Useful to Usable (U2U) End-of-Project Survey Results from a Survey of Farmers

DATA FOR ALL 12 STATES

Methods

The survey frame for the project consisted of owners of land producing corn and who received federal assistance in 2013 and 2014 in 12 Midwestern states. The survey population was identified through a Farm Service Agency (FSA) Freedom of Information Act (FOIA) request in January, 2016. The total number of addresses received through the FOIA request was 390,553. Using the FSA list 6,644 (subtracting bad addresses) were randomly selected of which 2,633 responded (39%). Of those who responded, 1,536 (58%) were agricultural producers (IA = 341; IL = 264; IN = 376; NE = 243; 8 states = 311). Sampling weights were applied to the data to account for the systematic error introduced due to oversampling from four states. The percentages presented in the results tables are from weighted data and the sample sizes provided with each question are from the unweighted original data.

Results

Asked of all:

Q1. Over the past five years, have you experienced significant drought? (n= 1,481)

Response	Percentage
No	47%
Yes	53%
	100%

Q2. Over the past five years, have you had problems with saturated soils, ponding, or significant flooding? (n= 1,420)

Response	Percentage
No	35%
Yes	66%
	100%

Q3. How concerned are you about weather or climate affecting farm management in your area? (n= 1,494)

Extent of concern	Percentage
Not at all concerned	9%
Slightly concerned	26%
Moderately concerned	38%
Very concerned	27%
	100%

Q4. To what extent are you using weather or climate information in farm decision making? (n= 1,493)

Extent of use	Percentage
Not using at all	10%
Using a little	17%
Using some	32%
Using quite a bit	30%
Using a great deal	11%
	100%

Q5. Do you currently receive or access weather or climate information in any of the following ways?

Ways of receiving information	No	Yes	n
Weather/climate information app	49%	51%	1,428
Weather/climate related website	40%	60%	1,431
Weather/climate information texts or email alerts	66%	34%	1,395

Q6. Do you use any of the following sources or providers of weather or climate information? If yes, how much influence do they have on your farming decisions?

Weather or climate information source	Use		Influence		
	No	Yes	Not influential	Somewhat influential	Very influential
Subscription or purchased weather/climate tools (e.g. MyDTN™, FieldView Plus or Pro, etc.)	84%	16% n= 1,462	16%	63%	22% n= 281
Free weather/climate services provided by a company, either tied to my purchases with the company or not (e.g. FieldView Prime, Pioneer 360 Tools, etc.)	71%	29% n= 1,457	15%	70%	15% n= 451
Free weather/climate services provided by a university or government agency including Extension (e.g. ISU corn nitrogen rate calculator, UMissouri Nitrogen Watch, UNL CornSoyWater, etc.)	78%	22% n= 1,453	12%	72%	16% n= 360
Weather/climate information provided personally by a farm advisor whom I pay	97%	7% n= 1,454	38%	45%	18% n= 345
Weather/climate information provided personally by a farm advisor whom I do not pay	91%	9% n= 1,455	20%	71%	9% n= 142

Q7. Indicate your level of agreement with the following statements about online decision support tools.

Statements	Strongly Disagree	Disagree	Neither Agree Nor Disagree	Agree	Strongly Agree	*n*
When farmers use tools with weather or climate information to aid decisions, it can result in better farm outcomes (related to yield, profit, and/or the environment).	3%	3%	37%	50%	7%	1,458
Other farmers like me are using decision support tools with weather or climate information to help with farm decisions.	2%	5%	46%	42%	4%	1,451
I want to meet the expectations of others when it comes to using decision support tools with weather or climate information.	5%	14%	54%	23%	4%	1,435

Q8. Are you willing to use online decision support tools with weather or climate information to inform your work? (n= 1,458)

Response	Percentage
No	42%
Yes, but don't currently use	47%
Yes, and currently use	11%
	100%

U2U Project Related Questions

Q9. Had you ever heard of Useful to Useful (U2U) project before receiving this survey, and, if so, from where?

