Almost 86% of participants who responded on the scale as “4” took more than two minutes to complete tasks on the web site. All participants (100%) who said that tasks were difficult to complete on the web site took more than two minutes on the second task.

			tsk2_time		
			2 minutes or less	More than 2 minutes	Total
ease_task	1.00	Count	2	2	4
		% within ease_task	50.0%	50.0%	100.0%
	2.00	Count	8	2	10
		% within ease_task	80.0%	20.0%	100.0%
	3.00	Count	5	13	18
		% within ease_task	27.8%	72.2%	100.0%
	4.00	Count	2	12	14
		% within ease_task	14.3%	85.7%	100.0%
	5.00	Count	0	4	4
		% within ease_task	.0%	100.0%	100.0%

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.682 ^a	4	.005
N of Valid Cases	50		

For the third task, all (100%) of the participants who said completing tasks on the web site was “easy” took two minutes or less for the third task (see Appendix H). Eighty percent of participants who responded with “2” on the 5-point scale took two minutes or

less. Nearly seventy-eight percent of participants who responded with neutral took more than two minutes on this task. Sixty-four percent of participants who responded on the scale as “4” took more than two minutes. Three-fourths (75%) of participants who said that information was difficult to find on the web site took more than two minutes on the third task.

			tsk3_time		
			2 minutes or less	More than 2 minutes	Total
ease_task	1.00	Count	4	0	4
		% within ease_task	100.0%	.0%	100.0%
	2.00	Count	8	2	10
		% within ease_task	80.0%	20.0%	100.0%
	3.00	Count	4	14	18
		% within ease_task	22.2%	77.8%	100.0%
	4.00	Count	5	9	14
		% within ease_task	35.7%	64.3%	100.0%
	5.00	Count	1	3	4
		% within ease_task	25.0%	75.0%	100.0%

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.791 ^a	4	.005
N of Valid Cases	50		

All (100%) of the participants who said completing tasks on the web site was easy for the fourth task took two minutes or less (see Appendix I). Seventy percent of participants who responded with “2” took two minutes or less. Sixty-one percent of participants who responded with “neutral” took two minutes or less on this task. More than 64% of participants who responded on the scale as “4” took more than two minutes. All (100%) of participants who said that tasks were “difficult” to complete on the web site took more than two minutes on the fourth task.

			tsk4_time		
			2 minutes or less	More than 2 minutes	Total
ease_task	1.00	Count	4	0	4
		% within ease_task	100.0%	.0%	100.0%
	2.00	Count	7	3	10
		% within ease_task	70.0%	30.0%	100.0%
	3.00	Count	11	7	18
		% within ease_task	61.1%	38.9%	100.0%
	4.00	Count	5	9	14
		% within ease_task	35.7%	64.3%	100.0%
	5.00	Count	0	4	4
		% within ease_task	.0%	100.0%	100.0%

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.385 ^a	4	.023
N of Valid Cases	50		

The eighth and last hypothesis stated that participants who successfully complete the tasks will be more likely to like the look and feel of the web site than those who don't complete the tasks. It was partially supported. Only the results for task 1 were

statistically significant (see Appendix J). The first task on the crop watch web site involved finding the form to receive weekly updates (see Appendix C). The survey question for look and feel of the web site had responses that were on a 5-point scale. The scale started with “like” and ended with “dislike”. Neutral was in the middle of the scale.

Over half (57%) of participants who responded on the survey that they didn’t like the look and feel of the web site were unable to complete task 1 (see Appendix K). However, seventy-five percent of participants who responded with “2” on the 5-point scale were able to complete task 1. In addition, seventy percent of participants who responded with neutral were unable to complete this task. The two participants who responded on the scale as “4” were evenly split (50%) between successfully completing the task and incomplete. Both of the participants who said they disliked the look and feel of the web site were able to complete task 1. The number of respondents indicating a 4 or 5 was only a total of four (two for each point on the scale). So even though the Chi-square test indicates there are statistically significant differences between the groups, the small number of respondents answering with a 4 or 5 on the scale makes it difficult to interpret this finding.

