

THE ECONOMICS OF COVER CROPS ON MINNESOTA FARMS

2023 data report



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EXECUTIVE SUMMARY

In 2021, Environmental Defense Fund (EDF), the University of Minnesota's Center for Farm Financial Management, the Minnesota State Farm Business Management program and the University of Minnesota Extension's Southwest Minnesota Farm Business Management Association began a collaborative effort to collect detailed financial data on cover crops from 2022 to 2024. The project gathered data from 121 Minnesota farms in 2022 and began expanding into Wisconsin in 2023. The objective of this project is to answer farmers' questions about cover crops by analyzing financial data across multiple years from a large group of real farms across Minnesota and surrounding states.

The 2023 cover crop cohort included 129 Minnesota farms and 12 Wisconsin farms (also referred to as the "cover crop cohort"). The planting and establishment of cover crops analyzed in this report were impacted by the exceptionally dry weather in the fall of 2022. The farms in the cover crop cohort had similar demographics to the average Minnesota farm in 2023, including similar years of farming experience, farm size and net worth.

Our key findings:

Cover crop related costs and returns

- Cover crops planted for feed purposes covered the cost of producing the cover crop and provided financial benefits to the farm.
- Total direct expenses across all cover crop enterprises in the 2023 database ranged from \$14 to \$285 per acre, with the average at \$60 and a median of \$48.
- Cost-share payments covered just over 10% of the total cover crop costs in the cover crop cohort. This includes all cost-share funds a farm may have received to support cover crop implementation from both government and private sector sources.
- Seed, machinery repairs and fuel and oil were the greatest cost contributors to cover crop enterprises.

Cover crop impacts on primary commodity crops

- The gross returns of fields with cover crops planted ahead of the commodity crop were similar to fields without cover crops in most of the crops evaluated.
- For the majority of commodity crops, the average fertilizer expense for fields planted with a cover crop was lower than the area average.
- For all regions and commodity crops analyzed, the average net return after accounting for labor and management of the cover crop and the following commodity crop was lower than the average net return of the same commodity grown without a cover crop.

Impact of cover crop experience

- Farmers contributing cover crop data had a range of experience planting cover crops, with a fairly similar split of farms in the database with one to three years of cover cropping experience (28%), four to five years of experience (33%) and farms with greater than six years of experience with cover crops (38%).
- Producers with more cover crop production experience had lower median cover crop expenses in 2023 compared to those with fewer years of experience in the cohort.
- There is no clear trend in net returns across different experience levels, both before and after labor and management charges, from the corn and soybean crops combined with the preceding cover crop.



DATA-DRIVEN INSIGHTS TO FARMERS' ECONOMIC QUESTIONS ON COVER CROPS

The U.S. agriculture sector is making major investments in climate-smart agriculture practices. The U.S. Department of Agriculture (USDA), along with food and agriculture companies, are funding billions of dollars' worth of climate-smart practices on farms and ranches across the country. At the same time, farmers are benefiting from the USDA Partnerships for Climate-Smart Commodities' \$3 billion investment in on-the-ground projects while also applying for \$850 million in conservation program funding through the Inflation Reduction Act.^{i,ii}

Farms and ranches across the nation are simultaneously navigating severe weather conditions, facing nearly \$22 billion in crop and rangeland damages caused by weather disasters in 2023.ⁱⁱⁱ Supporting farmers in profitably implementing climate-smart agriculture practices is critical for the resilience of their operations and our food system.

The planting of cover crops has the potential to improve soil health and water quality, as well as provide additional climate adaptation benefits. In the U.S. Midwest, a winter cover crop is planted after (and sometimes before) harvesting the previous crop, with the general objective of maintaining soil cover and soil structure over the winter months. These cover crops naturally die off in the winter, are harvested or are terminated before planting the next

main feed or commodity crop the following spring. Cover crops can increase soil organic matter in the surface soil layers, reduce erosion, and improve soil structure, water retention and drainage.^{iv} Improving soil health by planting cover crops and reducing tillage may reduce yield risk during extreme rain events.^v

Despite their positive agronomic potential, farmers continue to have questions about the economic impacts of cover crops on their farming operations. Out of the farmers surveyed in the 2022-2023 National Cover Crop Survey who do not use cover crops, 83% identified "no measurable economic return" as a concern regarding planting cover crops with 60% considering it a major concern.^{vi}

In 2021, EDF, the University of Minnesota's Center for Farm Financial Management, the Minnesota State Farm Business Management program and the University of Minnesota Extension's Southwest Minnesota Farm Business Management Association began a collaborative effort to gather farm-level financial data on cover crops to address farmers' financial questions. The project is gathering detailed financial data on cover crops between 2022-2024 from corn, soybean and other row crop farms across Minnesota. The project began expanding into Wisconsin in 2023 and data will be gathered from North and South Dakota farms in 2024. The project aims to inform producer decisions by analyzing actual farm financial data consistently gathered from a large sample of farms.

