iowa farm and rural life poll

# 2020 Summary Report

## Introduction

The Iowa Farm and Rural Life Poll is an annual survey of Iowa farmers. The survey project collects and disseminates information on issues of importance to farmers and agricultural stakeholders across Iowa and the Midwest. Except for 2019, the Farm Poll has been conducted every year since its establishment in 1982, and is the longest-running survey of its kind in the nation. The project is supported by Iowa State University Extension and Outreach and the Iowa Agriculture and Home Economics Experiment Station. The information gathered through the annual survey is used to inform the development and improvement of research and extension programs and is used by local, state, and national leaders in their decision-making processes. The authors thank the many farm families who responded to this year's survey and appreciate their continued participation.

## Changes in 2020

The Farm Poll went through a major transition in 2019. From 1982 to 2018, the survey was conducted by the United States Department of Agriculture's National Agricultural Statistics Service (NASS) with support from the Iowa Department of Agriculture and Land Stewardship. In recent years, NASS has made changes in policies regarding surveys conducted for external clients. These changes greatly reduced our survey design flexibility and analytical possibilities. After the 2018 survey we decided that we would end our partnership with NASS and work with the Iowa State Center for Survey Statistics and Methodology (CSSM) to conduct the survey.

The transition to CSSM had sampling implications. Because NASS drew the Farm Poll samples from the Census of Agriculture Master List and conducted the survey and data entry, we did not have contact information for the participants. NASS graciously allowed us to send a letter to the 2018 Farm Poll panel inviting them to continue to participate in the survey, and 515 farmers agreed to continue. CSSM added 824 farmers to the sample, 343 who were recruited from a random sample list of farmers purchased from market research firm Dynata, and 481 who were sampled from a previous random sample for a different survey. Thus, the survey was sent to 1,339 Iowa farmers in late February 2020. CSSM determined that 14 of the farmers were not eligible (i.e., they had stopped farming), resulting in an eligible sample of 1,325. We

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received 1,059 completed surveys, for a response rate of 80%.

As a result of both the annual survey panel design and the new sampling approach, the new Farm Poll sample cannot be considered a random sample. Thus, the results cannot be generalized to the overall population of Iowa farmers with confidence. That said, we have conducted statistical analyses comparing 1) members of the 2018 panel who were surveyed in 2020 to those who declined to participate in the 2020 survey and 2) members of the 2018 panel who were surveyed in 2020 to participants who were new in 2020 on selected farm variables (acres of corn, soy, small grains, fruit and vegetables, and pasture and hay, owned and rented, and gross farm income) and demographic variables (age).

Comparisons of 2018 survey respondents who participated in 2020, to the 2018 respondents who declined to participate in 2020, were conducted using 2018 data. Analysis did not find any statistically significant differences. Comparisons of 2020 data between the members of the 2018 panel who elected to continue participating and the newly recruited participants detected a number of differences. Predictably, respondents who had participated in the Farm Poll panel in the past were older (67 vs. 62). The new recruits tended to have larger farm operations, with more overall acres (681 vs. 443), more corn acres (363 vs. 219), more soybean acres (250 vs. 161), and higher levels of gross farm income. As a result, the 2020 Farm Poll sample is biased to some degree toward larger-scale farmers and is older on average than the general population of farmers.

A second important consideration for the 2020 Farm Poll survey is the arrival of COVID-19. About 78% of participants responded after March 11, the day Iowa's three public universities were closed, followed by k-12 schools on March 15, and many businesses on March 17. The COVID-19 crisis likely had some influence on responses to questions such as those regarding future quality of life and future farm economic prospects.

Copies of this or any other year's reports are available from your local county extension office, the Extension Distribution Center (www.extension.iastate.edu/store), Extension Sociology (www.soc.iastate.edu/extension/farmpoll), or from the authors.

# Quality of life and well-being

Every two years since 1982, the Farm Poll has asked farmers to report on changes in quality of life (QOL), defined as "the degree of satisfaction with all aspects of life," for their families and families in their communities. In 2020, 80% of participants reported that quality of life for their families either stayed the same or improved over the five years leading up to February/March 2018 (Table 1). This represents a continuing downward trend from 84% in 2018, 87% in 2016 and 91% in 2014. Farmer assessments of quality of life among families in their communities also continued to decline, with 71% indicating that QOL had either remained the same or improved, down from 74% in 2018, 79% in 2016, and from the all-time Farm Poll high of 85% in 2014.

Farmers were split about prospects for the future, with 34% predicting that quality of life would improve for their families over the next five years, compared to 19% who predicted it would be worse (Table 1). They were somewhat less optimistic about other families in their community, with 21% indicating that QOL would improve over the next five years, and 31% predicting decline. Respondents' predictions regarding the overall economic prospects for farmers were even less optimistic. While 23% predicted improvements in the next five years, 52% indicated that economic prospects would become worse (Table 1). This is the first time since 2002 that more than half of Farm Poll respondents have predicted worsening farm economic conditions for the next five years.

**Table 1. Quality of life, 2020**

| | Become Much Worse | Become Somewhat Worse | Remained the Same | Become Somewhat Better | Become Much Better |
|---|---|---|---|---|---|
| During the past five years, has the quality of life for families in your community | 3% | 26% | 46% | 23% | 2% |
| During the past five years, has the quality of life for your family | 2% | 18% | 43% | 31% | 6% |
| In the next five years, will the quality of life for families in your community | 3% | 28% | 48% | 20% | 1% |
| In the next five years, will the quality of life for your family | 2% | 17% | 47% | 30% | 4% |
| In the next five years, will the overall economic prospects for Iowa farmers | 11% | 41% | 26% | 21% | 2% |

## *Farm financial well-being*

The 2020 Farm Poll survey repeated a short question set about "current financial well-being" that was previously asked in 2018, 2016 and 2008. As expected, given weakness in commodity crop markets, evaluations of financial well-being declined, with 59% reporting that the financial well-being of farmers in their part of the state was either a moderate or serious problem. This statistic increased from 46% in 2018, 39% in 2016, and 21% in 2008 (Table 2). Thirty-eight percent reported that the financial well-being of agribusiness firms in their local area was a moderate or serious problem, up from 32% in 2018. Respondents' rating of the financial well-being of their own farms as a problem also rose substantially, to 31% reporting a moderate or serious problem compared to 20% in 2018,

**Table 2. Perceptions of current financial well-being, 2008-2020**

| | | Not Sure | Not A Problem | A Slight Problem | A Moderate Problem | A Serious Problem |
|---|---|---|---|---|---|---|
| Of farmers in your area | 2020 | 4% | 6% | 31% | 42% | 17% |
| | 2018 | 6% | 9% | 39% | 38% | 8% |
| | 2016 | 9% | 13% | 39% | 31% | 8% |
| | 2008 | 7% | 43% | 30% | 17% | 4% |
| Of agribusiness firms in your area | 2020 | 7% | 15% | 40% | 30% | 8% |
| | 2018 | 7% | 21% | 40% | 27% | 5% |
| | 2016 | 11% | 23% | 34% | 28% | 5% |
| | 2008 | 7% | 42% | 30% | 17% | 4% |
| Of financial institutions in your area | 2020 | 8% | 38% | 33% | 17% | 4% |
| | 2018 | 8% | 48% | 25% | 17% | 3% |
| | 2016 | 11% | 43% | 28% | 15% | 3% |
| | 2008 | 8% | 53% | 23% | 13% | 3% |
| Of your own farm | 2020 | 1% | 31% | 36% | 23% | 8% |
| | 2018 | 2% | 43% | 35% | 17% | 3% |
| | 2016 | 3% | 47% | 31% | 15% | 3% |
| | 2008 | 3% | 59% | 25% | 11% | 2% |

18% in 2016, and 13% in 2008. Overall, these statistics point to a long-term trend of increasing concern about the agricultural economy (Figure 1).

### *Satisfaction with life and work*

Periodically the Farm Poll surveys provide statements related to life and work satisfaction and ask farmers to rate them on a five-point scale from very dissatisfied to very satisfied. Table 3 reports responses on these items for the five times they have been posed, going back to 1991. In 2020, just 25% reported satisfaction with their farm's profitability, compared to a high of 71% in 2007. Satisfaction with farming as an occupation had also declined, from 75% in 2007 to 50% of respondents reporting being somewhat or very satisfied. Satisfaction with community financial conditions declined from 55% somewhat or very satisfied to 18%, and satisfaction with the adequacy of conservation measures on the farm declined from 84% somewhat or very satisfied to 68%. Figure 2 shows that the proportion of farmers who reported being somewhat or very satisfied declined precipitously for all items since 2007, the last time the question was asked. Satisfaction with farm profitability and community financial conditions were the lowest ever reported, at 25% and 18% somewhat or very satisfied, respectively.

