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Assessment of the Format, Content, and Potential Uses of the AgClimate Website and Crop Yield Risk Assessment Tool by Extension Agents in North Florida

Authors: Jim Barham, Yael Gichon, Shoana Humphries, Frederick Rossi,
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Publication of the Southeast Climate Consortium Technical Report Series:
SECC-04-001, Gainesville, FL, Spring 2004



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SUMMARY

This report provides a synthesis of results gathered from student-conducted interviews with Extension agents in North Florida to evaluate the AgClimate website and yield tool. The website and tool provide climate-based information associated with the El Nino Southern Oscillation (ENSO) and its related effects on agricultural production. The main objective was to determine the efficacy of the website and tool in disseminating this information to potential users. As the website and tool are still under development, feedback from intended users is necessary for further refinement of these products. While much of the website and tool contain useful and relevant material for some users, there is considerable room for improvement in the format, content, and ability to reach the intended audience.

ACKNOWLEDGEMENTS

We thank the following farmers and members of the Cooperative Extension Service who gave generously of their time and ideas during our sondeo discussions: Gary Brinen, Kevin Campbell, Anthony Drew, Rose Koenig, Clay Olson, Cynthia Sanders, Mark Shelby, Paulette Tomlinson, and Chris Vann

1.0 INTRODUCTION

1.1 Background and Purpose of Study

A consortium of southeastern Universities (University of Florida, Florida State University, University of Miami, Auburn University, University of Georgia and University of Alabama at Huntsville) is involved in research to bridge the gap between current capabilities of climate forecasts and the needs of potential users for this information. Recent advances in climate prediction, based mostly on “El Nino-Southern Oscillation” (ENSO) occurrence and increased access to information worldwide, offer the potential for farmers to make informed decisions that can decrease unwanted impacts or take advantage of expected favorable conditions. Toward this end, a website and accompanying tool is currently being developed to facilitate the transfer of climate prediction-related information to Extension agents and farmers in a format that can be readily accessible and useful.

The purpose of this study was to interview a number of Extension agents in several of Florida’s northern counties and get their feedback on the AgClimate website and Crop Yield Risk Assessment Tool. With Extension agents as our target audience, this study was designed to assess:

- The “user-friendliness” of the website/tool
- The content and quality of the information provided in the website/tool
- The usefulness of the website/tool to farmers and Extension agents
- The potential users of the website/tool, including different types of farmers and other stakeholders.

1.2 Study Area

This study builds on the previous work of Cabrera et al (1999) that investigated the potential use of long-range climate forecasts by agricultural Extension agents in Florida. One of the major findings of this report was that farmers in the northern part of Florida are better positioned to respond to climate predictions, due to the more diverse and smaller operations found in this region, compared to those in the south. Given this consideration, Extension agents from northern counties were selected as the primary target group of this study. Over the course of a two-week period, eight Extension agents and one organic grower were interviewed. The interviewees are from the following counties: Alachua, Bradford, Sarasota, Lafayette, Levy, Gilchrist, Taylor, and Madison.

2.0 METHODOLOGY

Interviews were conducted using the methodology known as “sondeo.” The sondeo (Hildebrand, 1981) is a team survey process that was developed to provide information rapidly and economically about agricultural and rural problems. It is structured around a series of informal, conversational interviews between the team and stakeholders. It is a multidisciplinary process from data collection through report writing, with each team ideally including people from the social and the agricultural sciences. This approach strives to avoid a typical problem of “team” reports in which professionals from separate disciplines write individual reports based on their specialties and then combine them without much cross fertilization. In a sondeo, data are shared among the different teams and report writing is done as a group so that observations are confirmed, debated and analyzed within teams, as well as with members of the other teams. The results may be quantified or not, but the accuracy of the findings is strengthened by the crosschecking process. Using this process, the final report may be completed within days of the final fieldwork, assuring the timeliness of the results.