ⁱ USDA. Partnerships for Climate Smart Commodities. <https://www.usda.gov/climate-solutions/climate-smart-commodities>.

ⁱⁱ USDA. September 29, 2023. As USDA Sees Record Interest in Conservation and Clean Energy Programs, Swift Implementation of Inflation Reduction Act Funding Continues. <https://www.usda.gov/media/press-releases/2023/09/19/usda-sees-record-interest-conservation-and-clean-energy-programs#:~:text=The%20Inflation%20Reduction%20Act%20made,demand%20for%20popular%20conservation%20programs>.

ⁱⁱⁱ Farm Bureau. (February, 2024). Major Disasters and Severe Weather Caused Over \$21 Billion in Crop Losses in 2023. <https://www.fb.org/market-intel/major-disasters-and-severe-weather-caused-over-21-billion-in-crop-losses-in-2023#:~:text=Updated%20crop%20and%20rangeland%20damage,NOAA's%20total%20economic%20impact%20figure>.

^{iv} Daryanto, S., Fu, B., Wang, L., Jacinthe, P.A. and Zhao, W., 2018. Quantitative synthesis on the ecosystem services of cover crops. *Earth-Science Reviews*, 185, pp.357-373.

^v AGree. February 2023. Conservation and crop insurance research pilot. Accessed at: <https://foodandagpolicy.org/wp-content/uploads/sites/17/2023/03/Conservation-Crop-Insurance-Data-Pilot-Results-1.pdf>

^{vi} SARE, CTIC & ASTA. 2023. National cover crop survey report 2022-2023. Accessed at: <https://www.sare.org/wp-content/uploads/2022-2023-National-Cover-Crop-Survey-Report.pdf>



The data and insights from this project may also provide value to federal and local cost-share programs, agricultural lending solutions and other climate-smart initiatives.

In July 2023, EDF published a [report presenting preliminary project data](#) on the financial impacts of cover crops on Minnesota farms during the 2022 growing season. Building on that effort, we continued gathering financial data in 2023, expanding the cohort to include additional farms from Wisconsin. This report provides cover crop financial data for the 2023 growing season from participating farms in Minnesota and Wisconsin.

The partners actively decided not to present the 2022 and 2023 cover crop data together since farmers faced different weather and market conditions during the two years. The project aims to conduct more robust research and analysis of the data after three years of data gathering to buffer the effects of weather and markets in a given year.

It is also important to consider that the agronomic benefits from cover crops occur over the long term, so the data presented in the report should be considered preliminary with the goal of providing initial insights on the costs of adding cover crops to crop rotations.

This report provides cover crop financial data for the 2023 growing season from participating farms in Minnesota and Wisconsin.



ABOUT THE DATA

About the FINBIN database

FINBIN is one of the largest farm financial databases in the world, and it is the largest publicly available farm financial database in the U.S. There are approximately 3,500 farms that contribute data to FINBIN annually from approximately 12 U.S. states. The database can be used to run summary financial reports of specific management systems, crop and livestock enterprises, and regions. It can also benchmark a farm's financial performance against peers. Roughly 40,000 FINBIN reports are run every year by farmers, lenders and other users.

FINBIN data is not survey data. Participating producers complete a comprehensive financial analysis of their operation at the end of each year with the help of a farm business management educator. FINBIN data is gathered by professionals with farm business management programs that provide producers financial education, recordkeeping, analysis and benchmarking support. The data is gathered by these professionals in a consistent way using the FINPACK farm financial management software system. The Center for Farm Financial Management provides annual training and updates to FINPACK to promote consistent data gathering across the FINBIN database. The farm financial data is processed through several rounds of screening for accuracy and completeness. Farms that do not meet strict accuracy requirements are excluded. Every effort is made to verify the integrity of each set of farm financial data included in the database. Prior to aggregation, each producer's data is anonymized and secured to prevent any individual data identification.

There are approximately 3,500 farms that contribute data to FINBIN annually from approximately 12 U.S. states. Roughly 40,000 FINBIN reports are run every year by farmers, lenders and other users.