## Economic and policy dimensions of commodity production

The Farm Poll often contains opinion questions about farm economics and policy issues. In 2020, the survey repeated several items previously asked in 2015 and 2009, and added new items. Respondents were provided with a number of statements related to economic, policy, and farm and rural structural issues and asked to indicate their agreement on a five-point scale from strongly disagree to strongly agree.

Among the economics-related questions, the item that had the highest level of agreement was "The cost of inputs (seeds, chemicals, land) seems to rise faster whenever profit margins go up," with 92% of respondents agreeing, about the same proportion as in 2015, the first time the item was posed (Table 4). The item "Profit margins on corn and soybeans get eaten up by land rents and/or input costs faster than they used to" garnered 87% agreement,

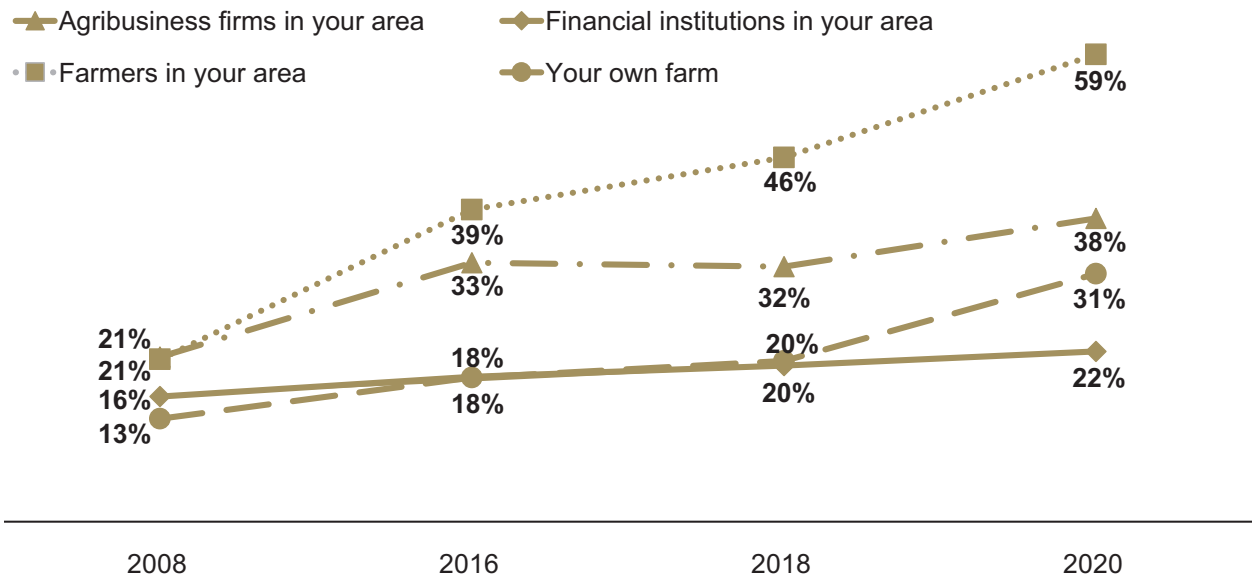


**Figure 1. Percent of farmers reporting that current financial well-being is a moderate or serious problem, 2008-2020.**

**Table 3. Satisfaction with life and work, 1991-2020**

| | | Very Dissatisfied | Somewhat Dissatisfied | Neutral | Somewhat Satisfied | Very Satisfied |
|---|---|---|---|---|---|---|
| Your farm's profitability | 2020 | 14% | 36% | 25% | 22% | 3% |
| | 2007 | 3% | 15% | 11% | 59% | 12% |
| | 1999 | 23% | 32% | 14% | 27% | 3% |
| | 1996 | 1% | 28% | 10% | 43% | 8% |
| | 1991 | 9% | 25% | 8% | 48% | 10% |
| Farming as your occupation | 2020 | 4% | 19% | 27% | 30% | 20% |
| | 2007 | 2% | 10% | 13% | 45% | 30% |
| | 1999 | 11% | 23% | 19% | 31% | 16% |
| | 1996 | 5% | 15% | 12% | 42% | 26% |
| | 1991 | 4% | 13% | 12% | 39% | 32% |
| Financial conditions in your community | 2020 | 4% | 36% | 42% | 16% | 2% |
| | 2007 | 4% | 19% | 21% | 50% | 5% |
| | 1999 | 7% | 25% | 29% | 36% | 4% |
| | 1996 | 4% | 45% | 19% | 25% | 7% |
| | 1991 | 8% | 24% | 31% | 34% | 3% |
| Adequacy of conservation measures on your farm | 2020 | 2% | 7% | 23% | 42% | 26% |
| | 2007 | 1% | 6% | 10% | 54% | 30% |
| | 1999 | * | * | * | * | * |
| | 1996 | 2% | 5% | 10% | 51% | 33% |
| | 1991 | 2% | 6% | 14% | 52% | 26% |

