



2017 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. 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. Iowa State University Extension and Outreach, the Iowa Agriculture and Home Economics Experiment Station, the Iowa Department of Agriculture and Land Stewardship, and the Iowa Agricultural Statistics Service are partners in the Farm Poll. 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. We thank the many farm families who responded to this year's survey and appreciate their continued participation.

Who participates?

The 2017 Farm Poll questionnaires were mailed in February to a statewide panel of 2,080 farmers. Completed surveys were received from 999 farmers, resulting in a response rate of 48 percent. On average, Farm

Poll participants were 66 years old. Because the Farm Poll is a panel survey, in which the same farmers participate in multiple years, participants are somewhat older on average than the general population of farmers. Farm Poll participants' farms were also somewhat larger than average, with a mean of 432 acres, compared to the 2012 USDA Census of Agriculture Iowa average of 345 acres.

This year's survey contained questions about weed and herbicide resistance management, soil health, use of small grains in extended rotations, the influence of agricultural stakeholders on farmers' decisions, and decision making among multiple farm operators. Copies of this or any past reports are available from your county extension office, the ISU Extension Store (<https://store.extension.iastate.edu>), Extension Sociology (<https://ext.soc.iastate.edu>), or from the authors.

Weed and herbicide resistance management

The 2017 Farm Poll survey asked farmers who planted corn or soybean the previous year four question sets about weed management and herbicide-resistant weeds. The first question set asked about the presence of herbicide-resistant

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weeds and changes in weed management and herbicide programs. Several of the questions had previously been asked in the 2013 Farm Poll survey, allowing comparisons between years. Questions were developed in partnership with Iowa State University weed science and entomology faculty and other stakeholders.

Two questions asked if farmers believed they had herbicide-resistant weeds in any of the fields they farmed in the preceding crop year (2012 and 2016, respectively). In 2017, 22 percent of respondents reported they believed they had weeds that were resistant to PPO inhibitor herbicides (e.g., Flexstar, Authority, Kixor) (table 1). This was a substantial increase from three percent in the 2013 survey. Similarly, in 2017 12 percent of farmers believed they had weeds that were resistant to HPPD inhibitor

herbicides (e.g., Callisto, Impact), compared to four percent in 2013.

Several questions focused on weed management behaviors. The first asked farmers if they had changed their weed management program due to concern about herbicide-resistant weeds. In 2017, 77 percent responded affirmatively, compared to 52 percent in 2013 (table 1). In 2017, 83 percent indicated they had made more than one herbicide application to a single crop in a single season over the last five years, compared to 81 percent in 2013. In both 2013 and 2017, 65 percent of farmers indicated they used a custom applicator to spray herbicides. The proportion of farmers who develop their own herbicide programs dropped from 45 percent in 2013 to 36 percent in 2017.

Table 1. Experience with and management of herbicide resistant weeds, 2013 and 2017

| | | Yes | No | Don't know |
|--|-----------|-----------|----|------------|
| | | —Percent— | | |
| In 2016, did you have weeds that were resistant to PPO inhibitor herbicides (e.g., Flexstar, Authority, Kixor) in fields that you farm?..... | 2013 | 3 | 63 | 34 |
| | 2017 | 22 | 58 | 21 |
| In 2016, did you have weeds that were resistant to HPPD inhibitor herbicides (e.g., Callisto, Impact) in any of the fields that you farm?..... | 2013 | 4 | 65 | 31 |
| | 2017 | 12 | 63 | 25 |
| In the last five years, have you changed your weed management program due to concern about herbicide-resistant weeds? | 2013 | 52 | 46 | 2 |
| | 2017 | 77 | 22 | 2 |
| In the last five years, have you made more than one herbicide application to a single crop in a single season? | 2013 | 81 | 17 | 2 |
| | 2017 | 83 | 15 | 2 |
| Do you develop your own herbicide programs? | 2013 | 45 | 55 | - |
| | 2017 | 36 | 64 | - |
| Do you hire a custom applicator to spray herbicides? | 2013 | 65 | 35 | - |
| | 2017 | 65 | 35 | - |
| Do you plan to use the dicamba-resistant soybean system with dicamba? | 2017 only | 14 | 65 | 21 |
| Do you plan to use 2,4-D Enlist with the corn and soybean 2,4-D Enlist resistant systems?..... | 2017 only | 13 | 71 | 16 |

Two final questions on weed management behaviors focused on whether farmers planned to use two relatively new products. The first asked farmers if they planned to use the dicamba-resistant soybean system with dicamba. Fourteen percent indicated that they would, 65 percent would not, and 21 percent were unsure (table 1). The second question asked if they planned to use 2,4-D Enlist with the corn and soybean 2,4-D Enlist resistant systems. Thirteen percent indicated that they did plan to use that combination.

Manageability of major weeds

A second question set examined farmer perspectives on management of different weeds.¹ The survey provided a list of weeds that have become more difficult to manage in different areas of the U.S., and asked survey respondents who plant row crops to rate ease or difficulty of control. The introductory statement was, “Considering the land you farm, please rate the manageability of the following weeds.”

Waterhemp was viewed as the most challenging weed: 57 percent reported it has become more difficult to control and 23 percent believed it has become resistant to herbicides (table 2). Marestalk/horseweed, giant ragweed, and lambsquarters were rated as having become more difficult to control by

nearly 50 percent of farmers, but fewer than 10 percent believed that these weeds have become resistant to herbicides. Common ragweed was rated as more difficult to control or resistant by 39 percent and 2 percent of farmers, respectively.

[Palmer amaranth](#) is a plant that weed scientists have classified as a serious concern for Iowa agriculture because it is highly invasive, fast growing, produces seed prolifically, and has evolved resistance to many herbicides in other states. Resistance is not confirmed in Iowa. As of August 2017, Palmer amaranth had been identified in 50 Iowa counties, and ISU Extension and Outreach specialists recommend that farmers be [increasingly vigilant](#) in [identifying](#) and [eradicating](#) it from their fields, conservation plantings, roadsides, and ditches.