Minnesota farm benchmarking data

Approximately 2,400 farms in FINBIN are Minnesota farms participating in the Minnesota State Colleges and Universities Farm Business Management program or the University of Minnesota Extension's Southwest Minnesota Farm Business Management Association. The FINBIN database includes a substantial share of Minnesota commercial farms. When compared to USDA National Agricultural Statistics Service data, FINBIN includes 13% of Minnesota farms that grossed over \$250,000 and a lower percentage of smaller Minnesota farms. It must be stressed, however, that this is not a random sample of Minnesota farms. These farms pay a fee to be part of these programs, and there are likely characteristics of participating farms that distinguish them from other farms in the state.

Gathering cover crop financial data

The methodology used to collect detailed cover crop financial data treats cover crops as their own enterprise by gathering all revenue and costs specifically associated with the cover crop. The cover crop enterprise is then presented alongside, and in combination with, the primary commodity crop grown after the cover crop. The methodology assesses these enterprises in combination because the cover crop can have production and soil health impacts that influence the production of the crop that follows. Grants from EDF, USDA Extension Risk Management Education, Minnesota Office for Soil Health, Minnesota Natural Resources Conservation Service and the Morgan Family Foundation are funding producer scholarships for the Farm Business Management program tuition and fees. With the support of these scholarships, participating producers who plant cover crops will be contributing financial data for this project over a three-year period (2022-2024).



DEMOGRAPHICS OF THE FARMS IN THIS REPORT

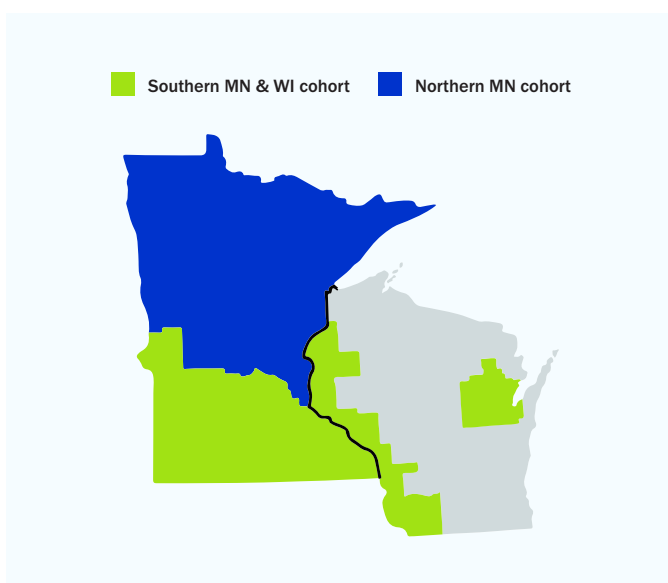
141 Minnesota and Wisconsin farms are gathering cover crop financial data

The cover crop group contributing data to the project in 2023 includes 129 Minnesota farms and 12 Wisconsin farms. One hundred of these farms contributed cover crop financial data in 2023, which was used for analysis in this report. The other 41 farms were unable to contribute 2023 cover crop field data but are members of the cohort because of their commitment to implementing cover crop practices.

We will refer to these 141 farmers as the “cover crop cohort” throughout this report. When possible, enterprises (such as the corn or cover crop enterprise) are separated into a northern Minnesota cohort and a southern Minnesota plus Wisconsin cohort. Figure 1 shows the general location of farms that contributed data.



FIGURE 1
Cover crop cohort locations



Farms using cover crops are similar to the average Minnesota farm

Table 1 compares demographics of the cover crop cohort to all Minnesota farms in the FINBIN database. The table demonstrates that the farms in the cover crop cohort were very similar to other Minnesota farms on average in 2023. This means the farms in the cover crop cohort can be considered representative of the average Minnesota farm. Analyzing a group of representative farms allows us to consider the potential impacts of cover crops on the “typical” farm in Minnesota. Due to the timing of data collection in FINBIN, the comparison was limited to Minnesota farms. A more detailed farm demographic comparison can be found in Table 1A in Appendix A.

The total crop acres in the cover crop cohort were slightly higher than the average Minnesota farm in FINBIN. The average operator age was very similar for the cover crop cohort compared to the average Minnesota farm (47 years

old vs. 48 years old, respectively) and the average number of years the operators have farmed was very similar between the two groups (24 years for the cover crop cohort and 23 years for the average Minnesota farm).

