

A photograph of a field of white flowering cover crops, likely buckwheat, with a row of red-leafed plants in the background. A green diagonal banner is overlaid on the bottom left.

Annual Report 2015-2016

Cover Crop Survey
July 2016



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ABSTRACT

The fourth annual SARE/CTIC Cover Crop Survey collected data from 2,020 respondents from 48 states and the District of Columbia. Eighty-one percent described themselves as cover crop users. Their plantings of cover crops charted a steady rise since 2010, and projected plantings in the summer of 2016 were expected to continue the trend, despite a bearish agricultural economy.

Farmers reported modest yield gains in both corn (1.9%) and soybeans (2.8%) following the use of cover crops, and indicated that the popular practice of planting a cereal rye cover crop before soybeans had a positive effect on both yield and broadleaf weed control for a majority of respondents.

Respondents said the most important benefits of cover crops were improved soil health, reduced erosion and increased soil organic matter. While a majority saw no loss in profit or lacked the data to tell, about one-third found a profit increase from cover crops, while only 5.7% had a reduction in profit. Asked whether cover crops reduced yield variability during extreme weather events, two-thirds of the respondents agreed.

Cereal rye was the most popular single species of cover crop, but mixes of two or more species were also popular and growing. Cereal rye was reported to boost soybean yields on a majority of farms, and 82% indicated that cereal rye as a cover helped reduce weed problems. Notably, 26% specifically indicated cereal rye improved control of troublesome herbicide-resistant weeds. A majority of farmers planting blends of cover crops reported that they “graduated” from single-species plantings to blends or from simpler to more complex mixes.

Overall, respondents were quite enthusiastic about cover crops, including newer trends like grazing cover crops. Tax credits, reduced crop insurance premiums and more information about cover crops topped the list of favored enticements for increased use of cover crops. Such perspective can help policymakers, educators and conservation advocates chart a course to further adoption of cover crops and even greater success for the farmers who use them.



FOREWORD

Again, in this year's report are the results of the national cover crop survey that was conducted by the Conservation Technology Information Center (CTIC), USDA's Sustainable Agriculture Research and Education Agency (SARE) and the American Seed Trade Association (ASTA) and some of their member companies. This is our fourth cover crop survey report, and I believe we still continue to gain vital information from farmers and great insight into the use of cover crops across various agricultural areas of the United States.

The partnership with SARE and ASTA has been instrumental in making this survey a valuable tool for gathering information. Jerry Hall and Jane DeMarchi from ASTA and Dr. Rob Myers and Alan Weber from SARE have been instrumental in developing and tweaking questions to gain the best insights from respondents. Without their help and expertise, this survey would not be near as valuable a tool as it has turned out to be.

Dr. Rob Myers also deserves the majority of the credit for his vision in creating the idea for this survey and helping to make it a reality. His vision and foresight to ask the right questions has added so much value to this survey and made it a valuable tool at multiple levels.

Samantha Tellatin of SARE deserves significant credit for helping to extract information out of the survey's raw data, organizing data and representing it in a format that made it simple to identify the key points and the best learning opportunities. Her work brought respondents' insights to life.

Dr. Wallace Tyner and Shanxia Sun, one of Dr. Tyner's students at Purdue University, dug deep into the yield data and conducted a statistical analysis. Their thorough work helped determine the significance of cover crops and validate the data that we collected.

Scott Grau and Kurt Lawton from Penton Media also helped once again to distribute the survey to farmers. Undoubtedly, their Corn and Soybean Digest readership significantly contributed to the number of respondents to the survey.

Also, insight on question formation and format from Dr. Linda Prokopy at Purdue was once again instrumental in helping us maximize the utility of all of the questions and ensuring that our questions would yield the kind of information that we were seeking. Dr. Prokopy's extensive experience with surveys and questions is certainly a contributing factor to the robust dataset we were able to capture through this survey.

Again, Steve Werblow, a communications professional from Oregon, has scanned the data and analysis and picked out the key learning opportunities from the information collected. It is his ability to identify the salient points, and draft language that exposes that information to a wide array of readers, that has strengthened the survey and expanded the outreach and utility of the information to a much broader audience.

As with all surveys, the most valuable element is those who give of their own time to provide information. Without farmers who are willing to share their information, this survey would not provide the kinds of valuable insights that it does. A debt of gratitude goes out to the 2,020 farmers who participated in the survey and contributed to the information base.

Thank you to all who helped make this survey a success.

Chad Watts, CTIC Executive Director

INTRODUCTION

Despite weather challenges and a bruising drop in commodity prices in 2015, cover crops continued their spread across American farmland. For the fourth year in a row, the Sustainable Agriculture Research and Education (SARE) program and Conservation Technology Information Center (CTIC) invited farmers across the U.S. to share their experiences, thoughts and concerns about cover crops in an online survey.

With help from the American Seed Trade Association (ASTA), Purdue University and Penton Farm Progress Media, and support from Albert Lea Seed, CHS, The CISCO Companies, La Crosse Seed, Mountain View Seeds, Allied Seed, Curtis & Curtis Inc., Grassland Oregon, Justin Seed and Seedway, SARE and CTIC posted the 49-question survey on SurveyMonkey and invited farmers via email, press release and web links to participate.

In all, 2,020 respondents, representing 48 states and the District of Columbia, completed the survey. Their commitment was noteworthy—answering a rather lengthy survey, respondents provided a detailed look at their operations and the role cover crops played there.

As in previous years, some of the respondents may have also participated in previous SARE/CTIC cover crop surveys. However, in statistical terms, each year's survey represents different samples, which imposes limits on how results can be compared from one year's survey to the next. Still, the data collected in this year's survey provides significant insight into farmers' view of cover crop benefits and risks, as well as into real-world practices in cover crop management in a range of crops.

It is our pleasure to share these results, and to encourage their use in the continued development of practices, policies and products that help further the adoption of cover crops.

Additional information from this survey is available online at www.sare.org/covercropsurvey.

METHOD

Project leaders from SARE and CTIC worked closely with colleagues from ASTA and researchers from Purdue University to create a finely tuned survey instrument.

The 2015-2016 questionnaire continued several lines of questioning from previous years (though, statistically, we cannot infer trends because the respondent samples are not necessarily the same from year to year). The survey also included new questions that allow researchers to explore emerging topics such as seed choices and other management variables.

All data was collected anonymously.

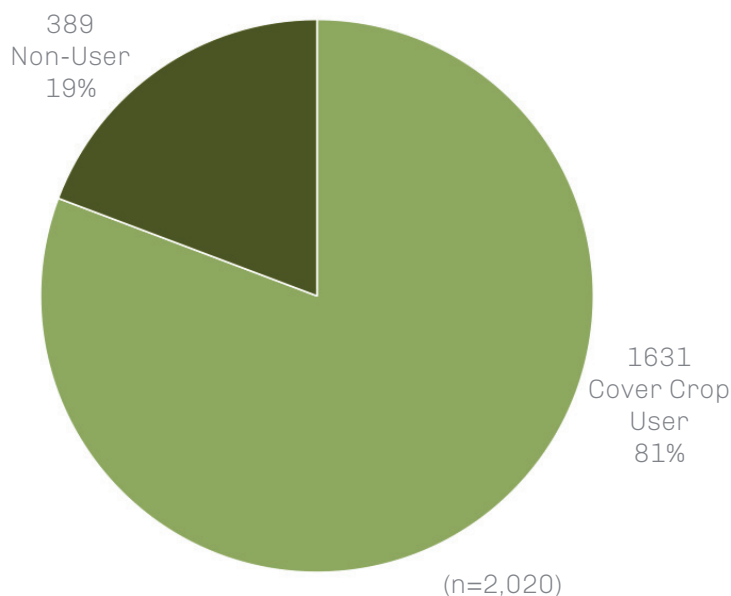


Invitations to participate were sent out in March 2016 to a broad, nationwide sample of farmers, including:

- More than 50,000 farmers from the subscriber lists of Penton Farm Progress publications, who received email blasts directly from the publisher;
- Past participants in CTIC activities including cover crop tours, research and demonstration projects, and visitors to CTIC booths at industry events like Commodity Classic;
- Members of the steering committees of the Indian Creek Watershed Project and the Conservation Agriculture Systems Alliance (CASA);
- Members of a variety of lists of farmers and advisors, including SARE lists;
- Volunteers who found the survey through press releases published in farm media, organization newsletters, and websites;
- Selected commodity organization lists;
- Respondents to previous SARE/CTIC Cover Crop Surveys.

Respondents were asked to identify whether they qualified as farmers—if not, they were led out of the survey—and how much experience they had with cover crops. Those who answered that they did not plant cover crops in 2015 were directed to a question track geared toward non-users. Of 2,020 farmers who completed the survey, 81% were cover crop users and 19% reported that they did not use cover crops.

Have you ever used cover crops on your farm?



In all, 2,020 respondents completed the questionnaire. Data from incomplete surveys was included in the results, accounting for a range in the number of respondents among the questions. The data we collected provide a detailed look at the thoughts and practices driving cover crop decisions in a wide range of crops across the country.

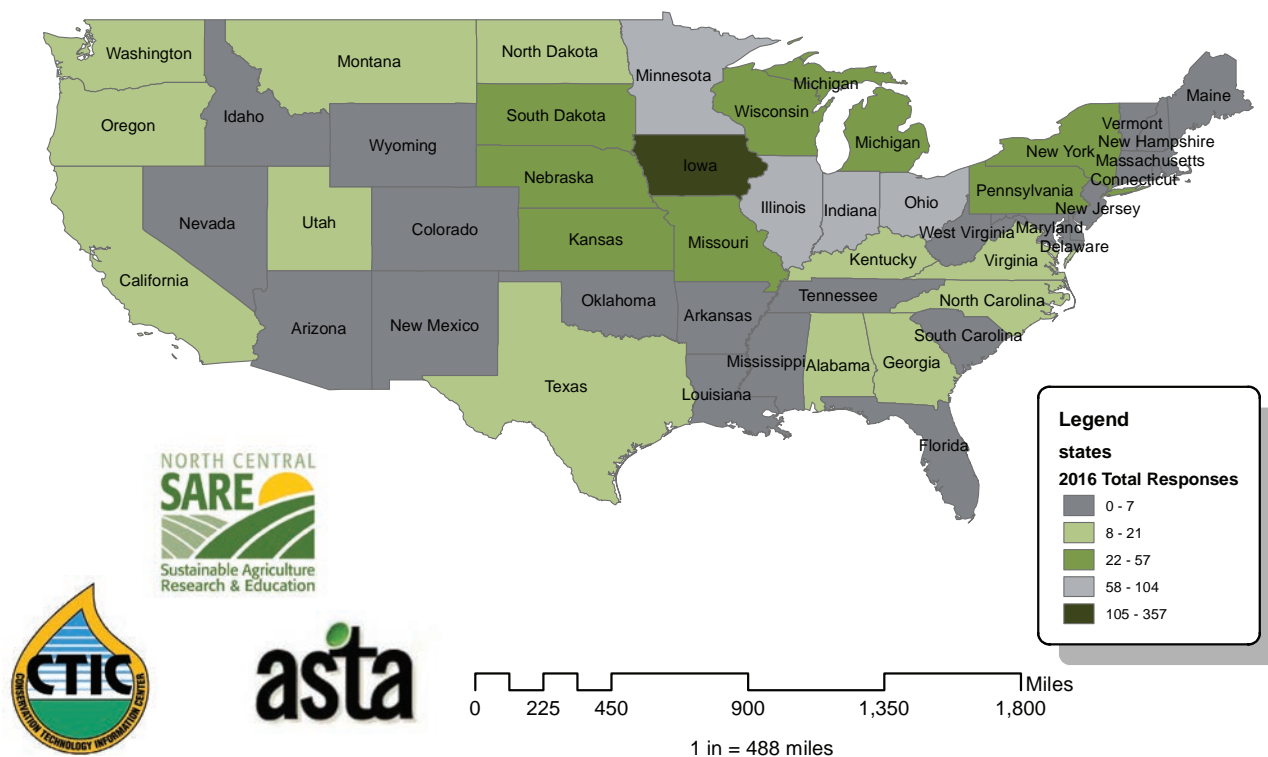
Those data can help guide decisions on policy, practices, promotions and products that could help connect farmers with cover crops that fit their operations; develop technical assistance materials to increase the chances of success with cover crops; aid in designing programs and policies that favor the adoption of cover crops; and assist seed companies in developing products to meet farmers' cover crop needs.

GENERAL INFORMATION

Participants from 48 states and the District of Columbia responded to the survey—only Nevada and New Hampshire were un-represented by the sample pool.

The top five states in terms of number of respondents were Iowa (213 users and 144 non-users; 357 total); Minnesota (67 users, 37 non-users; 104 total); Illinois (78 users, 19 non-users; 97 total); Indiana (80 users, 15 non-users; 95 total); and Ohio (71 users, 9 non-users; 80 total).

2016 Cover Crop Survey Respondents



*This map represents only those who indicated their state location in the survey, about two-thirds of all respondents.



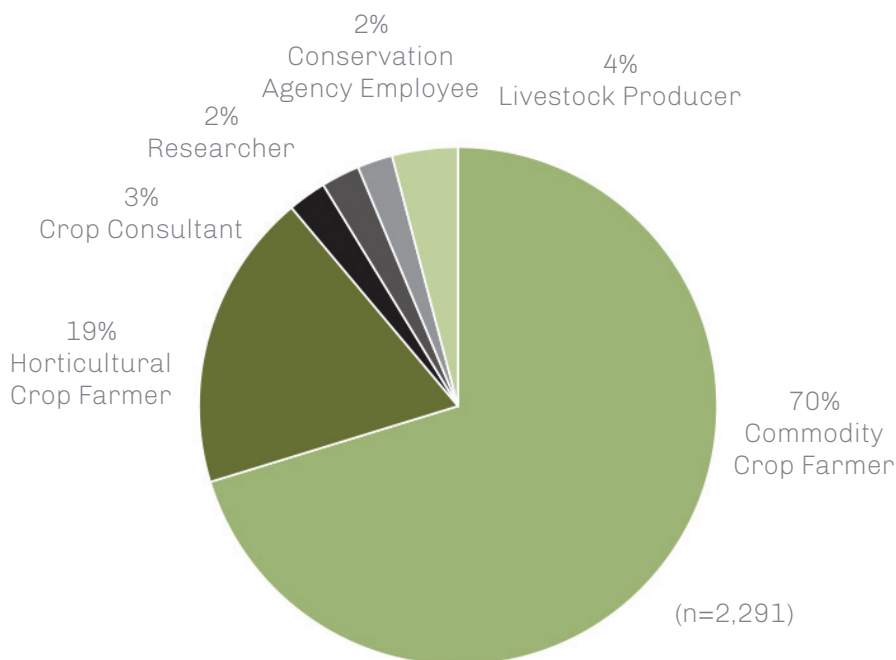
FARM DATA

A significant majority—64%, or 1,006—of the 1,572 respondents reporting farm acreage in the survey operates on more than 180 acres. That is very close to last year's figure, in which 65% fell into the 180-plus-acre range.

In the 2015-2016 survey, more than 29% (459) farmed 1,000 acres or more, while 17% (273) farmed 9 acres or fewer. Seven hundred nineteen (719) respondents chose not to answer the question or were sent down the non-farmer track.

Among the respondents in this year's survey, 1,609 (70%) described themselves as commodity crop farmers, which the survey question defined as corn, soybeans, wheat, cotton, sorghum and "etc." Horticultural crop or vegetable farmers accounted for 426 respondents (19%).

How Would you Categorize Yourself?



COVER CROP ACREAGE

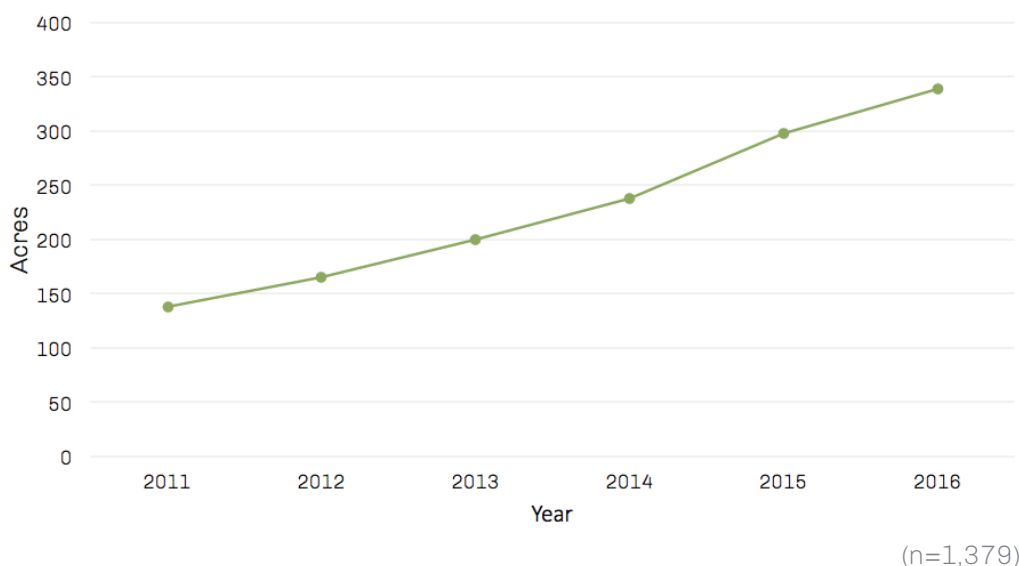
Cover crop users reported a steady increase in the number of acres they have planted to cover crops over the past five years, and predicted a continued increase in acreage to be planted to cover crops in the late summer or fall of 2016.

The mean number of cover crop acres planted in 2015 among 1,379 users was 298, a 25% increase in acreage over 2014. The respondents expected to increase that figure to a mean of 339 in the 2016 season, a 14% projected increase in the average user's cover crop acreage in 2016. The projected 2015-2016 expansion represents a slower rate of increase compared to the previous year, but the adoption curve maintains a fairly consistent slope since 2011.

In fact, both the 2015 and 2016 figures represent more than twice the average acreage of cover crops the respondents said they had planted to cover crops in 2011 (137 acres).

It is worth noting that the U.S. Department of Agriculture's 2012 Census of Agriculture reported 10.3 million acres of cover crops planted in 2012. Based on the trend line of this survey data, today's current cover crop acreage could be projected as several million acres higher than in 2012, but the exact acreage will not be known until the next Census of Agriculture in 2017.

Acres of Cover Crops per Respondent



Though the survey sample is not the same from year to year of these cover crop surveys—which means we cannot track trends among the surveys—the 2015-2016 survey data is very consistent with results collected over the past two years.

Last year, respondents to the 2014-2015 survey predicted they would commit an average of 300 acres of cropland to cover crops in 2015—a figure almost exactly equal to the planted acreage reported by this year's participants. Last year's farmers said they had planted an average of 225 acres to cover crops in 2014, slightly lower than the 238 acres reported by this year's respondents.

It is worth noting that the figure for the average acres of cover crops per farm represents both grain farmers and smaller horticulture producers; if grain farms alone were considered, the average acreage of cover crops per farm would likely be significantly higher.

