

PERCEIVED BENEFITS AND NET RETURNS OF COVER CROPS IN MIDWESTERN US AGRICULTURE

COVER CROPS HAVE generally been accepted as an effective method of controlling nitrate pollution and promoting soil sustainability. The Iowa Nutrient Reduction Strategy lists cover crops as a practice with great potential to reduce nitrate loads; and, long-term simulations have shown that winter rye cover crops may reduce nitrate concentrations in tile drainage by as much as 54%.

Despite the benefits, cover crop adoption rates in the US Midwest are low. Iowa has an estimated 30 million acres of farmland, but the Natural Resource Conservation Service estimated that Iowa farmers only planted about 353,000 acres of cover crops in 2016. Several surveys have been conducted to determine what factors prevent farmers from planting cover crops. In previous

surveys farmers have stated that the greatest challenges were establishment, time (labor required), and species selection. An Iowa Farm and Rural Life Poll found that 57% of farmers felt profit margins made it difficult to invest in conservation practices, and respondents of other polls stated the need for economic analyses to document the short- and long-term impacts of cover crops and revealed the belief that farmers would need to see more economic incentives to drive further cover crop adoption.

Using focus groups, surveys, and partial budgets, we examined annual net returns as well as farmers' perceptions about cover crops. Our study was unique, in that we examined each farmer's practices where they did and did not use cover crops.

FOCUS GROUP RESULTS

With assistance from Practical Farmers of Iowa, we recruited 16 farmers from the US Midwest region to participate in a series of discussions in December 2015. On average, participants in our focus groups had nine years of experience with cover crops. The average area planted to cover crops per respondent was 460 hectares, with 11 farmers planting cereal

MOST FARMERS REVEALED THAT THEY STARTED USING COVER CROPS DUE TO:

- potential benefits (e.g., soil health, erosion control);
- availability of outside resources (e.g., education events, cost-share programs);
- perceived fertilizer and herbicide savings; and
- improvement of water quality.

THE MOST COMMON REASONS GIVEN FOR THE CONTINUED USE OF COVER CROPS WERE:

- perceived reduction in soil erosion;
- soil health improvement;
- lawsuit risk management (several farmers felt it may help prevent inclusion in future environmental lawsuits); and,
- cost savings (reduction of herbicide/fertilizer costs for cash crops following cover crops).



Photo courtesy of Practical Farmers Of Iowa

rye and the remainder planting either annual ryegrass mixes or mixes including radish. Most farmers terminated cover crops with herbicide. The focus group sessions afforded the opportunity to understand why farmers chose to use cover crops. The same farmers were given a questionnaire to evaluate the changes in revenues and costs they faced associated with cover crops use in 2014.

Based on survey responses and a partial budgeting tool we were able to calculate changes in net profit due to cover crop use, which showed farmers suffered an average loss of \$21.74 per acre in 2014 due to cover crop

use. The entire range of net economic changes ranged from a reduction of \$67.34 per acre to an increase of \$66.09 per acre, with the median being a decrease of \$25.92 per acre. However, cost-share payment programs and yield increases from cover crop use both positively impacted farmer revenue at \$11.73 and \$8.96 per acre, respectively.

Even with cost-share payments accounted for, in 2014 the average change in net returns due to cover crops was negative. Thus, we conclude that cost-share programs are likely to play a role in incentivizing cover crop use among inexperienced farmers.

Ultimately, our research has shown that making general agronomic and economic recommendations for all types of cover crops in Midwest row crop systems should be avoided—recommendations should be issued for specific regions and specific cover crop mixes.

The full findings are detailed in the journal article “Cover crops use in Midwestern US agriculture: Perceived benefits and net returns,” published by *Renewable Agriculture and Food Systems* and are available at <https://doi.org/10.1017/S1742170518000194>.