Both groups had a similar percentage of crop farms, meaning over 70% of their gross revenue is generated from crop production. The rest of the farms in each group consisted of similar splits between livestock farms, crop and livestock farms and “other” farms (see Table 1A in Appendix A).

The average farm in the cover crop cohort was in a similar financial position to the average Minnesota farm in FINBIN in 2023. The cover crop cohort had a slightly higher net income and a slightly lower net worth in 2023. The cover crop cohort and all Minnesota farms in FINBIN had almost identical debt-to-asset ratios and operating expenses as a percentage of revenue.

TABLE 1
Farm demographics comparison, 2023 (This table displays averages unless otherwise noted)

| | Cover crop cohort | All Minnesota farms in FINBIN |
|---|-------------------|-------------------------------|
| Number of farms (Total) | 141 | 2,448 |
| Total crop acres per farm | 822 | 794 |
| Operator age | 47 | 48 |
| Years farming | 24 | 23 |
| Percentage of farms that are beginning farmers* | 21% | 29% |
| Share of farms that are crop farms | 52% | 60% |
| Average net farm income | \$96,741 | \$89,359 |
| Median net farm income | \$68,846 | \$44,719 |
| Net worth | \$2,691,280 | \$ 2,754,311 |
| Debt-to-asset ratio | 34% | 32% |
| Operating expense ratio | 80% | 82% |

*Beginning farmers are defined as someone who has operated a farm for 10 years or less.



COMPARISON ACROSS COVER CROP TYPES

The 100 farms that reported cover crop financial data from the 2023 growing season planted cover crops on 228 differentiated fields. The primary cover crop enterprises included rye silage, cover crop rye mix and cover crop mix. The cover crop rye mix enterprise is a mix of two to four species, with a base species of cereal rye. The cover crop mix enterprise consists of four or more species without a specific cereal rye base. Other cover crop enterprises in the cover crop cohort included rye and cover crop forage; however, there were not enough of these enterprises to include in this report.

2023 crop and financial conditions

The cover crops analyzed in this report were planted in the fall of 2022, harvested or terminated in the winter or spring of 2023, and then analyzed alongside the primary commodity crop that was planted in the spring of 2023 and harvested in the fall of 2023. The crops were mostly located in Minnesota.

The fall of 2022 was extremely dry in Minnesota. These conditions made it difficult for farms to plant a cover crop. For the farms that planted a cover crop, the dry conditions made it difficult to establish a good cover crop stand. Subsequently, the entire 2023 growing season remained dry, leading to lingering drought conditions across much of the state. Despite the drought conditions, crop yields maintained 10-year averages for corn and soybeans, and yields were above average for wheat.

Even with average yields, Minnesota farms experienced significantly decreased financial results in 2023. Farms had the lowest net farm income seen since 2019. The primary reasons for low net returns were high input costs, low commodity prices for most crops sold in 2023, lower crop inventory values on year-end balance sheets, and mostly lower livestock prices overall. Increasing interest rates and inflationary pressures further exacerbated the financial challenges. Collectively, these factors led to a drastic decline in profitability from 2022 to 2023.



228

Cover crop fields were evaluated in 2023



Overview of gross returns and direct expenses from cover crops

Figure 2 shows the average gross return and average total direct expense associated with the cover crop enterprises in FINBIN in 2023. It represents all Minnesota and Wisconsin cover crop enterprises in FINBIN. Returns from cover crop enterprises are generated from crop production, grazing the cover crop, or from cost-share or other incentive program payments. Farmers growing a rye silage cover crop had the greatest gross returns at an average of \$134 per acre. All other cover crop enterprises had substantially lower gross returns (\$11/acre for cover crop rye mix and \$9/acre for cover crop mix). Rye silage was the only cover crop enterprise with a higher average gross return than average total direct expense.

The 2023 cover crop data shows that cover crop direct expenses can vary considerably. One substantial variation seems to be between cover crop enterprises meant for feed purposes (i.e., rye silage) and those that contribute to soil health only (i.e., cover crop mixes). Those cover crop enterprises used for feed incur higher machinery related costs due to the harvesting activities involved. The 2023 data also shows significant variation in total direct expenses throughout different farms that plant the same cover crop type. This variation will continue to be evaluated in subsequent years.

Approximately 44% of cover crop fields received cost-share payments. These payments covered 43% of the total cover crop costs for those fields on average. Overall, the cost-share payments accounted for just over 10% of the total cover crop costs when considering all fields. This includes all cost-share funds received from both government and private sector sources.