CONSERVATION ORIENTATION

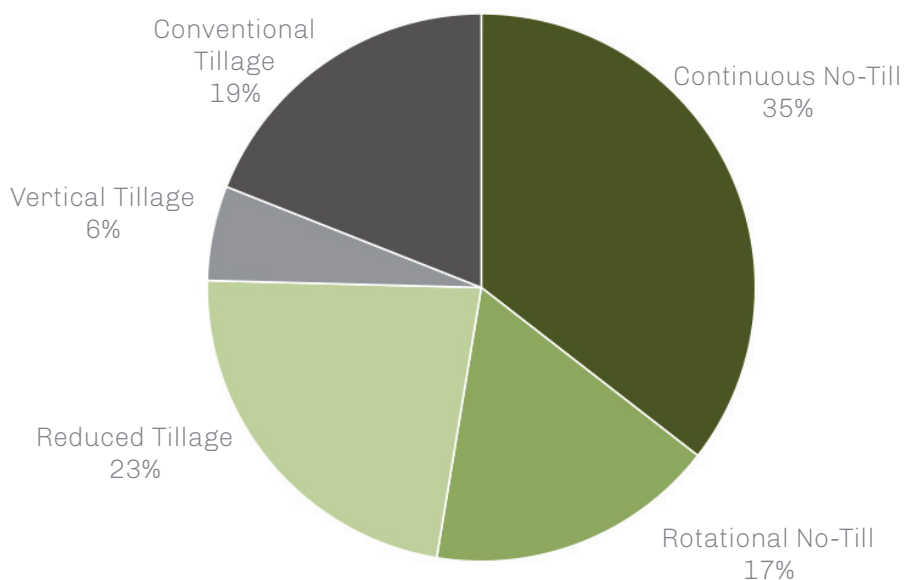
Respondents to this year's survey exhibit a strong conservation bent. Three-quarters (75%, or 1,187) of the 1,574 farmers who answered this question perform some sort of reduced tillage, whether it's mulch tillage, strip till, rotational no-till or continuous no-till. A small but notable percentage—6%, or 88 respondents—only do vertical tillage, and just 19% (299) report doing conventional, full-width tillage.

The 2015–2016 survey delved deeper into the conservation orientation of respondents. Roughly 62% (1,439) of the respondent pool rated their agreement with the following statement: “I consider myself to be more likely to adopt conservation practices than my neighbors.”

Of those who answered, almost half—48%, or 692 respondents—strongly agreed with the statement, and another 37% (534) selected “moderately agree.” Fewer than 2% (23 respondents) selected “strongly disagree.” In all, the average score was 1.7 out of 5 on a scale in which 1 was “strongly agree.” Clearly, this is a population that identifies closely with conservation farming.

The next question asked respondents to rate their agreement with the statement, “My neighbors look to me for conservation advice.” The rating average was 2.71, weighted heavily by 45% of the 1,441 answers falling into “neither agree nor disagree,” while just 7% (101) identified themselves as opinion leaders with “strongly agree” and another 34% (490) selected “moderately agree.”

Tillage Practices of Respondents



COVER CROPS ON OWNED VS. RENTED LAND

Just over half of the 1,574 people who answered a question on land rental vs. ownership (52%, or 814 respondents) own half or more of the land they farm; 404 of them (26%) own all the land they farm. In contrast, 206 farmers (13%) answering the question rent all their farmland.

Ownership of farmland can have a significant impact on cover cropping decisions. Last year's cover crop survey revealed that landlords' influence was moderately influential on users' cover crop purchase decisions—a score of 2.34 on a scale of 1 (no influence) to 5 (high influence), and even higher—2.76—on non-users' purchase decisions. Landlords' influence was quite close to the sway that cash crop seed dealers have over cover crop choices among cover crop users.

This year's survey explored whether users were more or less inclined to plant cover crops on land they owned vs. land they rented.

Among the respondents, 1,307 farmers provided information on the percentage of their own farmland that was planted to cover crops – the mean was 53% and the median was 50%. Answering the same question for rented land, 1,187 respondents reported planting a mean of 33% of their rented acreage to cover crops—a substantially lower figure. The median acreage planted to cover crops was 20%, indicating that a large commitment by a relatively small number of users pulled up the mean.

This result, coupled with previous years' insight into the influence of landlords on cover crop decisions, indicates that technical information and promotion of cover crop benefits targeted specifically at landlords might impact cover crop acreage. It could also reflect a lack of confidence by renters in investing in improving the health of soil on rented land. More investigation is warranted.

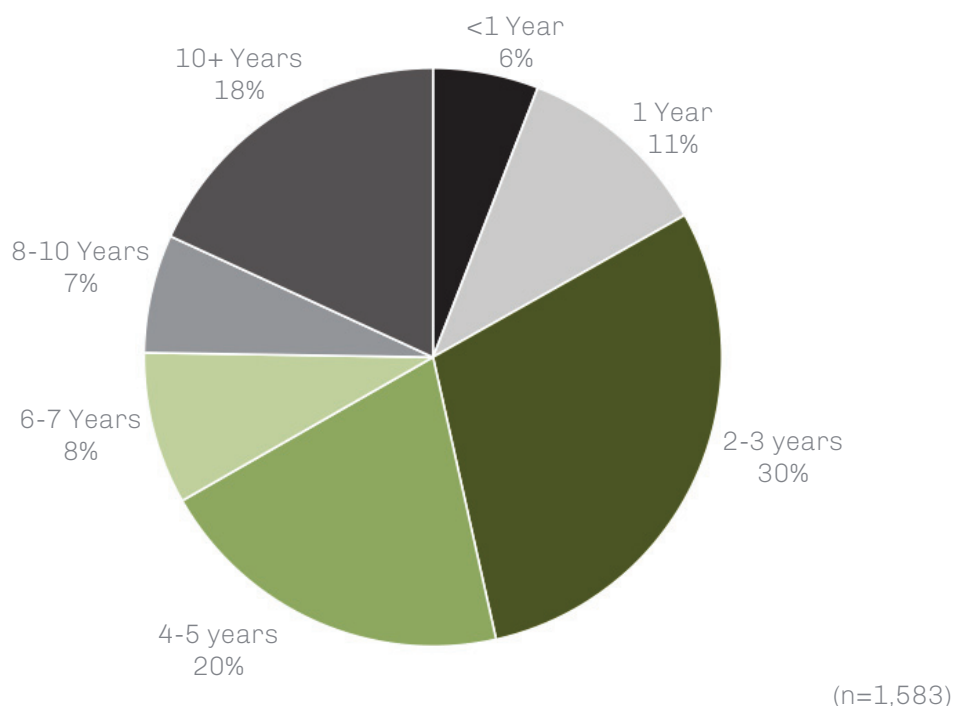
COVER CROP EXPERIENCE

Of 2,020 respondents answering the question “have you ever used cover crops on your farm?” 1,631 (81%) identified themselves as cover crop users. Nineteen percent (389) said they have not used cover crops on their farm, and 271 people did not answer the question.

At this point, people who identified themselves as cover crop users followed the “user” track of questioning, while people who said they had never planted cover crops on their farm were put on the non-user path.

People who did not respond to the question or who classified themselves as crop advisors, government agency personnel or other non-farmer occupations were directed to a screen in which the full list of questions was available for review. Many of these visitors to the site were interested in the survey itself rather than in providing data.

Years of Experience with Cover Crops



The fact that more than half of this year's cover crop users have been working with cover crops for four years or more may influence how the sample population views cover crop benefits as well as the cover crop species/mixes they plant. Of 1,583 users who answered a question on how long they have used cover crops, 469 (30%) had two to three years' experience and 320 (20%) reported having four to five years of experience.

Just 94 respondents (6%) were new to cover cropping, reporting less than one year of experience—one-third of the number (287 people, or 18%) who reported more than a decade of cover crop experience.

In all, the largest group of respondents among cover crop users in the 2015–2016 survey farmed in the North-Central Region of the U.S. and had more than four years of experience with cover crops.

Gaining insight into the level of experience of cover crop users can be very important to extension agents, crop advisors, seed dealers and other technical service providers, as greater familiarity with cover crops may result in better management and greater willingness to experiment with cover crops.

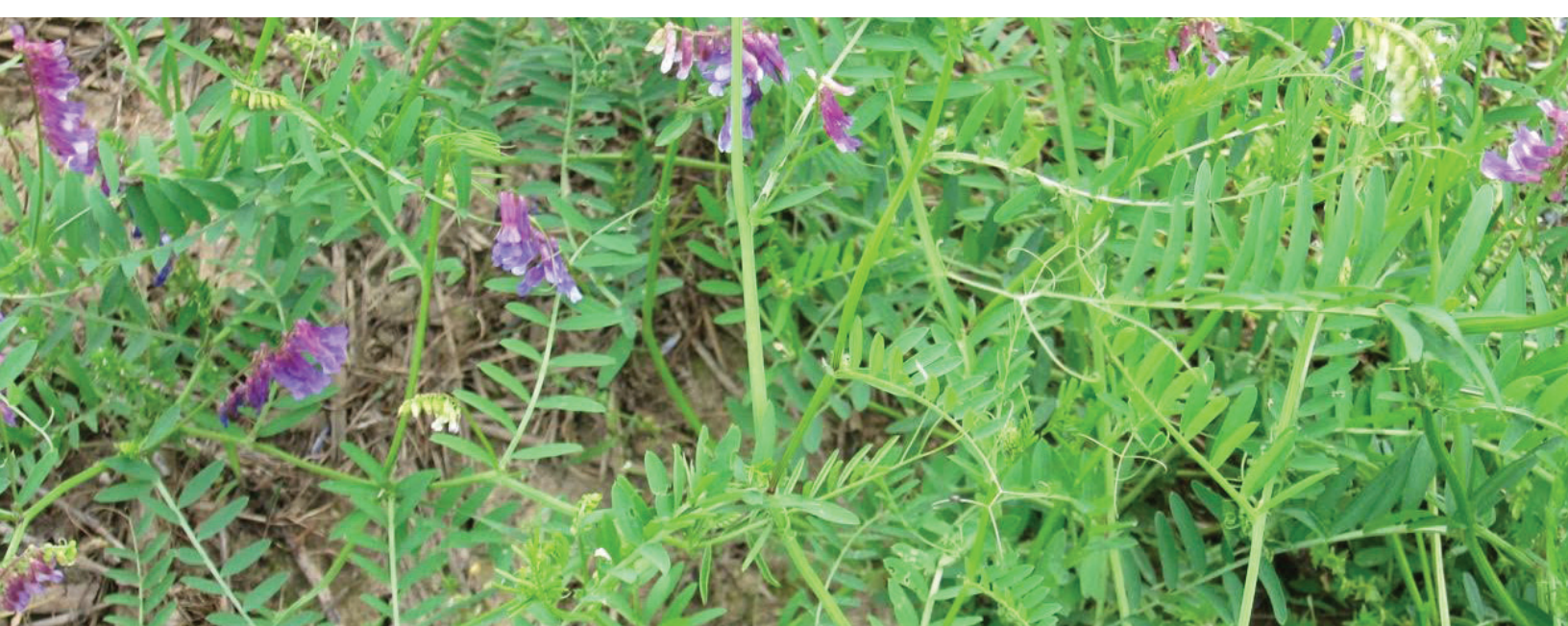
COVER CROP BENEFITS

Farmers plant cover crops in hopes of specific benefits that would justify the time, cost, and management effort that cover crops represent. Clearly, many farmers see the effort as worthwhile, as evidenced by the steadily growing acreage of cover crops planted by users.

Understanding the perceived benefits of cover crops has been a major focus of the SARE/CTIC Cover Crop Survey project since its inception. This year, the survey framed the question in a way that asked respondents to indicate whether they considered the benefits in a provided list major, minor or not a benefit on their farm.

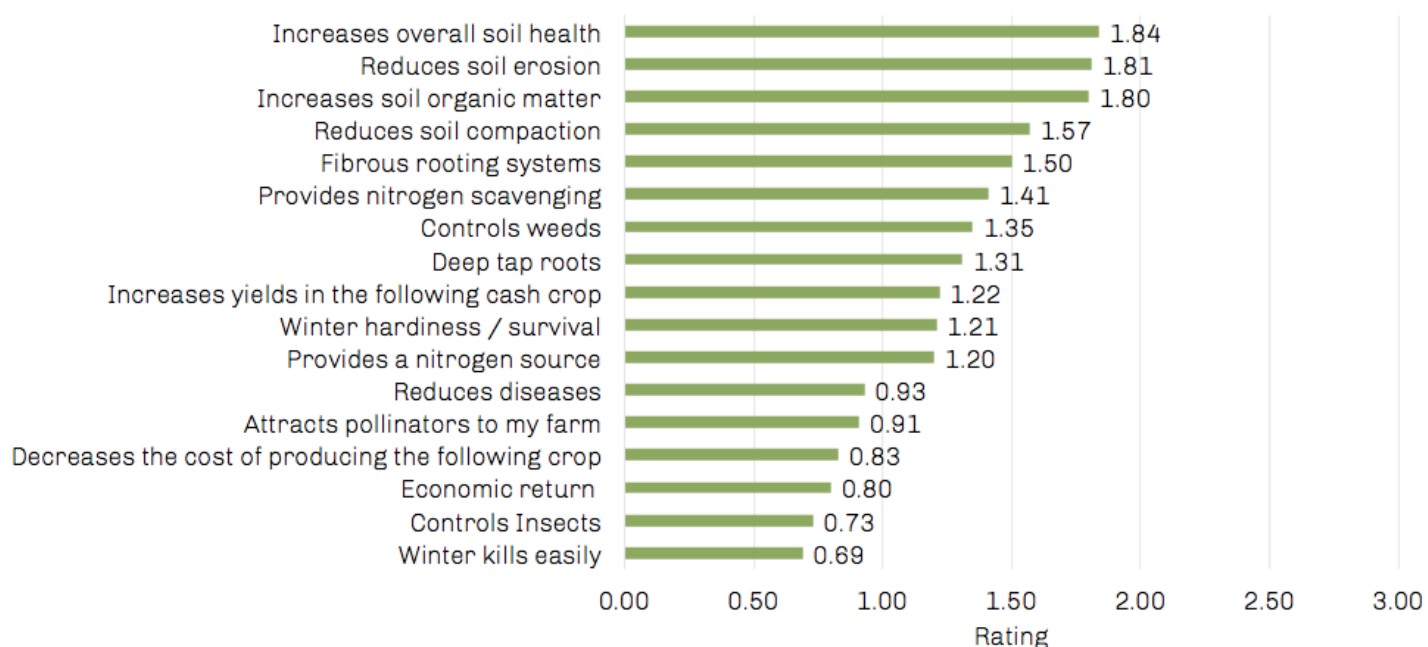
There were 17 benefits in the list. Among respondents who answered this question—which, depending on the benefit, ranged from 1,350 to 1,423—the top 3 benefits by far were, in order of score, “Increases overall soil health” (1,219 positive answers; 86%); “Reduces soil erosion” (1,174; 83%); and “Increases soil organic matter” (1,163; 82%). Notably, just 24 respondents (2%) said “Increases soil organic matter” was not a benefit on their farm, and 25 said the same for “Increases overall soil health.”

It is interesting to note that increased soil health, increased soil organic matter and reduced soil erosion were last year's top three benefits, too.



Relative Average Value Rating of Cover Crop Benefits

1=Not A Benefit, 3=Major Benefit



(n=1,350 to 1,423)

Other benefits that garnered significant attention in this year's survey included "Reduces soil compaction" (890 respondents; 63%); "Fibrous rooting systems" (816; 58%) and "Provides nitrogen scavenging" (707; 50%).

Key minor benefits included "Reduces diseases" (674; 49%); "Controls insects" (652; 48%); "Increases yields in the following cash crop" (634; 45%) and "Controls weeds" (631; 45%).

The overall number of responses under the "Not a benefit on my farm" category was significantly lower than in the ranking of major or minor benefits with the exception of "Winter kills easily (no spring burndown required)" (676; 49%); "Economic return (e.g.: from yield, haying, grazing, biofuels)" (616; 44%); "Controls insects" (533; 39%); "Decreases the cost of producing the following crop" (523; 38%); and "Attracts pollinators to my farm" (521; 37%).

In fact, it is interesting to note that the benefits that would presumably be most attractive—the economic ones—were not in the top benefits, appearing instead as leading entries in "Not a benefit on my farm." Equally interesting is that such economic benefits were not in the list chosen by last year's cover crop user respondent pool, either, though it was third place last year among non-users.

Another question worth exploring more deeply is cover crop users' knowledge of or interest in attracting pollinators with cover crops. Just 399 respondents of 1,394 who answered the question (29%) identified attracting pollinators as a benefit on their farm, while 474 (34%) said it was a minor benefit and 37%, as noted above, said it was not a benefit. This could indicate either that the cover crops being used by most respondents are not viewed as attractive to pollinators, or that cover crop users do not perceive pollinators as a positive outcome of cover crop planting.

Asked to identify the single biggest benefit from using cover crops on their farms, 158 respondents provided a write-in answer. A wide range of benefits was identified. Standing out among the entries were comments on grazing, soil health/organic matter, erosion control, reducing soil compaction, and scavenging or adding nitrogen for the following crop.

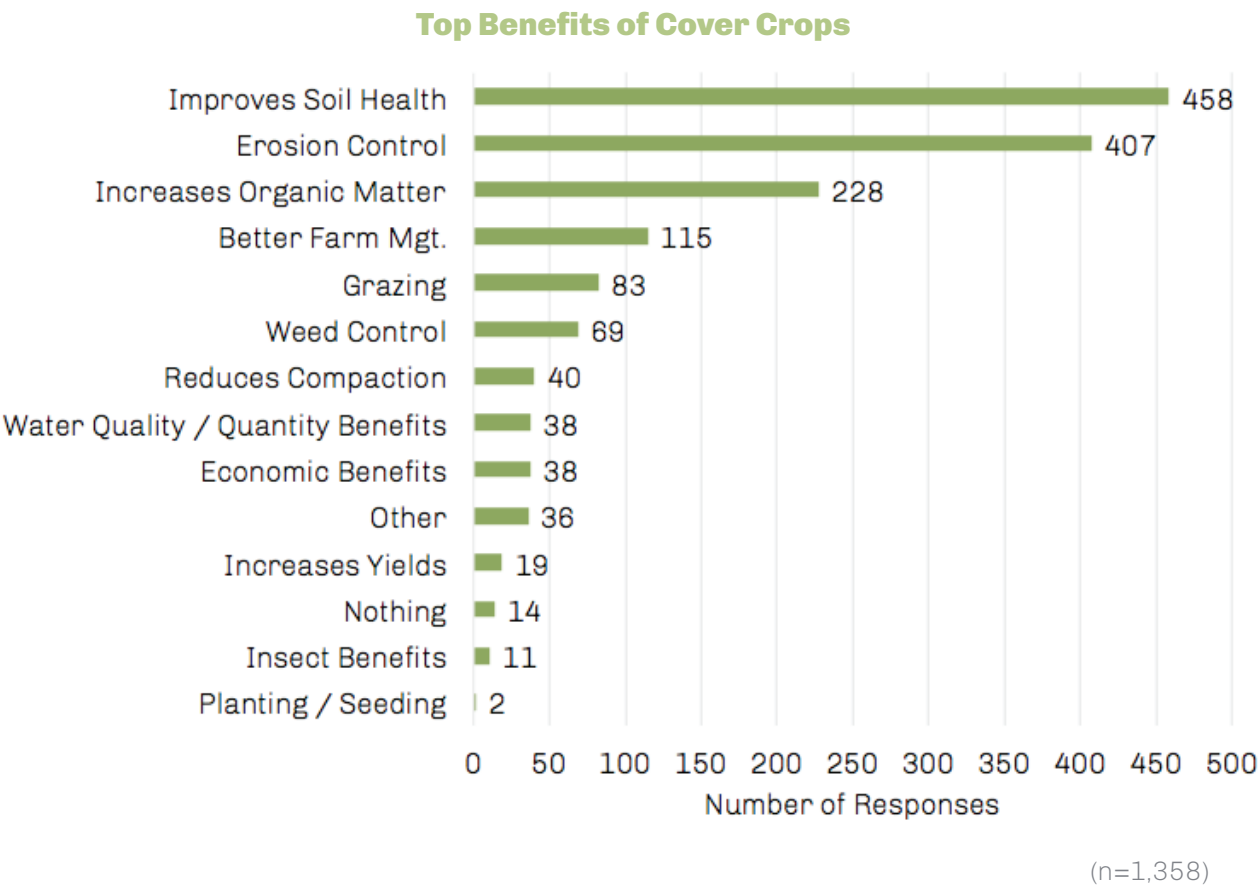
Other unique but noteworthy answers included providing a place to spread manure in the fall, “Healthy soils, healthy water, healthy life,” “None; can’t get them established” and “Gives the neighbors someone to talk about at the coffee shop.”