Response	Percentage
No	95%
Yes, at U2U sessions at outreach events/meetings/conferences	1%
Yes, in U2U newsletter	0.3%
Yes, received an advertisement in the mail	2%
Yes, received an email advertisement	0.1%
Yes, from peers/colleagues (other farmers, Extension Educator, etc.)	1%
Yes, from an internet search	0.3%
Yes, I don't remember	2%
Yes, other	0.4%

Q10. Before receiving this survey, had you ever visited the U2U website? (n= 1,501)

Response	Percentage
No	99%
Yes	1%
	100%

AgClimate View (ACV)

Q11a. Had you ever heard of the AgClimate View (ACV) tool before this survey? (n= 1,440)

Response	Percentage
No	95%
Yes	5%
	100%

Asked of those that had heard of ACV:

Q11b. Have you ever used the ACV tool in your decision making? (n= 71)

Response	Percentage
No, I don't plan to	55%
No, but I'm thinking about it	36%
Yes, but I do not plan to use again	1%
Yes, and I will use again	8%
	100%

Asked of those that are not using ACV now **AND** have used it but do not plan to use again:

Q11c. Which of the following reasons make you hesitate to use the ACV tool?

Reason	Percentage
Not relevant to the types of decisions I make	23%
Another tool provides this information	9%
My advisor gives me this information	5%
I don't think it does a very good job	5%
It is hard to use	2%
I don't know enough about it	57%
Other	6%

Please elaborate on the reasons stated above.

35% of the respondents expressed doubts about the relevance and accuracy of the ACV tool, questioning the usefulness of long-time weather data in their day-to-day decision-making. 30% cited a lack of interest, experience, and computer access when it came to using a tool such as ACV on their operations. 13% use other tools for the similar information.

Q11d. What decisions did the tool help you with and how helpful it was?

Regarding decision-making, 50% of respondents who used the ACV tool referenced the data for planning their harvest and planting schedules, and 25% used it for whole-farm planning or fertilizer and pesticide scheduling.

Q11e. Would you recommend ACV to others? (n= 57)

Response	Percentage
No	64%
Yes	36%
	100%

Corn GDD

Q12a. Had you ever heard of the Corn GDD tool before this survey? (n= 1,453)

Response	Percentage
No	82%
Yes	18%
	100%

Q12b. Have you ever used the Corn GDD tool in your decision making? (n= 251)

Response	Percentage
No, I don't plan to	37%
No, but I'm thinking about it	37%
Yes, but I do not plan to use again	2%
Yes, and I will use again	24%
	100%

Q12c. Which of the following reasons make you hesitate to use the Corn GDD tool?

Reason	Percentage
Not relevant to the types of decisions I make	28%
Another tool provides this information	12%
My advisor gives me this information	13%
I don't think it does a very good job	2%
It is hard to use	3%
I don't know enough about it	44%
Other	4%

Please elaborate on the reasons stated above.

Among respondents who hesitated to use the GDD tool, 27% already had other sources for the information provided by the tool, either from private sources or extension services to get information on GDD. 24% expressed doubts about the accuracy and origins of the data, and 21% expressed concern that the information was not useful for their own operations.

Asked of those that have used Corn GDD in decision making and will use it again:

Q12d. What decisions did the tool help you with and how helpful it was?

Where it was used, 63% of respondents used the Corn GDD tool to make decisions about planting and harvest schedule, including varietal selection and estimating plant maturity throughout the season. 31% used the tool for scheduling fertilizer, pesticide, or irrigation applicaitons.

Q12e. Would you recommend Corn GDD to others? (n= 190)

Response	Percentage
No	52%
Yes	48%
	100%

Corn Split N

Q13a. Had you ever heard of the Corn Split N tool before this survey? (n= 1,462)

Response	Percentage
No	84%
Yes	16%
	100%

Asked of those that had heard of Corn Split N:

Q13b. Have you ever used the Corn Split N tool in your decision making? (n= 228)

Response	Percentage
No, I don't plan to	34%
No, but I'm thinking about it	36%
Yes, but I do not plan to use again	6%
Yes, and I will use again	24%
	100%

Q13c. Which of the following reasons make you hesitate to use the Corn Split N tool?

Reason	Percentage
Not relevant to the types of decisions I make	24%
Another tool provides this information	13%
My advisor gives me this information	13%
I don't think it does a very good job	4%
It is hard to use	8%
I don't know enough about it	45%
Other	10%

Please elaborate on the reasons stated above.

