

# A Farmer's Guide to Soil Health Economics

FINDINGS FROM **NATIONAL SURVEYS** FOR CORN, SOYBEAN, AND SMALL GRAIN

According to the U.S. Department of Agriculture (USDA), soil science research has shown that practices which improve soil health can lead to benefits such as reduced erosion, maximized water infiltration, improved nutrient cycling, and improved resilience.<sup>5</sup> These “soil health practices” not only have direct benefits for the producers, but they can also have public benefits for the surrounding community.

Although practices such as no-till, cover crops, change in crop rotation or nutrient management have been shown to improve soil health, adoption remains limited: just 21% of cultivated acres are in continuous no-till<sup>1</sup> and only 3.9% are in rotation with cover crops.<sup>6</sup> One barrier to conservation practice adoption is that farmers bear all the costs of practice adoption while sharing the benefits with the public. Soil health practices can allow farmers to reduce input costs, and, in some cases, increase crop yield.

To shed light on the economic impacts of adopting soil health practices, we searched for relevant economic analyses. We organized the results into three factsheets highlighting key findings from surveys, budget analyses, and research trials. In this factsheet, we share findings from **TWO NATIONAL SURVEYS**. This guide focuses on the production of corn, soybeans, and small grains.

Surveys provide excellent insight into a large sample of producer decisions and the economic effects of those decisions. If large enough and generalizable, surveys can examine national trends in conservation practices. Whereas a case study or research trial tells detailed stories about one or a group of producers, surveys can provide a more overarching view. In this section, we will focus on two large national surveys, USDA's Agricultural Resource Management Survey (ARMS)<sup>4</sup> and the Sustainable Agricultural Research and Education (SARE) National Cover Crop Survey.<sup>3</sup>

The SARE National Cover Crop Survey is a biannual survey specifically targeting producers using cover crops across the country. It asks in-depth questions about cover crop adoption and the effects they have on a producer's operation. The yearly ARM Survey provides information on producers' production practices, resource use, and economic well-being. Within ARMS, there are a few sections that provide insights into soil health practices. It is important to note that each survey has limitations. The SARE survey is limited to current cover crop users and does not include producers for whom cover crops did not work, potentially biasing



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the results. The ARM Survey, although very large, only has a limited proportion of data from respondents using cover crops.

The SARE Cover Crop Survey showed two important yield-related findings.

- **Producers self-report that their corn and soybean yields improved by 2% and 5% on average**, respectively, over time with the addition of cover crops.<sup>3</sup>
- In an earlier version of the SARE survey (2015–2016), researchers found **gradual increases in yield and input savings over the five years for both corn and soybeans** after the adoption of cover crops, which led to an increase in net income.<sup>2</sup> Corn and soy producers both saw negative returns in their first year of adoption (-\$31/ac and -\$23/ac, respectively). By the third year, producers of both crops broke even (\$1/ac and \$0/ac, respectively). Ultimately, producers in the fifth year experienced positive net results of \$18/ac for corn and \$10/ac for soybeans, showing the importance of a long-term approach (see Table 1).

**One key trend highlighted in both national surveys is that farmers are adopting cover crops with and without financial incentives.** Although there are different incentives potentially available, such as federal financial assistance, a large number of producers are adopting these practices without monetary support. According to the USDA ARM Survey, only one-third of cover crop acres in the U.S. were planted with an incentive program,<sup>4</sup> thus two-thirds were planted without financial support. The SARE National Cover Crop Survey found that nearly 50% of the 1,172 farmers that responded did not receive incentive payments

**TABLE 1. SARE COVER CROP SURVEY CHANGE IN NET INCOME FROM ADOPTING COVER CROPS**

	ONE YEAR	THREE YEARS	FIVE YEARS
Corn Net Income (\$/ac)	-\$31	\$1	\$18
Soybean Net Income (\$/ac)	-\$23	\$0	\$10

Source: Myers et al. 2019<sup>2</sup>

(SARE, 2020). Incentives still remain important in providing transitional support to farmers who need assistance as they start adopting cover crops.<sup>2</sup>

**Another key trend mirrored in both national surveys is that combining no-till and cover crops is common and potentially beneficial.** According to the ARM Survey, farmers were two to three times more likely to use no-till on fields with cover crops.<sup>4</sup> Within the SARE survey, 48% of cover crop producers also used no-till.<sup>3</sup> Farmers can use the savings from no-till, e.g., fuel, and labor savings from the reduction in the number of passes across a field, to offset the costs of cover crops and then continue both practices to maintain the numerous soil health benefits they observe in their fields.<sup>2</sup>

### Key Takeaways

- 1. Yield benefits might not start right away.** Evidence from the SARE Cover Crop Survey suggests that yield improvements are possible with cover crops but may take a few years to materialize.<sup>2</sup>
- 2. Incentives are important, but potentially not a limitation.** Both the ARM and SARE Cover Crop surveys show that many producers using cover crops are finding a way to be successful without financial incentives.
- 3. No-till and cover crops are being used in combination.** According to both ARM and SARE Cover Crop surveys, producers are using both cover crops and no-till in their operations.



Planting green into a six-way cover crop with a 40-ft, 16-row corn planter

KEVIN KEENAN

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