Toward the end of the survey, 543 respondents answered the question, “What other benefits do you get by planting cover crops?”

By far the highest percentage—40%—reported that grazing livestock on cover crops was a top benefit. Another 18% said their cover crops provide valuable hay or livestock bedding. Three percent use their cover crops for hunting or recreation, and less than 1% sell harvested cover crop biomass for biofuel production.

Write-in answers by 38% of the respondents ranged from erosion control, nutrient management and soil improvement to creating refuge for natural enemies of pests, providing a source of cut flowers, presenting a good image to the community, making them attractive to landlords, and even aesthetic benefits. Several wrote that they saw no benefits.

Approaching the subject of benefits from a different direction, the survey also asked subjects to name the single biggest benefit they receive from cover crops. Among 1,358 write-in responses, “Improves soil health” was the top choice—accounting for 30% of the answers—and “Reduces erosion” came in second with 26%. Each of those was roughly twice as popular as the third-ranking choice, “Increased organic matter.” In all, the free-response benefits were consistent with the selections in the multiple-choice question.



MOTIVATION TO PLANT COVER CROPS

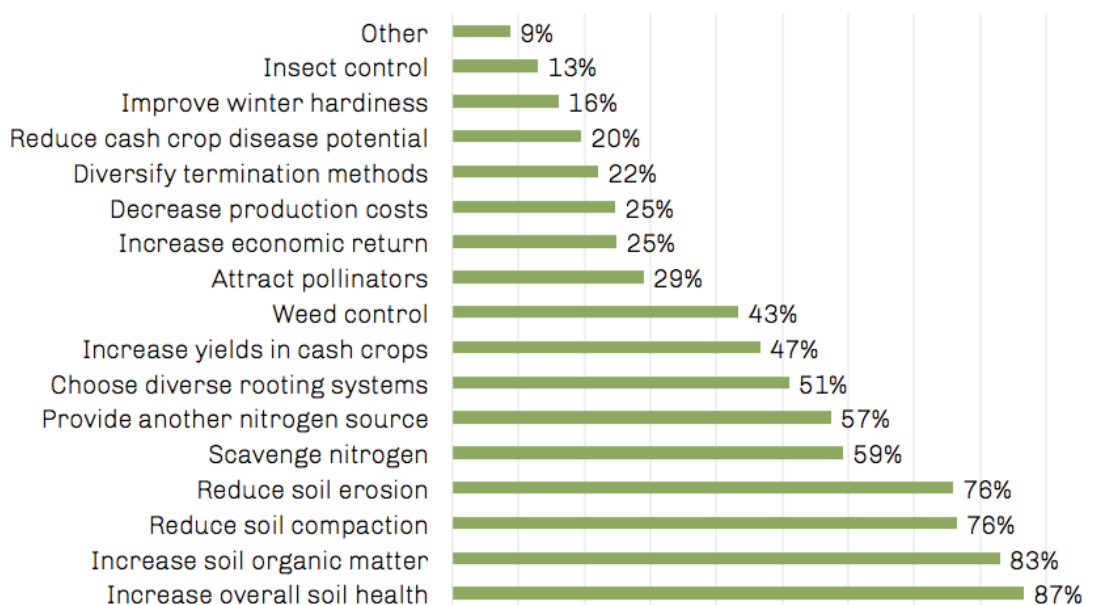
Ostensibly, farmers' impression of the benefits that cover crops deliver can provide excellent insight into the motivators to adopting the practice. But to minimize the chance for error or misunderstanding, the 2015–2016 survey also asked farmers specifically about motivators to planting cover crops.

The answers underscored the importance of the top three choices—increased overall soil health (86% of 784 respondents), increased soil organic matter (83%), reduced soil compaction (76%) and reduced soil erosion (76%).

Clearly, the question was structured to allow respondents to choose as many answers as they wanted, which accounts for the percentages going far above 100.

Motivation for Using Cover Crops

(% of respondents)



IMPACT ON NUTRIENT USE

The effect of cover crops on soil nutrients can cover a wide range, depending on the species used. Many farmers choose to plant legumes because they fix atmospheric nitrogen in the soil for the benefit of subsequent cash crops. Other cover crops sequester nutrients, concentrating them in the upper inches of the soil. Still others can temporarily tie up nitrogen as they decompose.

In the 2015–2016 survey, SARE and CTIC sought data on how farmers manage their fertilizer inputs as a result of their cover crop practices.

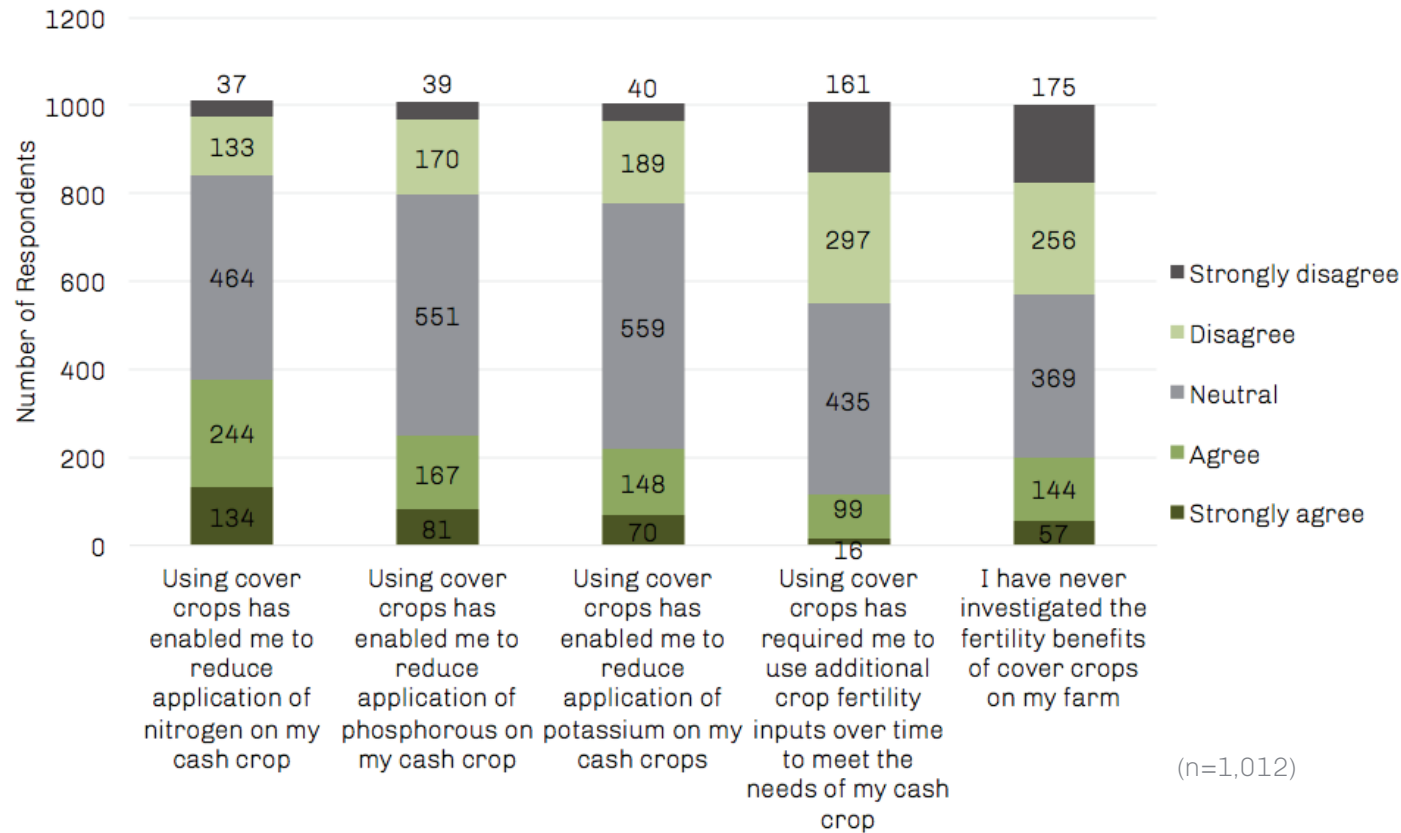
Cover crop users were asked to indicate their level of agreement with a series of fertilizer-related statements, using a scale ranging from 1 (strongly agree) to 5 (strongly disagree).

The statement that got the highest level of agreement was, “Using cover crops has enabled me to reduce application of nitrogen on my cash crop,” with 134 of 1,012 respondents strongly agreeing and 244 checking “agree.” The statement that had the highest level of disagreement was “Using cover crops has required me to

use additional crop fertility inputs over time to meet the needs of my cash crop,” which garnered less than 2% strong agreement and 16% strong disagreement among 1,008 farmers.

In all, the respondents were largely neutral—of five statements, which covered reducing applications of nitrogen, phosphorus and potassium in cash crops, using more fertilizer following cover crops, and a comment that the user had never investigated the fertility benefits of cover crops—the average rating was 3.1 out of 5.

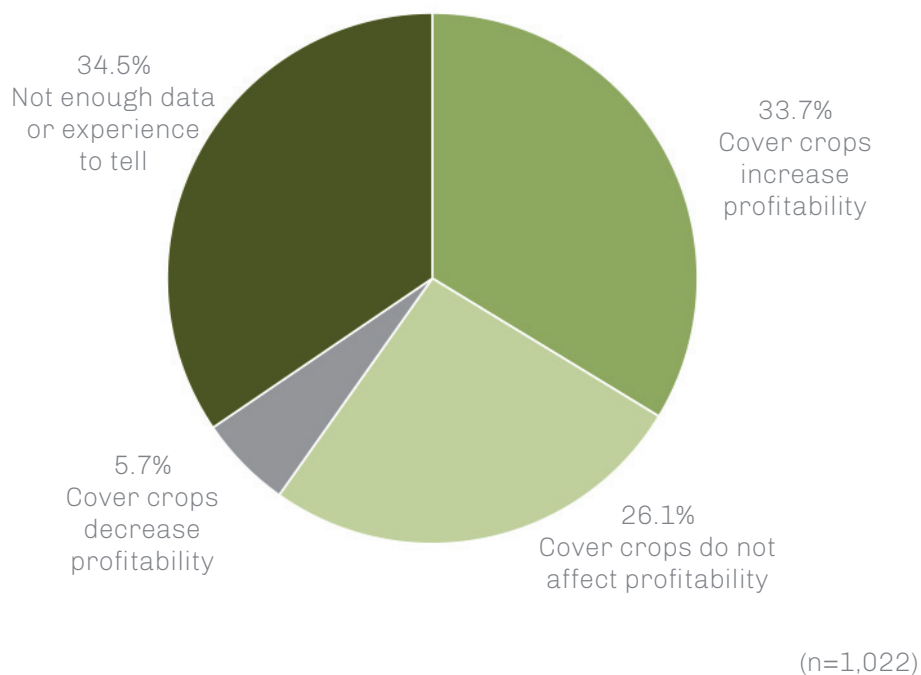
Nutrient Benefits of Cover Crops



IMPACT ON PROFITABILITY

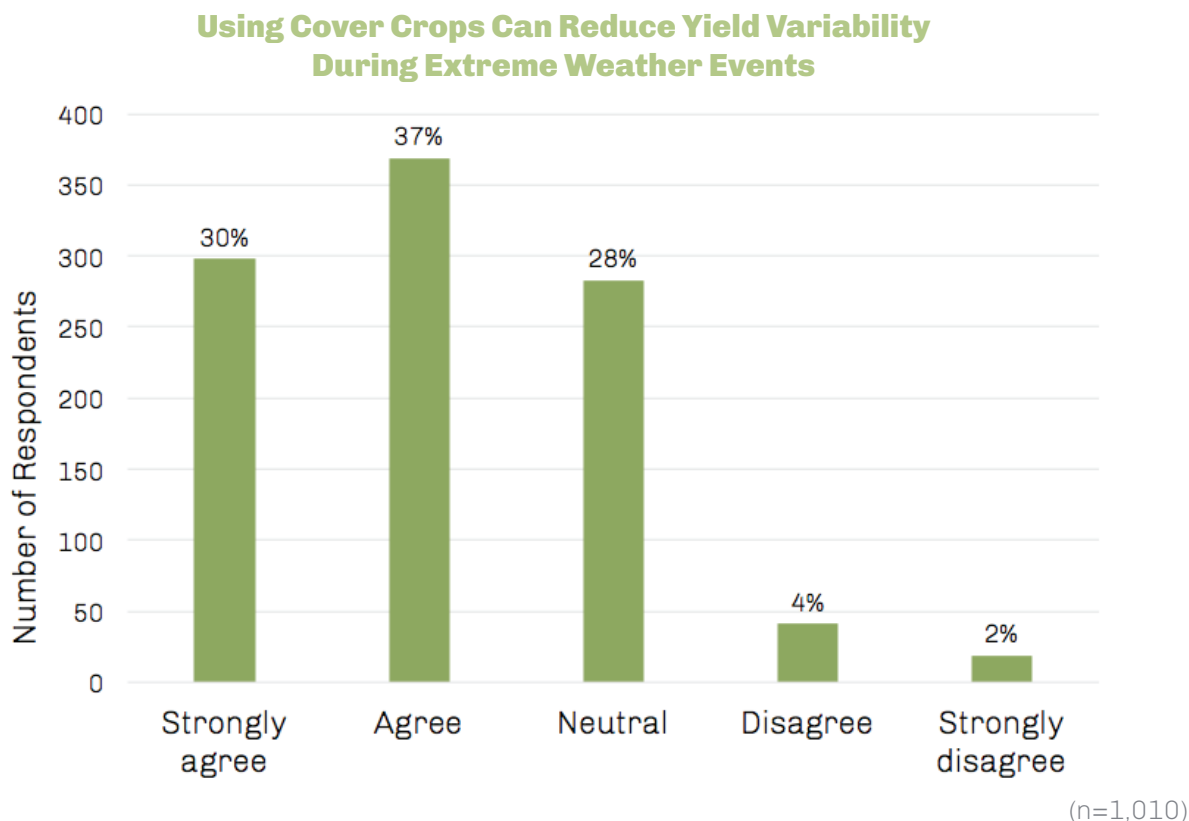
Asked to assess the impact of cover crops on their overall farm profitability, 34% of 1,022 respondents reported that cover crops, on average, increase their profitability. Another 26% said cover crops neither increase nor decrease their overall profitability, and just under 6% reported a decrease in profitability. Thirty-five percent of the respondents said they did not have enough data or experience with cover crops to know their impacts on their farm profitability.

Profit Impact of Cover Crops



COVER CROPS AND RESILIENCY

Asked to rate their level of agreement with the statement, “Using cover crops can reduce yield variability associated with weather extremes such as strong, intense storms and droughts, etc.,” 30% of 1,010 respondents strongly agreed, 37% agreed—two-thirds supporting the statement. “Neutral” received 28% of the responses, and only 6% either disagreed or strongly disagreed.

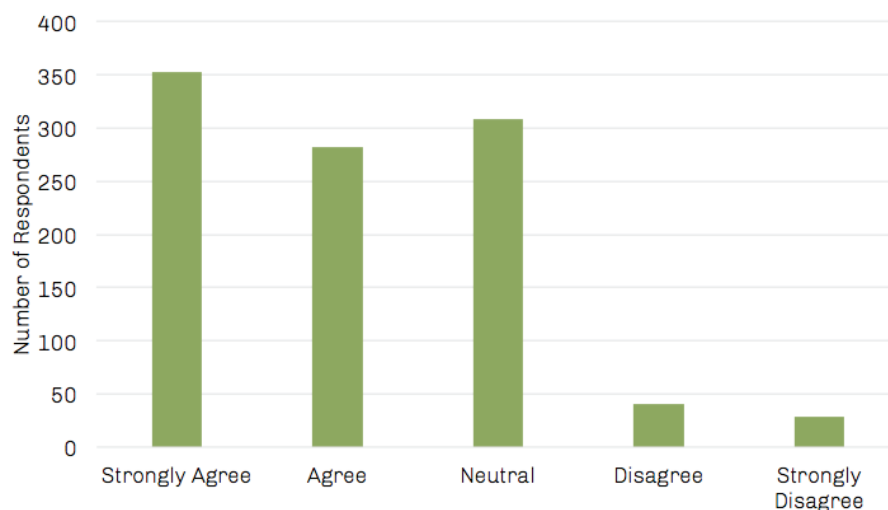


The 2015–2016 survey sought not only to ascertain whether cover crop users believed that cover crops increased their resiliency in the face of extreme weather events, but also to determine how that benefit could be used to influence the adoption of cover crops.

The same 1,010 respondents that rated the extreme weather statement were asked to indicate their level of agreement with the statement, “If using cover crops lowered my crop insurance premiums, I would definitely increase my use of cover crops.”

Agreement was high: 352 of the group (35%) strongly agreed, 282 (28%) agreed, and 308 (30%) were neutral. Only 40 (4%) said they disagreed with the statement and 28 (3%) strongly disagreed. Clearly, crop insurance premiums could be a useful tool in promoting cover crop adoption—and a highly relevant one as research data is amassed supporting the link between cover crops and resiliency in extreme weather.

**If using cover crops lowered my crop insurance premiums,
I would definitely increase my use of cover crops.**



(n=1,010)

The severe cyclical low in commodity prices that plagued agriculture throughout the 2015 season put significant pressure on farmers to produce as economically as possible and try to simply weather the storm. One of the survey questions asked respondents to share their perspective on how much influence commodity prices have on the decision whether or not to plant cover crops.