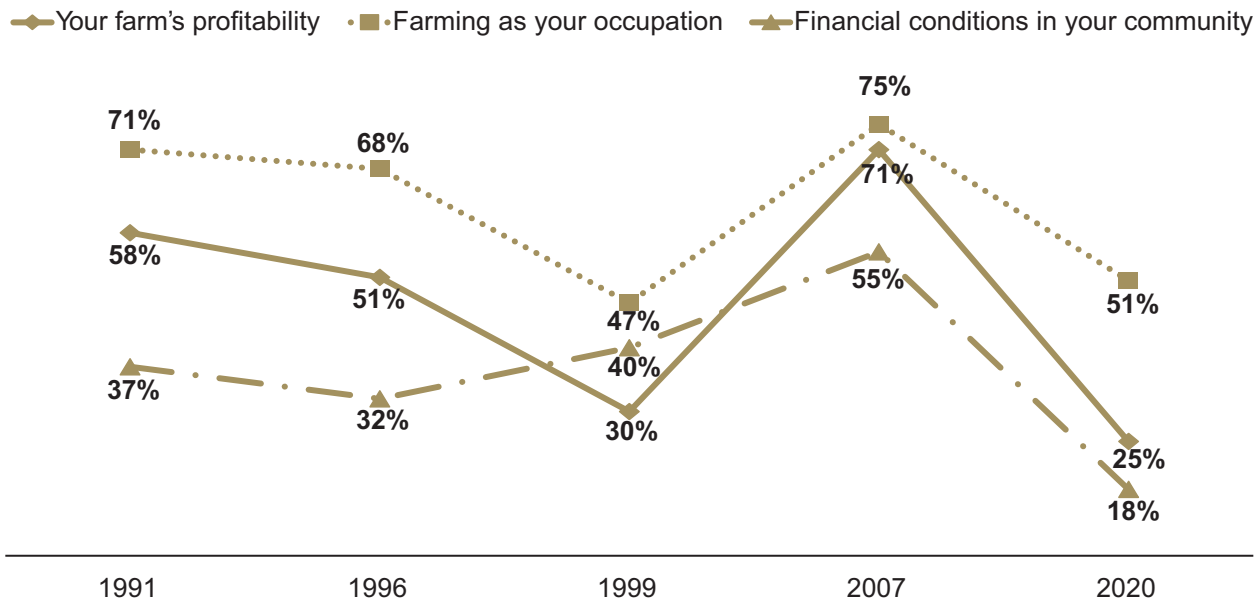


**Figure 2. Percent somewhat or very satisfied with life and work, 1991-2020.**

**Table 4. Farmer perspectives on economic, policy, and farm structural issues**

| | | Strongly Disagree | Disagree | Uncertain | Agree | Strongly Agree |
|---|---|---|---|---|---|---|
| **Farm economic issues** | | | | | | |
| The cost of inputs (seeds, chemicals, land) seems to rise faster whenever profit margins go up | 2020 | 1% | 1% | 6% | 49% | 43% |
| | 2015 | 1% | 1% | 7% | 52% | 40% |
| The boom-bust cycles of commodity production are hard on farmers | 2020 | 0% | 2% | 11% | 54% | 33% |
| Profit margins on corn and soybeans get eaten up by land rents and/or input costs faster than they used to | 2020 | 0% | 2% | 11% | 59% | 28% |
| | 2015 | 1% | 3% | 16% | 55% | 26% |
| | 2009 | 1% | 4% | 10% | 48% | 38% |
| Too much reliance on corn and soybeans contributes to financial risk for row crop farmers | 2020 | 1% | 8% | 23% | 55% | 13% |
| | 2015 | 1% | 9% | 27% | 54% | 9% |
| | 2009 | 1% | 14% | 30% | 48% | 7% |
| Sometimes I feel like I have little control over the profitability of my farm | 2020 | 2% | 14% | 13% | 58% | 14% |
| | 2015 | 2% | 16% | 20% | 50% | 12% |
| | 2009 | 3% | 16% | 13% | 54% | 14% |
| Sometimes I feel overly dependent on purchased inputs | 2020 | 1% | 8% | 34% | 52% | 6% |
| I generally enjoy the challenge of trying to maintain profit margins by balancing expenses and crop revenues | 2020 | 4% | 23% | 24% | 46% | 3% |
| | 2015 | 4% | 20% | 30% | 43% | 4% |
| **Policy issues** | | | | | | |
| Federal ethanol policy has generally been good for Iowa farmers | 2020 | 5% | 7% | 20% | 53% | 16% |
| | 2015 | 2% | 4% | 16% | 55% | 22% |
| | 2009 | 3% | 6% | 19% | 54% | 18% |
| Each time the Farm Bill is renewed I worry about how changes will affect my operation | 2020 | 2% | 10% | 19% | 55% | 14% |
| | 2015 | 1% | 10% | 15% | 54% | 20% |
| | 2009 | 3% | 9% | 18% | 52% | 18% |
| Commodity programs (e.g., crop insurance, DCP, ACRE, ARC, PLC) have been an important safety net for my farm operation over the years | 2020 | 5% | 14% | 17% | 50% | 14% |
| | 2015 | 6% | 13% | 25% | 45% | 11% |
| | 2009 | 6% | 14% | 25% | 45% | 10% |
| If there were no crop insurance or commodity support programs, I would manage risk by producing a more diverse mix of crops/livestock | 2020 | 3% | 21% | 50% | 22% | 4% |
| | 2015 | 4% | 22% | 41% | 27% | 6% |
| **Farm and rural structural issues** | | | | | | |
| Increased specialization in commodities (corn, soybeans, hogs, etc.) has led to loss of farms | 2020 | 1% | 7% | 25% | 47% | 20% |
| | 2015 | 2% | 7% | 21% | 45% | 26% |
| | 2009 | 2% | 8% | 19% | 42% | 30% |
| To make a living producing corn and soybeans, farmers have to continually increase acreage | 2020 | 4% | 28% | 31% | 33% | 5% |
| | 2015 | 5% | 32% | 32% | 27% | 5% |
| | 2009 | 4% | 22% | 24% | 41% | 9% |
| The shift away from diversified farm operations and toward specialized grain or livestock operations has generally been good for Iowa's farmers | 2020 | 14% | 34% | 40% | 12% | 2% |
| | 2015 | 9% | 33% | 40% | 18% | 1% |
| | 2009 | 16% | 32% | 34% | 18% | 1% |
| The shift away from diversified farm operations and toward specialized grain or livestock operations has generally been good for Iowa's rural communities | 2020 | 16% | 34% | 39% | 10% | 1% |
| | 2015 | 14% | 37% | 35% | 13% | 1% |
| | 2009 | 19% | 36% | 30% | 12% | 2% |

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up from 2015, but about the same as 2009. A new item measuring perspectives on the volatility of commodity markets, "The boom-bust cycles of commodity production are hard on farmers," also reached 87% agreement. The item "Too much reliance on corn and soybeans contributes to financial risk for row crop farmers" received 68% agreement, up from 63% in 2015 and 55% in 2009. Similarly, 72% of respondents agreed with the statement, "Sometimes I feel like I have little control over the profitability of my farm," up from 62% in 2015 and 68% in 2009. An item first asked in 2015, "I generally enjoy the challenge of trying to maintain profit margins by balancing expenses and crop revenues," received 49% agreement, up slightly from 47% in 2015. A final economics-related item was posed for the first time in 2020: "Sometimes I feel overly dependent on purchased inputs." Fifty-eight percent of farmers agreed with that statement.

Four policy-related items were posed, three of which have been asked in all three years. "Federal ethanol policy has generally been good for Iowa farmers" was agreed with by 69% of farmers, down from a high of 77% in 2015 and 72% in 2009 (Table 4). "Each time the Farm Bill is renewed I worry about how changes will affect my operation" also received 69% agreement. A strong majority of 64% of respondents agreed with the item, "Commodity programs (e.g., crop insurance, DCP, ACRE, ARC, PLC) have been an important safety net for my farm operation over the years," an increase from 56% in 2015 and 55% in 2009. Finally, a plurality of farmers – 50 percent – selected the uncertain category in response to the item, "If there were no crop insurance or commodity support programs, I would manage risk by producing a more diverse mix of crops/livestock." This was an increase from 41 percent uncertain in 2015, the first time it was posed.

The final four items in this section focused on farm structural and rural structural issues. The item with the highest level of agreement was "Increased specialization in commodities (corn, soybeans, hogs, etc.) has led to loss of farms," at 67%. This was a decline from 71% and 72% agreement in 2015 and 2009, respectively (Table 4). A second item, "To make a living producing corn and soybeans, farmers have to continually increase acreage," received 38% agreement, up from 32% in 2015 but lower than the 50% agreement reported in 2009. The items that received the lowest levels of agreement were statements about the impact of specialized commodity production on farmers and communities. Just 13% of farmers agreed with the statement, "The shift away from diversified farm operations and toward specialized grain or livestock operations has generally been good for Iowa's farmers," down from 19% in 2015 and 2009. Just 11% of farmers agreed that "The shift away from diversified farm operations and toward specialized grain or livestock operations has generally been good for Iowa's rural communities," down from 14% in both 2015 and 2009.

## Prairie strips

Since the mid-2000s, the Prairie STRIPS project at Iowa State has conducted research on how to incorporate strips of native prairie into fields of corn, soybeans, and other annual crops to improve soil and water and habitat quality. STRIPS stands for Science-based Trials of Rowcrops Integrated with Prairie Strips. Project research has shown that converting 10% or less of crop fields to diverse, native perennials can reduce soil loss from fields by 90% and reduce nitrogen loss through surface runoff by up to 85%. Prairie strips also provide habitat for wildlife, including pollinators and other beneficial insects. Increasing numbers of farmers and farmland owners are implementing the prairie strips practice and finding it to be a cost-effective conservation practice that offers multiple production and conservation benefits.

As more farmers and agricultural landowners have implemented prairie strips on working lands, the project team has become interested in understanding the potential for more widespread adoption of the practice. To this end, both the 2018 and the 2020 Farm Poll survey contained a brief set of three questions to gauge farmer knowledge of and interest in the practice statewide. To ensure that all respondents had a basic understanding of the prairie strips practice, the survey provided a short description that was developed in consultation with project researchers:

> Prairie strips are an agricultural conservation practice that uses strips of native prairie vegetation within or at the edges of fields to protect soil and water and provide habitat for wildlife. Iowa State University researchers have shown that strategically converting small areas of crop fields to native prairie (generally in-field contour buffer strips or filter strips at the edge of fields) can significantly reduce soil erosion and nutrient loss and improve wildlife habitat.

About two-thirds (66%) of farmers reported that they had heard about the practice before reading the description, up from 56% in 2018 (Table 5). A second question asked respondents if they would be interested in learning more about the practice. In 2020 27% selected "yes" and 26% selected "maybe," compared to 22% and 36%, respectively, in 2018. Similarly, in 2020 20% responded that they would be interested in planting prairie strips on their land, and 31% indicated that they might be interested, compared to 15% and 39% in 2018.

In 2019, the prairie strips practice became eligible for the USDA's Conservation Reserve Program (CRP). This new eligibility allows landowners to plant prairie strips on land enrolled in CRP and receive cost share, incentive payments, and annual rental payments. To gauge farmer interest in this new option, the survey posed the question, "Prairie strips are now eligible for annual rental payments through the Conservation Reserve Program (CRP). Would CRP payments increase your interest in establishing prairie strips?" Almost half (47%) indicated that CRP payments would increase their interest, and 22% selected the "maybe" category (Table 5).