Given Palmer amaranth’s invasiveness and potential to evolve herbicide resistance, it is critically important that farmers be able to identify and eradicate it. The survey results, however, indicate that a majority of farmers (54 percent) were not familiar with the weed (table 2). Twenty-three percent reported that it has become more difficult to control on the land they farm, and 16 percent believed it has become resistant to herbicides. These results suggest that more intensive efforts to increase farmers’ awareness of the weed and eradication methods are necessary.

Table 2. Rating of weed manageability

| | I’m not familiar with this weed | Is easily controlled | Has become more difficult to control | Has become resistant to herbicides |
|---------------------------|--|-----------------------------|---|---|
| | —Percent— | | | |
| Waterhemp..... | 5 | 14 | 57 | 23 |
| Marestail/Horseweed | 10 | 38 | 46 | 6 |
| Giant Ragweed..... | 5 | 44 | 47 | 4 |
| Lambsquarters..... | 5 | 46 | 45 | 4 |
| Common Ragweed | 4 | 55 | 39 | 2 |
| Palmer Amaranth..... | 54 | 7 | 23 | 16 |
| Kochia | 54 | 19 | 25 | 3 |

Concern about herbicide-resistant weeds

Several questions measured farmer concern about herbicide-resistant weeds.² These questions were designed to examine how concerns vary with geographic proximity, but there was little variation in concern at different geographic scales. Nearly 80 percent of farmers agreed that they were concerned about the spread of herbicide-resistant weeds from other regions of the U.S. (79 percent) and other counties (79 percent) (table 3). Seventy-seven percent agreed that they are concerned about spread from nearby farms, and 82 percent agreed with the item “Even if I keep my fields clean, I could get herbicide-resistant weeds from neighboring farms.” Considered together, these results indicate that Iowa farmers are highly concerned about herbicide-resistant weeds across geographic levels. A single item, reported only for farmers who rent land, indicated that most farmers are no less concerned about resistance on their rented land than on their owned land.

Effectiveness of weed resistance management approaches

In January 2017, after more than a year of collaborative planning among major Iowa agricultural stakeholders, the [Iowa Pest](#)

[Resistance Management Plan](#) was released.

The plan outlines a number of activities that will be pursued to help Iowa’s farmers and other agricultural stakeholders increase their awareness of and capacity to address pesticide resistance in the state. The Farm Poll survey contained a set of items to gauge farmers’ perspectives on the potential effectiveness of several hypothetical approaches to addressing herbicide-resistant weeds.³ The question set was preceded by the text, “In your opinion, how likely is it that the following approaches would help reduce the development and/or spread of herbicide-resistant weeds during the next five years?”

Farmers were provided short descriptions of nine different resistance management approaches and asked to rate their likelihood of success on a 5-point scale from very unlikely to very likely. Three of the approaches can be categorized as “quick technological fixes” that are products of private or public-sector scientific research. Three approaches can be characterized as “cooperative solutions” involving multiple stakeholders working together. Two items are related to financial incentives to spur behavior change. A single item described a government mandate approach.

Table 3. Concern about herbicide-resistant weeds

| | Strongly disagree | Disagree | Uncertain | Agree | Strongly agree |
|--|-------------------|----------|-----------|-------|----------------|
| | — Percent — | | | | |
| Even if I keep my fields clean, I could get herbicide resistant weeds from neighboring farms | 2 | 3 | 13 | 58 | 24 |
| I am concerned about herbicide resistant weeds spreading to my farming operation from nearby farming operations..... | 3 | 5 | 15 | 48 | 29 |
| I am concerned about herbicide resistant weeds spreading to my county from nearby counties..... | 2 | 5 | 14 | 50 | 29 |
| I am concerned about herbicide resistant weeds spreading to my region of the U.S. from other regions..... | 2 | 5 | 14 | 48 | 31 |
| I am more concerned about herbicide resistance on my own land than on land that I rent..... | 23 | 44 | 12 | 14 | 7 |

The highest-rated options were the “quick fix” approaches entailing new technologies. “Private company discovery and development of new herbicides” and “private company discovery and development of new herbicide-tolerant crops” were the two highest-rated approaches, with 70 and 69 percent of farmers, respectively, indicating that such approaches would be likely or very likely to reduce the development and spread of herbicide resistant weeds (table 4). “Land grant university discovery and development of new weed management strategies” was the fourth highest rated, at 62 percent likely or very likely.

The survey posed three cooperative approach scenarios, ranging from collaboration just

between farmers to a complex collaboration between multiple agricultural stakeholders. The cooperative scenario that farmers believed would be least likely to succeed was “Local farmers working together to improve adoption of weed Best Management Practices,” with 40 percent of farmers selecting either likely or very likely (table 4). “Local farmers and agricultural input supplier representatives working together to improve adoption of weed Best Management Practices” was rated substantially higher, with 61 percent of farmers indicating such an approach would be likely or very likely to succeed. The highest-rated option was the one that involved the most stakeholders: “Local farmers, agricultural input

Table 4. Rating of potential effectiveness of management approaches

| | Very unlikely | Unlikely | Neither likely nor unlikely | Likely | Very likely |
|---|---------------|----------|-----------------------------|--------|-------------|
| | —Percent— | | | | |
| Quick technical fixes | | | | | |
| Private company discovery and development of new herbicides..... | 4 | 8 | 18 | 55 | 15 |
| Private company discovery and development of new herbicide tolerant crops..... | 4 | 9 | 19 | 54 | 14 |
| Land grant university discovery and development of new weed management strategies..... | 5 | 10 | 23 | 52 | 10 |
| Cooperative approaches | | | | | |
| Local farmers, agricultural input supplier representatives, Iowa State University research and extension staff, state agency staff, and commodity group staff working together to improve adoption of weed Best Management Practices..... | 4 | 11 | 22 | 49 | 15 |
| Local farmers and agricultural input supplier representatives working together to improve adoption of weed Best Management Practices..... | 4 | 11 | 24 | 49 | 12 |
| Local farmers working together to improve adoption of weed Best Management Practices..... | 9 | 24 | 28 | 31 | 8 |
| Financial incentives, mandates | | | | | |
| Private company financial incentives to farmers to spur adoption of weed Best Management Practices... | 11 | 23 | 31 | 30 | 6 |
| Government financial incentives to farmers to spur adoption of weed Best Management Practices..... | 13 | 22 | 29 | 30 | 5 |
| Government-mandated weed Best Management Practices requirements for farmers..... | 21 | 25 | 35 | 17 | 3 |

supplier representatives, Iowa State University research and extension staff, state agency staff, and commodity group staff working together to improve adoption of weed Best Management Practices.” Sixty-four percent of farmers rated this strategy as likely or very likely to succeed.