		tsk1_success		
		Complete	Incomplete	Total
like_lookfeel	1.00 Count	3	4	7
	% within like_lookfeel	42.9%	57.1%	100.0%
	2.00 Count	12	4	16
	% within like_lookfeel	75.0%	25.0%	100.0%
	3.00 Count	7	16	23
	% within like_lookfeel	30.4%	69.6%	100.0%
	4.00 Count	1	1	2
	% within like_lookfeel	50.0%	50.0%	100.0%
	5.00 Count	2	0	2
	% within like_lookfeel	100.0%	.0%	100.0%

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.665 ^a	4	.046
N of Valid Cases	50		

Conclusions and Discussion

This study was designed to assess the relationship between user motivation and web site likability and usability.

Usability was defined as how easy it is for the users of the web site to find information (Nielsen, 2000). Rubin and Chisnell (2008) found that making web sites usable helps eliminate user frustration and improves profitability.

Findings of this study indicated that participants who identify as being involved in crop production were more likely to be asked for their opinion by others involved in crop production than those who are not involved in crop production. The majority of participants who responded as being involved with crop production said they were “sometimes” asked for their opinion by others involved in crop production while most of those that responded they were not involved in crop production said they are “never” or “almost never” asked for their opinion by others involved in crop production. It may seem self evident that those involved in crop production would be more likely to be asked for their opinion by others involved in crop production, however this study provides evidence to support that contention.

This study found that participants who indicated they are involved in crop production were more likely than those not involved in crop production to pass on information they find on web sites to others involved in crop production. While the majority of participants who were not involved in crop production said they “never” pass on information they find on web sites to others.

In addition, the data from this study indicates that those who completed tasks in less time were more likely to say that finding information on the web site was easy than

those who took more time to complete the tasks. Respondents who reported information was difficult to find on the web site were more likely to have completed the tasks in over 2 minutes.

The study results indicate that participants who completed tasks in two minutes or less were more likely to respond that tasks were easy to complete on the web site than those who took more than two minutes. Findings of this study indicate that if participants were able to complete tasks in less time on the web site, they were likely to also say in the survey that tasks were easy to complete. The participants who took more time in completing tasks indicated increased difficulty in the survey. Based on these results, it can be said there is a connection between taking less or more time to complete a task and the perception of ease or difficulty of the task.

The last hypothesis stated that participants who successfully complete tasks would be more likely to like the look and feel of the web site. Only the results for task 1 were statistically significant. For this task, the findings indicate that most participants responded either positively or were neutral about the web site's look and feel regardless of success with completing the task on it. This finding indicates that there was not a direct relationship between likability of a web site and its usability as was the case in the preliminary study. Participants' usability results had a mixed effect on their likability of the look and feel of the web site.

The small number of respondents in the study often meant that there were fewer than five respondents in a cell. Therefore, caution should be used in trying to generalize beyond this sample. However the pattern of differences found was similar for most of the comparisons by time, liking, and success.

Recommendations for CropWatch Stakeholders and Future Research

The primary investigator suggests doing several items differently in future similar research studies. T-shirts were used to entice passersby at Husker Harvest days to participate in this study. It is recommended that for future research items not be rewarded so participants don't get involved with this as their sole motivation.

On the subject of motivation, further testing could be done to determine if participants are motivated to find information on the web site in the study. For example, one task in this study involved finding information about the top producing wheat variety in Scotts Bluff County. Participants in the study were from several states and counties so they may not have been motivated to find information specific to Scotts Bluff County. Either a more general task should be used or some prescreening of participants could be done to determine in which county they live. Then they could be presented with different tasks depending on their own county so they are motivated to complete tasks.

The survey instrument in this study utilized a 5-point hedonic scale. However the continuum on the scale contained both terms as well as numbers. For example, the progression on the scale was like, 2, neutral, 4, dislike. It may be easier for participants if the 2, 4 were not present on the scale.

Another issue, which may have affected the results of this study, is the varying Internet connection speeds at the Husker Harvest Days event. It would be ideal if the Internet connection speed can be kept constant so it does not become a variable in the study.