## Climate change and agriculture

Climate change is impacting Iowa agriculture and negative impacts are expected to increasingly threaten agricultural productivity in the state. There are many ways, however, that farmers and landowners can increase the resiliency of production systems, reduce greenhouse gas emissions, and even capture carbon. The Farm Poll survey asked a number of questions about climate change in

**Table 5. Awareness of and interest in the prairie strips practice**

| | | Yes | Maybe | No |
|---|---|---|---|---|
| Before reading the description above, had you ever heard of the prairie strips conservation practice? | 2020 | 66% | 6% | 28% |
| | 2018 | 56% | 8% | 36% |
| Would you be interested in learning more about the prairie strips conservation practice? | 2020 | 27% | 26% | 47% |
| | 2018 | 22% | 36% | 42% |
| Would you be interested in planting prairie strips on your farmland? | 2020 | 20% | 31% | 48% |
| | 2018 | 15% | 39% | 46% |
| Prairie strips are now eligible for annual rental payments through the Conservation Reserve Program (CRP). Would CRP payments increase your interest in establishing prairie strips? | 2020 | 47% | 22% | 31% |
| | 2018 | -- | -- | -- |

agriculture in 2011 and 2013. In 2020, the survey included many of the previous years' questions to examine change over time in beliefs, attitudes, perceived risks, adaptation plans, and trust in information sources. It also included a question set measuring actual adaptation actions taken recently in response to weather variability.

### *Alignment with the scientific consensus about climate change and its causes*

The Farm Poll has posed a question about climate change and its causes three times in the last decade: in 2011, 2013, and 2020. The question has provided five statements and a brief introductory text: "There is increasing discussion about climate change and its potential impacts. Please select one statement that best reflects your beliefs about climate change." As Table 6 and Figure 3 show, there have been substantial shifts in Iowa farmers' perspectives on climate change and its causes over the last decade.

The statement, "Climate change is occurring, and it is caused mostly by human activities," characterizes the scientific consensus on climate change and its causes. In 2020, 18% of respondents selected this response, an increase of eight points from 2011 (Table 6). Forty percent of farmers selected "Climate change is occurring, and it is caused more or less equally by natural changes in the environment and human activities," up from 35% in 2011 and 36% in 2013. Twenty-three percent of respondents chose "Climate change is occurring, and it is caused mostly by natural changes in the environment," the same proportion as in 2011. The largest shift occurred for the statement, "There is not sufficient evidence to know with certainty whether climate change is occurring or not," which declined by 12 percentage points. The proportion of respondents who selected "Climate change is not occurring" declined from five percent in 2011 to 3% in both 2013 and 2020.

Figure 3 presents the data in a stacked column format visually representing these shifts. Perhaps most notable is that the percentage of farmers who attribute climate change to human activity, at least in part, rose from a minority of 45% in 2011 to a sizeable majority of 58% in 2020. Furthermore, the proportion of respondents who concurred that climate change is happening increased from 68% to 81%. According to a recent survey by the Yale Program on Climate Change Communication, 67% of adult Iowans agreed with the statement, "Global warming is happening." Although the language used in the surveys was different (global warming vs. climate change), the Farm Poll results suggest that Iowa farmers' perspectives on climate change now align more closely with the scientific consensus than do those of Iowa's general adult populace.

**Table 6. Alignment with the scientific consensus about climate change and its causes, 2011-2020**

| | 2011 | 2013 | 2020 |
|---|---|---|---|
| Climate change is occurring, and it is caused mostly by human activities | 10% | 17% | 18% |
| Climate change is occurring, and it is caused more or less equally by natural changes in the environment and human activities | 35% | 36% | 40% |
| Climate change is occurring, and it is caused mostly by natural changes in the environment | 23% | 21% | 23% |
| There is not sufficient evidence to know with certainty whether climate change is occurring or not | 28% | 23% | 16% |
| Climate change is not occurring | 5% | 3% | 3% |

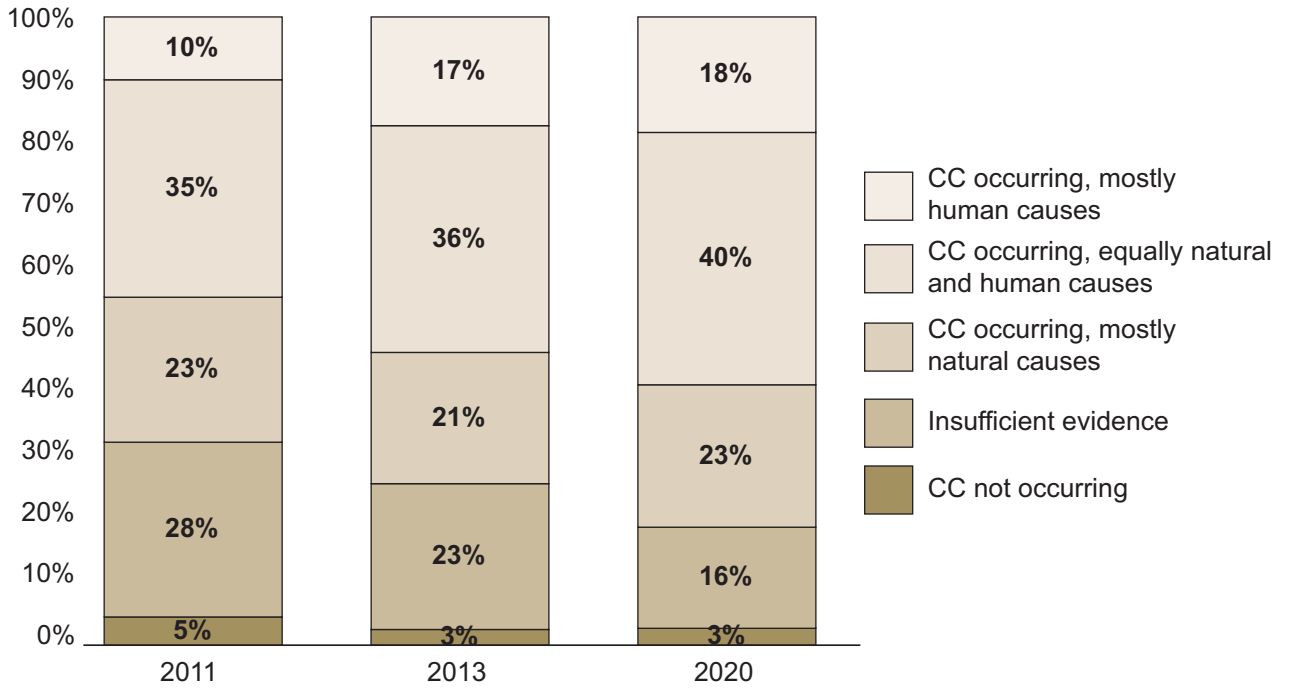


**Figure 3. Iowa farmers' climate change beliefs, 2011-2020.**

## *Climate change attitudes, plans, perceived capacity*

A major question set contained 18 items measuring perceived risks, attitudes, plans and capacity related to climate change adaptation, and attitudes about greenhouse gas (GHG) mitigation, some of which were also asked in 2011 and 2013. Farmers were asked to rate their agreement or disagreement with the statements on a five-point scale from strongly disagree to strongly agree. The question set was preceded by the following introductory text: "A number of people and organizations are concerned about the potential impacts of climate change on Iowa agriculture. Please provide your opinions on the following statements related to climate change and agriculture."

The first section of Table 7 examines perceived risks. Slightly more than half (51%) of farmers agreed with the statement, "I am concerned about the potential impacts of climate change on my farm operation," and 50% agreed that "…extreme weather events will happen more frequently in the future. As Figure 4 shows, agreement with the extreme weather item increased from 46% in 2011 to 50% in 2020, and agreement with the concern about impacts item increased from 35% in 2011 to 51% in 2020.

The item "Climate change is not a big issue because human ingenuity will enable us to adapt to changes" garnered 21% agreement, just slightly higher than the 19% who agreed that "Crop insurance and other programs will protect the viability of my farm operation regardless of weather." Just 5% agreed with the statement, "My farm operation will likely benefit from climate change." Figure 5 indicates that farmers' faith in human ingenuity and crop insurance and other programs to protect them has dropped substantially since 2011.