These results indicate that although the “quick technological fix” options were viewed as most likely to succeed, cooperative solutions were also seen as promising. The [2014 Farm Poll survey](#) found that only 14 percent of corn and soybean farmers agreed with the statement, “herbicide-resistant weeds are not a major concern because new technologies will be developed to manage them.” So, although Iowa farmers agreed that a technological fix would be most likely to succeed, many do not believe that such technologies are forthcoming, and support the concept of cooperative pest management as a viable option. It is important to highlight that the most complex cooperative arrangement, involving stakeholders from across the private and public sectors, was rated as the most likely to succeed. This echoes [2014 Farm Poll findings](#) that multiple private and public stakeholders bear responsibility for resistance management, and indicates that many farmers would support involvement of diverse stakeholders in cooperative resistance management efforts.

The financial incentives and mandate items were the lowest-rated. “Private company financial incentives to farmers to spur adoption of weed Best Management Practices” and “Government financial incentives to farmers to spur adoption of weed Best Management Practices” were rated as likely or very likely to succeed by 36 and 35 percent of farmers, respectively (table 4). “Government-mandated weed Best Management Practices requirements for farmers” was rated least likely to succeed, with just 19 percent of farmers selecting the likely or very likely categories.

Soil health

Awareness of and interest in soil health has been increasing, with major outreach efforts by public agencies such as the [USDA Natural Resources Conservation Service \(NRCS\)](#), [private-public partnerships](#), and private sector entities focused on helping farmers learn about and improve the health of their soils. In [2013](#) and [2015](#), the Farm Poll survey examined aspects of farmers’ knowledge of and attitudes toward soil health and their capacity to improve it. In 2017, several measures of awareness from previous years were repeated, and two new question sets asked farmers to evaluate their own performance on actions that can improve soil health and their farm operations’ performance on key biophysical indicators of soil health. Questions were developed in consultation with NRCS staff, Iowa State agronomy faculty, and other stakeholders.

As in previous years, the question sets were introduced with a short definition of soil health:

The concept of “soil health” has been a topic of discussion in the agricultural community in recent years. Soil health has been defined as “the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans.”

Awareness of soil health

Responses on the awareness items that were asked in both 2015 and 2017 showed little change over the two-year period. Eighty-one percent of respondents agreed that they had noticed more discussion of soil health in the farm press over the last couple of years, compared to 80 percent in 2015 (table 5). Seventy-six percent agreed that they had paid more attention to soil health over the last couple of years, compared to 72 percent in 2015. Fifty-two percent agreed that they had noticed more discussion of soil health

Table 5. Awareness of soil health

| | | Strongly disagree | Disagree | Uncertain | Agree | Strongly agree |
|--|------|-------------------|----------|-----------|-------|----------------|
| | | -Percent- | | | | |
| I have noticed more discussion of soil health in the farm press in the last couple of years | 2015 | 1 | 2 | 16 | 64 | 16 |
| | 2017 | 1 | 3 | 15 | 61 | 20 |
| I have paid more attention to soil health in the last couple of years | 2015 | 2 | 8 | 19 | 60 | 12 |
| | 2017 | 2 | 6 | 16 | 59 | 17 |
| I have a good understanding of the concept of soil health | 2015 | 1 | 6 | 25 | 58 | 11 |
| | 2017 | 2 | 6 | 27 | 50 | 15 |
| I have noticed more discussion of soil health among fellow farmers in the last couple of years | 2015 | 2 | 11 | 41 | 42 | 4 |
| | 2017 | 2 | 10 | 36 | 45 | 7 |

among other farmers, compared to 46 percent in 2015. The only decline was for the item, “I have a good understanding of the concept of soil health,” which dropped to 65 percent agreement in 2017 from 69 percent agreement in 2015.

Evaluation of personal action for soil health

Farmers were provided with a list of six actions that can have positive impacts on soil health, and asked to rate how well their farm operations were performing in terms of those actions on a 5-point scale from very poorly to very well. Only results for farmers who had row crops are reported here. The highest-rated actions were “keeping the soil covered as much

as possible” and “disturbing the soil as little as possible,” with 75 percent and 71 percent of farmers, respectively, indicating they were performing well or very well on these indicators (table 6). Sixty-five percent of farmers reported they were doing well or very well at eliminating or greatly reducing tillage.

Farmers were less favorable in their self-ratings for the remaining three items. Thirty-eight percent reported they were doing well or very well on “keeping plants growing in fields throughout the year,” with the balance selecting fair, poorly, or very poorly (table 6). A similar proportion, 32 percent, reported they were doing well or very well at “varying rotations with crops other than corn and

Table 6. Self-rating of effectiveness of personal soil health management actions

| | Very poorly | Poorly | Fair | Well | Very well |
|---|-------------|--------|------|------|-----------|
| | -Percent- | | | | |
| Keeping the soil covered as much as possible | 0 | 2 | 22 | 41 | 34 |
| Disturbing the soil as little as possible | 0 | 4 | 24 | 36 | 35 |
| Eliminating or greatly reducing tillage | 2 | 8 | 24 | 26 | 39 |
| Keeping plants growing in fields throughout the year..... | 6 | 27 | 29 | 23 | 15 |
| Varying rotations with crops other than corn and soybean..... | 18 | 32 | 18 | 15 | 17 |
| Using cover crops..... | 30 | 31 | 16 | 12 | 12 |

soybean.” Using cover crops was the lowest-rated item, with 24 percent rating their operations as performing well or very well.

Evaluation of biophysical indicators of soil health

The survey provided a list of nine major physical and [biological indicators of soil health](#) and asked respondents to rate their farm operations’ performance on those indicators on a scale from very poor to very good. A “don’t know” category was also provided. As above, results are only presented for farmers who planted at least some row crops.