This study found that those who are involved in crop production were more likely to pass on information they find on web sites to others involved in crop production and

also more likely to be asked for their opinion by others involved in crop production. Since crop producers are among the target audience for this web site, it is advised the web site be refined so a good impression can be made upon them. These crop producers are likely to communicate to others in crop production about their experience with this web site.

The usability results for the CropWatch web site revealed a pattern in user difficulty in completing tasks. It is recommended that the owners of the CropWatch web site consider improving the organization of information on the web site. The information in the usability tasks will need to be made available on the web site in a more user-friendly manner. Some participants in this study were observed leaving the CropWatch web site without realizing it while trying to find information. This could be made more obvious to users of the web site by providing a definite separation when moving off-site.

Another issue that should be addressed is the multiple search boxes on the web site. This proved to be problematic for participants in this study, as they would often wonder which one to use and why there were two separate search boxes. Rather than having two search boxes, it would more user-friendly to have one search box that searches everything.

Information used in tasks for this study must be made self-evident on the web site. This will enable the web site to become a more effective communication tool. The target audience should be able to easily and quickly determine the main purpose of a web page and how to navigate to their desired information.

It is recommended that web designers and web site content owners pay attention to the finding that there is a connection between taking less time to complete a task and

the perception of ease. Some of the information provided on the CropWatch web site may be difficult for some to understand. But as Krug (2005, p. 148) says, “experts are rarely insulted by something that is clear enough for beginners.” Information should be organized in a manner that is self-explanatory for even novices on the subject matter on the CropWatch web site. This will translate into users of the web site being able to find information more easily.

Future researchers and web designers should take note that this study did not find a relationship between web site likability and usability. This indicates that even if users say they like a web site, there is still a need for usability testing to ensure the web site is usable. It’s recommended to do usability testing to ensure information is easy to find on a web site. If this is not done, the credibility of a web site could be lessened. As Fogg (2003, p. 171) found, making a web site easier to use can help in achieving earned credibility.

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Appendix A



Web Usability and Likability of UNL Web Sites

Page 1 - Heading

Please take this brief survey to share your experience using our site and help us improve in the future.

Page 1 - Question 1 - Open Ended - One Line

[Mandatory]

Participant number (61xx)

Page 1 - Question 2 - Choice - One Answer (Bullets)

[Mandatory]

Cropwatch.unl.edu is a central resource for University of Nebraska–Lincoln Extension information on crop production and pest management. How often do you go to the cropwatch.unl.edu web site?

- ☐ Frequently
- ☐ Sometimes
- ☐ Almost Never
- ☐ Never

Page 1 - Question 3 - Open Ended - Comments Box

If you have visited the site, what type of information were you looking for?

Page 1 - Question 4 - Choice - One Answer (Bullets)

[Mandatory]

Are you involved with crop production?

- ☐ Yes
- ☐ No

Page 1 - Question 5 - Choice - One Answer (Bullets)

If yes, then which of the following best describes what you do?

- ☐ Crop Production
- ☐ Crop Consultant
- ☐ Agribusiness
- ☐ Agribusiness- Fertility/Pesticide
- ☐ Government
- ☐ Education
- ☐ Commercial Banking
- ☐ Other, please specify

Page 1 - Question 6 - Rating Scale - Matrix

[Mandatory]

How often do you seek information about crop production and pest management from the following sources?

	Frequently	Sometimes	Almost Never	Never
AM/FM Radio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Commercial Services (DTN, Doanes, Pro Farmer, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other crop producers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Internet web sites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Newspapers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Television news	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Text message reports on cell phone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Agricultural magazines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Agricultural newsletters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extension Educator	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Extension Program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page 1 - Question 7 - Rating Scale - One Answer (Horizontal)

[Mandatory]

How frequently do others involved in crop production ask you for your opinion?

Frequently	Sometimes	Almost Never	Never
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page 1 - Question 8 - Rating Scale - One Answer (Horizontal)

[Mandatory]

How frequently do you pass on information you find on web sites to others involved in crop production?

Frequently	Sometimes	Almost Never	Never
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page 1 - Question 9 - Choice - One Answer (Bullets)

[Mandatory]

Do you have a home computer?