31% of respondents expressed hesitancy to use the Split N tool because already used other tools to calculate fertilizer costs or application timing. An additional 31% expressed doubts about the relevance of the fertilizing practices on their operations, and noted they were limited by variability in weather or equipment in their decision to sidedress their crops. An additional 16% expressed doubts about the data provided by the tool or the practicality for their farm decisions.

Q13d. What decisions did the tool help you with and how helpful it was?

Where it was used, 29% of respondents cited the usefulness of the Split N tool for planning their fertilization and irrigation scheduling. 24% used the tool to plan for and improve their yields.

Q13e. Would you recommend Corn Split N to others? (n= 167)

Response	Percentage
No	46%
Yes	54%
	100%

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Climate Patterns Viewer (CPV)

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Q14a. Had you ever heard of the Climate Patterns Viewer (CPV) tool before this survey? (n= 1,484)

Response	Percentage
No	93%
Yes	7%
	100%

Q14b. Have you ever used the CPV tool in your decision making? (n= 108)

Response	Percentage
No, I don't plan to	50%
No, but I'm thinking about it	34%
Yes, but I do not plan to use again	5%
Yes, and I will use again	11%
	100%

Q14c. Which of the following reasons make you hesitate to use the CPV tool?

Reason	Percentage
Not relevant to the types of decisions I make	22%
Another tool provides this information	17%
My advisor gives me this information	9%
I don't think it does a very good job	2%
It is hard to use	4%
I don't know enough about it	47%
Other	4%

Please elaborate on the reasons stated above.

The questions about the climate patterns viewer tool received the fewest responses, but 33% of respondents cited lack of training or knowledge about how to use it, while 42% expressed doubts about the usefulness and applicability on their farms.

Q14d. What decisions did the tool help you with and how helpful it was?

Of those who did use the CPV tool, 50% considered it useful for picking varieties and planning their planting and harvest dates. 7% expressed personal interest, but 29% weren't sure about the usefulness or applicability on their own farms.

Q14e. Would you recommend CPV to others? (n= 73)

Response	Percentage
No	59%
Yes	41%
	100%

Hesitancy with tools	Frequency of responses for each tool			
	ACV	Corn GDD	Corn Split N	CPV
Not relevant to the types of decisions I make	10	49	38	22
Another tool provides this information	7	21	17	13
My advisor gives me this information	4	21	19	9
I don't think it does a very good job	3	6	2	0
It is hard to use	15	18	33	20
I don't know enough about it	27	65	50	28
Other	2	9	12	1

Across all tools, the majority of respondents hesitated to use the tools because they felt they did not know enough about how to use the information or how the tools worked. Farmers also hesitated to use the Corn GDD, Corn Split N, and CPV tools because they felt the tools weren't relevant to the decisions they needed to make, and hesitated to use the ACV and CPV tools because they felt they were hard to use.

The written responses in the survey were coded for themes and their frequencies were tallied for each, with one theme identified per written response. There were significantly fewer written responses than those selected with multiple choice.

Hesitancy with tools	Frequency of responses for each tool			
Themes in written responses	ACV	Corn GDD	Corn Split N	CPV
Use other tools for this information	3	9	10	1
Insufficient data for farm decisions and practices	3	7	2	2
Doubts about accuracy and reliability	8	8	3	3
Not useful for my focus	0	1	10	1
This is outside my cropping system or region	0	1	0	0
Insufficient time or resources to adopt	0	2	1	0
Unsure about data use or interpretation	2	2	1	4
Don't know	7	3	1	1
Already use it	0	0	4	0
Total	23	33	32	12

The reasons for hesitation with using the tools varied between the tools for farmers. For the ACV tool, the top reasons for hesitancy among respondents were doubts about the accuracy and reliability of the data provided by the tool, and uncertainty about the tool in general. For the Corn GDD tool, farmers noted that they used other tools for the same information, or expressed doubts about the accuracy, reliability, and applicability of the data for their on-farm decisions and practices. The majority of those who hesitated to use the Corn Split N tool also had other tools for the same information, or did not

consider the tool useful for their focus of activities. Respondents who hesitated to use the CPV tool, which had the fewest number of written comments, largely hesitated because of uncertainty about how to use or interpret the data that the tool provided, or expressed doubts about the accuracy or reliability of the data.