Respondents generally seemed confident about their soil health indicators, with majorities selecting good or very good for nearly all items. They rated percent organic matter highest, with 74 percent reporting either good or very good levels (table 7). Available water capacity was also high, with 73 percent good or very good ratings. These were followed by presence of earthworms and water infiltration rate, both at 68 percent good or very good. Biological activity, aggregate stability, and bulk density each received good or very good ratings by about 60 percent of farmers. Low levels of soil-borne disease (54 percent good or very good) and presence of macropores (48 percent good or very good) rounded out the list. It is notable

that substantial proportions of farmers selected the “don’t know” category for the categories that they did not rate as highly, such as bulk density and presence of macropores.

Additional soil health questions

Three additional questions focused on policy and outreach. The survey asked the question, “If more cost-share funding were available for soil health practices such as cover crops or adding additional crops to rotations, would you be more likely to try them or expand use?” Fifty-six percent of farmers responded affirmatively, 21 percent would not try them or expand use and 23 percent selected “don’t know” (table 8). Similarly, 47 percent of farmers indicated that they would “...be interested in learning more about soil health by attending field days, workshops, etc.” Finally, anecdotal evidence has pointed to crop insurance as a barrier to soil health-enhancing actions such as cover crops. However, just eight percent of farmers indicated that insurance requirements had discouraged them from using practices to improve soil health.

Table 7. Rating of selected indicators of soil health, fields in their farm operation

| | Very poor | Poor | Fair | Good | Very good | Don’t know |
|--|------------------|-------------|-------------|-------------|------------------|-------------------|
| | -Percent- | | | | | |
| Percent organic matter | 0 | 2 | 16 | 42 | 32 | 8 |
| Available water capacity | 0 | 2 | 16 | 47 | 26 | 9 |
| Presence of earthworms | 0 | 4 | 19 | 36 | 33 | 9 |
| Water infiltration rate | 0 | 3 | 19 | 47 | 21 | 10 |
| Biological activity | 0 | 2 | 20 | 39 | 22 | 17 |
| Aggregate stability | 0 | 3 | 21 | 44 | 15 | 17 |
| Bulk density | 0 | 3 | 22 | 43 | 14 | 18 |
| Low levels of soil-borne disease | 0 | 3 | 23 | 37 | 16 | 20 |
| Presence of macropores | 0 | 4 | 22 | 34 | 14 | 26 |

Table 8. Additional soil health questions

| | Yes | No | Don't know |
|---|-----------|----|------------|
| | —Percent— | | |
| If more cost-share funding were available for soil health practices such as cover crops or adding additional crops to rotations, would you be more likely to try them or expand use?..... | 56 | 21 | 23 |
| Would you be interested in learning more about soil health by attending field days, workshops, etc.? | 47 | 28 | 25 |
| Do crop insurance requirements discourage you from using different kinds of soil health practices (e.g., cover crops, adding additional crops to rotations)?.. | 8 | 78 | 15 |

Extended rotations with small grains and forages

An [increasing number of studies](#) have focused on measuring the agronomic, ecological, and economic impacts of diversifying conventional corn-soybean crop rotations. [Long-term studies of systems](#) that add small grains, clover, alfalfa, or other crops to cropping systems have found that increasing diversity can decrease dependence on purchased inputs and fuel with little impact on profitability over time. Despite mounting evidence of the potential benefits of such “extended rotations,” few Iowa farmers use them. The 2017 Farm Poll survey sought to learn about farmers’ perspectives on the potential benefits of extended rotations, barriers to their use, and possible ways to facilitate more widespread use of crop diversification. Questions were developed in partnership with Iowa State agronomy faculty

and graduate students and staff from Practical Farmers of Iowa. Data are presented only for farmers who planted corn or soybean in 2016.

The first question set focused on attitudes toward extended rotations, in particular the perceived benefits associated with their use and perceived impediments to more widespread use. The question set was preceded by the following introductory text:

Long-term agricultural research in Iowa and other Midwestern states has been examining how “extended” rotations that integrate small grains such as oats, wheat, and cereal rye, forages such as alfalfa, and cover crops in addition to corn and soybeans can impact soil health, yields, input costs, and other aspects of cropping systems. Please provide your opinions on the following statements regarding extended rotations.

Table 9. Perceived benefits of extended rotations

| | Strongly disagree | Disagree | Uncertain | Agree | Strongly agree |
|---|-------------------|----------|-----------|-------|----------------|
| | -Percent- | | | | |
| Extended rotations can improve soil health..... | 0 | 2 | 16 | 63 | 19 |
| Extended rotations can decrease pesticide needs by controlling insect pests | 1 | 6 | 28 | 56 | 10 |
| Extended rotations can decrease herbicide needs by controlling weeds | 1 | 8 | 27 | 55 | 9 |
| Over the long term, extended rotations that include crops other than corn and soybeans can be as profitable as corn-corn or corn-soybean rotations | 5 | 27 | 41 | 24 | 3 |

Most farmers believed extended rotations can lead to multiple benefits. Eighty-two percent agreed or strongly agreed they can improve soil health, 66 percent agreed or strongly agreed they can decrease pesticide needs by controlling pests, and 64 percent agreed or strongly agreed they can decrease herbicide needs by controlling weeds (table 9).

Just 28 percent, however, agreed with the statement, “Over the long term, extended rotations that include crops other than corn and soybeans can be as profitable as corn-corn or corn-soybean rotations.” The plurality response for that item was “uncertain,” at 41 percent.

Among the perceived barrier items, “the decline of mixed grain and livestock farming has made production of small grains and forages less viable” garnered the most agreement, at 77 percent (table 10). Seventy percent of farmers agreed extended rotations are risky due to lack of viable markets for crops other than corn and soybeans. Similarly, 68 percent indicated they would be more likely to use extended rotations if markets for small grains were more robust. Fifty-eight percent agreed

with the statement, “since agribusiness companies don’t generally produce seeds and inputs for alternative crops, ag retailers are not likely to promote extended rotations,” and 55 percent agreed that, “agribusiness companies are not interested in crop rotations that reduce reliance on purchased inputs.” Finally, 50 percent agreed that the “culture of Iowa agriculture” is not supportive of crops aside from corn and soybeans.