- ☐ Yes
☐ No

Page 1 - Question 10 - Choice - One Answer (Bullets)

[Mandatory]

What is your experience browsing and/or working on internet?

- ☐ Less than 6 months
☐ Between 6 months and 1 year
☐ Between 1 to 2 years
☐ Between 2 to 3 years
☐ Between 3 to 4 years
☐ More than 4 years

Page 1 - Question 11 - Choice - One Answer (Bullets)

[Mandatory]

Do you have a cell phone or smart phone?

- ☐ Yes
☐ No

Page 2 - Question 20 - Rating Scale - One Answer (Horizontal)

[Mandatory]

Ease/difficulty of completing the tasks

Please indicate on the scale below how easy or difficult it was to complete tasks on the cropwatch.unl.edu web site.

Easy	2	Neutral	4	Difficult
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page 2 - Question 21 - Rating Scale - One Answer (Horizontal)

[Mandatory]

Headings on pages

Please indicate on the scale below how much you liked or disliked the page headings on the cropwatch.unl.edu web site.

Like	2	Neutral	4	Dislike
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page 2 - Question 22 - Rating Scale - One Answer (Horizontal)

[Mandatory]

Photographs

Please indicate on the scale below how much you liked or disliked the photographs on the cropwatch.unl.edu web site.

Like	2	Neutral	4	Dislike
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page 2 - Question 23 - Rating Scale - One Answer (Horizontal)

Search feature (if used)

Please indicate on the scale below how easy or difficult it was to use the search feature on the cropwatch.unl.edu web site.

Easy	2	Neutral	4	Difficult
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page 1 - Question 12 - Choice - One Answer (Bullets)

[Mandatory]

Do you access crop production information on the internet from your cell phone?

- ☐ Yes
- ☐ No

Page 1 - Question 13 - Choice - One Answer (Bullets)

[Mandatory]

Gender

- ☐ Male
- ☐ Female

Page 1 - Question 14 - Open Ended - One Line

[Mandatory]

Age (categorize- 19-29, 30-49, 50+)

Page 1 - Question 15 - Open Ended - One Line

[Mandatory]

County and state in which you reside

Page 1 - Question 16 - Open Ended - One Line

[Mandatory]

Years in crop production

Page 2 - Heading

The next questions are for rating the cropwatch.unl.edu web site.
Check the point on the scale that best describes your feeling about the look and feel of the web site. Your opinion is important. An honest expression of your personal feeling will help us.

Page 2 - Question 17 - Rating Scale - One Answer (Horizontal)

[Mandatory]

Overall web site

Please indicate on the scale below how much you liked or disliked the cropwatch.unl.edu web site.

Like	2	Neutral	4	Dislike
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page 2 - Question 18 - Rating Scale - One Answer (Horizontal)

[Mandatory]

Look and feel of the web site

Please indicate on the scale below how much you liked or disliked the look and feel of the cropwatch.unl.edu web site.

Like	2	Neutral	4	Dislike
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page 2 - Question 19 - Rating Scale - One Answer (Horizontal)

[Mandatory]

Ease/difficulty of finding information

Please indicate on the scale below how easy or difficult it was to find information on the cropwatch.unl.edu web site.

Easy	2	Neutral	4	Difficult
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Appendix B



EXTENSION
INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
Communications and Information Technology

INFORMED CONSENT FORM

Web Usability and Likeability of UNL Web Sites

The purpose of this project is to determine how the University of Nebraska, Institute of Agriculture and Natural Resources, or Extension websites are meeting the needs of our users. The information gained from this study will help us to improve our websites to be more usable for our target audience of those involved with crop production. We are testing the website to see if it is easy to navigate and find information. We are not testing you nor your ability to complete the tasks.

Anyone age 19 and over may participate in this study. You will be asked to complete tasks on the University of Nebraska, Institute of Agriculture and Natural Resources, or Extension websites. We will record both what you are doing on the computer as well as your reactions and what you are saying while you are completing the tasks.