2.1 Data Collection

The sondeo was carried out from January 29 to February 11 by six graduate students from the spring course AEE 5232 (Farming Systems Research and Extension). The students brought to the study a diverse research background in the fields of anthropology, forestry, natural resource management, agricultural economics, and entomology. Sondeo members were broken into teams of two or three for each interview. Interviews were conducted as informal conversations. After a team introduced itself and explained the subject of the research, the stakeholder and the team informally discussed different aspects of the web page and the tool. This open-ended approach enabled topics to emerge and be pursued that might have been missed if the researchers had used only previously formulated questions. Notes were not taken in the sondeo interviews. Following each interview, the team members wrote individual notes, then they compared them and wrote a joint report for the interview.

2.2 Data Analysis

During class periods, the joint reports from each team were shared and thoroughly discussed among all the teams. As each team presented its findings, they could be clarified, challenged or contrasted with the results of the other teams. Everyone was expected to take notes on the findings of each team, as all members were responsible for the findings of all the teams. This process of reporting and discussion served as the opportunity to begin noting trends, gaps in information and new questions to be pursued.

2.3 Report Writing

The report structure was discussed and agreed upon by all of the team members. Two-person teams took responsibility for writing drafts of each section of the report. The entire sondeo team worked together to edit and produce the final report. As the group discussed each section, changes were made to the document. Class members wrote conclusions and recommendations collectively at the time of editing.

3.0 RESULTS

3.1 The AgClimate Website

This section of the report provides a summary of information about the format and content of the “AgClimate” website that was collected during the sondeo. In general, the website received varying amounts of praise. Although many recommendations were forthcoming, particularly with regard to the content of the website, *the typical agricultural-crop Extension agent liked the site, thought it was useful, and found it to be rather user-friendly*. These agents seemed to be comfortable with computers, possessing the requisite website navigation skills necessary to access the information presented by this website.

Curiously, the more critical reviews came from participants more adept at using computers. For example, a particular Extension agent was very critical and had many comments/suggestions for improving the website based on his in-depth familiarity and expertise with computers and websites. (Please review the Appendix for specific comments and recommendations from this agent.) Two other reviewers (who seemed to rely less on computers, in general) questioned the applicability of the website to their concerns, appeared to be confused with the overall intent (or goal) of this website, and inquired about who the intended audience for this product actually was.

Although one participant stated that producers currently do not make decisions based on ENSO forecasts, many agreed that consideration and/or use of the information provided by this website would be important for farmers (and Extension agents). Some important questions raised that impinge upon the potential use/adoption of this website were:

- How accurate are the forecasts? Was it accurate for this past year? Farmers are going to want to know how reliable the predictions have been.
- Where will this website be located? Inside of FAWN?
- Will the ENSO forecasts be updated periodically? (For example, will forecasts be updated that reflect an increased accuracy of predictions as the date of the next ENSO phase approaches?)

3.1.1 Format of the website

Respondents were split in their assessments of whether the site is user-friendly or not. Approximately half found it easy to use and to be laid out fairly well, while the others did not. In terms of both the layout and the explicit links to information, there was general agreement about the necessity of keeping user operations simple if farmers are expected to use this site. The reason for this is that *most farmers want specific information quickly*. They do not want to dig through layers of extraneous information, or browse through various pages of the site.

Specific comments and suggestions regarding the format include:

- One Extension agent said that it was easy to get to specific crop information pages (through the links on the “Crop Management Tools” page), and that farmers would like the ease of accessibility that this example displays.
- Another agent stated that the selection of a commodity crop from the “Crop Management Tools” page sends the user to a worthless page (e.g., “Important Tomato-Producing Counties in the SECC Region”) that does not add any real information – it is merely an extraneous page that complicates and slows navigation through the website.
- Also, the sub-heading reprinted in the parentheses above might be insulting to someone growing tomatoes in a county that is not listed (highlighted) as “important.”
- There was general consensus that all tables and graphs need to be clearly labeled. In addition, several participants questioned the source of data for different tables and graphs, and suggested that this information should be noted.
- The CLIMATE link at the top of the homepage for any given crop needs to be featured more prominently, as this is the core information of the website

In general, most respondents agreed that explanatory information and recommendations presented on the website need to be more explicit, use less “academic” language, and provide better instructions (e.g., inside the website, with the tools, etc.). Some interviewees also expressed that the AgClimate homepage should state more explicitly how this website differs from others, because if not, farmers may simply conclude that it is “just another website” despite containing potentially useful information for producers and other users.