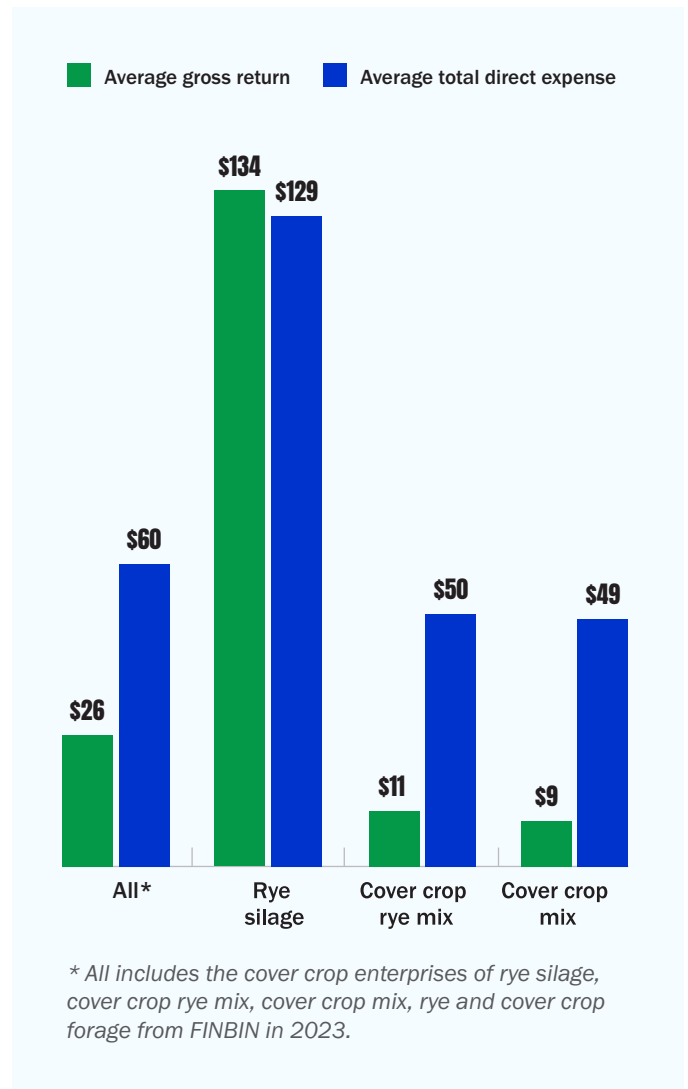
Detailed cover crop direct expenses

Table 2 shows the detailed expenses associated with the cover crop enterprises in FINBIN for 2023. The minimum, maximum, average and median per acre costs are presented for each expense category. The values are rounded to the nearest number to protect individual producer data. The median value represents the middle of the database, meaning 50% of the enterprises in that

FIGURE 2

Costs and returns of cover crops by species

Data: Minnesota and Wisconsin, Owned and Rented, 2023



category are below the median, and 50% of the enterprises are above. It is valuable to consider both the average and the median from a group when the sample size is small since outliers can affect the average.

The total direct expenses across all cover crop enterprises in the 2023 database ranged from \$14 to \$285 per acre, with the average at \$60 and a median of \$48. Total direct expenses include seed, chemical, fertilizer, fuel and oil, repairs and custom hire cost categories. Table 2 presents a breakdown of each of these expense categories across the various cover crop species.