You may ask any questions concerning this research and have those questions answered before agreeing to participate, or during the study. The following contact information is provided if you have additional questions. The primary investigators are Dr. Linda Shipley (402-472-8232) and Vishal Singh (402-472-7856). Sometimes study participants have questions or concerns about their rights. In that case, you should call the University of Nebraska Lincoln Institutional Review Board at (402) 472-6965. You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators and the University of Nebraska-Lincoln. There are no known risks involved in participating in this research.

Participation in this study will require approximately 5-10 minutes of your time. Steps for the testing include:

1. You will sit in front of our computer which is opened to one of the websites we are testing.
2. We will give you written tasks on a sheet of paper to complete.
3. As you work on the tasks, we will be recording your actions on the computer as well as video taping you.
We ask that you "think out loud"-- that is, that you talk to us as you go through the website -- so we know what you are thinking as you work on the task.

Information obtained during this study will be summarized and provided to UNL administrators. The positive or negative results of this study will not affect the grades of students working on this study. Information from this study may also be presented at professional, education, communication and technology meetings, internally within UNL or published in a professional journal. Personal information will not be used in the summary reports. Video files may be shown in presentations about this study. Video files will be assigned a number and will not be associated with your name. Only from face recognition would you be identifiable. The data will be stored in a locked cabinet in the investigator's office for 5 years.

By signing below, you are indicating your consent to participate in the research. You will be given a copy of this form to keep.

Thank you for your time and input.

Signature: _____ Date: _____

Agricultural Communications Building / P.O. Box 830918 / Lincoln, NE 68583-0918 / (402) 472-2821 / FAX (402) 472-0025

UNIVERSITY OF NEBRASKA-LINCOLN, COOPERATING WITH COUNTIES AND THE U.S. DEPARTMENT OF AGRICULTURE

Appendix C

1. **You want to receive weekly updates from CropWatch. Find the form to sign up.**

Goal: Left menu HOME- Subscribe to the “Get CropWatch Updates by Email”

2. **The 2009 harvest is around the corner. What are the recommended insecticides you could use to clean and treat your grain bin?**

Answer:

- a. CropWatch homepage > Left navigation Home - Archive > in middle content area - CropWatch Newsletter No. 09-22, August 7, 2009 > middle content area on Grain Storage - Clean and Treat Bins to Protect Your Crop Investment to
<http://cropwatch.unl.edu/web/cropwatch/archive?articleId=989014>
 article name is
 August 7, 2009
 Preharvest Preparations
 Clean And Treat Grain Bins to Protect Your Crop Investment
- b. If they didn't pay attention to the 2009 in the task, they may end up on older information. The search didn't put the newest at the top of the list.
http://cropwatch.unl.edu/web/cropwatch/archive?articleId=.ARCHIVES.2007.CROP21.GRAIN_STORAGE.HTM

3. **How many dollars per acre could you save on costs (fuel, labor, machinery wear) if you eliminated one trip through the field this season?**

Answer:

CropWatch homepage >> Surviving High Input Prices (green & blue graphic button on the bottom left of the home page under Related Topics navigation menu item) >> middle content area under Production Practices – link that says “Eliminate One Field Operation (Save \$8-\$10/ acre)” to
[http://cropwatch.unl.edu/web/cropwatch/archive?articleId=.INPUT\\$.FEWERFIELDOPS.HTM](http://cropwatch.unl.edu/web/cropwatch/archive?articleId=.INPUT$.FEWERFIELDOPS.HTM)

4. **You live in Scotts Bluff County and want to plant the top producing wheat variety from the most recent UNL testing. What is that variety?
 (Answer: NE03490)**

Answer:

- a. [CropWatch homepage > Wheat in left navigation menu >> Variety/Biotechnology in the left navigation > Variety Testing box in right column OR from a link -- Check Wheat Variety Testing results from UNL

-- about midway down on page in content area > content area - 2009
Panhandle:Scotts Bluff County Rainfed - to results top line in the excel
file sheet] ((I would say if they found the spreadsheet they were very
successful!)

- b. They may search for it and find it that way – if they find answer of
NE03490, it is good!