A next set of questions asked farmers about factors that could potentially facilitate integration of small grains crops into rotations. The question set was preceded by the following text:

Small grains such as oats, wheat, barley, and triticale are crops that can be integrated into extended crop rotations. There are a number of factors that could help farmers to incorporate small grains and/or forage crops into their crop rotations. In your opinion, how important would the following be in encouraging farmers to try extended rotations?

Table 10. Perceived barriers to extended rotations

| | Strongly disagree | Disagree | Uncertain | Agree | Strongly agree |
|--|-------------------|----------|-----------|-------|----------------|
| | -Percent- | | | | |
| The decline of mixed grain and livestock farming has made production of small grains and forages less viable..... | 1 | 4 | 18 | 61 | 16 |
| Extended rotations are risky due to lack of viable markets for crops other than corn and soybeans..... | 1 | 8 | 21 | 58 | 12 |
| If there were more robust markets for small grains and/or forages in my area, I would be more likely to use (or expand use of) extended rotations | 1 | 6 | 25 | 56 | 11 |
| Since agribusiness companies don’t generally produce seeds and inputs for alternative crops, ag retailers are not likely to promote extended rotations | 1 | 6 | 35 | 46 | 12 |
| Agribusiness companies are not interested in crop rotations that reduce reliance on purchased inputs .. | 1 | 9 | 35 | 40 | 15 |
| The culture of Iowa agriculture is not supportive of field crops other than corn and soybeans..... | 3 | 20 | 27 | 42 | 8 |

Table 11. Potential facilitators of integration of small grains into rotations

| | Not at all important | Somewhat important | Important | Very important |
|---|----------------------|--------------------|-----------|----------------|
| | —Percent— | | | |
| Development of robust markets..... | 2 | 8 | 47 | 43 |
| Facilitation of linkages with specialty crop buyers..... | 3 | 17 | 57 | 23 |
| Strong documentation of the economics/longer-term profitability | 4 | 20 | 53 | 23 |
| Research-based evidence of soil health benefits | 3 | 23 | 56 | 18 |
| Revenue protection crop insurance | 6 | 22 | 47 | 24 |
| Workshops, field days, and trainings on production practices | 6 | 38 | 45 | 11 |
| Technical assistance from local ag retailers | 9 | 35 | 48 | 8 |
| Cost share to offset short-term costs | 8 | 37 | 42 | 12 |

All of the items were rated as important or very important by at least half of farmers. “Development of robust markets” was the highest-rated item, with 90 percent of farmers selecting important or very important (table 11). Eighty percent of respondents indicated that “facilitation of linkages with specialty crop buyers” was important or very important, 76 percent rated “strong documentation of the economics/longer-term profitability” as important or very important, and 74 percent indicated that “research-based evidence of soil health benefits” was important or very important. “Revenue protection crop insurance for small grains” was seen as important or very important by 71 percent

of respondents. Both “workshops, field days, and trainings on production practices” and “technical assistance from local ag retailers” were rated important or very important by 56 percent. The lowest-rated item was “cost share to offset short-term costs,” at 54 percent important or very important.

The next set of items focused on potential barriers to planting small grains as part of longer crop rotations. Similarly, this set was preceded by the text, “Considering your farm operation, how important are the following as factors that may limit your capacity to incorporate the production of small grains into your crop rotation?” “Lack of robust markets

Table 12. Potential barriers to integration of small grains into rotations

| | Not at all important | Somewhat important | Important | Very important |
|---|----------------------|--------------------|-----------|----------------|
| | —Percent— | | | |
| Lack of robust markets for small grains | 5 | 12 | 41 | 43 |
| Land rental rates are too high | 8 | 11 | 34 | 48 |
| Lack of small grain varieties with elite genetics for yield and pest and disease resistance | 7 | 27 | 51 | 15 |
| Lack of necessary equipment for planting, harvesting, etc..... | 17 | 24 | 37 | 22 |
| Lack of good technical support for small grain production..... | 10 | 30 | 48 | 12 |
| Lack of experience with/knowledge of small grain production..... | 27 | 37 | 32 | 6 |

for small grains” and “land rental rates are too high” were the highest-rated by far, with 83 and 82 percent of respondents, respectively, indicating they were important or very important barriers to small grains production (table 12). Two-thirds of farmers rated “lack of small grain varieties with elite genetics for yield and pest and disease resistance” as an important or very important impediment. Sixty and 59 percent, respectively, indicated the same about “lack of good technical support for small grain production” and “lack of necessary equipment for planting, harvesting, etc.” The lowest-rated item was “lack of experience with/knowledge of small grain production,” at 37 percent important/very important.

Influence of agricultural information sources

Influence can be defined as “power to affect others,” or “power to produce effects because of wealth, position, ability, etc.”⁴ In the context of agricultural decision making, there are a number of stakeholders who may exert a degree of influence on decisions, and the level of influence may vary by type of information. The [2016 Farm Poll](#) asked farmers to rate how much they trust a range of organizations and individuals as sources of information to help them make production and conservation decisions. The 2017 survey posed identical questions, but focused on *influence* rather than trust. The survey provided two question sets with identical lists of stakeholders, preceded by two introductory statements, one focused on crop and livestock production, and the other on soil and water conservation:

The following individuals, agencies, and organizations are agricultural stakeholders. Please indicate how much influence each generally has on your crop and livestock production decisions such as seed selection, planting rates, fertilizer rates, and pest and disease management.

and,

The following individuals, agencies, and organizations are agricultural stakeholders. Please indicate how much influence each generally has on your soil and water conservation decisions such as what conservation practices to use for erosion control, reducing nutrient loss into waterways, and preparing for or dealing with extreme weather events and other weather-related challenges.

Farmers were asked to rate the degree of influence each entity generally has on those types of decisions on a 5-point scale from no influence to very strong influence. The ranked orders presented below are based on the average score for each entity on the 5-point influence scale.