Uses of tools	Frequency of responses for each tool			
Themes in written responses	ACV	Corn GDD	Corn Split N	CPV
Harvest and planting schedule	4	35	3	7
Financial planning	1	3	1	1
Fertilizer or pesticide schedule	1	11	12	1
Did not use or don't know	2	3	12	4
Personal interest or context	0	4	3	1
Calculating and making decisions to improve yields	0	0	10	0
Total	8	56	41	14

The top uses that respondents cited for the ACV, Corn GDD, and CPV tools were to inform decisions around harvest and planting schedules, including crop variety or hybrid selection, calculating harvest dates and fuel needs to dry or process corn, and using moisture predictions to determine which acres to plant to corn or other crops. Respondents who used the Corn Split N tool used it largely for scheduling fertilizer and making calculations to improve their yields. A large number of respondents also noted that they did not know how to use the Corn Split N tool.

Illustrative quotes on use:
"Deciding which level of crop insurance to purchase." (ACV)
 "Used to determine split planting timing for seed corn male and female." (Corn GDD)
"helped to save N and to improve yields." (Corn Split N)
 "allows later decision on N app rate" (Corn Split N)
"Determining what acres to plant to beans versus corn, due to moisture predictions." (CPV)
"I used [CPV] to decide what crops to plant and the planting dates" (CPV)

Asked of all

Q15. In general, do you think any of the U2U tools are needed for informing farm decisions? Please rely on the descriptions of the tools on previous pages of the survey if you are not familiar with them. (n= 1,293)

Response	Percentage
No	41%
Yes	59%
	100%

Q16. Please tell us whether you believe each statement is more true for public sources, more true for private sources, equally true for both, or not true for either.

Statement	Not true for either	More true for public	Equally true for both	More true for private	I don't know	*n*
The information is provided in time for me to make a decision	7%	8%	42%	11%	32%	1,375
The information is specific to my farm fields	16%	6%	21%	24%	33%	1,369
The information is relevant to the decisions I make	8%	7%	46%	12%	27%	1,367
The information is accurate	10%	6%	39%	8%	37%	1,362
The information addresses the most important decisions or problems in corn production	14%	4%	30%	13%	39%	1,366
The provider of the information is trustworthy	5%	8%	41%	7%	39%	1,369
The information is used as a way to sell farmers something	10%	4%	22%	28%	35%	
The way the information is distributed to farmers is fair	5%	9%	37%	5%	44%	1,365
The information helps me reduce financial risks	15%	4%	34%	7%	40%	1,369
The information leads to better crop yields	13%	3%	35%	7%	42%	1,372
The information gives me a competitive advantages over other farmers	22%	1%	20%	8%	49%	1,372

Q17. Uncertainty is part of making any decision. The following set of questions ask about how you deal with uncertainty and new information in your decision making. Please indicate your level of agreement with the following statements.

Statement	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	*n*
I enjoy the uncertainty of using a new farming practice without knowing exactly what might happen	20%	38%	29%	12%	1%	1,397
I don't like to adopt a farming practice without knowing what I can expect from it	2%	6%	16%	63%	13%	1,398
I like unpredictable situations	27%	46%	20%	5%	2%	1,393
I don't like it when scientific research about farming can be interpreted in many different ways	2%	6%	30%	51%	11%	1,393

I find that a well ordered life with regular hours suits my temperament	8%	31%	35%	22%	4%	1,396
I don't like it when questions about farming practices can be answered in more than one way	2%	15%	42%	35%	5%	1,393
I consult many different opinions before deciding to change my farming practices	2%	9%	21%	57%	12%	1,398
I see many possible solutions to problems I face on my farm	1%	6%	27%	60%	7%	1,394
When I have not made a decision on how to manage my farm, I feel stressed	2%	14%	36%	43%	5%	1,396
When I am confronted with a problem on my farm, I am worried if there is no apparent solution	5%	28%	31%	32%	4%	1,392
I become impatient and irritated if I can't find a solution to a problem immediately	5%	35%	34%	22%	4%	1,391
I don't like the routine aspects of farming	13%	49%	31%	6%	1%	1,389
I feel uncomfortable when I don't understand the reason why events on my farm occurred	4%	21%	35%	36%	4%	1,397
I find that establishing a consistent routine enables me to enjoy life more	2%	12%	36%	45%	5%	1,401