3.1.2 Content of the website

3.1.2.a What is ENSO?

Generally speaking, most farmers are going to understand the difference between climate and weather, and are likely be familiar with the term “El Niño” – although perhaps only to the point that they associate it with “weird” weather, according to one Extension agent. However, if farmers do know somewhat more, they may still tend to get the associated weather patterns for El Niño and La Niña confused.

However, the term “ENSO” itself will probably be meaningless to most farmers. Almost all of the interviewees made comments about the ENSO acronym, generally displaying confusion (and distraction) by the repeated use of, and emphasis on, this academic term. The general consensus is that specific reference to El Niño and/or La Niña should substitute for ENSO whenever possible; one agent suggests the generic term “Climate Pattern” can be used in place of the ENSO acronym.

On a positive note, one agent stated that the homepage link “About El Niño/La Niña” provided good background information/explanation of the ENSO phenomenon. This generally reflected the dichotomy between what farmers would want/use vs. what Extension agents would want. *Farmers want specific and concise information*, whereas Extension agents would be much more likely to access additional detailed information located elsewhere through a link.

3.1.2.b Increased forecast detail required

A prominent concern was the ambiguous weather descriptions corresponding to the three different ENSO phases. For example, descriptors such as “strong wet”, “strong cold”, “weak warm” were confusing at best, and meaningless at worst. Interviewees felt that, at the very least, farmers would want much greater detail in terms of the intensity of expected rain or temperature levels for a particular forecasted phase; but *what they really need to know is the expected ranges of rainfall and temperature, and information about freezes*. It was suggested that average ranges in temperature and precipitation, perhaps by county or regional zones, would be much more informative and clear.

Many respondents discussed the importance of frost/freeze information and the necessity of having the website display this for planning purposes. One agent stated such information would be extremely useful, but was concerned that this website offered little reliability with regard to freeze forecasting at this point in time.

3.1.2.c Discernment of ENSO phases

Another main concern regarding the forecasted ENSO phases is the need to have explicit dates attached to both the current phase and to the next (forecasted) phase. This is important for every instance where the current phase is shown in the website (e.g., on the homepage and in the management guidelines). This addresses the request for greater clarity in terms of users being able to distinguish between the two (current vs. next forecast) phases, and the information/recommendations associated with each.

In addition, to facilitate the understanding of how management practices differ between the phases of ENSO, it was suggested that recommendations for all ENSO phases be contained in one table, with the current phase highlighted. For example, the planting recommendations for El Niño, La Niña, and Neutral could all be exhibited in one table, so users can compare the information/recommendations across phases.

3.1.2.d Graphical representations

Much attention was directed towards the various graphs of the website/yield tool, which included both criticism and suggestions for additional graphs. For example, some participants inquired about the graph entitled “Influence of ENSO Phases on Florida Tomato Yields” (from the “Historical Yield Analysis” link), which presents differences in average yield between El Niño, La Niña, and Neutral. Questions included: What is the information based on? What does “Neutral” really mean?

Some agents were interested in historical rainfall and other historical climate data (e.g., temperature, frost, etc.). It was suggested that such data ought to be presented graphically with specific reference to El Niño/La Niña/Neutral years, and plotted against

historical yield data (as opposed to simulated data) in order to visually show/explain the physical connections this website seeks to address. These graphs could be displayed on the web pages associated with the “CLIMATE” link that is located at the top of the homepage. *Farmers tend to think in terms of their past experiences – thus, such graphs would help them understand the other information presented, and would probably facilitate use of the website.*

3.1.2.e Management guidelines

Interviewees were generally enthusiastic about the management guidelines and recommendations based on ENSO forecasts, stating that the relevance of the material made it useful to both Extension agents and producers. Activities/information contained on the various crop web pages (e.g., planting dates, land preparation, insurance options, etc.) were discussed in detail by participants, which indicates the importance of this information to them. For example, some agents thought this information would help farmers to optimally allocate crop rotations/crop mixes, and make related land leasing decisions.