TABLE 2

Cost comparison across Minnesota and Wisconsin cover crop enterprises in 2023

| | All | Rye silage | Cover crop rye mix | Cover crop mix |
|---------------------------------------|----------------|------------|--------------------|----------------|
| Number of enterprises | 228* | 28 | 87 | 106 |
| % of all enterprises | 100% | 12% | 38% | 46% |
| Seed (\$/acre) | n = 228 | | | |
| Minimum | \$3 | \$7 | \$3 | \$6 |
| Maximum | \$74 | \$48 | \$74 | \$70 |
| Median | \$23 | \$25 | \$20 | \$23 |
| Average | \$24 | \$24 | \$25 | \$23 |
| Fertilizer (\$/acre) | n = 3 | | | |
| Minimum | \$0 | \$0 | \$0 | \$0 |
| Maximum | \$94 | \$94 | \$0 | \$0 |
| Median | \$0 | \$0 | \$0 | \$0 |
| Average | \$1 | \$10 | \$0 | \$0 |
| Chemical (\$/acre) | n = 18 | | | |
| Minimum | \$0 | \$0 | \$0 | \$0 |
| Maximum | \$31 | \$31 | \$12 | \$11 |
| Median | \$0 | \$0 | \$0 | \$0 |
| Average | \$1 | \$2 | \$0 | \$1 |
| Fuel & Oil (\$/acre) | n = 206 | | | |
| Minimum | \$0 | \$4 | \$0 | \$0 |
| Maximum | \$33 | \$33 | \$17 | \$27 |
| Median | \$6 | \$17 | \$6 | \$4 |
| Average | \$7 | \$18 | \$6 | \$6 |
| Repairs (\$/acre) | n = 219 | | | |
| Minimum | \$0 | \$5 | \$0 | \$0 |
| Maximum | \$79 | \$79 | \$36 | \$44 |
| Median | \$12 | \$31 | \$13 | \$7 |
| Average | \$16 | \$33 | \$15 | \$12 |
| Custom Hire (\$/acre) | n = 49 | | | |
| Minimum | \$0 | \$0 | \$0 | \$0 |
| Maximum | \$129 | \$129 | \$33 | \$48 |
| Median | \$0 | \$0 | \$0 | \$0 |
| Average | \$5 | \$22 | \$2 | \$4 |
| Total direct expense (\$/acre) | n = 228 | | | |
| Minimum | \$14 | \$36 | \$26 | \$14 |
| Maximum | \$285 | \$285 | \$87 | \$95 |
| Median | \$48 | \$127 | \$44 | \$46 |
| Average | \$60 | \$129 | \$50 | \$49 |

* There was also cover crop data submitted for rye and cover crop forage enterprises, however, there was not enough data for either enterprise to show them independently in this report.

The rye silage enterprises had the highest average total direct expenses at \$129 per acre. The cover crop rye mix enterprise had an average total direct expense of \$50 per acre, and the average total direct expense for cover crop mix enterprises was \$49 per acre. The increased direct expenses for the rye silage enterprise relate to higher machinery expenses resulting from harvesting activities of the crop for feed purposes.

Seed, machinery repairs, and fuel and oil were the three greatest cost contributors to cover crop enterprises. The average seed expense across all cover crop enterprises was \$24 per acre, while the maximum seed expense was \$74 per acre, and the minimum was \$3 per acre. The average repair costs for all cover crop enterprises were \$16 per acre with a maximum of \$79 per acre and a minimum of \$0 per acre. The cover crop enterprises had an average fuel and oil cost of \$7 per acre. Additionally, custom hire was a large expense contributor to the rye silage enterprise, with an average of \$22 per acre on the rye silage acres.



COVER CROP IMPACTS ON CROP ENTERPRISES

In this section, we evaluate the financial performance of Minnesota and Wisconsin farms using cover crops and compare them to Minnesota farms that are not using cover crops. Cover crops can impact the management and performance of the crop that follows it through their effects on soil fertility, weeds and other pests, water availability and planting effectiveness (due to field accessibility by equipment or cover crop termination timing). It is therefore important to evaluate the costs and returns of cover crops themselves, and the financial performance of the cash crops that follow them. For this analysis, the cover crop enterprises are those planted in the fall of 2022. These cover crops were harvested or terminated in the spring of 2023 before planting the 2023 growing season's primary commodity crop.

The data comparing crops grown after a cover crop is separated by Northern and Southern regions of Minnesota when possible. Wisconsin farms are included in the Southern Minnesota comparisons. Minnesota is a large state, and growing conditions vary from north to south. Growing degree days for the two regions are different, as are the related management and input decisions. The corn silage and wheat data are not separated by region because there is not a sufficient sample size to do so.

The data is also separated by crop tenure type, differentiating owned land from rented land when there are enough enterprises to do so. Land rental costs may vary significantly from land ownership costs, so this is a helpful separation when available.

Costs in this report reflect the average accrual adjusted expenses paid by producers. Therefore timing, management and vendor have an impact on the costs displayed. Likewise, the crop value reflects the marketing strategies of producers. As a result, timing, methodology and location impact the values displayed.

It should be noted that while these results show potential differences in profitability between cover cropped acres and non-cover cropped acres, other factors that impact profitability are not captured directly in our data. For example, weather events, soil quality and management styles could have an impact on profitability and are not controlled for in our data set. All these factors should be considered when interpreting the data.



How to interpret the data tables

COLUMN 1

Crop grown after cover crop

This represents the cover crop cohort's crop that was planted after a cover crop and is considered the primary commodity crop. This crop was planted in the spring of 2023 and harvested in the fall of 2023. The acres of this enterprise and the cover crop enterprise match exactly to ensure that any long-term impacts of cover crops in the cropping system can be analyzed in future years.