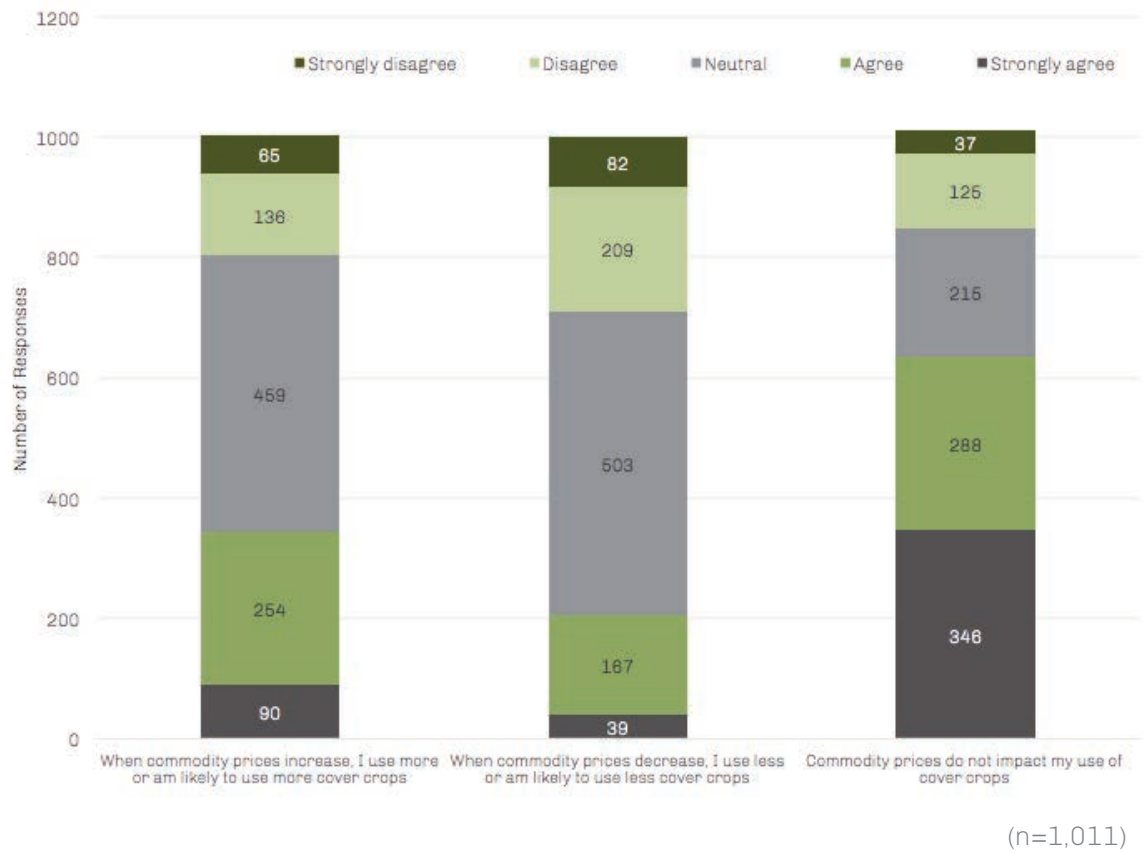
Asked to rate their level of agreement with the statement, “When commodity prices increase, I use more or am likely to use more cover crops” on a scale of 1 to 5 in which 1 was “strongly agree” and 5 was “strongly disagree,” 254 (24%) of 1,004 respondents selected “agree” and 90 (9%) strongly agreed. The rating average was 2.70, on the agreeable side of neutral.

The statement, “When commodity prices decrease, I use less or am likely to use less cover crops” rated 3.13, pulled down from neutral by 21% (209 of 1,000 respondents) indicating that they disagreed with the statement and another 8% (82) strongly disagreeing.



In fact, the most agreed-upon statement was, “Commodity prices do not impact my use of cover crops,” which rated an average of 2.23, quite close to “agree.” Of 1,011 respondents, 346 (34%) strongly agreed with the statement and 288 (29%) agreed, while only 162 (16%) disagreed or strongly disagreed.

Impact of Commodity Prices on Cover Crop Use



The 2015–2016 survey found results similar to the insight shared by the respondent pool the previous year—commodity prices had little to no effect on their decision to plant cover crops. Especially in bearish markets, that should be welcome news to conservation agriculture proponents.

COVER CROP CHALLENGES

Eleven possible challenges of cover crops were presented to respondents in the 2015–2016 survey. Respondents—the number ranging from 1,392 to 1,415 depending on the challenge—rated each one as “Major,” “Minor” or “Not a challenge on my farm.”

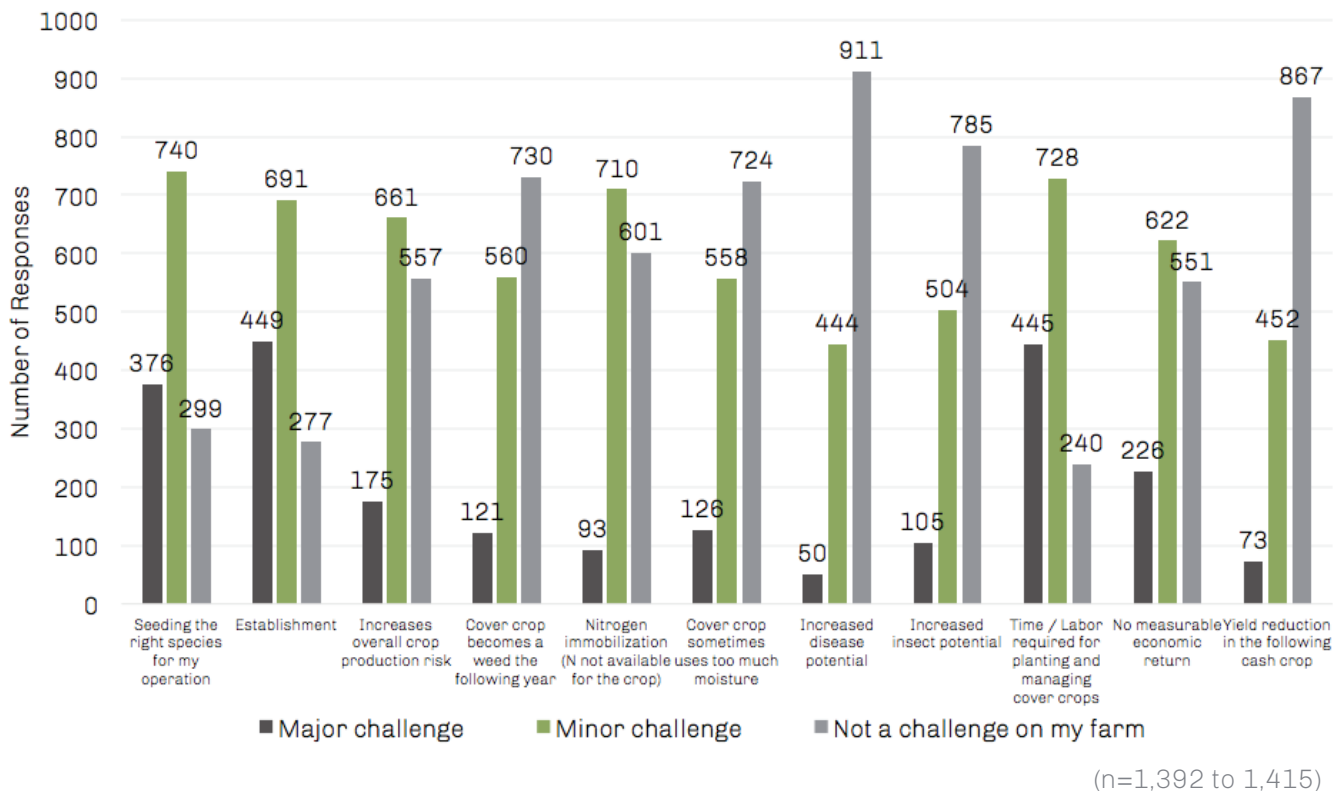
The top perceived challenges among cover crop users were “Establishment” (449 responses as “Major”; 32%); “Time/labor required for planting and managing cover” (445; 31%) and “Seeding the right species for my operation” (376; 27%).

Interestingly, “No measurable economic return” appeared on the list as a minor challenge (622; 44%).

Topping the “Minor challenge” list were “Seeding the right species for my operation,” (740; 52%); “Time/labor

required for planting and managing cover” (728; 52% of the respondents who commented on that challenge) and “Nitrogen immobilization (N not available for the crop)” (710; 51%). This is clearly a sophisticated set of cover crop users.

Producer Challenges to Using Cover Crops



COVER CROP SPECIES, 2015

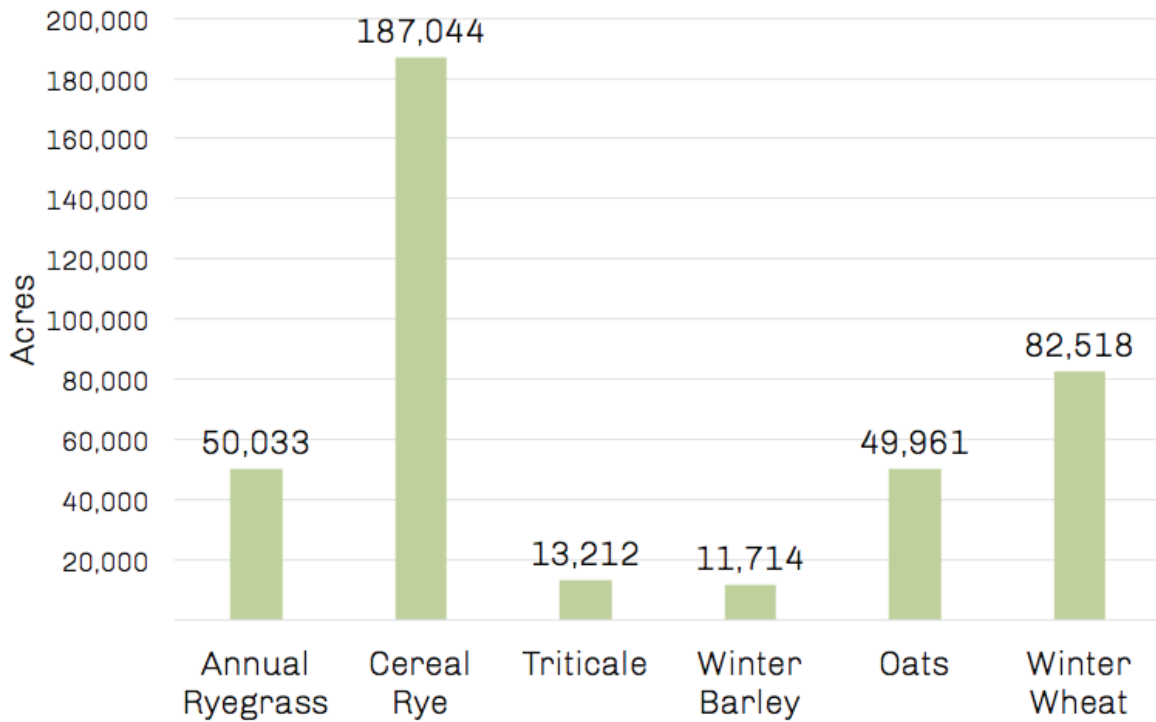
The 2015–2016 Cover Crop Survey delved deeply into cover crop species and mixes planted by cover crop users, information that can be very valuable in helping ascertain the kinds of benefits producers are seeking from their cover crops, as well as the direction seed suppliers and technical service providers may need to go to serve the growing market.

Cereals and grasses accounted for the lion’s share of the acreage among cover crop users who participated in the 2015–2016 survey. Of those, cereal rye was planted by 82% (994) of the 1,219 participants who answered the question. Those farmers reported planting an average of 188 acres apiece to cereal rye, amounting to a total of 187,044 acres planted by survey participants in 2015.

Radish was the second most prevalent cover crop and the clear leader in the brassica/mustard/cole crop category, with 95% of the 983 respondents to the question planting radish, for a total of 97,784 acres. Average radish acreage reported by each respondent topped 100, at 104 acres.

Winter wheat accounted for an equal per-user acreage as radish—an average of 104 per user. Planted by 65% of the respondents to the cereals/grasses question (793 of 1,219), winter wheat accounted for a total of 82,518 acres in 2015. Annual ryegrass (50,033 acres) and oats (49,961 acres) ranked equally in third place in the cereals/grasses category for total acreage, with 13% of the total grass cover crop acreage each and 67% and 70% of grass cover crop users, respectively.

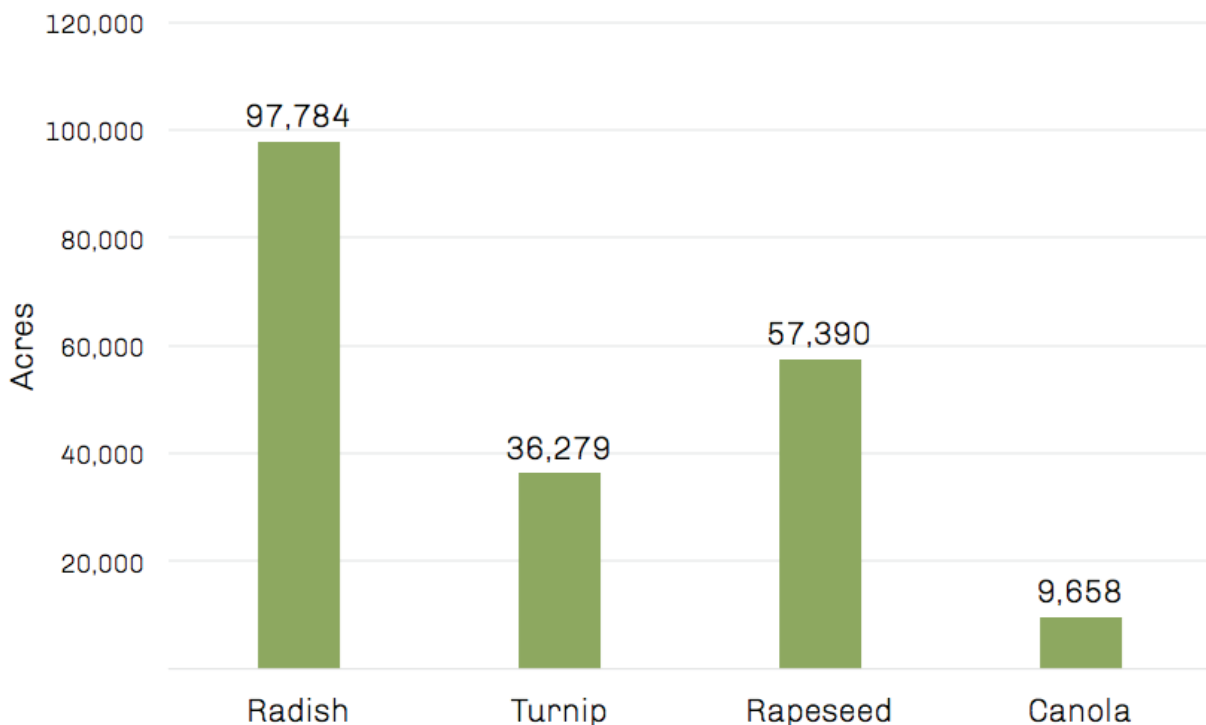
Cereals/Grasses Planted in 2015



(n=1,219)

In the brassica/mustard/cole crop group planted in 2015, rapeseed (79%; 57,390 acres, with a mean of 47 acres planted per respondent) and turnip (79% of respondents; 36,279 total acres) had equal shares of proponents among brassica users, but fell far behind radish in total acres planted.

Brassicas Planted in 2015

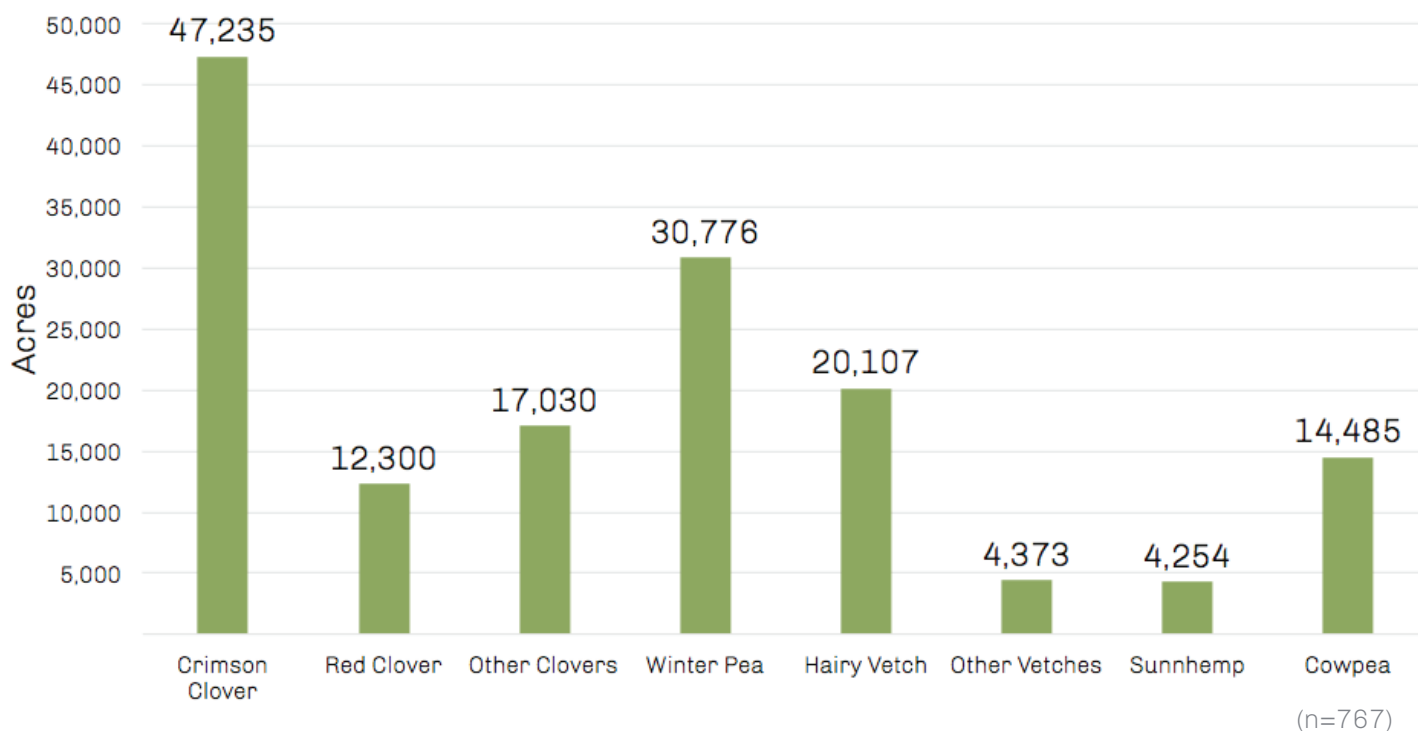


(n=983)

Legumes are popular among many cover crop users because they fix nitrogen in the soil, among other benefits. Crimson clover led the legume category in average acreage per user, with a mean of 59 acres planted during the 2015 season (47,235 acres total). Of the 961 respondents who answered the question about planting legume species, 796 (82%) planted crimson clover that year.

Winter pea (767 respondents; 80%) was the second-most-popular legume in 2015, accounting for a mean per-user acreage of 40, or a total of 30,776 acres among all respondents. Hairy vetch (753; 78%) and red clover (751; 78%) tied for third among legumes, though respondents reported planting a mean of 27 acres of hairy vetch (20,107 acres total) compared to just 16 acres each of red clover (for a total of 12,300 acres) and cowpea (14,485 acres).