Appendix D

ease_info * tsk2_time

Crosstab

			tsk2_time		Total
			2 minutes or less	More than 2 minutes	
ease_info	1.00	Count	2	1	3
		% within ease_info	66.7%	33.3%	100.0%
	2.00	Count	9	2	11
		% within ease_info	81.8%	18.2%	100.0%
	3.00	Count	4	13	17
		% within ease_info	23.5%	76.5%	100.0%
	4.00	Count	2	13	15
		% within ease_info	13.3%	86.7%	100.0%
	5.00	Count	0	4	4
		% within ease_info	.0%	100.0%	100.0%
	Total	Count	17	33	50
		% within ease_info	34.0%	66.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	18.382 ^a	4	.001
Likelihood Ratio	19.523	4	.001
Linear-by-Linear Association	13.938	1	.000
N of Valid Cases	50		

a. 5 cells (50.0%) have expected count less than 5. The minimum expected count is 1.02.

Appendix E

ease_info * tsk3_time

Crosstab

			tsk3_time		
			2 minutes or less	More than 2 minutes	Total
ease_info	1.00	Count	3	0	3
		% within ease_info	100.0%	.0%	100.0%
	2.00	Count	8	3	11
		% within ease_info	72.7%	27.3%	100.0%
	3.00	Count	5	12	17
		% within ease_info	29.4%	70.6%	100.0%
	4.00	Count	5	10	15
		% within ease_info	33.3%	66.7%	100.0%
	5.00	Count	1	3	4
		% within ease_info	25.0%	75.0%	100.0%
Total	Count	22	28	50	
	% within ease_info	44.0%	56.0%	100.0%	

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.249 ^a	4	.036
Likelihood Ratio	11.511	4	.021
Linear-by-Linear Association	6.937	1	.008
N of Valid Cases	50		

a. 5 cells (50.0%) have expected count less than 5. The minimum expected count is 1.32.

Appendix F

ease_info * tsk4_time

Crosstab

			tsk4_time		Total
			2 minutes or less	More than 2 minutes	
ease_info	1.00	Count	3	0	3
		% within ease_info	100.0%	.0%	100.0%
	2.00	Count	9	2	11
		% within ease_info	81.8%	18.2%	100.0%
	3.00	Count	8	9	17
		% within ease_info	47.1%	52.9%	100.0%
	4.00	Count	7	8	15
		% within ease_info	46.7%	53.3%	100.0%
	5.00	Count	0	4	4
		% within ease_info	.0%	100.0%	100.0%
	Total	Count	27	23	50
		% within ease_info	54.0%	46.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.333 ^a	4	.023
Likelihood Ratio	14.327	4	.006
Linear-by-Linear Association	9.355	1	.002
N of Valid Cases	50		

a. 4 cells (40.0%) have expected count less than 5. The minimum expected count is 1.38.

Appendix G

ease_task * tsk2_time

Crosstab

			tsk2_time		Total
			2 minutes or less	More than 2 minutes	
ease_task	1.00	Count	2	2	4
		% within ease_task	50.0%	50.0%	100.0%
	2.00	Count	8	2	10
		% within ease_task	80.0%	20.0%	100.0%
	3.00	Count	5	13	18
		% within ease_task	27.8%	72.2%	100.0%
	4.00	Count	2	12	14
		% within ease_task	14.3%	85.7%	100.0%
	5.00	Count	0	4	4
		% within ease_task	.0%	100.0%	100.0%
	Total	Count	17	33	50
		% within ease_task	34.0%	66.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.682 ^a	4	.005
Likelihood Ratio	15.797	4	.003
Linear-by-Linear Association	10.122	1	.001
N of Valid Cases	50		

a. 6 cells (60.0%) have expected count less than 5. The minimum expected count is 1.36.

Appendix H

ease_task * tsk3_time

Crosstab

			tsk3_time		Total
			2 minutes or less	More than 2 minutes	
ease_task	1.00	Count	4	0	4
		% within ease_task	100.0%	.0%	100.0%
	2.00	Count	8	2	10
		% within ease_task	80.0%	20.0%	100.0%
	3.00	Count	4	14	18
		% within ease_task	22.2%	77.8%	100.0%
	4.00	Count	5	9	14
		% within ease_task	35.7%	64.3%	100.0%
	5.00	Count	1	3	4
		% within ease_task	25.0%	75.0%	100.0%
	Total	Count	22	28	50
		% within ease_task	44.0%	56.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.791 ^a	4	.005
Likelihood Ratio	16.768	4	.002
Linear-by-Linear Association	8.270	1	.004
N of Valid Cases	50		

a. 5 cells (50.0%) have expected count less than 5. The minimum expected count is 1.76.