Asked of those that had heard of at least one U2U tool

Q18. Compared to other sources of weather or climate information that you have used, in general U2U tools: (n= 222)

Response	Percentage
Provide useful information I am not getting from other sources	13%
Provide the same information that I get from other sources	20%
Provide less useful information than I get from other sources	2%
I cannot compare because I have not used U2U tools AND other sources of weather/climate information	65%
	100%

Q19. How has your likelihood of using weather or climate information in farm decision making changed due to the U2U project or tools? (n= 210)

Likelihood change	Percentage
Decreased my likelihood	1%
Slightly decreased my likelihood	5%
No change	57%
Slightly increased my likelihood	28%

Increased my likelihood	9%
	100%

Q20. Please indicate your level of agreement with each of the statements related to climate variability

Statement	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	*n*
In the past 5 years, I have noticed more variable/unusual weather on my farm	3%	14%	27%	46%	10%	1,407
In the past 5 years, I have noticed more variable/unusual weather across the Corn Belt	2%	12%	30%	47%	9%	1,405
I am willing to use seasonal climate outlooks to help me make decisions about agricultural practices	3%	11%	28%	46%	2%	1,390
Changes in weather patterns are hurting my farm operation	4%	26%	45%	23%	2%	1,394
I have the knowledge and technical skill to deal with any weather-related threats to the viability of my farm operation	3%	20%	47%	27%	2%	1,400
Changing my practices to cope with increasing climate variability is important for the long-term success of my farm	3%	9%	37%	45%	6%	1,399

Q21. Please indicate your level of agreement with each of the statements related to sustained long-term changes to climate patterns.

Statement	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	*n*
Earth's climate conditions occur at random with no cycles or trends	8%	49%	26%	14%	3%	1,387
Earth's climate conditions occur in a cyclical pattern	1%	6%	32%	56%	5%	1,382
Even if climate changes, we can't predict what those changes will be in the future	1%	14%	29%	49%	7%	1,382
Having more information about climate change will reduce uncertainties about future conditions on my farm	3%	15%	38%	42%	2%	1,380
Climate models are accurate enough to predict long-term climate patterns in my area	10%	35%	44%	10%	1%	1,379
Climate change is happening	5%	11%	32%	46%	6%	1,382
Earth's climate always changes	0.2%	2%	14%	68%	16%	1,383
Human activities are contributing to climate	7%	16%	34%	37%	6%	1,380

change						
Climate change will not affect the way that I farm	6%	42%	34%	16%	2%	1,380
Climate change will cause more extreme weather events in my area	2%	11%	48%	34%	5%	1,380
There is enough evidence that climate is changing	6%	15%	35%	40%	4%	1,382
Climate change has affected my farm management practices	5%	25%	43%	25%	2%	1,383

Q22. Given what you believe to be true about the potential impacts of climate change on agriculture in the Corn Belt, please indicate your level of agreement with the following statements.

Statement	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	*n*
There's too much uncertainty about the impacts of climate change to justify changing my agricultural practices and strategies	2%	13%	39%	43%	4%	1,391
It is important for farmers to adapt to climate change to ensure the long-term success of U.S. agriculture	3%	9%	38%	45%	5%	1,385
Changing my practices to cope with increasing climate variability is important for the long-term success of my farm	2%	10%	40%	43%	4%	1,384

Demographics

Asked of all

Q23. How many years have you been farming? (n= 1,358)

Measures of central tendency: Average= 35 years, Median= 37 years, Mode= 40 years
Measures of variation: SD= 15, Range= 78, Minimum= 2, Maximum= 80

Q24. How many acres do you farm? (n= 1,411)

Measures of central tendency: Average= 1044 acres, Median= 500 acres, Mode= 1,000 acres
Measures of variation: SD= 1,671, Range= 18,000, Minimum=0, Maximum= 18,000

Q25a. In 2015, how many acres of corn did you manage? (n= 1,363)