Total Legume Acres Planted

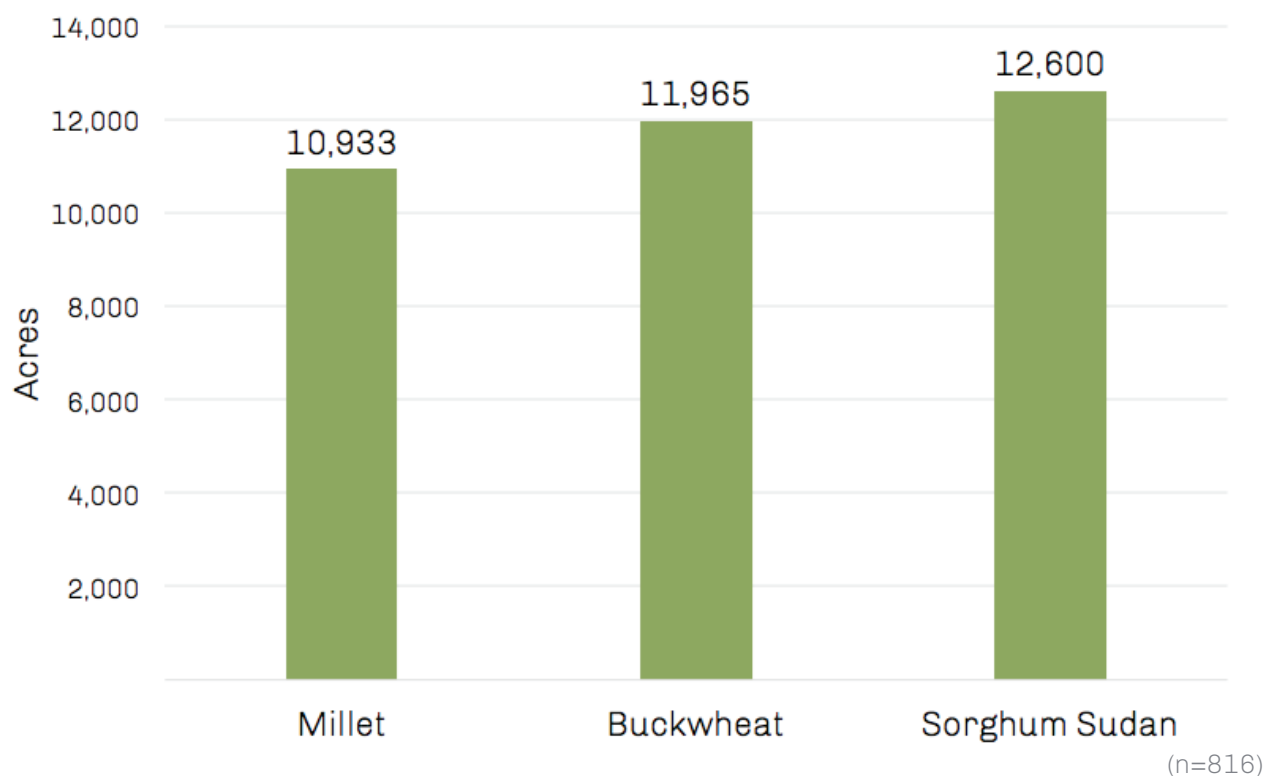


Summer annual non-legumes took up the rear as a category in the 2015 cropping season, accounting for 12,600 total acres of sorghum sudan, 11,965 acres of buckwheat and 10,033 acres of millet planted by respondents. In fact, the number of respondents reporting that they planted non-legume annual broadleaves was quite consistent across the three choices, indicating significant overlap within the category—93% of the 816 respondents to the question planted buckwheat, 89% planted sorghum sudan, and 86% planted millet.

It is interesting to note that respondents predicted planting nearly 10,000 acres more buckwheat in 2016—a huge jump in the pollinator-friendly cover crop.

(It is important to note here that buckwheat is being discouraged as a cover crop on or adjacent to land being used to produce wheat, as Japanese buyers are extremely sensitive to concerns about serious buckwheat allergies, which are regarded in Japan like peanut allergies are in the U.S. This is an excellent example of the importance of relevant, crop-and-geography-specific information on cover crops.)

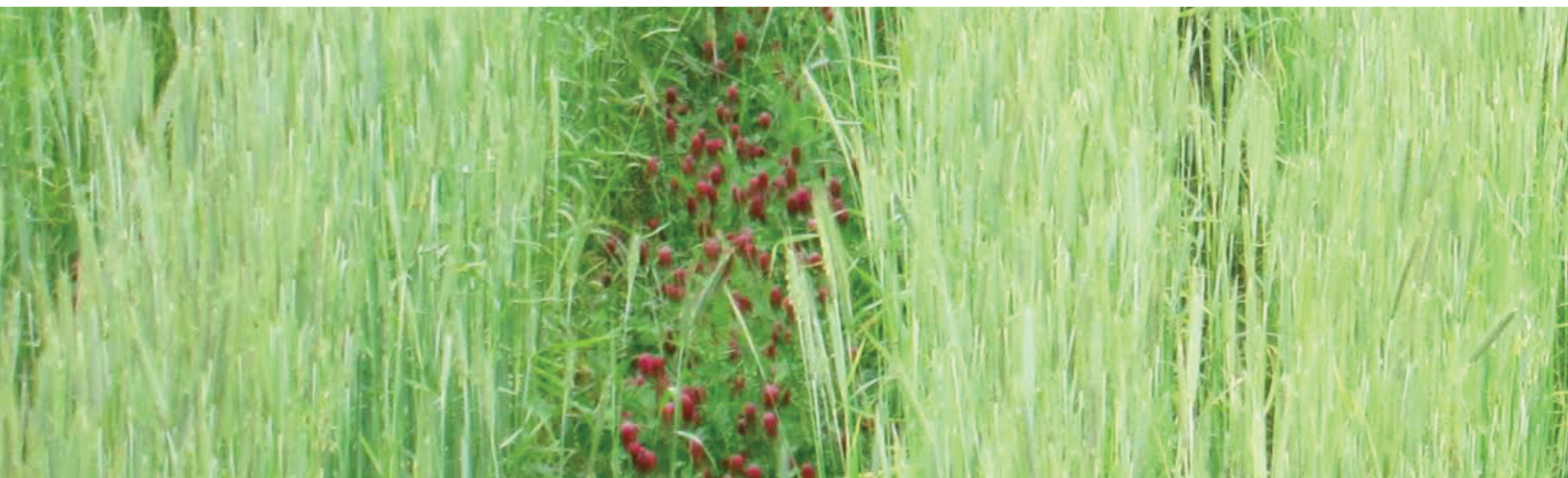
Summer Annual Non-Legumes Planted



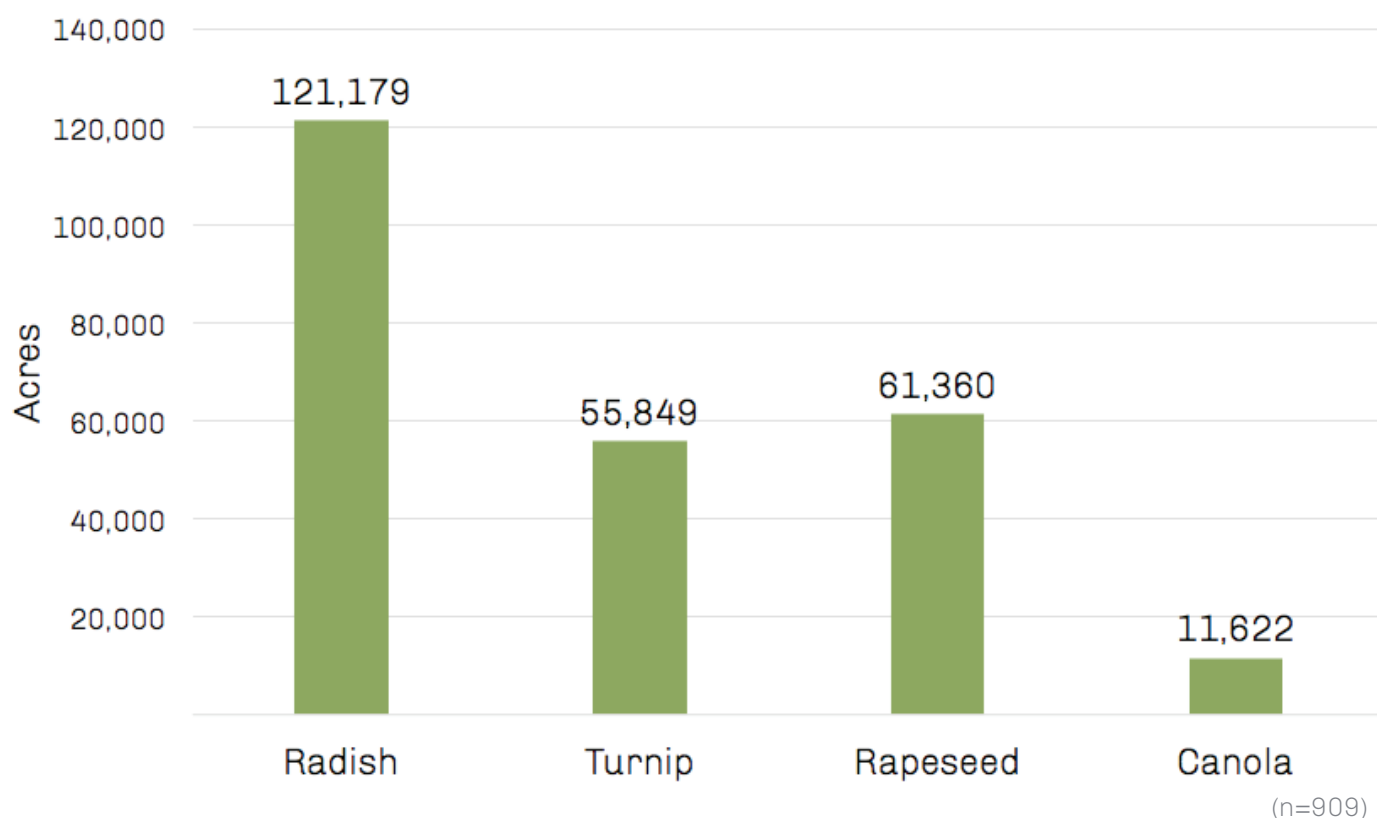
COVER CROP SPECIES, 2016

Asked about their plans to plant cover crops in the summer of 2016, 858 of 909 respondents (94%) planting brassicas projected an average of 141 acres of radish—up from an average of 104 acres in 2015—which would cover 121,179 acres in total.

Overall acreage predicted to be planted to turnips in 2016 also jumped significantly to 55,849 acres by 701 respondents (an average of 79 acres per respondent, which represents a 68% increase in mean acreage in turnip cover crops compared to 2015, a significant jump considering there was a fairly consistent 77% of brassica planters compared to 79%). Rapeseed acreage projections were also up, with plans for 61,360 acres of rapeseed in 2016 compared to 57,390 the previous year. That works out to a mean of 75 acres per user, a 60% per-capita jump.



2016 Projected Brassica Acres

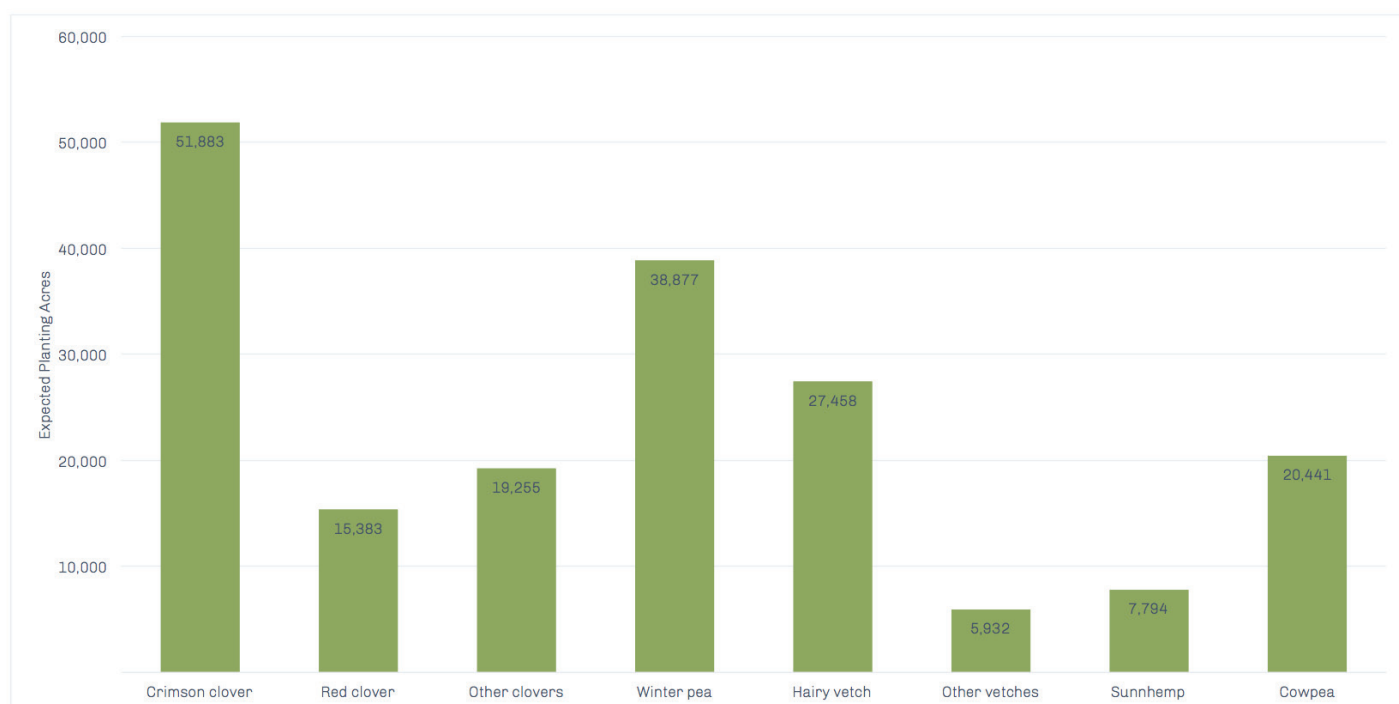


Cereal rye—the reigning queen of cover crop species in 2015—was expected to maintain its primacy by respondents. Eighty-one percent of the 1,105 people who provided projected planting grass acres for 2016 predicted planting a mean of 241 acres each to cereal rye. The overall percentage of grass-planting respondents was consistent from year to year—81% in 2016 vs. 82% in 2015—but their growing enthusiasm for the species amounts to a 28% increase in mean area dedicated to cereal rye and adds up to an impressive 217,562 total acres. Annual ryegrass was expected to rise 30% in total to 65,384 acres in 2016 and oats slated to jump 27% to 63,406 acres from 49,961 in total.

The mean number of acres expected to be planted to winter wheat remained nearly unchanged in 2016, with a projected 106 acres per respondent barely moving the needle from 2015's 104 acres and 64% planning to plant the crop in 2016, compared to 65% in 2015. In all, winter wheat acres planted by respondents were predicted to drop from 82,518 in 2015 to 75,552 in 2016.



Expected 2016 Legume Acres



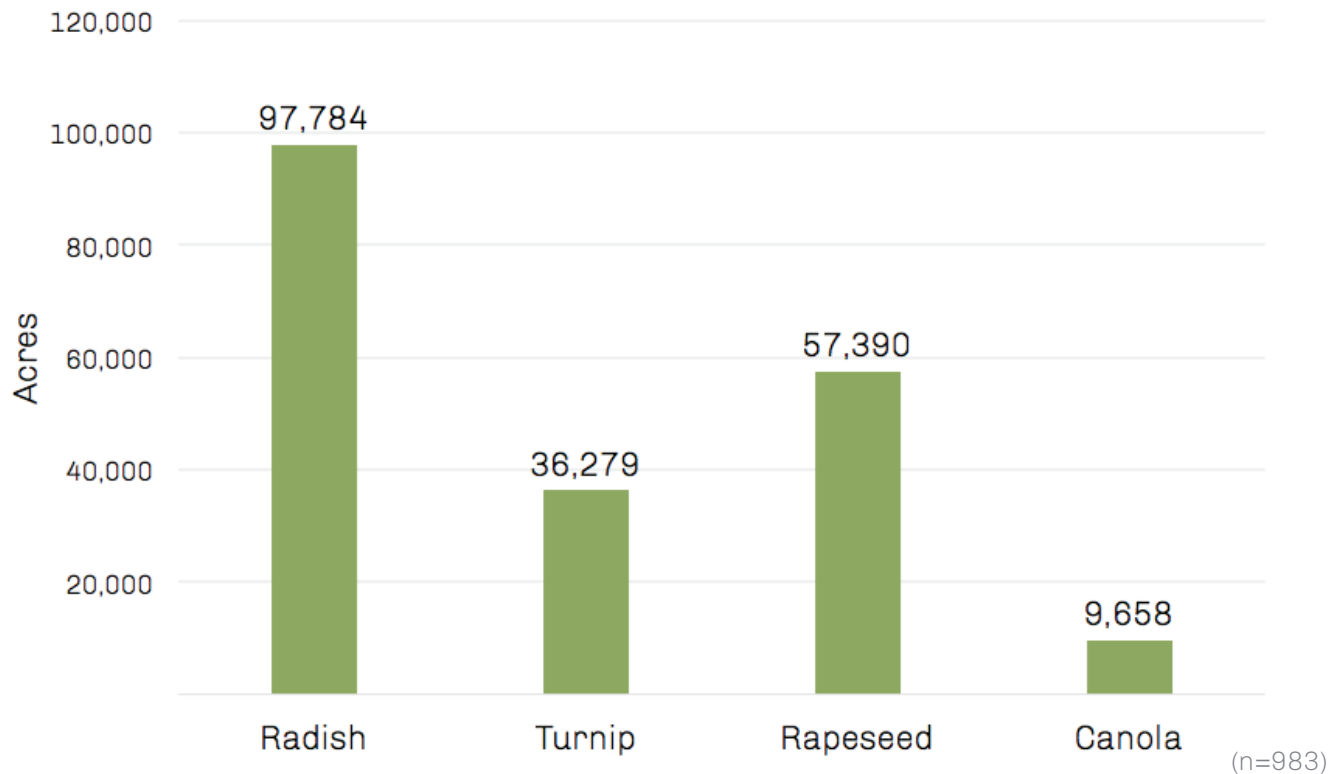
(n=901)

Top legume species were also projected to increase in per-user acreage. Crimson clover, which topped the legume list at a mean of 59 acres per respondent in 2015, was predicted to cover 70 acres per farmer in 2016 by 901 respondents. With that 19% increase, crimson clover total acreage would creep up to 51,883 from 47,235. The percentage of farmers among legume planters was expected to be consistent—82%—in 2016 and 2015.

Winter pea was expected to account for 55 acres per user in 2016, a 27% jump that would total 38,877 acres. Respondents projected planting hairy vetch on an average of 39 acres, up from 27 in 2015. Red clover was predicted to grow from 16 acres per respondent in 2015 to 22 in 2016 (a 38% increase) and cowpea to roughly double, from 16 to 31 acres on average.



Expected 2016 Legume Acres



As noted earlier, respondents projected planting almost twice as much buckwheat in 2016 as in 2015, amounting to a mean of 30 acres per user and a total coverage of 21,888 acres. The percentage of non-legume annual cover crop users planting buckwheat—94%—rose 1% in 2016 compared to 2015, though the overall number of respondents dropped from 816 reporting on their 2015 crop to 763 projecting their 2016 plantings. Sorghum sudan and millet were expected to make minor gains in overall coverage.