Appendix I

ease_task * tsk4_time

Crosstab

			tsk4_time		Total
			2 minutes or less	More than 2 minutes	
ease_task	1.00	Count	4	0	4
		% within ease_task	100.0%	.0%	100.0%
	2.00	Count	7	3	10
		% within ease_task	70.0%	30.0%	100.0%
	3.00	Count	11	7	18
		% within ease_task	61.1%	38.9%	100.0%
	4.00	Count	5	9	14
		% within ease_task	35.7%	64.3%	100.0%
	5.00	Count	0	4	4
		% within ease_task	.0%	100.0%	100.0%
	Total	Count	27	23	50
		% within ease_task	54.0%	46.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	11.385 ^a	4	.023
Likelihood Ratio	14.471	4	.006
Linear-by-Linear Association	10.477	1	.001
N of Valid Cases	50		

a. 5 cells (50.0%) have expected count less than 5. The minimum expected count is 1.84.

Appendix J

like_lookfeel * tsk1_success**Crosstab**

		tsk1_success		
		Complete	Incomplete	Total
like_lookfeel	1.00 Count	3	4	7
	% within like_lookfeel	42.9%	57.1%	100.0%
	2.00 Count	12	4	16
	% within like_lookfeel	75.0%	25.0%	100.0%
	3.00 Count	7	16	23
	% within like_lookfeel	30.4%	69.6%	100.0%
	4.00 Count	1	1	2
	% within like_lookfeel	50.0%	50.0%	100.0%
	5.00 Count	2	0	2
	% within like_lookfeel	100.0%	.0%	100.0%
Total Count		25	25	50
% within like_lookfeel		50.0%	50.0%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.665 ^a	4	.046
Likelihood Ratio	10.720	4	.030
Linear-by-Linear Association	.092	1	.761
N of Valid Cases	50		

a. 6 cells (60.0%) have expected count less than 5. The minimum expected count is 1.00.

Appendix K

production * asked_foropinion

Crosstab

		asked_for opinion				
		Frequentl y	Sometime s	Almost Never	Never	Total
production Yes	Count	2	24	7	3	36
	% within production	5.6%	66.7%	19.4%	8.3%	100.0%
No	Count	0	3	4	8	15
	% within production	.0%	20.0%	26.7%	53.3%	100.0%
Total	Count	2	27	11	11	51
	% within production	3.9%	52.9%	21.6%	21.6%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	15.386 ^a	3	.002
Likelihood Ratio	15.643	3	.001
Linear-by-Linear Association	14.656	1	.000
N of Valid Cases	51		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is .59.

Appendix L

production * pass_on_info

Crosstab

		pass_on_info				
		Frequentl y	Sometime s	Almost Never	Never	Total
production Yes Count n		3	24	6	3	36
	% within production	8.3%	66.7%	16.7%	8.3%	100.0%
No Count		0	5	2	8	15
	% within production	.0%	33.3%	13.3%	53.3%	100.0%
Tot Count al		3	29	8	11	51
	% within production	5.9%	56.9%	15.7%	21.6%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.335 ^a	3	.004
Likelihood Ratio	13.241	3	.004
Linear-by-Linear Association	11.738	1	.001
N of Valid Cases	51		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is .88.