Measures of central tendency: Average= 509 acres, Median= 202 acres, Mode= 100 acres
Measures of variation: SD= 1,294, Range= 40,000, Minimum= 0, Maximum= 40,000

Q25b. In 2015, how many acres of soybean did you manage? (n= 1,214)

Measures of central tendency: Average= 413 acres, Median= 250 acres, Mode= 0 acres

Measures of variation: SD= 759, Range= 9,000, Minimum= 0, Maximum= 9,000

Q25c. In 2015, how many acres of other crops did you manage? (n= 751)

Measures of central tendency: Average= 267 acres, Median= 70 acres, Mode= 0 acres
Measures of variation: SD= 625, Range= 4,800, Minimum=0, Maximum= 4,800

Q26. What other crops do you manage? (n= 735)

Responses were coded for each crop mentioned. Many farmers managed two or more additional crops.

What other crops do you manage?	Percentage
Alfalfa	17%
Hay / Pasture	46%
Conservation Reserve Program (CRP) wildlife habitat	3%
Woodlands	2%
Wheat	23%
Oats	5%
Vegetables, fruit, small grains (sunflowers, peas, pumpkins, sugar beets, millet, small grains)	3%
None	3%
Total	100%

While many farmers managed two or more additional crops, 17% of the crops listed included alfalfa (n=126), 46% of answers included hay or pasture (n=338), and 23% mentioned wheat (n=167). Oats, small vegetable crops such as pumpkins or sugar beets, and woodlands or timber each had fewer than 3% of total mentions.

Q27. Do you have access to the internet? (n= 1,450)

Response	Percentage
No	18%
Yes	82%
	100%

Q28. On a continuum of early adopter to late adopter, where "Early Adopter" is adopting a new technology along with the first set of farmers and "Late Adopter" is adopting the technology after most farmers adopt it, where would you place yourself? (n= 1,408)

Adopter category	Percentage
Early adopter	7%
Early majority	23%
Neither early majority nor late majority	37%
Late majority	20%
Late adopter	13%

	100%

Q29. What is your gender? (n= 1,450)

Gender	Percentage
Male	95%
Female	5%
	100%

Q30. What is the highest level of school you have completed? (n= 1,446)

School level	Percentage
Some formal schooling	2%
High school diploma/GED	33%
Some college	20%
2 year degree	14%
4 year degree	24%
Graduate degree	7%
	100%

Q31. In comparison to others in the U.S., your opinions on most issues are: (n= 1,419)

School level	Percentage
1 (Extremely conservative)	9%
2	17%
3	25%
4	16%
5 (Neither conservative nor liberal)	24%
6	4%
7	4%
8	0.6%
9 (Extremely liberal)	0.4%
	100%

Association Between Demographic and Outcome Variables

Purposively selected variables such as gender, age, education level, technology adopter category, farming experience in years and number of acres farmed were tested for any statistically significant associations with the medium term outcomes such as the use of U2U tools in decision making and intention to recommend U2U tools to others. No statistically significant associations were observed between any of the demographic variables and the two outcome variables. Further, associations between select climate change related beliefs and attitudes and the use of tools in decision making and intention to recommend them to others were also tested. All but one of these associations were not significant (Table 1).

Table 1. Association Between Select Climate Change Beliefs and Attitudes and The Use of Tools in Decision Making and Intention to Recommend the Tools to Others

Climate Change Belief/Attitude	Use of Tools In Decision Making	Intention to Recommend the Tools to Others
When farmers use tools with weather or climate information to aid decisions, it can result in better farm outcomes (related to yield, profit, and/or the environment)	NS for all the tools.	NS for ACV, Corn GDD and CPV. Significant for Corn Split N with farmers *agreeing* with this statement recommending the tool to others in higher numbers than expected.
Climate change is happening	NS for all the tools.	NS for all the tools.
Human activities are contributing to climate change	NS for all the tools.	NS for all the tools.
Changes in weather patterns are hurting my farm operation	NS for all the tools.	NS for all the tools.
Climate models are accurate enough to predict longterm climate in patterns in my area	NS for all the tools.	NS for all the tools.

NS= Not Significant at 0.05 level of significance.

*Expected= The frequency that would exist if there was no statistically significant association between the two test variables at 0.05 level of significance