Several agents also made suggestions regarding how management guideline information should be augmented/specified to address the particular crops grown in their counties. For instance, land preparation details for cucumbers, melons, etc. are needed for north Florida counties with considerable amounts of non-irrigated land, such as Alachua County. To this end, a general grouping under the “cucurbit family” would probably suffice because many details will be similar for the different species (e.g., planting dates).

3.1.2.f Market information needed

Several participants mentioned the lack of price/market information for commodity crops and timber/wood products. Several agents stressed that markets, as opposed to climate, tend to drive production decisions. They suggested that links to market information for the Southeast, as well as other important regions (e.g., Mid-west), would be good additions to the website. This is because some producers may be affected by crop/livestock/input prices in other regions of the country.

3.2 Crop Yield Risk Assessment Tool

This section of the report provides a summary of information about the format and content of the Crop Yield Risk Assessment Tool. Generally speaking, Extension agents found the yield tool to have great potential both for use by Extension as well as for farmers. With the understanding that this tool is still under construction, the agents made several suggestions concerning how both the “user-friendliness” and substantive content of the tool could be improved. By far the most common criticism of the yield tool is that there are no clear instructions on how to use it. *As the yield tool now stands, most Extension agents would have great difficulty in navigating their way through it.* Once sondeo members explained how to use the tool, most Extension agents were able to grasp the utility of the tool and how they and farmers could effectively use it. The following subsections detail the agents’ comments regarding the yield tool.

3.2.1 Format

Issues concerning format of the yield tool focused primarily on the lack of clarity or confusion with the information presented. In general, there needs to be greater explanation of what is being visually represented. Most of the Extension agents appreciated both the numerical and bar graph representation of yield probabilities, but several agents felt that the tool lacked the information on how exactly such data should be interpreted. Specific comments regarding the format of the yield tool included:

- The naming of this tool (Crop Yield Risk Assessment Tool) is too academic; consider a simpler name for this tool.
- There is no way to know how to input multiple planting dates into the graph.
- The label “percentage” on the Y-axis is difficult to read.
- The labels “probability” and “probability of exceeding” are confusing. Several Extension agents recommended that these names be changed for clarity purposes.
- In the numerical graph, the range label should be changed to yield since this better reflects what is being represented.
- Under tomato soil types, “haplaqualfs” means nothing to most Extension agents.
- There is a need to explain where information comes from and how tables are derived (i.e., how are crop yields derived?).
- Given the fact that partial color blindness is not uncommon – particularly in older men – considerations should be given to changing bar graphs to patterns so that they are more easily distinguished when putting in multiple planting dates.

3.2.2 Questions Concerning Content

As several points just mentioned illustrate, Extension agents were very interested (and very concerned) about how the information was derived for this tool. If they are to use this tool with farmers, they must be assured that the information transferred is both reliable and accurate. Some of the more pressing questions included:

- Where is this information coming from?
- How accurate is the information given?
- How are the crop yields calculated?
- What models are being used?
- Will information of predicted yields be compared with actual yields from previous years?
- What is the timeframe for the climate forecast yield predictions?
- Will these predictions change often, and how often would one be expected to check this tool?
- How often would this tool be updated?