Appendix M

seek_web sites * pass_on_info

Crosstab

		pass_on_info				
		Frequentl y	Sometimes	Almost Never	Never	Total
seek_web sites	Frequentl y Count % within seek_web sites	2 15.4%	8 61.5%	1 7.7%	2 15.4%	13 100.0%
	Sometim es Count % within seek_web sites	1 5.6%	14 77.8%	2 11.1%	1 5.6%	18 100.0%
	Almost Never Count % within seek_web sites	0 .0%	6 54.5%	3 27.3%	2 18.2%	11 100.0%
	Never Count % within seek_web sites	0 .0%	1 11.1%	2 22.2%	6 66.7%	9 100.0%
	Total Count % within seek_web sites	3 5.9%	29 56.9%	8 15.7%	11 21.6%	51 100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	20.805 ^a	9	.014
Likelihood Ratio	20.702	9	.014
Linear-by-Linear Association	12.369	1	.000
N of Valid Cases	51		

a. 12 cells (75.0%) have expected count less than 5. The minimum expected count is .53.

Appendix N

UNL

Visitor

Prospective Student

Current Student

Faculty & Staff

Business, Industry & Government

UNL Web

GO

UNL Quick Links


GO

UNL > IANR > UNL Extension > CropWatch > Home

cd/people/weather/com

CropWatch

Nebraska crop production & pest management information



Navigation



Home

About, Archives, Contacts, Subscribe, Weather (GDD, ET), Ag Links

Corn

Forages

Sorghum

Soybeans

Sugar Beets

Wheat

Bioenergy Crops

Other Crops

Related Topics

Economics & Marketing, Organic, Pest Management, Site Specific Management, Soil Management & Tillage/No-Till Systems, Variety/Genetic Improvement



Information and recommendations on cutting crop input costs and improving your bottom line in 2009

Related Links

Pesticide Education

IANR

UNL Extension

Agricultural Research Division


CASNR

September 11, 2009 Issue



From Harvest to Planting

Custom wheat crews working near Hemingford in August. With harvest completed and planting to begin soon, growers should check out the new CropWatch Wheat page. See [MORE](#)



The Future of Ag

Stop by IANR's Husker Red building at Husker Harvest Days Sept. 15-17 to see what's coming next for Nebraska farms. See [VIDEO](#) & [MORE](#)

Weather Alert

Northeast Nebraska could see a killing freeze Sept. 24-29. See [MORE](#)

Crop Reports

Nebraska Corn Harvest Predicted to be a Record High

USDA NASS: Nebraska Crop Conditions

Quality Issues Related to Hail Damaged Crops (Links to Sept. 9, 2009 ISU Newsletter) [NEW](#)

Weather & Forecasts

Next 2 Weeks Predicted to be Frost-Free

Weather Alert: Freeze Possible in Northeast NE Sept. 24-29

Wheat Production

Heavy Grasshopper Presence Warrants Caution for Winter Wheat Planting

Soybean Production

2nd Generation Bean Leaf Beetles Active

Harvest Soybeans at 13% Moisture (Save \$11.48/acre)

Organic Production

USDA to Provide More Cost-Share Funds for Nebraska Organic Industry

Forage & Alfalfa

A Guide to Harvesting Alfalfa During The Winterizing Period

Consider Cover Crops after Early Bean and Corn Harvests

Extension News & Programs

Soil Fertility Specialist Joins WCREC

2009 Soybean Production Practices Tour Sept. 14

Upcoming Events

No-till Cover Crops Field Day Sept. 23 near Bladen
Sep 23, 9:00 AM, Brian & Keith Berns Farm

Platte River Basin Science and Resource Symposium
Oct 14, 2:00 PM, Kearney Ramada & Convention Center

AG-optional Women's Conference
Nov 20, 8:00 AM, Lifelong Learning Center

Annual Bean Day - Mitchell, Nebraska
Jan 12, 9:30 AM, Mitchell Event Center & Fair Grounds

Crop Production Clinic
Jan 19, 9:00 AM, TBA

[More events...](#)


AgNews

John Owens, Harlan vice chancellor of the Institute of Agriculture and Natural Resources at UNL, will step down June 30, 2010. [MORE](#)

USDA scientists have found that a byproduct of corn processing can be used as an extender for plywood glues, enhancing their adhesive action. [MORE](#)

Leave more residue and store more soil moisture by switching from a combine to a stripper header for wheat and millet. [MORE](#)

Market Journal



Television for Ag Business Decisions

Timely stories for crop and livestock producers on markets, risk management, ag policies, and more.

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