A second series of items examined attitudes regarding actions that could be taken to adapt to climate change's impacts. The item that received the highest level of agreement was "Seed companies should be developing

**Table 7. Climate change attitudes, plans, perceived capacity**

| | Strongly Disagree | Disagree | Uncertain | Agree | Strongly Agree |
|---|---|---|---|---|---|
| **Perceived risks** | | | | | |
| I am concerned about the potential impacts of climate change on my farm operation | 5% | 13% | 31% | 42% | 9% |
| I believe that extreme weather events will happen more frequently in the future | 2% | 6% | 42% | 40% | 10% |
| Climate change is not a big issue because human ingenuity will enable us to adapt to changes | 10% | 29% | 39% | 18% | 3% |
| Crop insurance and other programs will protect the viability of my farm operation regardless of weather | 8% | 27% | 46% | 18% | 2% |
| My farm operation will likely benefit from climate change | 12% | 39% | 44% | 4% | 1% |
| **Adaptation attitudes** | | | | | |
| Seed companies should be developing crop varieties adapted to coming changes in weather patterns | 1% | 4% | 31% | 56% | 8% |
| I should take additional steps to protect the land I farm from increased precipitation | 1% | 8% | 33% | 51% | 7% |
| Profitable markets for biomass should be developed to encourage planting of perennial crops (grasses, trees) on vulnerable land | 3% | 8% | 41% | 41% | 7% |
| Extension should do more to help farmers and landowners to prepare for increased precipitation | 3% | 12% | 50% | 31% | 4% |
| State agencies should do more to help farmers and landlords to prepare for increased precipitation | 4% | 17% | 46% | 30% | 3% |
| **Adaptation plans** | | | | | |
| I plan to use more conservation practices to increase my farm operation's resilience to extreme weather | 2% | 6% | 42% | 46% | 5% |
| I plan to invest in agricultural drainage (tile, ditches) to prepare for increased precipitation | 5% | 16% | 38% | 37% | 5% |
| **Perceived adaptation capacity** | | | | | |
| I have the knowledge and technical skill to deal with any weather-related threats to the viability of my farm operation | 4% | 17% | 48% | 28% | 3% |
| I have the financial capacity to deal with any weather-related threats to the viability of my farm operation | 8% | 30% | 35% | 25% | 2% |
| **Mitigation attitudes** | | | | | |
| Government should do more to reduce the nation's greenhouse gas emissions and other potential causes of climate change | 10% | 18% | 34% | 26% | 13% |
| Programs and/or markets for carbon capture should be developed to help farmers earn money from adopting practices that capture greenhouse gases | 8% | 9% | 47% | 31% | 6% |
| I should reduce greenhouse gas emissions from my farm operation | 8% | 21% | 45% | 23% | 3% |

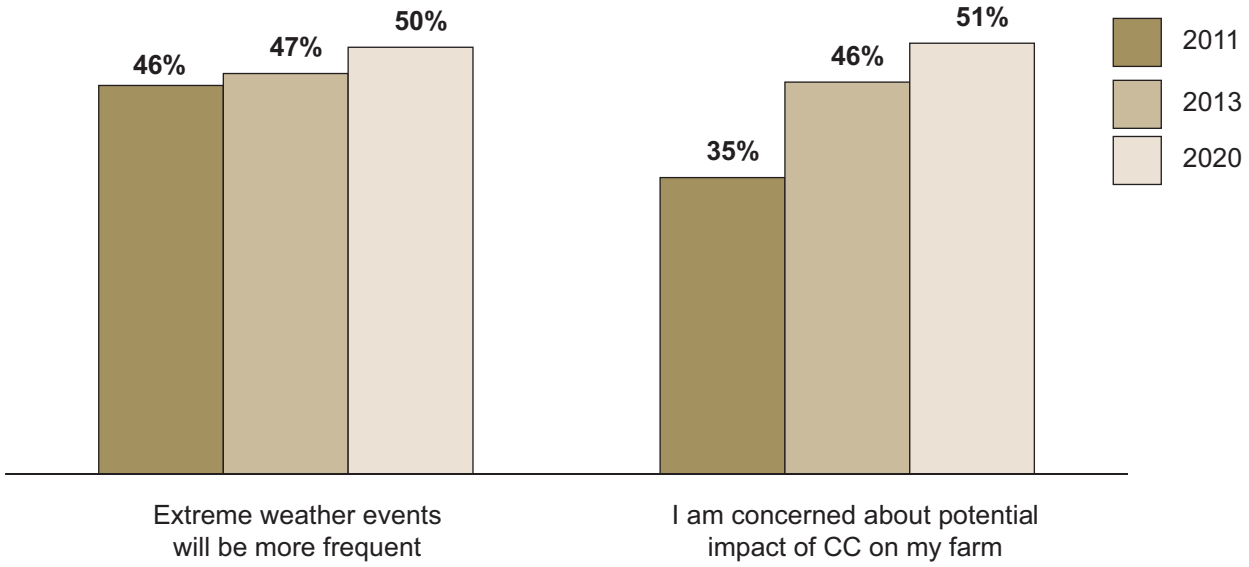


**Figure 4. Percent agreement with selected perceived risk statements, 2011-2020.**

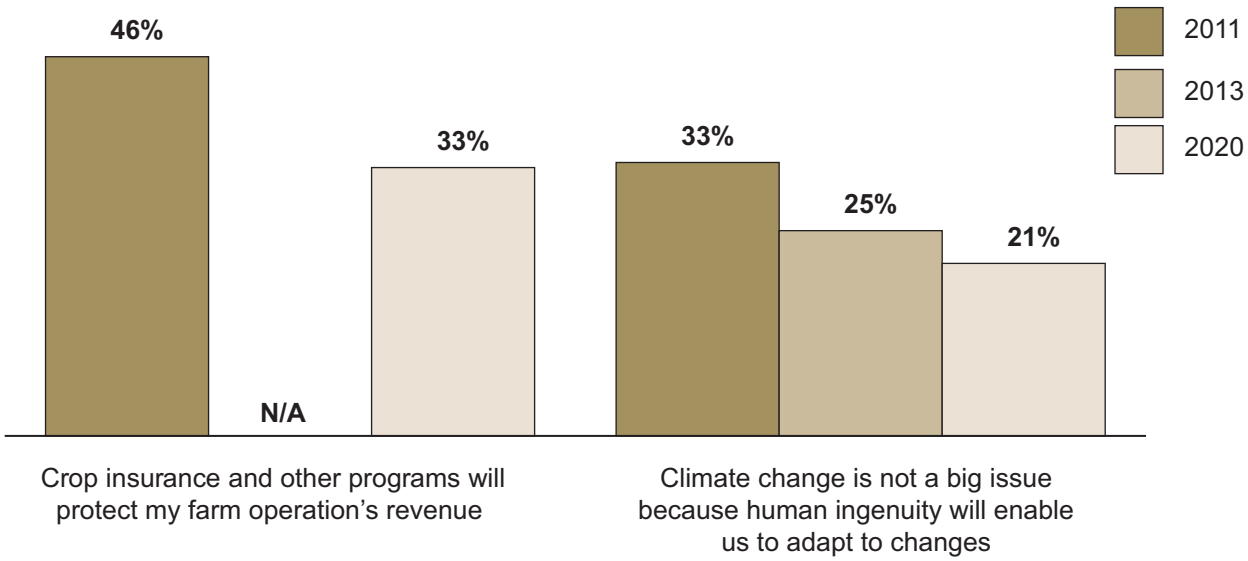


**Figure 5. Percent agreement with selected perceived risk statements, 2011-2020.**

crop varieties adapted to coming changes in weather patterns," with 64% agreement (Table 7). This was also the highest-rated item in 2011 and 2013. Fifty-eight percent of respondents agreed with the statement, "I should take additional steps to protect the land I farm from increased precipitation." Forty-eight percent of respondents agreed with the statement, "Profitable markets for biomass should be developed to encourage planting of perennial crops (grasses, trees) on vulnerable land." None of these statements had been posed in previous years.