3.2.3 Further Comments and Suggestions

Many Extension agents made comments on information they felt was missing or misrepresented in the yield tool. One Extension agent identified data problems with the

probability graph in regard to peanut production. When the agent punched in a higher average yield than the graph identified, the program did not handle it well (there were gaps in the yield columns; the “more” column peaked on the scale). Likewise, certain crops have earlier planting dates than represented in the tool – the specific example given was in regard to peanuts in Madison County with planting dates that begin as early as April 15. Other suggestions regarding the tool are:

- Include price or market effects (or responses) to ENSO
- Include graphs of yield for a crop over the four climate options (i.e., El Nino, La Nina, Neutral, all years) on one page.
- Include a graphical presentation of historical yields vs. past ENSO events.
- The best time to plant should be highlighted; farmers want to know what their chances are for getting the highest yield.
- Additional, similar crop models for forestry, livestock, cucurbits, and perennial peanuts should be included in the tool.

3.3 Potential Users and Associated Agricultural Activities

In this section, information is presented regarding Extension agents’ opinions on the types of management practices and commodities that may be more or less influenced by climate predictions. Information is also presented on the potential users of the website and tool.

3.3.1 Specific Management Practices

Some agents felt as though management practices would not change regardless of the climate predictions. They suggested that decisions seem to be more weather than climate-based. At the same time, several agents commented on specific areas of management where the information contained in this web site and yield tool could be useful. This section summarizes a few areas of management that were addressed during the sondeo.

3.3.1.a Pest and disease management

If farmers know in advance that precipitation is going to be greater or less than normal, they can take measures to minimize damage to their crops. For example, if it is going to be wetter, they might decide to apply more fungicide, or if it is going to be drier, they might apply more insecticide. Farmers might also enhance their disease management practices or use disease resistant varieties depending on what type of year it is going to be.

3.3.1.b Irrigation

In counties where irrigation is a fairly common practice or mandatory, management guidelines and proposed alternative options to irrigation are not going to be relevant to farmers. However, this information could be useful in relation to irrigation decisions around crop mixes and land allocation.

3.3.1.c Market commitments and management

Farmers have a series of commitments for delivering their products, which decreases their flexibility to adopt changes in management practices based on climate. This is

exacerbated by the fact that agricultural businesses today cannot have large margins of production deficits, as profit margins are very slim. Production errors could leave them out of business. It was also mentioned that many products have very specific market windows, so planting dates might not be flexible.

3.3.1.d Land use

A possible use for medium-term climate information would be in the decision of how to distribute farm fields. For example, farmers could plant in higher fields to avoid flooding if they knew that it was predicted to be a wetter year.

3.3.2 Where producers obtain information

3.3.2.a Internet

In general, most Extension agents agreed that many producers use the Internet for production-related information, for example to check daily fluctuations in the price of beef or to receive emails from extension agents. Some agents stated that 80 to 100 percent of the farmers in their counties use the Internet for farming-related information. Others mentioned potential differences in the use of the Internet among different segments of the farmer population. For example, perhaps large farmers and hobby farmers use it more frequently than medium size farmers. It was also stated that since women and children might be more likely to use the Internet, they could be targeted as users of the website and tool. This could be especially important, as wives of male farmers tend to handle many of the logistical details involved in the operation of the farm. Finally, a concern was also expressed that since the average age of farmers is rising (it is currently around 51), older farmers with less computer experience may not be comfortable using the technology of the yield tool.

3.3.2.b Extension

Farmers would be more likely to use the website and tool at the Extension office, co-op, or feed store, than on their own. With the website in its current form, most farmers will still rely on some intermediary to navigate this site and feel comfortable with the information that is presented. Extension would be the ideal link between this information and farmers.

3.3.3 Farm size and type of production

Larger farmers are less flexible in responding to climate predictions. Therefore, the options provided for different climate years in this tool might not be relevant to larger farmers. For example, the forecasting tool recommends the use of alternate crops that would be better suited for the different climate years. However, larger farmers with mono-cropping practices require specialized equipment, which would not allow them to diversify their crops based on climate forecasts.

A problem exists because market demand is weighed more heavily than planting dates in relation to climate. Market is the primary driver of planning, not climate. Therefore, even if the recommendation is not to plant early, farmers will still plant early and get lower yields since the early crop will have higher prices.

The varieties in the tomato recommendations are ones used by large growers. Therefore, large growers who produce high dollar commodity crops would use this information rather than small producers that have a direct market. In many cases, large tomato producers are not actually the ones farming, but rather hire crop advisors to guide management decisions.