GROWING POPULARITY OF MIXES

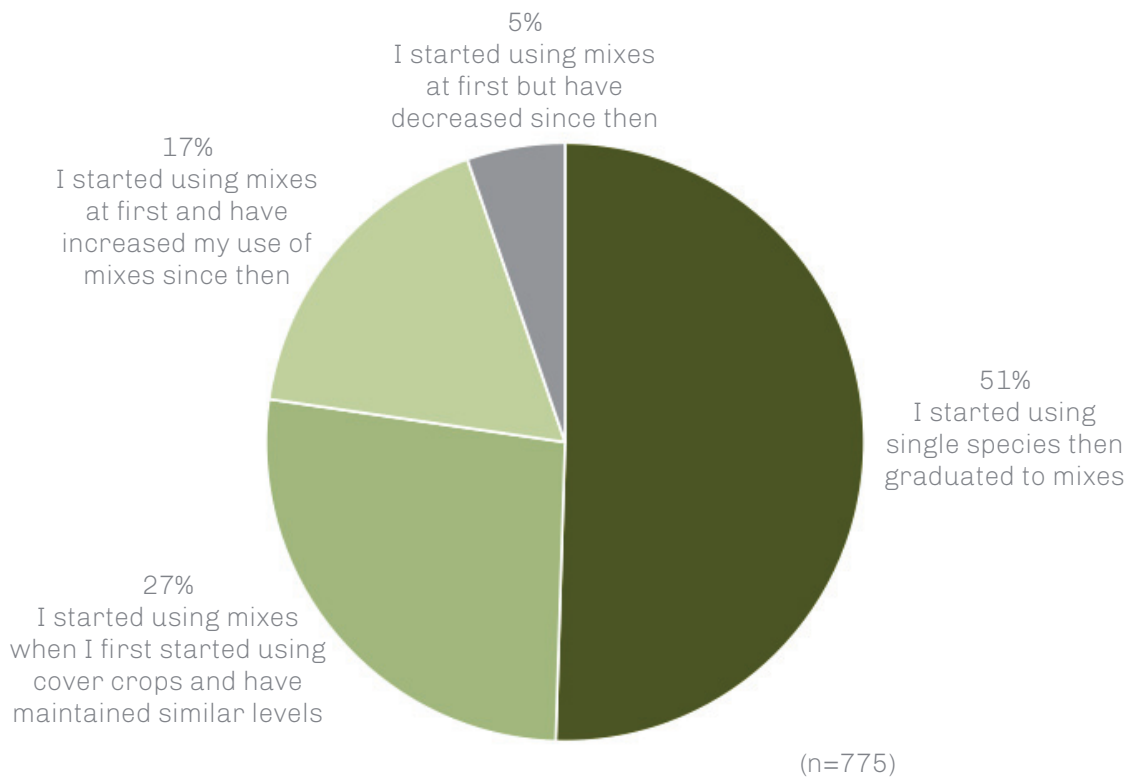
Blends of cover crop species are gaining ground. In total, respondents to the 2015–2016 survey reported planting more than 161,000 acres to cover crop mixes—almost as much as the acreage planted to cereal rye, the top single species of cover crop in the survey.

Asked to identify which of four statements best matched their use of cover crop mixes, 51% of 775 respondents chose “I started using cover crops with single species, then began trying mixes.”

The second most popular choice was selected by 27% of respondents, who reported that they used mixes when they first started planting cover crops and have maintained similar levels [of mixes]. Another 17% said they started using mixes early in their cover crop experience and have been increasing their use of mixes over the years, and just 5% reported that they started early on mixes but have been decreasing their use over time.

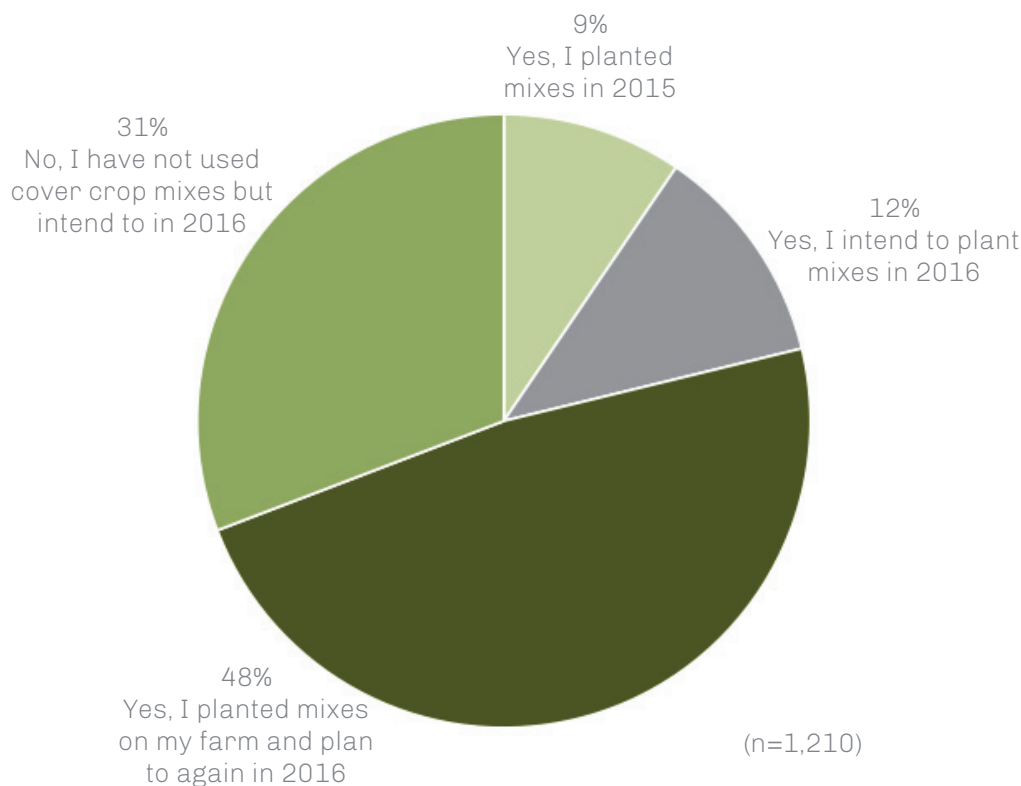
In sum, about two-thirds of the respondents are increasing their use of cover crop blends.

Increasing Use of Cover Crop Mixes



Asked about planting cover crop mixes in 2015 or plans to do so in 2016, 9% of 1,210 respondents said they planted mixes in 2015, and an additional 48% reported that they planted mixes in 2015 and intended to do the same in 2016. Another 12% planned to try mixes in 2016, and 31% declared that they have not used cover crop mixes in the past but intend to do so in the future. Clearly, blends have an important and growing role in the future of cover crops.

Planting Cover Crop Mixes

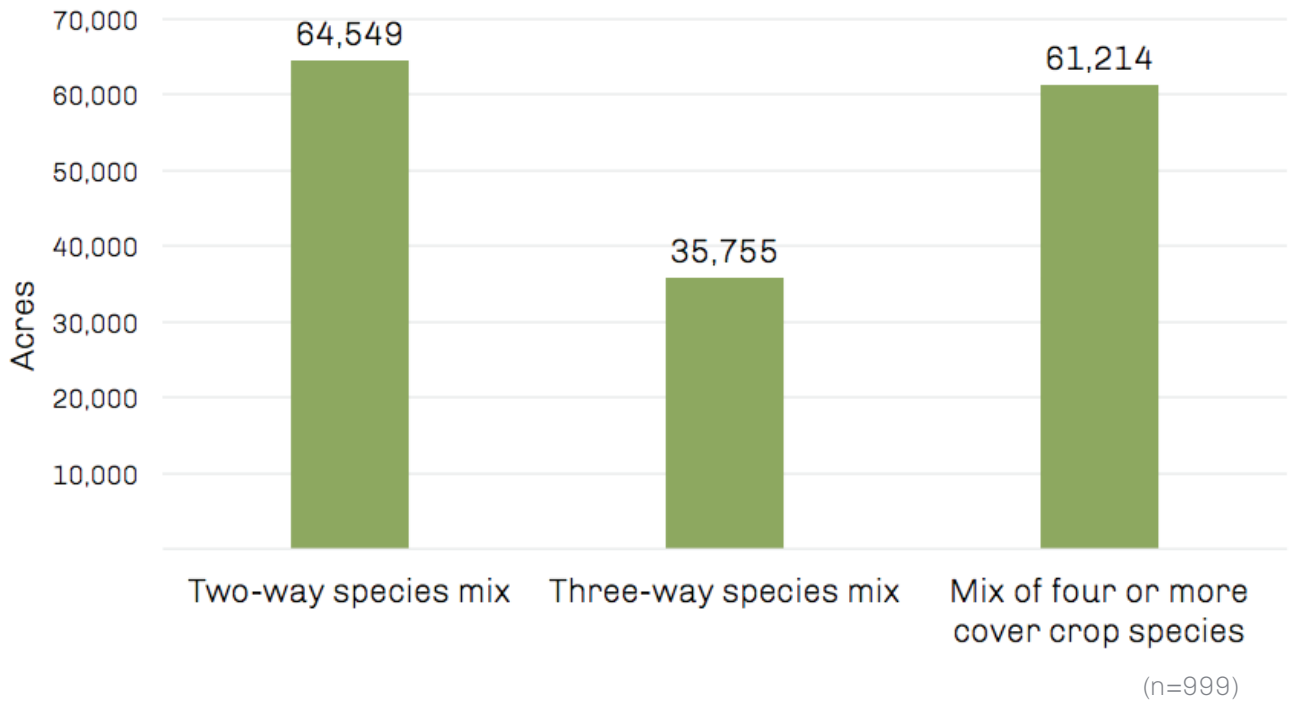


Of 999 respondents answering a question about the cover crop mixes they planted in 2015, a two-way species mix averaged 79 acres per respondent for a total of 64,549 acres among 812 surveyed growers (82%). A mix of four or more cover crop species was planted on 80 acres, on average, by 768 respondents (77%), totaling 61,214 acres across the survey area. Three-way mixes were planted on 35,755 acres, a mean of 48 acres per user by 744 (74%) of the respondents.

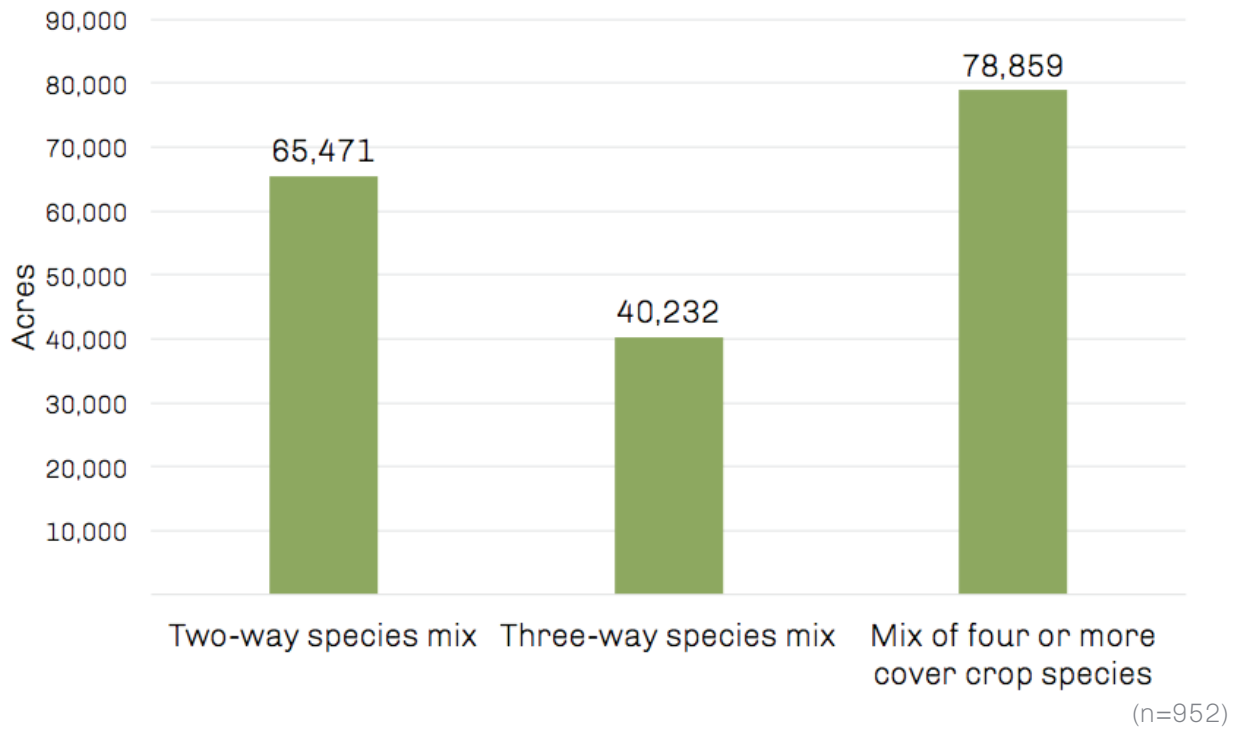
Looking ahead to 2016, data from 952 respondents pointed to significant increases in per-user average as well as overall acreage covered by mixes. The most dramatic jump was projected to be in mixes of four or more crop species, which was expected to average 109 acres per user (a 36% jump over 2015) while accounting for a very close 76% of mix users. Projected totals amounted to 78,859 acres of four-way-or-more mixes among the surveyed group.

Users expected to plant 65,471 acres of two-way mixes (86 acres on average, a 9% increase in per-capita mean acreage and a drop of 2% of respondents) and 40,232 acres of three-way mixes (58 acres, or 20% more per user).

Acres of Mixes Planted in 2015



Expected 2016 Cover Crop Mix Acres



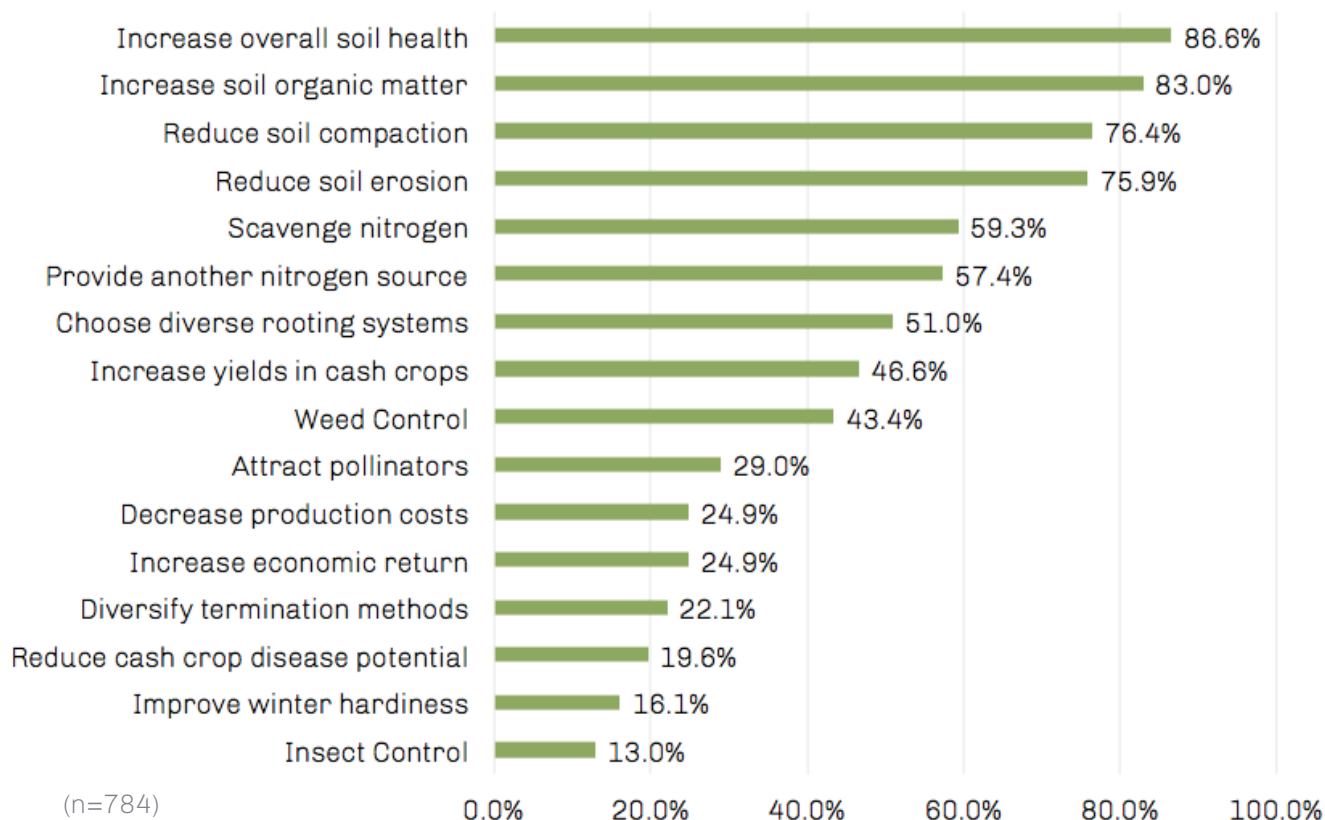
COVER CROP SPECIES MIXES

Survey participants were asked to rate key benefits of cover crop mixes from among a provided list. Prime motivators were similar to the benefits of cover crops overall: increasing soil health was by far the most popular (87% of 784 respondents), followed closely by increasing soil organic matter (83%), reducing soil compaction and reducing soil erosion were neck-and-neck for third-highest benefit at 76%.

Nitrogen management—scavenging nitrogen and providing another nitrogen source—were write-in benefits by users of single species cover crops, but were the number-four and number-five benefit in this question.

Perceived Benefits of Cover Crop Mixes

(% of respondents)



Offered an opportunity to write in a benefit under “Other,” 9% of the 784 respondents shared their thoughts. As with cover crops in general, grazing appeared on the list of write-in benefits often.

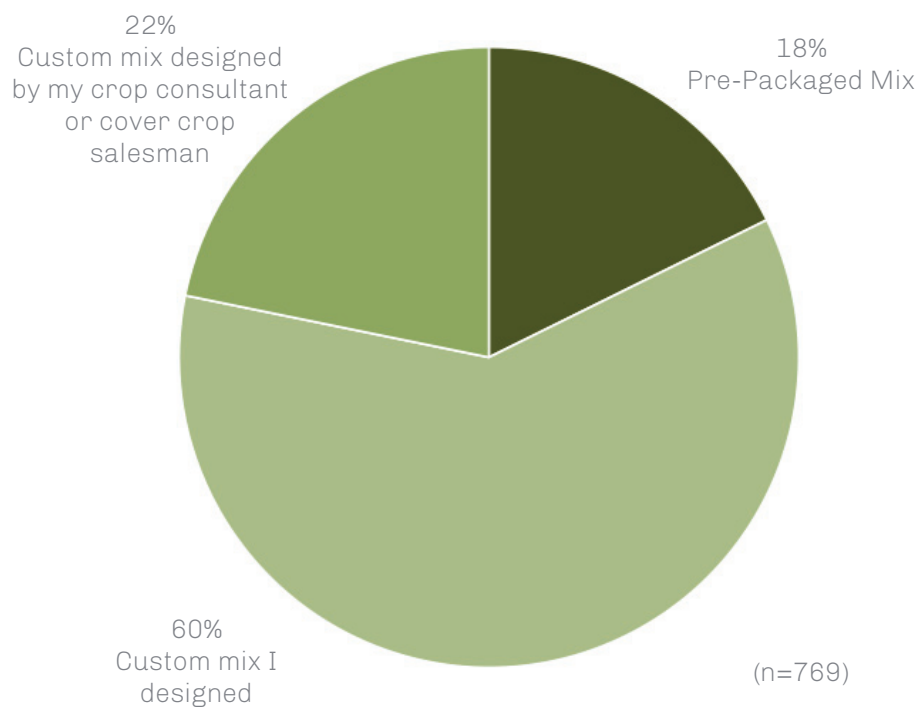
Other answers included improving water infiltration, providing food for wildlife, qualifying for or practicing for CSP programs, improving cover crop effectiveness (for instance, allowing ryegrass to compete with weeds while clover was still getting established), and facilitating organic production. One farmer complained that the survey had gotten too long and detailed by this point.