The remaining items in this category received lower levels of agreement, with many farmers selecting the uncertain category. (Table 7). Thirty-five percent agreed that "Extension should do more to help farmers and landowners to prepare for increased precipitation," while 50% were uncertain. Similarly, 33% agreed that state agencies should do the same, and 46% were uncertain. Figure 6

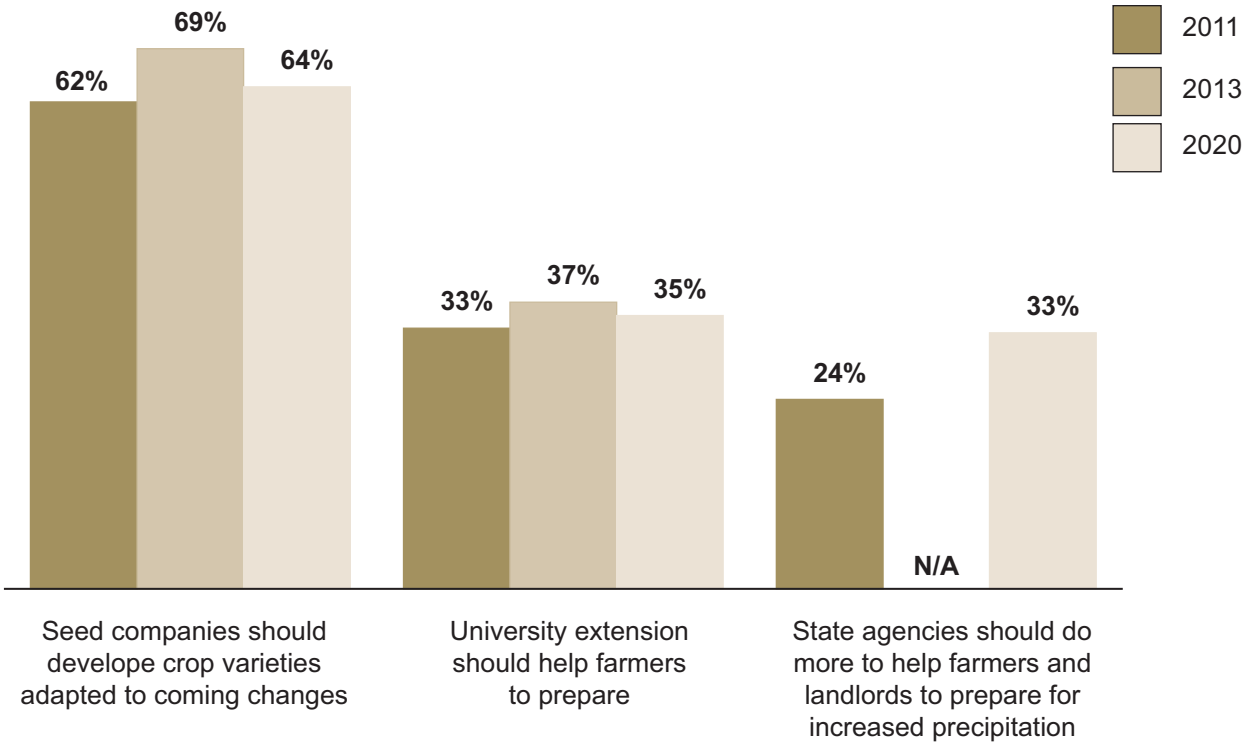


**Figure 6. Percent agreement with selected adaptation action statements, 2011-2020.**

shows some variation in agreement on three of these items over the years, but only the item regarding state agency actions increased appreciably, from 24% in 2011 to 33% in 2020.

Two items referenced potential adaptation actions that farmers might take. The first, "I plan to use more conservation practices to increase my farm operation's resilience to extreme weather," received agreement from 51% of respondents. Forty-one percent of farmers agreed with the statement, "I plan to invest in agricultural drainage (tile, ditches) to prepare for increased precipitation." Neither of these statements had been posed in previous years.

Two items measured farmers' perspectives on their perceived capacity to adapt to climate change. Almost one-third (32%) of respondents agreed with the statement, "I have the knowledge and technical skill to deal with any weather-related threats to the viability of my farm operation," while 48% selected the uncertain category (Table 7). For the second item, "I have the financial capacity to deal with any weather-related threats to the viability of my farm operation," more farmers disagreed (38%) or were uncertain (35%) than agreed (27%). Neither of these statements had been posed in previous years.

A final section of the question set examined perspectives on GHG reduction. Thirty-nine percent of participants agreed with the statement, "Government should do more to reduce the nation's greenhouse gas emissions and other potential causes of climate change." Carbon capture or sequestration through various agricultural practices such as no-till and cover crops is seen to have potential as a pathway toward carbon neutrality. Thirty-seven percent of farmers agreed with the statement, "Programs and/or markets for carbon capture should be developed to help farmers earn money from adopting practices that capture greenhouse gases," while 47% were uncertain, and very few disagreed. Finally, 26% of respondents agreed with the statement, "I should reduce greenhouse gas emissions from my farm operation." Figure 7 shows that farmer agreement with the item regarding

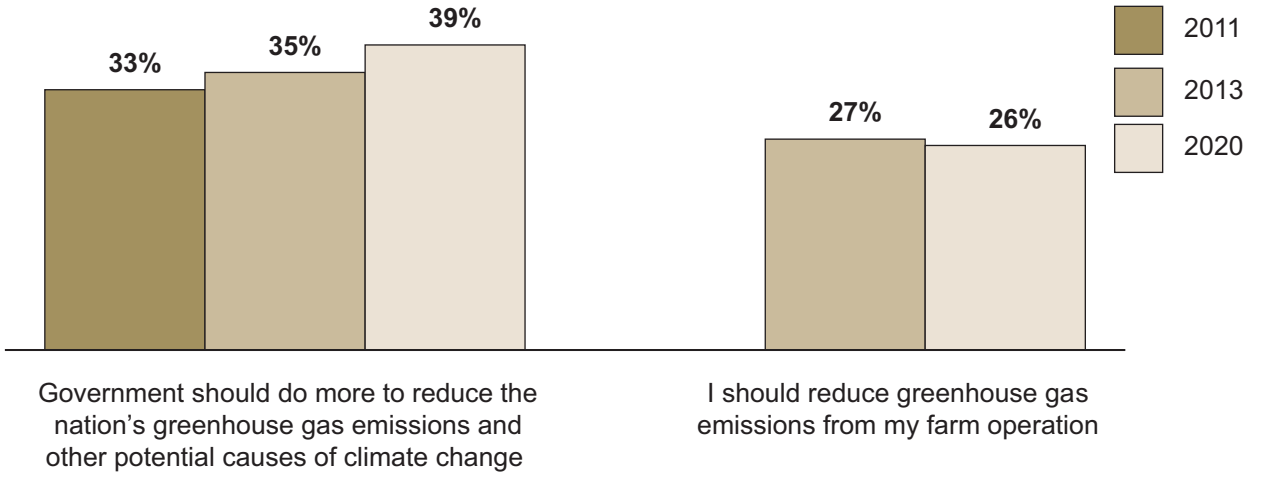


**Figure 7. Percent agreement with selected greenhouse gas action statements, 2011-2020.**

government action on GHG emissions has risen moderately since 2011, while attitudes toward taking mitigation action on individual farms has remained essentially steady.

## *Concern about threats to agricultural productivity*

Another section of the survey asked farmers to rate their level of concern about a number of climate change-related threats to agricultural productivity that alarm climate and agricultural scientists. The survey provided a list of potential threats preceded by the statement: "The following are problems that some farmers have experienced over the past years. Thinking about your farm operation, please indicate how concerned you are about them for the future." Concern was rated on a three-point scale ranging from not concerned to very concerned.

Most farmers were either concerned or very concerned about all of the climate-related potential threats to agriculture. The two highest-rated items were more frequent extreme rains and increased weed pressure, with 83% of farmers indicating that they were either concerned or very concerned. Eighty-two percent of farmers rated both increased insect pressure and higher incidence of crop disease as a concern, and increases in saturated soils and ponded water was rated as a concern by 81% of respondents. Longer dry periods and drought, increased heat stress on crops, and increased flooding rounded out the list, with 78%, 75%, and 70% of farmers indicating they were either concerned or very concerned about these issues.

**Table 8. Concern about threats to agricultural productivity**

| | Not Concerned | Concerned | Very Concerned |
|---|---|---|---|
| More frequent extreme rains | 17% | 56% | 27% |
| Increased weed pressure | 16% | 63% | 21% |
| Increased insect pressure | 18% | 66% | 16% |
| Higher incidence of crop disease | 18% | 68% | 14% |
| Increases in saturated soils and ponded water | 19% | 59% | 22% |
| Longer dry periods and drought | 22% | 64% | 14% |
| Increased heat stress on crops | 25% | 63% | 12% |
| Increased flooding | 30% | 53% | 17% |

## *Farm operation changes in response to weather variability and extremes*

A major section of the survey was titled "Weather Variability and Extremes and Farming in Iowa." The question set provided a list of 18 potential adaptation actions that farmers might take in response to recent changes in Iowa's climate. The list was preceded by the following introductory text: "Iowa has experienced increasingly variable weather such as unusually wet springs, more intense rainfall, floods, and drought that has impacted farming. In the last 10 years, have you made any changes to the following types of management operations in response to weather variability and its impacts?" Twelve of the actions are best management practices (BMPs) that might be recommended to adapt to variable and extreme weather and its impacts, and six of the actions were other practices or actions that farmers might take. Table 9 shows the percentage distributions across the following categories for each of the adaptation actions: major decrease; moderate decrease; moderate increase; and major increase. Statistics are presented for farmers who reported some kind of crops and/or hay/pasture only.