COLUMN 2

Cover crop

This represents the revenue and expenses associated directly with the cover crop. It represents cover crops that were planted prior to a primary commodity crop. This crop was planted in the fall of 2022 and was harvested or terminated in the spring of 2023. Product return represents the value generated from selling or using the cover crop as feed or forage. Any cost-share funding is included as government payment income.

COLUMN 3

Crop grown after cover crop and cover crop combined

This is the combined values from Column 1 and Column 2 and displays the total income and expense for the acres that were planted as a cover crop in the fall of 2022 and then planted as a primary crop in the spring of 2023. No production information (yield per acre or value per unit) is detailed here because two distinct types of crop enterprises are being combined. The gross revenue and expense details are the combined value of Columns 1 and 2.

COLUMN 4

Cover crop cohort, fields with no cover crop

This column includes primary crop enterprises planted by growers in the cover crop cohort on fields that did not utilize cover cropping practices in 2023. This column allows you to compare the cover crop cohort's fields planted with a cover crop (Column 3) and non-cover cropped acres (Column 4). Column 4 is a subset of Column 5.

COLUMN 5

Average crop grown without a cover crop in 2023

This column is the average of all fields for the crops in the region that were grown without a cover crop. Due to limited data from Wisconsin farms, the average is calculated using only data from Minnesota farms.