The lone farmer interviewed, a small organic producer, was generally concerned that this site offered little to small growers because the website seemed to address only large-scale commodity crops. Small farmers are not interested in any one particular variety because they mix crops and varieties in order to diversify and minimize risk. Management practices in relation to pests and disease depending on climate would be useful to a small producer, as would more detailed frost information.

3.3.4 Commodity specific comments

3.3.4.a Vegetables and fruits

In order to make the website and tool relevant for a wider range of producers, it was recommended that the list of fruits and vegetables addressed be augmented. Specific recommendations were to include: cucurbits, watermelon, peanuts, and lettuce. However, it was stressed again that, *while producers would consider climate predictions, they manage these commodities primarily according to market demand.*

3.3.4.b Cattle

For cattle management, climate information is relevant to decisions regarding the production of forage and estimating pasture yield. Predictions regarding the expected precipitation for the next season would help producers determine whether or not to plant forage crops, the varieties to plant, and dates for planting. In addition, if yield is estimated to be low due to decreased precipitation and/or changes in temperature, producers may decide to wean calves earlier than normal and stocker ranchers may decide to adjust their orders for commodity feed or the number of calves that they receive.

A specific forage crop that several Extension agents recommended for inclusion in the website and tool is perennial peanut. This has become an important cash crop in Madison and Taylor counties. Climate prediction could be very helpful for the production of perennial peanuts, especially regarding irrigation during the first three years when the root system is being established.

3.3.4.c Horses (both for recreational and breeding purposes):

Climate predictions could help equestrian operations take precautionary measures regarding animal health. Some diseases are affected by climate, such as encephalitis, which is transmitted by a mosquito that is more abundant in wetter seasons. Climate prediction would allow producers time to take measures to protect animals against this disease. Also, climate prediction could inform decisions regarding the varieties of grasses to be planted for forage. For example, when it is very wet Bahia grass develops a certain association with a bacterium, which can cause abortions in mares when ingested.

3.3.4.d Forestry

Climate predictions could help forest managers make decisions regarding the planting and harvesting of plantations. Regarding planting, if drier conditions are forecasted, managers could decide to delay planting for a year, as drought conditions are not conducive to seedling survival and establishment. In contrast, if wetter conditions are expected, managers may decide to plant earlier than normal to give seedlings time to establish themselves well-enough to resist flood conditions. With respect to harvests, if a wetter season is predicted, loggers may decide to log early or to postpone logging because of the difficulties of operating in wet conditions. However, it was also asserted that climate prediction would be less relevant to plantation operations due to the long-term nature of tree production and harvest rotations.

3.3.4.e Other producers

Urban horticulturalists and hobby farmers were identified as other producers who may use the web site and tool. However, because urban horticulturalists work in fairly climate-controlled environments, predictions regarding climate are not particularly relevant to them. Regarding hobby farmers, because they do not rely on production for their primary income and therefore are not as concerned with risk (i.e., they plant what they enjoy growing), they are not likely to use the information regarding climate forecasts. At the same time, since hobby farmers who do produce for the market are more flexible in their production (due to their smaller size), they may be more likely than larger farmers to change their crops in response to the management recommendations given on the web page and in the tool.

3.3.4.f Others (non-producers)

Other non-producers may be interested in the web site and tool, as well. Institutions concerned with risks associated with production and crop disasters may use the tool, such as: the USDA and RMA, banks who make loans to producers, and insurance agencies. In addition, the tourism industry was identified as a potential user, especially tourist fishing operations.