The adaptation action that farmers increased most was scouting for pests and disease, with 52% reporting a moderate or major increase in this activity in the previous 10 years (Table 9). Scouting was followed by increases in use of no-till (43%), use of other conservation tillage (36%), growing season application of nitrogen fertilizer (34%), and spring application of nitrogen fertilizer (32%). Thirty-two percent of farmers reported increased use of structural, in-field conservation practices such as terraces, grassed waterways, and contour buffer strips, and 27% reported increases in cover crop use. A quarter of respondents reported increased interaction with conservation professionals for conservation assistance, and 22% reported increases in attendance of field days, workshops, and other learning events. Twenty-two percent reported increases in shifting marginal cropland into other uses such as pasture/hay and use of structural, edge-of-field conservation practices such as buffer strips along streams. Finally, 15% reported that they increased planting of crops besides corn and soybean as part of their crop rotation.

Among the other practices used to respond to weather extremes, installation or renovation of agricultural drainage was highest, with 47% of farmers reporting an increase (Table 9). Forty percent reported increases in crop insurance coverage. Thirty-two percent of respondents reported increasing their use of pesticides (insecticide, herbicides, or fungicides).

For the three remaining practices, more farmers reported decreases rather than increases. Twenty-four percent reported decreases in amount of nitrogen fertilizer used per acre, versus 19 percent reporting an increase. Forty-four percent reported decreases in amount of tillage, compared to 12 percent who reported increases. Finally, 27% reported decreases in fall application of nitrogen fertilizer, compared to 8% who reported increases.

These results indicate that many Iowa farmers are taking steps to adapt to increases in weather variability and extremes.

## *Trust in sources of information about climate change*

The 2020 Farm Poll survey repeated a question set from 2011 that assessed the degree to which farmers trust or distrust a number of entities that are potential sources of information about climate change. Trust was measured on a five-point scale ranging from strongly distrust to strongly trust. The full data from 2020 are presented in Table 10. Figures 8 and 9 show differences between 2011 and 2020 in the proportion of farmers who selected trust or strongly trust.

**Table 9. Changes to farm operations in response to weather variability and its impacts**

| | Major decrease | Moderate decrease | No change | Moderate increase | Major increase |
|---|---|---|---|---|---|
| **BMP use and related actions** | | | | | |
| Scouting for pests and disease | 0% | 1% | 46% | 38% | 14% |
| Use of no-till | 2% | 3% | 53% | 23% | 20% |
| Use of other conservation tillage | 2% | 3% | 59% | 26% | 10% |
| Growing season application of nitrogen fertilizer (e.g., side-dress) | 4% | 3% | 59% | 22% | 12% |
| Spring application of nitrogen fertilizer | 3% | 8% | 57% | 19% | 13% |
| Structural, in-field conservation practices such as terraces, grassed waters, and contour buffer strips | 1% | 2% | 66% | 23% | 9% |
| Use of cover crops | 2% | 3% | 68% | 15% | 12% |
| Meeting with NRCS or other conservation professionals for conservation assistance | 1% | 4% | 71% | 17% | 5% |
| Attended field days, workshops, and other learning events | 2% | 4% | 73% | 18% | 4% |
| Shifting marginal cropland into other uses such as pasture/hay | 1% | 3% | 74% | 17% | 5% |
| Structural, edge-of-field conservation practices such as buffer strips along streams | 1% | 2% | 75% | 15% | 7% |
| Planted crops besides corn and soybean as part of crop rotation | 2% | 3% | 80% | 12% | 3% |
| **Other practices and actions** | | | | | |
| Installation or renovation of agricultural drainage (tile, ditches, etc.) | 1% | 2% | 51% | 35% | 12% |
| Crop insurance coverage | 1% | 3% | 57% | 32% | 8% |
| Use of pesticides (insecticide, herbicides, or fungicides) | 1% | 8% | 59% | 27% | 5% |
| Amount of nitrogen fertilizer per acre | 2% | 22% | 57% | 18% | 1% |
| Tillage | 13% | 31% | 44% | 9% | 3% |
| Fall application of nitrogen fertilizer | 15% | 12% | 65% | 6% | 2% |

As was the case in 2011, University Extension was the most trusted source of information about climate change, with 60% of farmers selecting trust or strongly trust (Table 10). Scientists and soil and water conservation organizations were both trusted by 50% of respondents, followed closely by farm groups at 47% and family and friends at 46%. Agricultural retailers and crop advisors were rated as trusted sources of climate change information by 40% of respondents, followed by the farm press at 39% and crop insurance agents/providers at 36%. Importantly, none of these sources were rated as untrustworthy sources of climate information by more than 20% of respondents.

Results were more mixed for other entities. State agencies were rated as trusted sources of climate change information by 34% of farmers, but 27% indicated distrust (Table 10). Similarly, television weather reporters and agribusiness companies were both trusted

**Table 10. Trust in sources of information about climate change, 2020**

| | Strongly Distrust | Somewhat Distrust | Neither Trust nor Distrust | Somewhat Trust | Strongly Trust |
|---|---|---|---|---|---|
| University Extension | 2% | 6% | 32% | 48% | 12% |
| Soil and water conservation organizations | 4% | 11% | 35% | 41% | 9% |
| Scientists | 5% | 13% | 32% | 36% | 14% |
| Farm groups | 3% | 13% | 37% | 41% | 6% |
| Family and friends | 2% | 6% | 47% | 37% | 9% |
| Agricultural retailers/crop advisers | 5% | 11% | 44% | 36% | 4% |
| The farm press | 5% | 14% | 42% | 36% | 3% |
| Crop insurance agents/providers | 5% | 12% | 47% | 32% | 4% |
| State agencies | 6% | 22% | 38% | 31% | 3% |
| Television weather reporters | 8% | 17% | 45% | 27% | 3% |
| Agribusiness companies | 6% | 21% | 44% | 28% | 1% |
| Federal agencies | 12% | 28% | 34% | 24% | 2% |
| Environmental organizations | 26% | 28% | 26% | 17% | 3% |
| Religious leaders | 14% | 16% | 52% | 14% | 4% |
| The mainstream news media | 40% | 25% | 25% | 8% | 1% |
| Radio talk show hosts | 22% | 31% | 37% | 9% | 1% |

by about 30% of respondents, but about a quarter indicated lack of trust. Respondents rated federal agencies and environmental organizations as distrusted more than trusted. Religious leaders also fell into that category, but a majority (52%) reported that they neither trusted nor distrusted this group as a source of climate change information. The least trusted groups for climate change information were radio talk show hosts and the mainstream media, which were both trusted by just 9% of respondents and rated as untrustworthy by 53% and 65%, respectively.

Examination of change over time shows that trust in most groups as sources of climate change information has increased (Figures 8 and 9). Figure 8 shows increases in the proportion of farmers who selected trust or strongly trust for all entities (note: agricultural retailers/crop advisers and crop insurance agents/providers were not included in the 2011 survey). Only two entities showed a decline in trust, television weather reporters (34% to 30%) and the mainstream news media (10% to 9%) (Figure 9).

# Communication technology

Every several years, the Farm Poll survey includes questions about farmers' use of various types of communication and computing technologies and frequency of use to access information to help make farming decisions. The same questions were asked in 2012, 2014, and 2020 so we can track changes over time.