Crop and livestock production

Among information sources for crop and livestock decisions, local agricultural retailers were the most influential, with 71 percent of respondents selecting moderate, strong, or very strong influence (table 13). Seed dealers were second, at 63 percent. Iowa State University was third, with 59 percent of farmers indicating a moderate or higher level of influence on crop and livestock decisions. Other family members who farm and other farmers who farm close by rounded out the top five. Table 13 shows the crop and livestock decision influence ranking of the remaining groups.

Soil and water conservation

The ranking of influence of information sources on soil and water conservation decisions was substantially different. USDA-NRCS/Soil and Water Conservation District service centers were rated as most influential, with 62 percent of farmers selecting moderate, strong, or very strong influence (table 14). Iowa State University was the second most influential information source, with 54 percent selecting moderate or higher influence on

Table 13. Influence of agricultural information sources on crop and livestock decisions

| | No influence | Slight influence | Moderate influence | Strong influence | Very strong influence |
|---|--------------|------------------|--------------------|------------------|-----------------------|
| | —Percent— | | | | |
| Local agricultural retailer(s) (e.g., fertilizer, agricultural chemical dealer, coop) | 13 | 16 | 36 | 30 | 6 |
| Seed dealer(s) | 16 | 21 | 35 | 24 | 5 |
| Iowa State University (e.g., extension field staff, campus researchers, field days, workshops, publications, videos)..... | 17 | 24 | 35 | 19 | 6 |
| Family members who farm..... | 29 | 15 | 24 | 24 | 8 |
| Other farmers who farm close by | 21 | 24 | 36 | 17 | 3 |
| USDA/NRCS/Soil and Water Conservation District Service Center | 22 | 26 | 31 | 16 | 5 |
| Independent/private crop adviser(s)/ agronomist(s)..... | 35 | 21 | 25 | 16 | 3 |
| Iowa Water Quality Initiative | 32 | 27 | 27 | 11 | 3 |
| Iowa Department of Agriculture and Land Stewardship | 31 | 28 | 31 | 8 | 3 |
| Landlord(s)/farm management firm(s) | 46 | 19 | 18 | 13 | 3 |
| Other farmers who farm outside of your neighborhood | 36 | 31 | 24 | 8 | 1 |
| Iowa Soybean Association..... | 42 | 27 | 22 | 8 | 2 |
| Iowa Corn Growers..... | 42 | 27 | 23 | 7 | 2 |
| Ag banker/lender(s) | 47 | 21 | 18 | 11 | 3 |
| Insurance agent(s) | 49 | 24 | 19 | 6 | 2 |
| Iowa Farm Bureau | 47 | 27 | 19 | 6 | 1 |

soil and water conservation decisions. Family members who farm and other farmers who farm close by were rated at 53 percent and 51 percent moderate or greater influence, respectively. The Iowa Water Quality Initiative (IWQI) rounded out the top five, at 43 percent moderate influence or more. This last result is interesting because the [IWQI, which helps coordinate implementation of the action plan for the Iowa Nutrient Reduction Strategy \(NRS\)](#), is relatively new, having been established after the launch of the NRS in 2013. The result indicates that the IWQI has attained a relatively high level of influence on soil and water conservation decisions over a short period of time.

The Iowa Department of Agriculture and Land Stewardship was number six, followed by local agricultural retailers, landlords or farm management firms, and independent crop advisers or agronomists (table 14). Seed dealers rounded out the top ten. Table 14 shows the soil and water conservation decision influence ranking of the remaining six groups.

Comparing influence and trust

Because the 2016 and 2017 Farm Poll surveys asked farmers to rate levels of trust (2016) in and influence (2017) of the same set of information sources, we can compare responses to evaluate how trust and influence may vary within entities. Tabulation of rankings⁵ reveal a number of similarities and differences. Here we

Table 14. Influence of agricultural information sources on soil and water conservation decisions

| | No influence | Slight influence | Moderate influence | Strong influence | Very strong influence |
|--|--------------|------------------|--------------------|------------------|-----------------------|
| | —Percent— | | | | |
| USDA/NRCS/Soil and Water Conservation District Service Center | 17 | 21 | 32 | 23 | 7 |
| Iowa State University (e.g., extension field staff, campus researchers, field days, workshops, publications, videos) | 22 | 25 | 31 | 17 | 5 |
| Family members who farm..... | 30 | 17 | 24 | 22 | 7 |
| Other farmers who farm close by | 20 | 29 | 33 | 16 | 2 |
| Iowa Water Quality Initiative..... | 31 | 25 | 26 | 14 | 3 |
| Iowa Department of Agriculture and Land Stewardship | 30 | 26 | 29 | 13 | 2 |
| Local agricultural retailer(s) (e.g., fertilizer, agricultural chemical dealer, coop) | 35 | 27 | 25 | 11 | 2 |
| Landlord(s)/farm management firm(s) | 45 | 18 | 20 | 13 | 4 |
| Independent/private crop adviser(s)/ agronomist(s)..... | 43 | 24 | 22 | 9 | 2 |
| Seed dealer(s) | 41 | 29 | 20 | 9 | 1 |
| Other farmers who farm outside of your neighborhood | 38 | 32 | 22 | 7 | 1 |
| Iowa Soybean Association..... | 50 | 25 | 18 | 6 | 1 |
| Iowa Corn Growers..... | 51 | 25 | 18 | 5 | 1 |
| Iowa Farm Bureau | 52 | 25 | 16 | 6 | 1 |
| Ag banker/lender(s) | 56 | 22 | 14 | 7 | 1 |
| Insurance agent(s) | 60 | 22 | 12 | 4 | 1 |

focus on the differences, which were calculated by subtracting the 2017 influence rank from the 2016 trust rank.

For crop and livestock production information, the top five groups remained in the top five, but order shifted. Local agricultural retailers increased from number three in trust to number one in influence, and family members who farm dropped from number one in trust to number four in influence (table 15). Seed dealers were three spots higher as the second-ranked influence. Iowa State University dropped one spot from second to third, and other farmers who farm close by dropped from fourth to fifth. Landlords or farm management firms scored a notable difference, up from last

place in trust to 10th place in influence. The largest difference was the IWQI's jump from second-to-last (#15) in trust to number eight in influence on crop and livestock decision making. It is possible that the difference is due to increased levels of awareness of IWQI and its ongoing and growing promotion of nutrient best management practices in support of the Iowa Nutrient Reduction Strategy.