4.0 CONCLUSIONS AND RECOMMENDATIONS

1. Target audience: A question that arose a few times throughout the interviews was: Who is the target audience for this website and yield tool? We concluded that the possible audiences were Extension, small producers, and/or medium to large producers. The following are some recommendations for each group of potential users:
 - Extension: The current information that is contained within the AgClimate website and the yield tool is designed and laid out to be most accessible to Extension agents with above average computer skills and the ability to sort through a lot of background information to glean what is useful to them. They would be able to transfer the information to their clients, perhaps on individual visits, but more likely through workshops or information sessions. One Extension agent suggested that these tools could be introduced at the feed store or the farmer's cooperative.
 - Farmers in general: The average age of farmers is increasing – it is currently 51. Women and children might be more receptive and able to use to this information and technology. To introduce this technology, workshops with farmers and their families could be held.
 - Small producers: The current information contained in the management guidelines is not geared towards small producers. Interviews with small farmers to assess what information would be useful to them in relation to ENSO and crop management could assist in targeting this tool to small producers. For example, more detailed frost effects for planning purposes and information on a wider diversity of crops would be valuable for small farmers.
 - Medium/large producers: Perhaps the information that currently exists is most relevant to producers who work on a larger scale. The question that arose was: Do these producers have flexibility to change management practices (such as planting dates) when a commodity market drives their production decisions? Also, if farmers on this scale mainly refer to crop advisors to make their management recommendations, how would the website and tool be useful for them? Conversations with farmers could assist in answering these questions.

2. Format and presentation: The above conclusions on target audience lead to the recommendation that the general interface of the website and yield tool should be simple so it is accessible to a wide range of users. More detailed background information should still be available, but perhaps a bit more 'hidden' so that it does not scare off people who want the bare facts. Many producers want the bottom line and the more accessible and simpler it is, the more likely they will use it. This being said, the format of the interface is really dependent on who the target audience will be, but the simpler it remains and the more clear instructions it contains, the more users it will have.

In today's mass communication age, there are many Internet sites that provide information. In order to set this website apart from the many others available to farmers, the site should clearly explain what exactly users can expect to gain from using this website

3. *Importance of climate in management decisions:* In relation to the distinction between climate and weather, it is not entirely clear as to what farmers actually take into consideration regarding management practices, planning decisions, and markets/economic factors. Participants confirmed that certain aspects of management would benefit from having predictions of seasonal variability six months in advance. Furthermore, if the information was conveyed in a way that was easily understood, with confidence of accuracy, it has the potential to be used in long-term decision-making. However, although long-term climate information could be useful, it seems that when it comes down to what actually happens in farming systems, the primary factors on which farmers will base their management decisions are day-to-day weather changes, knowledge of their systems from experience, and the market conditions.
4. *Reconnecting academics, Extension, and producers:* Feedback from this sondeo suggests a disconnect between research, Extension, and farmers. There is a frustration felt by both farmers and Extension over the type of research generated by academia, its presentation, and its utility to everyday practices. Caution is pertinent in further developing a product that creates a technology that does not incorporate input from the end-users in the process of its development. This project has the potential to reconnect the research conducted at the university-level with the people who could most benefit from it. It would be valuable to have this as a resource that actually reaches its target audience. The one farmer interviewed provided very valuable insights on the website and tool. Perhaps a sondeo similar to this one could be carried out with farmers, rather than Extension agents, to get their feedback on the website and tool. The results could serve as a complement to this report.

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APPENDIX

One Extension agent had many comments/suggestions for improving the website based upon his experience with website design. These include:

- At the initial introduction to the SECC website, the homepage should emphasize the important links (Crops, Forestry, Pasture, Livestock) on this page more by presenting them in the center of the page.
- Related to the above bullet point was that the SECC logo was very prominent, but essentially meaningless.
- Emphasize the explanatory phrase at the lower right (“AgClimate provides important new tools...”) by substituting this for the current title and sub-header displayed under the SECC logo.
- Instead of instructing the user to click on “the (weather) station that best represents your growing conditions,” have them simply select their county.
- Separate the three states so it’s easier to find and click on the user’s county.
- Most of the information on ENSO management practices is very boring and not interactive – use of small graphics to highlight certain things might help.
- Information could be presented in a better fashion by separating it out onto discrete pages, instead of having the user scroll down one very long page.
- The website should be called AgClimate.net so it’s easy to remember.