Among the list of technologies provided, use of a computer with dial-up internet access was the least common in 2020, with 11% of farmers reporting use. This statistic is virtually unchanged since 2012 (Table 11). Tablet computer (e.g., iPad) without cellular data/mobile access to internet was the second least used, at 19% in 2020, but up from 10% in 2012. A minority of farmers (41%) reported using a basic cell phone (not a smartphone)

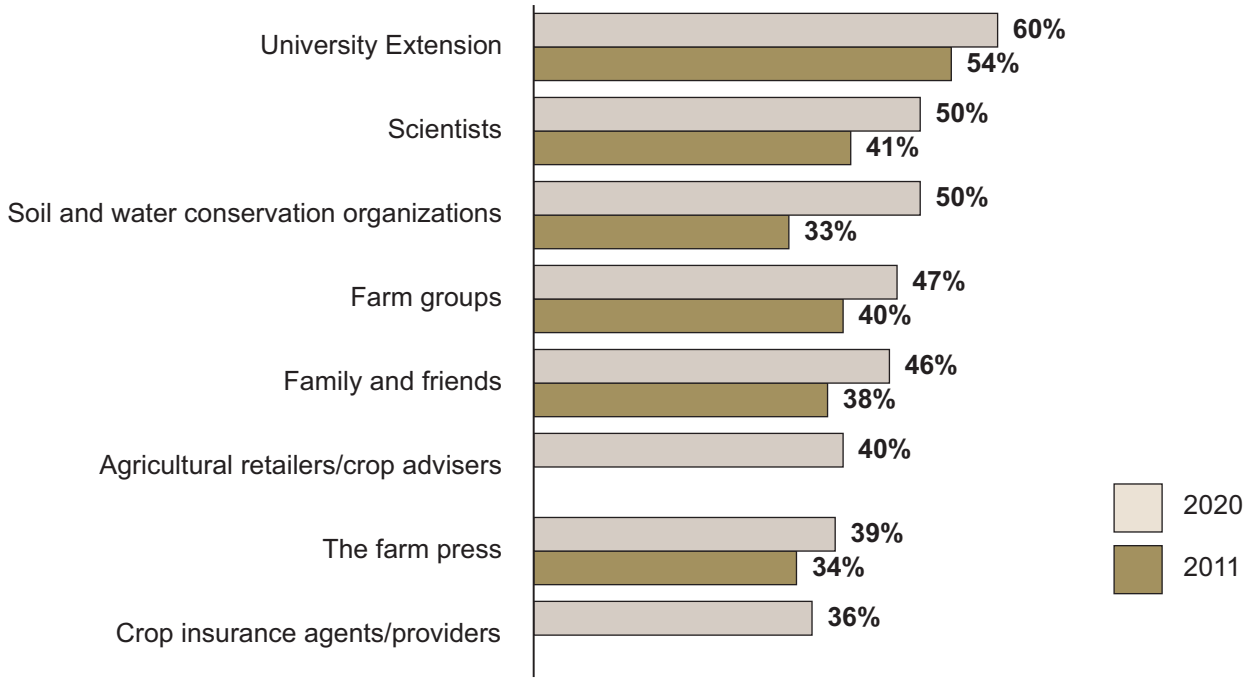


**Figure 8. Trust in selected entities as sources of information about climate change, 2011-2020.**

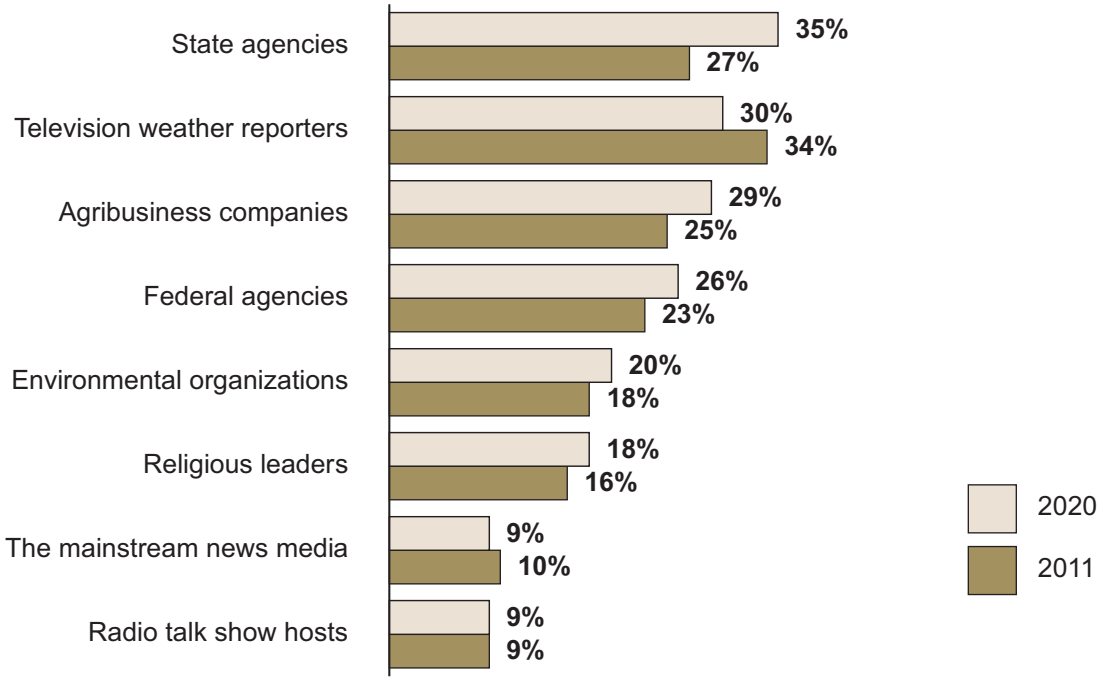


**Figure 9. Trust in selected entities as sources of information about climate change, 2011-2020.**

**Table 11. Use of communications and computing technologies**

| | 2012 | 2014 | 2020 |
|---|---|---|---|
| Computer with dial-up Internet access | 11% | 14% | 11% |
| Tablet computer (e.g., iPad) without cellular data/mobile access to internet | 10% | 18% | 19% |
| Basic cell phone (not a smartphone) | 75% | 80% | 41% |
| Tablet computer (e.g., iPad) with cellular data/mobile access to internet | | 19% | 41% |
| Smartphone (e.g., iPhone, Android) | 11% | 30% | 66% |
| Computer with high-speed Internet access | 58% | 70% | 71% |

in 2020, down from 80% in 2014. Forty-one percent reported using a tablet computer (e.g., iPad) with cellular data/mobile access to internet, which represents a major increase from the 10% reported in 2014, the first time that technology was listed. As expected, use of a smartphone (e.g., iPhone, Android) continued to increase, with 66% of farmers reporting use, compared to 30% in 2014 and 11% in 2011. The most commonly reported technology was a computer with high-speed internet access, with 71% reporting use, basically unchanged since 2014.

In terms of frequency of use for accessing information for agricultural decision making, smartphones and computers with high-speed internet access were most frequently used. Among farmers who reported using these technologies, 81% and 80%, respectively, reported using them often or very often to access information for decision-making purposes (Table 12). Among farmers who reported using a tablet computer, 68% of those whose tablets had mobile data access and 55% with non-mobile data tablets used them often or very often for agricultural information seeking.

## Well use and well testing

Safe drinking water is critically important to good health. Iowa State University and many other organizations are working to help raise awareness of the importance of periodic testing for harmful contaminants. The Farm Poll survey contained several questions to help learn about well water use and testing among Iowa's farm families. Sixty percent of respondents reported that their primary source of household water was a private well, and 56% reported that their well was the primary source of drinking water. Seventy-eight percent of respondents who reported having a well also indicated that they had had their well tested at some point. Among those who had tested, 16% reported that contamination had been detected. Farmers who reported a contamination in

**Table 12. Frequency of use of technologies to access information for agricultural decision making**

| | Never | Seldom | Often | Very Often |
|---|---|---|---|---|
| Smartphone (e.g., iPhone, Android) | 3% | 16% | 37% | 44% |
| Computer with high-speed internet access | 3% | 17% | 43% | 37% |
| Tablet computer (e.g., iPad) with cellular data/ mobile access to internet | 5% | 28% | 40% | 28% |
| Tablet computer (e.g., iPad) without cellular data/ mobile access to internet | 8% | 37% | 35% | 20% |
| Basic cell phone (not a smartphone) | 23% | 30% | 30% | 18% |
| Computer with dial-up Internet access | 14% | 43% | 28% | 15% |

the past were asked what the contaminant had been. The results were fairly evenly split between coliform bacteria and nitrates, with a few farmers reporting both, and a handful reporting iron and other minerals. Finally, all respondents were asked if they used any kind of household drinking water filters, including on-tap, in-fridge, or whole house filter. Fifty-eight percent responded affirmatively.

**Table 13. Well use and well testing**

| | Yes | No | Don't know |
|---|---|---|---|
| Is your primary source of household water a private well? | 60% | 40% | 0% |
| Is your primary source of household drinking water a private well? | 56% | 44% | 0% |
| If you have a well, have you ever had your well water quality tested? | 78% | 20% | 2% |
| If you have a well and have tested it, has a test ever detected contamination? | 16% | 75% | 8% |
| Do you use any kind of household drinking water filters, including on-tap, in-fridge, or whole house? | 58% | 42% | 1% |

Prepared by J. Gordon Arbuckle Jr., Iowa State University extension sociologist. Renea Miller provided valuable layout assistance to the questionnaire and this report. The Iowa State University Center for Survey Statistics and Methodology conducted the data collection process. This report is a product of the Iowa Agriculture and Home Economics Experiment Station, Ames, Iowa, which is supported by the State of Iowa and the USDA.

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