Comparisons between influence of and trust in sources of soil and water conservation information showed a similar pattern. The top four groups remained in the top four, with some reordering (table 16). The top-ranked influence on soil and water conservation decision making, USDA-NRCS/Soil and Water

Table 15. Crop and livestock decisions: Influence versus trust

| | Trust (2016) | Influence (2017) |
|---|-------------------------|-----------------------------|
| | –Rank– | |
| Local agricultural retailer(s) (e.g., fertilizer, agricultural chemical dealer, coop)..... | 3 | 1 |
| Seed dealer(s) | 5 | 2 |
| Iowa State University (e.g., extension field staff, campus researchers, field days, workshops, publications, videos) | 2 | 3 |
| Family members who farm..... | 1 | 4 |
| Other farmers who farm close by | 4 | 5 |
| USDA/NRCS/Soil and Water Conservation District Service Center | 6 | 6 |
| Independent/private crop adviser(s)/agronomist(s) | 7 | 7 |
| Iowa Water Quality Initiative | 15 | 8 |
| Iowa Department of Agriculture and Land Stewardship | 9 | 9 |
| Landlord(s)/farm management firm(s) | 16 | 10 |
| Other farmers who farm outside of your neighborhood | 8 | 11 |
| Iowa Soybean Association..... | 10 | 12 |
| Iowa Corn Growers..... | 11 | 13 |
| Ag banker/lender(s) | 12 | 14 |
| Insurance agent(s) | 14 | 15 |
| Iowa Farm Bureau | 13 | 16 |

Table 16. Soil and water conservation decisions: Influence versus trust

| | Trust (2016) | Influence (2017) |
|---|-------------------------|-----------------------------|
| | –Rank– | |
| USDA/NRCS/Soil and Water Conservation District Service Center | 4 | 1 |
| Iowa State University (e.g., extension field staff, campus researchers, field days, workshops, publications, videos) | 2 | 2 |
| Family members who farm..... | 1 | 3 |
| Other farmers who farm close by | 3 | 4 |
| Iowa Water Quality Initiative | 12 | 5 |
| Iowa Department of Agriculture and Land Stewardship | 5 | 6 |
| Local agricultural retailer(s) (e.g., fertilizer, agricultural chemical dealer, coop)..... | 6 | 7 |
| Landlord(s)/farm management firm(s) | 14 | 8 |
| Independent/private crop adviser(s)/agronomist(s) | 7 | 9 |
| Seed dealer(s) | 9 | 10 |
| Other farmers who farm outside of your neighborhood | 8 | 11 |
| Iowa Soybean Association..... | 10 | 12 |
| Iowa Corn Growers..... | 11 | 13 |
| Iowa Farm Bureau | 13 | 14 |
| Ag banker/lender(s) | 15 | 15 |
| Insurance agent(s) | 16 | 16 |

Conservation District service centers, was three spots higher than its number four ranking on trust. Family members who farm shifted from the top rank in trust to number three in influence. Iowa State University maintained second position in both influence and trust. Landlords or farm management firms again were notably higher in influence than in trust, up six spots from 14th in trust to eighth in influence. The IWQI again had the largest difference, rising from 13th in trust to number five in influence.

Multiple farm operators: Gender and decision making

Starting in 2018, the USDA Census of Agriculture will begin to ask about decision-making participation for up to four farm operators. This change is in response to increasing size and complexity of U.S. farms and a recognition that there is a need to better understand women’s roles in farming. As farms become larger and include multiple families and generations, decision making is increasingly shared among multiple operators, both male and female, and little information about women’s participation in different kinds of decision making is available. The 2017 Farm Poll adapted the Census of Agriculture questions for use in Iowa.

The first question asked respondents to report how many men and women, including themselves, family members, and hired managers, were involved in decisions for the farm operation. Overall, respondents reported an average of 2.1 decision makers per farm

operation, with a maximum of 15. The average number of men involved was 1.5, and the average number of women was 0.6.

The second question set was preceded by the introductory statement, “Considering the persons from the previous question, which are involved in the following farm decisions? Please answer for up to four of the people who are involved in decisions.” A table with major decision-making categories was provided and respondents were asked to check the ones in which the operators (including themselves) were involved. The respondent was asked to indicate the gender of each operator.

Respondents reported that 97 percent of the primary operators were male and three percent were female (table 17). For operator number 2 and 3, the gender distribution was more balanced, at 48 percent male and 52 percent female and 51 percent male and 49 percent female, respectively. Forty percent of operator 4 were male, and 60 percent were female.

Reported participation in decision making by gender is shown in table 18. Similar patterns are evident across all operators. However, because so few primary operators were female, comparisons for operator 1 are not discussed in detail here.

The data show clear gender-related patterns by decision-making area. Men tended to predominate in crop management and soil and water conservation decisions, while women participated in financial management and estate planning at higher rates than men. The percentages in the table represent the

Table 17. Gender of multiple farm decision makers

| | Male | Female |
|------------------|-----------|--------|
| | —Percent— | |
| Operator 1 | 97 | 3 |
| Operator 2 | 48 | 52 |
| Operator 3 | 51 | 49 |
| Operator 4 | 40 | 60 |

Table 18. Percent of operators involved in farm decision making, by gender

| | Operator 1 | | Operator 2 | | Operator 3 | | Operator 4 | |
|--|-----------------|------------------|-----------------|-------------------|-----------------|-------------------|----------------|------------------|
| | Male (n=730) | Female (n=31) | Male (n=315) | Female (n=343) | Male (n=117) | Female (n=114) | Male (n=30) | Female (n=44) |
| | —Percent— | | | | | | | |
| Crop decisions, including planting, fertilizer, pesticides | 86 | 58 | 71 | 26 | 50 | 13 | 37 | 5 |
| Nutrient management decisions | 85 | 71 | 62 | 22 | 42 | 4 | 37 | 7 |
| Decisions about conservation practices to use (e.g., cover crops, buffer strips)..... | 86 | 71 | 66 | 36 | 45 | 21 | 37 | 18 |
| Livestock decisions, including purchases, sales, feed, pasture and hay management..... | 70 | 65 | 38 | 30 | 27 | 16 | 23 | 11 |
| Day-to-day decisions | 90 | 81 | 56 | 41 | 33 | 21 | 20 | 18 |
| Marketing crops and/or livestock | 84 | 74 | 56 | 39 | 32 | 25 | 23 | 23 |
| Record keeping and/or financial management..... | 80 | 77 | 43 | 67 | 25 | 54 | 17 | 50 |
| Estate planning or succession planning..... | 75 | 74 | 42 | 79 | 27 | 70 | 7 | 75 |

proportion of farm operators within each gender category who participated in each type of decision, so they do not add up to 100 percent.