SOURCE OF MIXES

The 2015–2016 survey, in an effort to delve more deeply into cover crop users’ seed-buying habits, asked about the source of cover crop mixes used in 2015. Of 769 respondents, 60% said they designed their own cover crop mix, 22% reported that their crop consultant or cover crop seed dealer developed their blend, and 18% bought a pre-packaged mix.

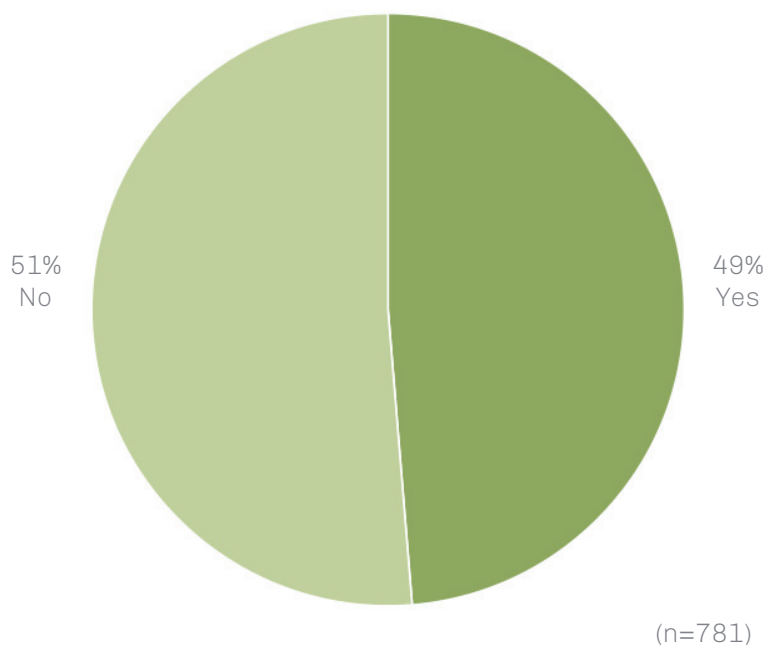
The average number of species in a 2015 mix reported by 750 respondents was 3.6.

What kind of cover crop mix did you use on your farm in 2015?



Interestingly, the proportion of 781 respondents who reported that their cover crop mixes were becoming more complex over the years was nearly equal—but slightly smaller—than the percentage reporting that their mixes were not becoming more complex (49% vs. 51%).

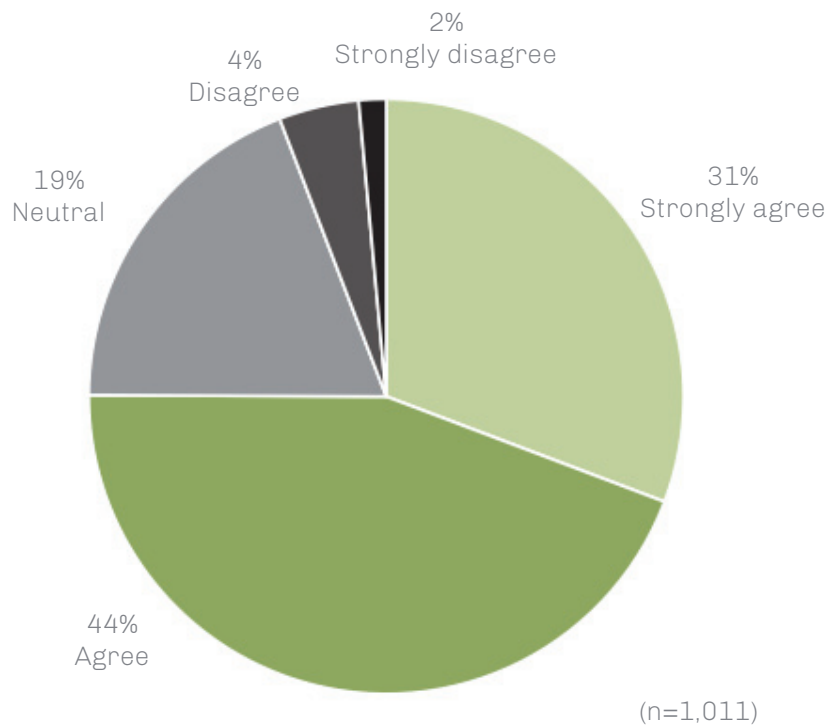
Have your cover crop mixes gotten more complex over the years?



With the growing interest in sourcing cover crop seed and the growing need to predict demand and farmers' purchasing behavior, survey partner ASTA (American Seed Trade Association) sought insight on the importance of seed tags in the cover crop market.

Cover crop users were asked to indicate their level of agreement to the statement, "It is important for me to see information about seed purity, germination and noxious weed content before planting cover crop seed on my farm." The scale ran from 1 ("strongly agree") to 5 ("strongly disagree"). Among 1,011 respondents, the average rating was 2.01, which equated to "agree." In fact, 311 farmers (31%) strongly agreed with the statement and 448 (44%) agreed, while just 44 (4%) disagreed and 15 (2%) strongly disagreed. Such ratings indicate that the large majority of farmers finds a reliable, verifiable source of quality cover crop seed to be very important.

It is important for me to see information about seed purity, germination and noxious weed content before planting cover crop seed on my farm.



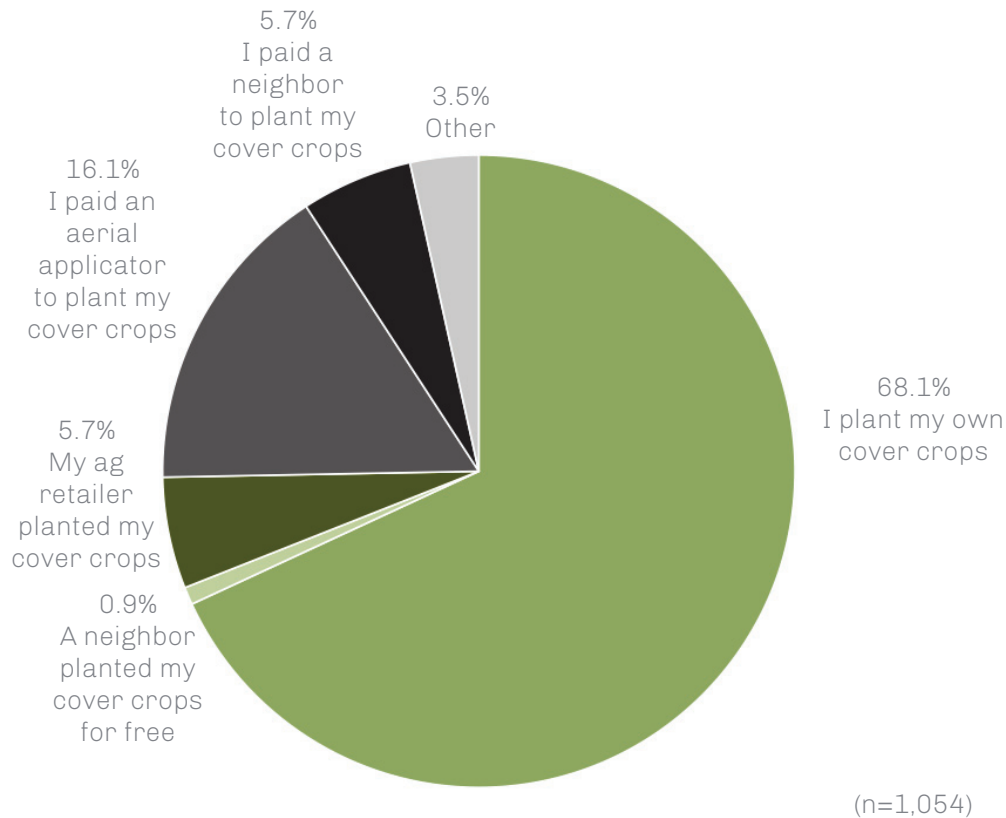
COVER CROP COSTS: SEED, PLANTING

Average per-acre seed costs—not including any planting costs—were reported by 897 respondents. The mean figure was \$30.07 and the median was \$22.00.

A mean cost of planting/establishing cover crops amounted to \$16.60, as reported by 308 respondents.

Understanding the nature of the investment is important. Of 1,054 respondents, 68% reported planting and establishing their own cover crops, 16% paid an aerial applicator to plant their cover crops. Paying an ag retailer or neighbor accounted for 6% of the sample each. "Other"—generally a combination of self-seeded and aerially seeded cover crops or renting equipment from neighbors—accounted for 4%.

Did you pay somebody to plant your cover crops?

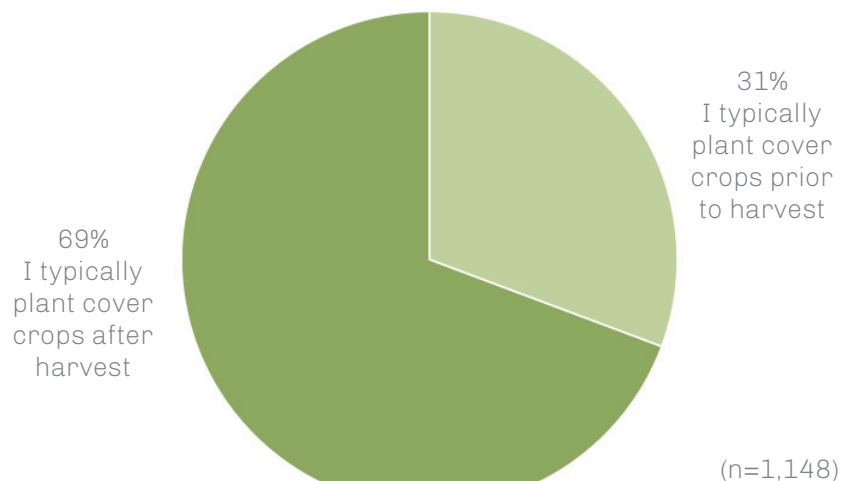


TIMING OF COVER CROPS

Cover crops have traditionally been planted after harvesting cash crops. However, many farmers have found that seeding cover crops into growing cash crops can provide a vital head start in establishing the covers.

For the first time, the 2015–2016 survey asked when farmers planted their cover crops. About half of the total number of respondents—1,148 farmers—responded to the question. Of those, 69% typically plant cover crops after harvesting their cash crops, but a surprising 31% reported planting cover crops prior to cash crop harvest.

When do you plant cover crops?



COVER CROPS AND YIELD

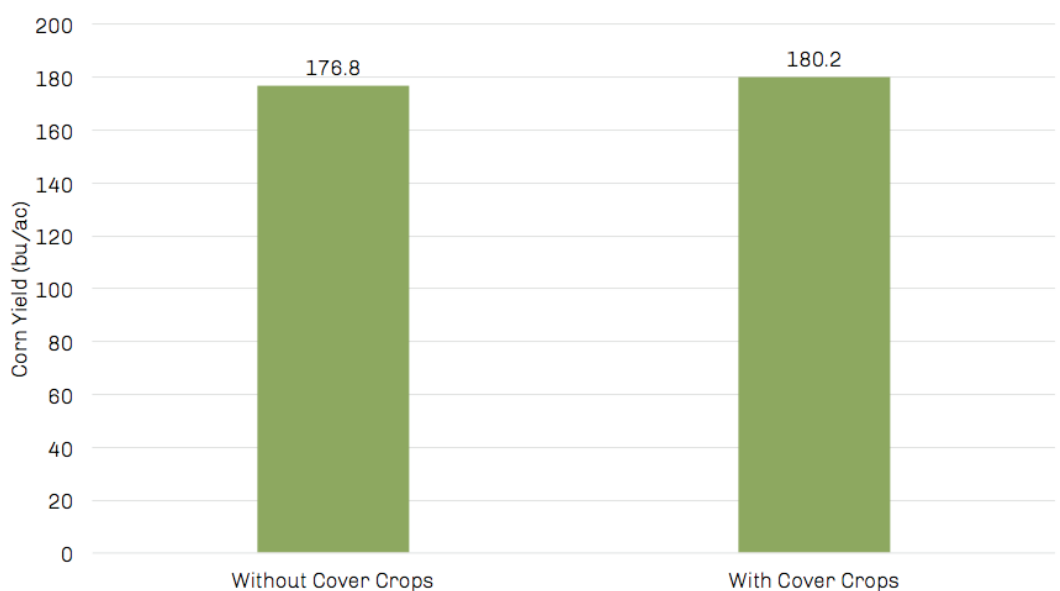
Consistent with findings from the previous three surveys, the fourth SARE/CTIC Cover Crop Survey conducted in 2015–2016 reports yield benefits for corn and soybeans from cover cropping. Shanxia Sun of Purdue University, under the guidance of Dr. Wallace Tyner and Dr. Michael S. Delgado, analyzed the yield data thoroughly.

Following the same procedure of analysis from previous years, observations with yield values in the top and bottom 1 percent are trimmed off to increase the reliability of the data, and remove the possibility that the analysis is affected disproportionately by outliers.

One important point: the data in this analysis are self-reported online, and are not collected randomly. This non-randomness may affect the extent to which the data are representative of yields across farmers who use cover crops and those who do not. It is possible that farmers who stand to gain the highest yield benefits from cover crops are also the most likely to report their yields. Since a t-test is only able to test for differences between two samples, and not overcome issues related to non-random data, the results in this analysis should be interpreted bearing this fact in mind.

In the survey, 430 farmers reported their 2015 corn yields on similarly managed fields with and without cover crops. Following cover crops, reported corn yield increased 3.4 bushels per acre, or 1.9%, averaged across all geographies in the survey. While the average yield of corn was 176.8 bushels per acre on non-cover cropped fields, the average yield increased to 180.2 bushels per acre on cover cropped fields. T-test results indicated that the difference between the two yields is statistically significant at the 1% significance level.

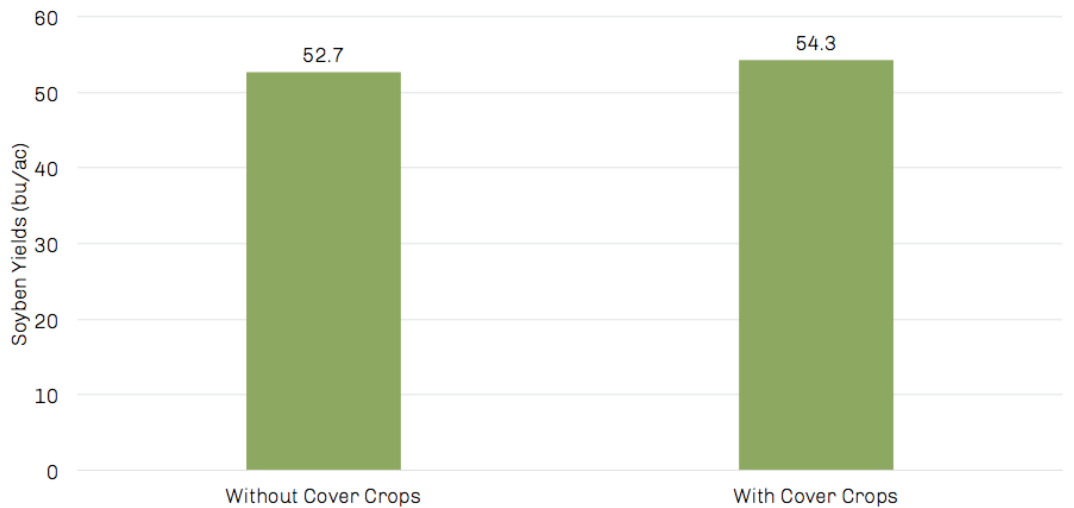
Corn Yields



(n=430)

Comparisons of 2015 soybean yields on similarly managed fields with and without cover crops were reported by 395 farmers. Respondents reported that cover cropping increased soybean yield by 1.5 bushels per acre, or 2.8%, at the national average level. Following cover crops, the mean soybean yield reported in the survey was 54.3 bushels per acre, while the figure was 52.7 bushels per acre without cover crops. These averages are found to be statistically significant at the 1 percent level using a t-test.

Soybean Yields



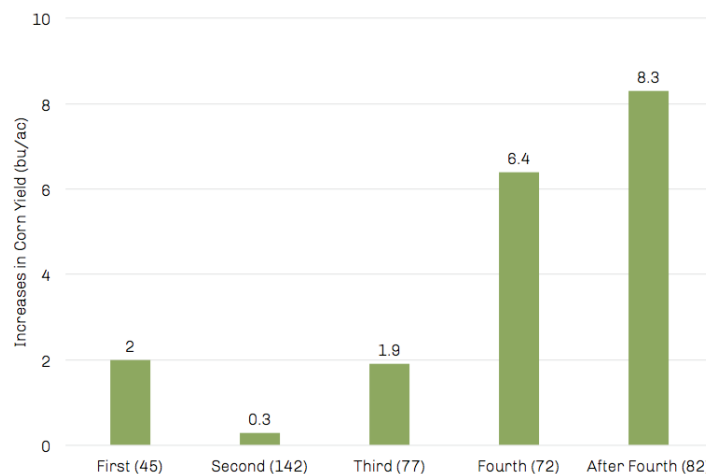
(n=395)

The yield benefits of corn and soybeans from cover crops in 2015 were consistent with findings from previous SARE/CTIC cover crop surveys. Three previous surveys, conducted in 2012–2013, 2013–2014 and 2014–2015, reported average increases of corn yields with cover crops of 9.6%, 3.1%, and 2.1% respectively, and that average increases of soybean yields with cover crops were 11.6%, 4.3% and 4.2% respectively.

Cover crops increase yields of cash crops mainly through slowing erosion, improving soil organic matter, and enhancing nutrient and moisture availability. Some impacts on soil or nutrition take place in the current cover cropping year but the others could take multiple years to fully manifest. As a result, the impact of cover crops on yields can be heterogeneous across the number of years that the cover crops have been planted continuously on the field.

For corn production, immediate benefits of cover cropping are observed in the first year that cover crops are planted: corn yields increase 2.0 bushels per acre on cover cropped fields in the first year. After cover crops have been planted for more than 2 years, larger benefits are observed: the yield benefit achieves 8.3 bushels per acre when cover crops have been planted for more than 4 years continuously.