For crop-related decisions, men were substantially more likely to participate than women across all operators. For operator 2, 71 percent of men participated in crop decisions, versus 26 percent of women, a difference of 45 percentage points (table 18). For operator 3, 50 percent of males participated in crop decisions compared to 13 percent of females, and the difference for operator 4 was 37 percent to 5 percent. Men also participated in nutrient management decisions at a higher rate than women, with percentage point differences as high as 41 points (operator 2). Decisions about conservation practices showed a similar participation gap as high as 30 points (operator 2).

Men and women participated in livestock management decisions, marketing decisions, and day-to-day decisions at more similar rates (table 18). Decision participation was still somewhat skewed toward men, however. Percentage point differences ranged from a low of one point (marketing, operator 4) to as high as 17 points (marketing, operator 2).

Women participated in record keeping and/or financial management and estate planning or succession planning at substantially higher rates than men (table 18). For record keeping, 43 percent of male operator 2 participated in decisions compared to 67 percent of female operator 2, a 24 percentage point difference. The percentage point difference was 30 points and 33 points for operator 3 and operator 4, respectively. In the realm of estate or succession planning women clearly predominated, with differences ranging from a low of 38 percentage points (operator 2) to a high of 68 points (operator 4).

The “better than average” effect

“Well, that’s the news from Lake Wobegon, where all the women are strong, all the men are good looking, and all the children are above average.”

Garrison Keillor, *Prairie Home Companion*

This famous quote that always closed the opening monologue of Garrison Keillor’s *Prairie Home Companion* radio program is an example of a social-psychological concept known as the “better than average” (BTA) effect. The BTA effect is a cognitive bias whereby people tend to think of themselves as exceptional and unique rather than average and common, especially when compared to peers.⁶ One objective of the 2017 Farm Poll was to examine whether the BTA effect extends to agricultural production and conservation behaviors. Respondents were provided with a list of five conservation and production-related performance indicators and asked the question, “Compared to other farm operations in your area, how well do you think your farm operation is performing in the following areas?” They were provided a 5-point scale ranging from far below average to far above average.

As anticipated, respondents tended to rate themselves higher than their local peers.

Controlling soil erosion was the conservation behavior on which farmers were most confident, with 69 percent rating themselves as above average or far above average (table 19). Controlling nutrient loss into waterways was second, with 63 percent of respondents rating themselves as above or far above average, followed closely by providing habitat for wildlife, at 58 percent. Farmers were less confident in the two items that were more focused on crop production. Fewer than half (49 percent) rated themselves as above or far above average in terms of crop yields or livestock performance, and 44 percent expressed the same about minimizing the use of pesticides. No more than 10 percent of respondents rated themselves as below average for any of the items.

These results have several implications. First, research has shown that the BTA effect is stronger for qualities that people place more social importance on, such as honesty and kindness (Brown 2012). The result that the BTA effect appears to be stronger for conservation indicators suggests that farmers believe that soil and water conservation is important. Second, the BTA effect tends to increase in magnitude following events that threaten people’s self-esteem (ibid 2012). It is possible that increased scrutiny of agriculture’s contribution to soil and water quality problems, including high-profile events such as the [lawsuit filed by the Des](#)

Table 19. The “better than average” effect in agricultural production and conservation

| | Far below average | Below average | Average | Above average | Far above average |
|---|-------------------|---------------|---------|---------------|-------------------|
| | —Percent— | | | | |
| Controlling soil erosion..... | 0 | 1 | 30 | 52 | 17 |
| Controlling nutrient runoff/loss into waterways | 0 | 2 | 35 | 49 | 14 |
| Providing habitat for wildlife | 1 | 9 | 31 | 38 | 20 |
| Crop yields and/or livestock performance..... | 2 | 5 | 44 | 44 | 6 |
| Minimizing use of herbicides, insecticides, and fungicides..... | 1 | 3 | 53 | 36 | 8 |

[Moines Water Works](#) and steady [press coverage and editorializing](#) about agriculture and water quality, is perceived by farmers as a threat to livelihood and self-esteem, leading to a greater BTA effect for the soil and water conservation items than for the production-related items.

Regardless, the reality is that not all people can be average or above, so these data suggest that Iowa farmers may be overestimating the efficacy of their soil and water conservation actions. This result points to a need to help farmers conduct accurate evaluations of their farm operations' actual soil and water conservation performance.

Endnotes

- 1.,3. Several of these items were adapted from a 2015 survey funded by USDA-sponsored Agriculture and Food Research Initiative grant number 122422.
2. These questions were developed for a 2015 survey of farmers in 22 states and funded by USDA-sponsored Agriculture and Food Research Initiative grant number 122422.
4. Webster's New World Dictionary, 1990 edition.
5. In 2016, trust in information sources was measured on a 5-point scale ranging from strongly distrust to strongly trust. In 2017, level of influence was measured on a 5-point scale from no influence (1) to very strong influence (5). Rank order of trust and level of influence was established by calculating the mean of each 5-point scale and sorting high to low.
6. This component of the research draws on this well-known study of the better than average effect: Brown, J. D. (2012). Understanding the Better Than Average Effect: Motives (Still) Matter. *Personality and Social Psychology Bulletin*, 38(2), 209-219. It is available for download at: <http://journals.sagepub.com/doi/abs/10.1177/0146167211432763>.

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