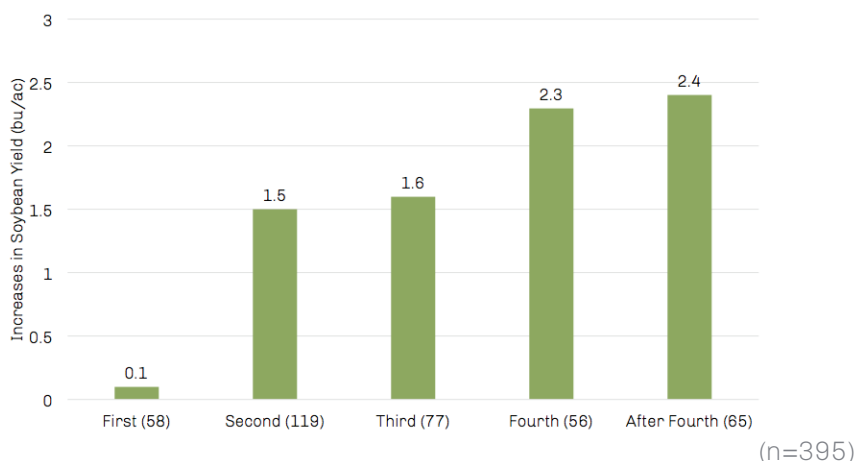
Increases in Corn Yields After Cover Crops: Years in Cover Crops



(n=430)

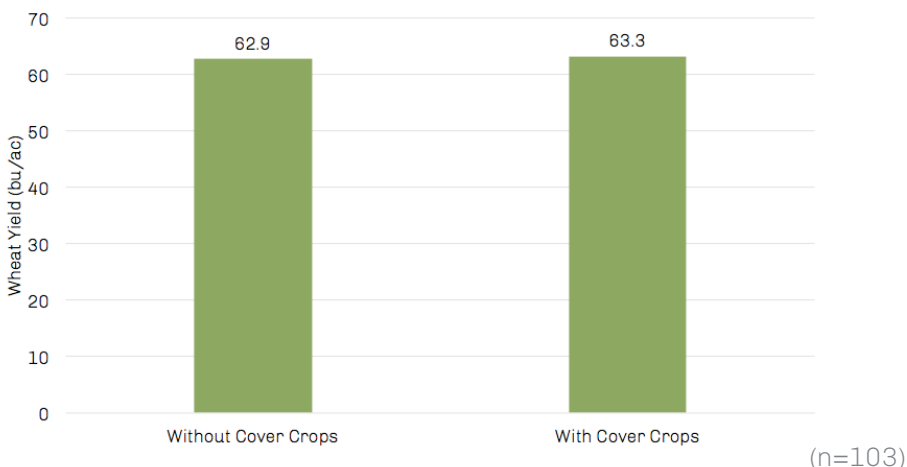
The yield benefits for soybeans increases from the first year when the use of cover crops spans multiple years. Similar to corn yields, the highest benefit is obtained after cover crops have been continuously planted for 4 years on the same fields (Figure 5). However, different from corn, no substantial yield benefit is observed in the first cover crop year for soybeans.

Soybean Yields After Cover Crops: Years in Cover Crops



Data on wheat yields in 2015 were also collected by the 2015–2016 survey. However, the sample size was relatively small, with only 103 farmers included. According to the available data, no significant difference existed between yields of wheat with cover crops and without cover crops, though the test may lack statistical power given the relatively small sample size.

Mean Wheat Yields With and Without Cover Crops



The survey also sought insight into the effects of cover crops on sorghum and cotton yields, but the sample size of a few dozen farmers comparing yields with and without cover crops was too small to provide conclusions.

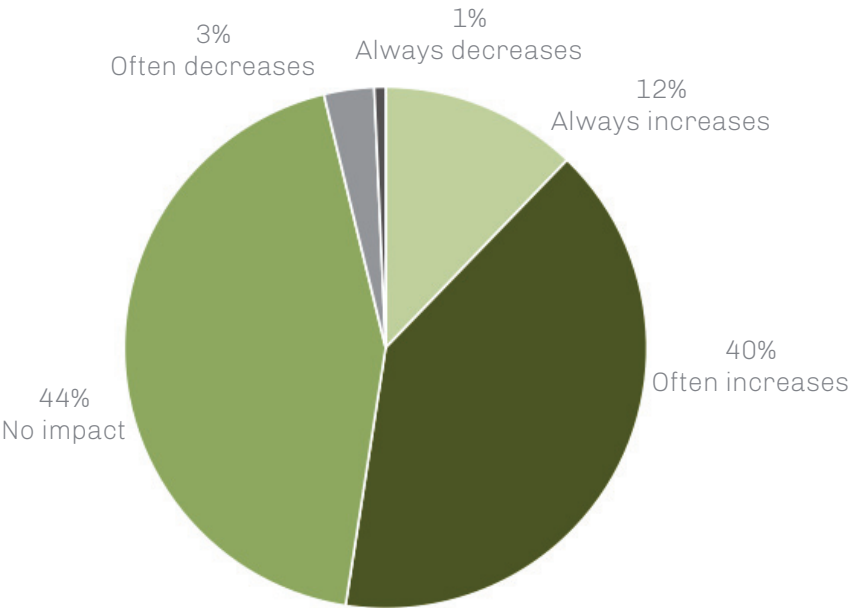
IMPACT OF CEREAL RYE COVER CROPS ON SOYBEANS

The use of a cereal rye cover crop prior to planting soybeans is well-established in many areas. The 2015–2016 survey explored this practice in detail for the first time in the SARE/CTIC survey series.

Asked whether the reported soybean yield benefit following cover crops was the result of planting soybeans after cereal rye, 44% of 726 respondents said “yes” and 56% said “no.”

However, another question explored the frequency of yield impact on soybeans following cereal rye cover crops. Of 286 respondents, 40% reported that their soybean yields often increase following a cereal rye cover crop, and 12% said their soybean yields always rise after cereal rye. Only 4% reported yields often or always decreasing in soybeans after a cereal rye cover crop, and 44% reported no impact on soybean yields from the practice.

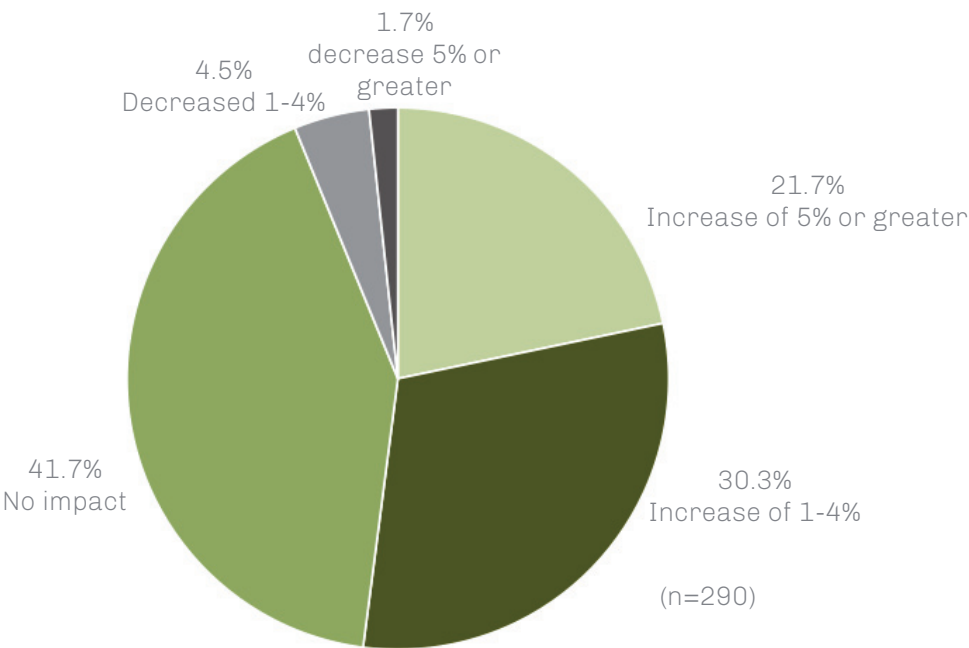
Yield response when planting soybeans after a cereal rye cover crop



(n=286)

Digging deeper into the relationship between soybean yields and cereal rye cover crops, 42% of 290 respondents reported that cereal rye cover crops prior to soybeans had no impact on their soybean yield. Thirty percent said they experienced a yield bump in soybeans of 1 to 4 bushels per acre following cereal rye, and 22% reported a yield improvement averaging 5% or more. Just 6% of the respondents to the question attributed a decrease in soybean yield to following a cereal rye cover crop.

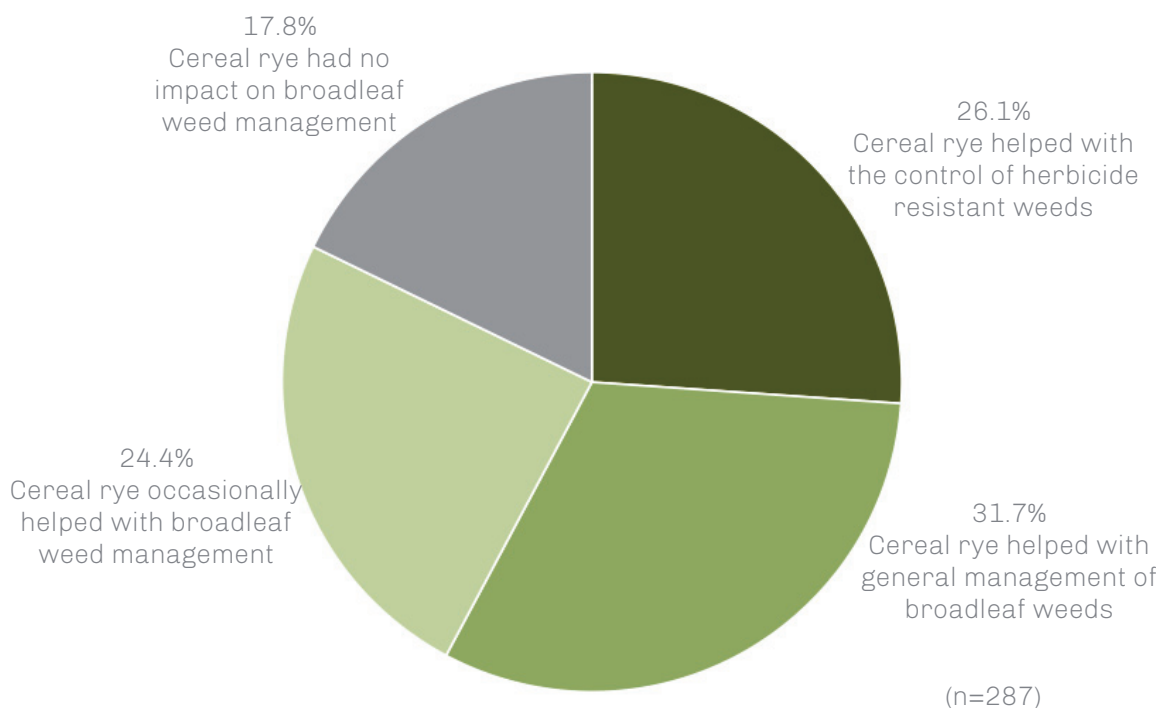
Response to soybean yields following a cereal rye cover crop



(n=290)

Farmers reported other benefits to cereal rye cover crops. Of 287 respondents, 32% agreed with a statement that cereal rye helped with general management of broadleaf weeds and an additional 24% said cereal rye cover crops occasionally helped with broadleaf weed management. Twenty-six percent agreed with the statement “cereal rye helped with the control of herbicide resistant weeds (e.g. marestail/horseweed, palmer amaranth, etc.).” Just 18% said cereal rye cover crops had no impact on broadleaf weed management.

Impacts of weed control in soybeans planted after a cereal rye cover crop



INFLUENCES ON ADOPTION

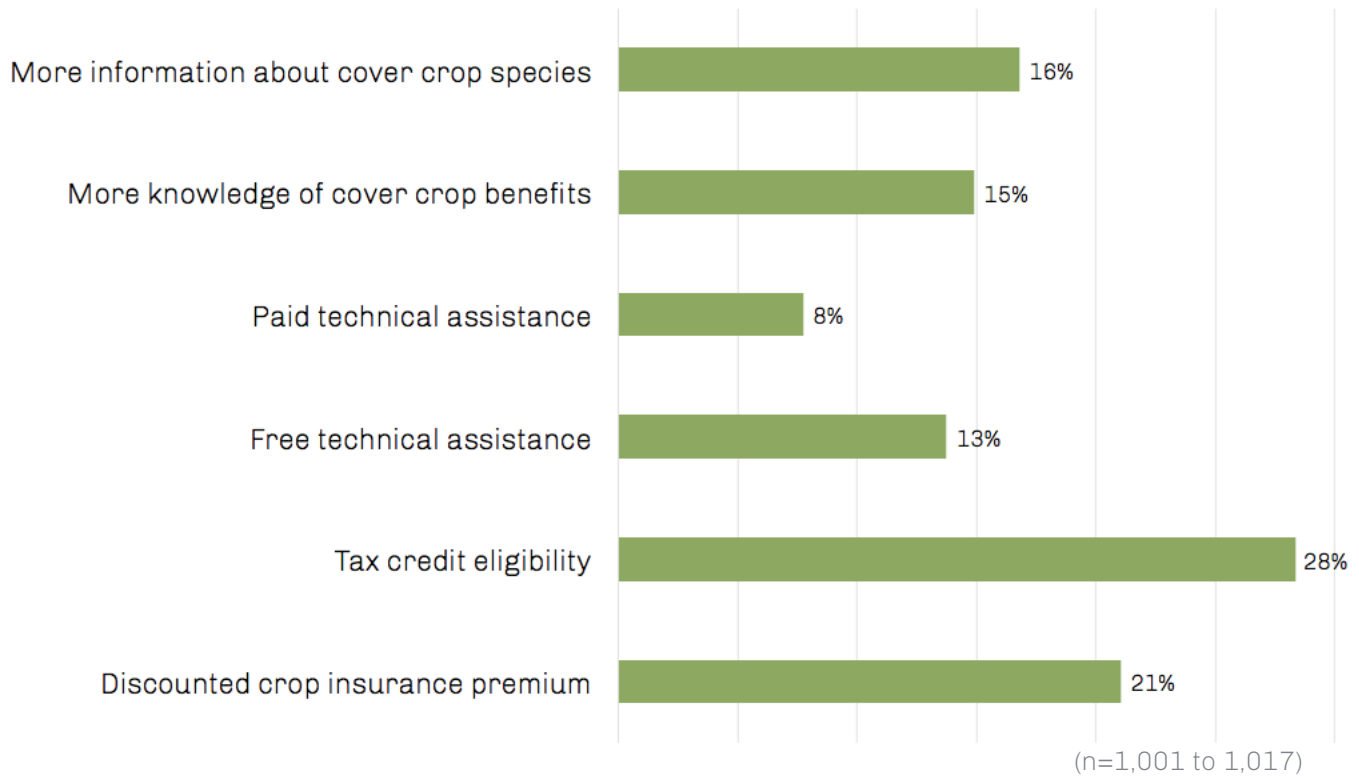
Insight gathered in the SARE/CTIC Cover Crop Surveys over the past four years helps guide policy, promotion, research and the development of technical support materials. Asking farmers—both users and non-users—about the factors that influence their adoption of cover crops is a vital part of the survey process.

The 2015–2016 survey contained several questions and statements designed to offer perspective on adoption influences.

Both users and non-users were asked to rate a series of enticements on a scale ranging from “very helpful” to “not helpful.” Asked, “If the following items were available to you, how helpful would they be in motivating you to adopt (or adopt more) cover crops?” the respondents significantly favored tax credit eligibility (568 of 1,017—57%—rated it “very helpful”), discounted crop insurance premium (421 of 1,008, or 42%, rating it “very helpful”) and more information about cover crop species (336 of 1,010, or 33%, rating it “very helpful”).

Paid technical assistance was the lowest-rated factor, with the smallest number of “very helpful” and largest proportion of “not at all helpful” votes.

"Very Helpful" Ratings on Cover Crop Influences



TELLING THE NEIGHBORS

An open-ended question in the 2015–2016 survey provided an opportunity for respondents to share comments in their own words on the benefits or risks of cover crop production. Asked, “What would you tell your neighbor about cover crops that would encourage them to use cover crops on their farms?” 859 respondents shared insights.

Many cited specific benefits that were ranked earlier in the survey, such as erosion control, building organic matter, improving soil quality, providing cost-effective grazing and attracting pollinators.

Some introduced new benefits such as, “Great for carbon sequestration and improved CEC.”

A few respondents made eloquent cases for cover crops, including, “Where in nature is the soil left uncovered or without live roots? How can you keep the soil life productive with only 3–4 months of food?”

Many cut right to the chase, with comments like, “effective at recovering unused nutrients you paid for,” or, “better get used to them—gonna be mandatory.”

Encouragement was the theme of dozens of answers. “Jump in.” “Just do it.” “Try it.” Several suggested experimenting on a small acreage to get the hang of managing cover crops before going full-scale.

Some comments addressed challenges with adoption or use of cover crops, like, “Hmmm, most of my neighbors love fall tillage, I’m the odd guy,” (pointing to resistance among neighbors to try cover crops). Another decried a lack of knowledgeable advisors in the field, recommending YouTube videos and no-till conferences as the only reliable sources of information on cover crops. And one farmer pointedly warned neighbors not to plant buckwheat in wheat country (in Japan, a major customer of American wheat, buckwheat allergies are taken as seriously as peanut allergies are in the U.S., so the wheat export industry is working diligently to discourage the use of buckwheat as a cover crop on fields that will be planted to wheat within two years).

Many comments were strongly rooted in the “seeing is believing” philosophy. “Look at my soil and tell me it’s not a better environment for crops to grow in,” challenged one grower. “Compare our fields with slopes to see soil loss of mine vs. his,” wrote another. “I wouldn’t say much at all, I would just show them the soil test results and let them decide for themselves,” said a third.

CONCLUSION

Data from the fourth annual SARE/CTIC Cover Crop Survey was very encouraging. Responses from more than 2,000 farmers who completed the survey showed that cover crop acreage continued its steady rise in 2015 and was on track to grow further in 2016, despite the major downturn in the U.S. agricultural economy.

In fact, respondents indicated that commodity prices had only a minor pull on cover crop planting intentions, and the majority agreed with the statement that commodity prices do not impact their use of cover crops.

While profitability underlies nearly all decisions in the farming business—as in any business—profit from cover crops is not the key driver among respondents to this year’s survey. About one-third of the respondents said cover crops increased their profitability, compared to only 6% who reported a profit decrease. The remainder either saw no difference in profit or said they didn’t have enough data to tell.

However, two-thirds of the respondents believed that cover crops reduce yield variability during extreme weather events, and the top three reported benefits of cover crops were all similarly non-numeric—an increase in overall soil health (86%), a reduction in erosion (83%) and increased soil organic matter (82%).

For the fourth year in a row, the survey found yield increases in both corn and soybeans after cover crops (1.9% in corn and 2.8% in soybeans). Those are modest bumps, but they are statistically significant. A new angle of exploration—on the effects of a cereal rye cover on a subsequent crop of soybeans—revealed that a majority (52%) responded that their soybeans often or always rise after a cover crop of cereal rye. Notably, 82% said cereal rye cover crops helped with weed control. In all, the popular practice of planting cereal rye cover crops before soybeans was validated in this year’s survey.

In fact, cereal rye was the most popular cover crop species in the survey overall, followed by radish. However, cover crop mixes were planted on nearly as many acres as cereal rye, and acreage blends are expected to increase based on the responses in this survey. That would follow the pattern described by many participants in the survey—51% reported that they started with single species of cover crops and “graduated” to mixes, while another 17% started with mixes and increased their use of blends.

That is important news for dealers of cover crop seed—while 61% of the respondents said they designed their own blends, 22% relied on their crop consultant or cover crop seed dealer to work with them on developing a mix. A strong majority also say seed tag information—which includes purity and germination data—is important to them.

In addition to helping the seed industry look at its customers in the cover crop space, results from this survey will be helpful in setting policy and guiding efforts to promote the adoption of cover crops by more farmers.

Tax credits and reduced crop insurance premiums could be effective enticements for a significant number of respondents, according to the poll. More information was the third-most-popular influence on adoption—a need that can be filled by government agencies, university and extension educators, ag retailers, seed dealers and independent crop advisors.

The goal of the SARE/CTIC Cover Crop Survey project over the past four years has been to understand the status of cover crops nationwide, explore farmers’ expectations and concerns, and gauge the needs of both users and non-users in an effort to promote successful use of cover crops. It is clear there is steadily increasing enthusiasm for cover crops.