CORN IN SOUTHERN MINNESOTA AND WISCONSIN ON OWNED LAND



Key results

FIGURE 3
Profitability comparisons



Corn combined with cover crop



All corn fields without a cover crop

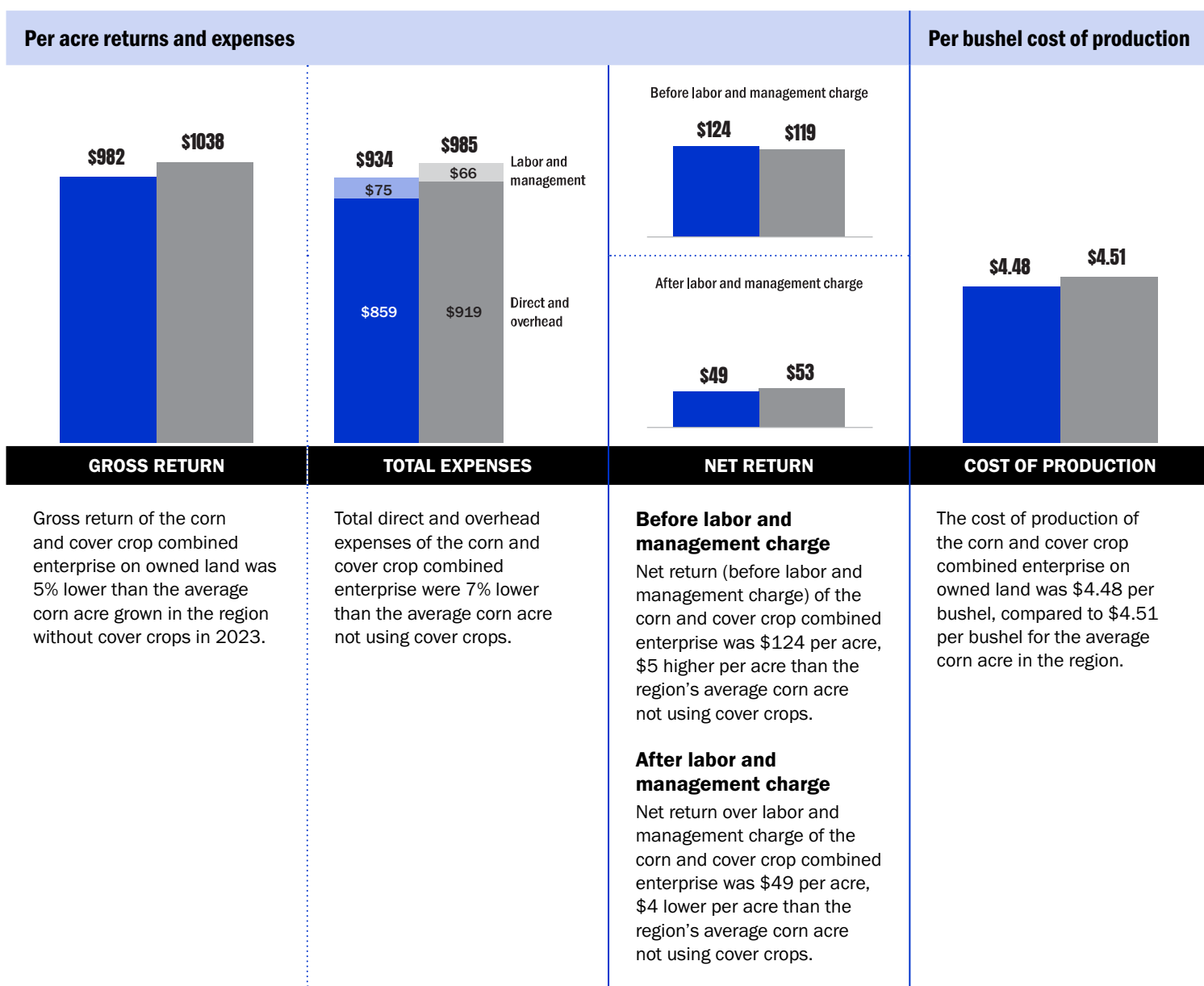


TABLE 3

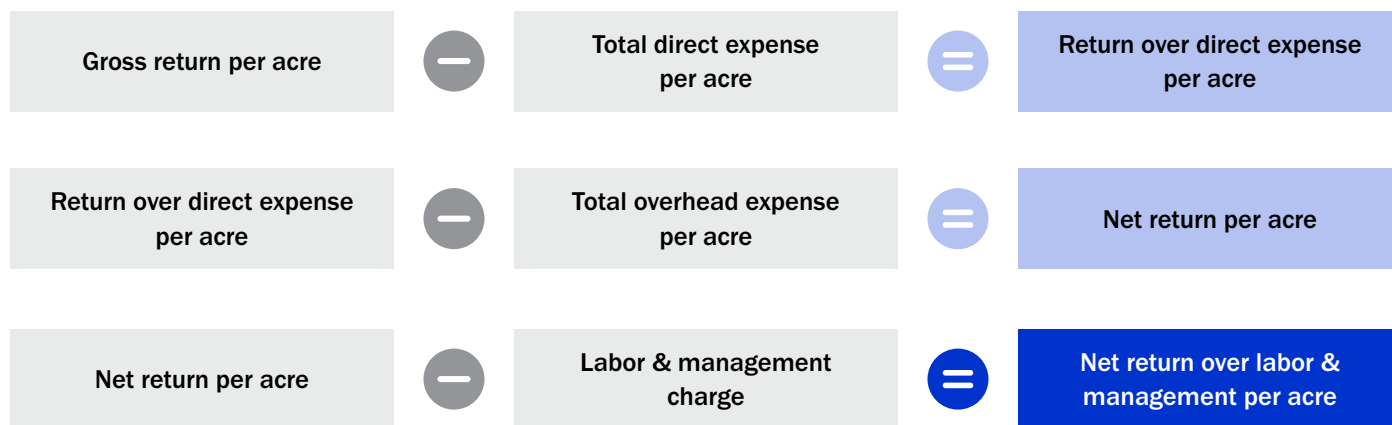
Southern Minnesota and Wisconsin corn enterprise analysis on owned land

[Explore the full cost and return data table](#)

|  | COVER CROP COHORT | | | | AREA AVERAGE |
|---|---------------------------------|---------------------------|--|----------------------------------|--------------------------------------|
| | Corn grown after cover crop (1) | Cover crop enterprise (2) | Corn & cover crop combined (3)=(1)+(2) | Corn fields w/ no cover crop (4) | All corn fields w/ no cover crop (5) |
| Gross return per acre | \$972 | \$11 | \$982 | \$974 | \$1038 |
| Total direct expense per acre | \$576 | \$43 | \$619 | \$571 | \$640 |
| Return over direct expense per acre | \$395 | -\$32 | \$363 | \$403 | \$398 |
| Total overhead expense per acre | \$220 | \$19 | \$240 | \$266 | \$279 |
| Net return per acre | \$175 | -\$52 | \$124 | \$138 | \$119 |
| Labor & management charge | \$62 | \$12 | \$75 | \$61 | \$66 |
| Net return over labor & management per acre | \$113 | -\$64 | \$49 | \$77 | \$53 |

Values displayed may be affected by rounding.

Table formula



CORN IN SOUTHERN MINNESOTA AND WISCONSIN ON RENTED LAND



Key results

FIGURE 4
Profitability comparisons



Corn combined with cover crop



All corn fields without a cover crop

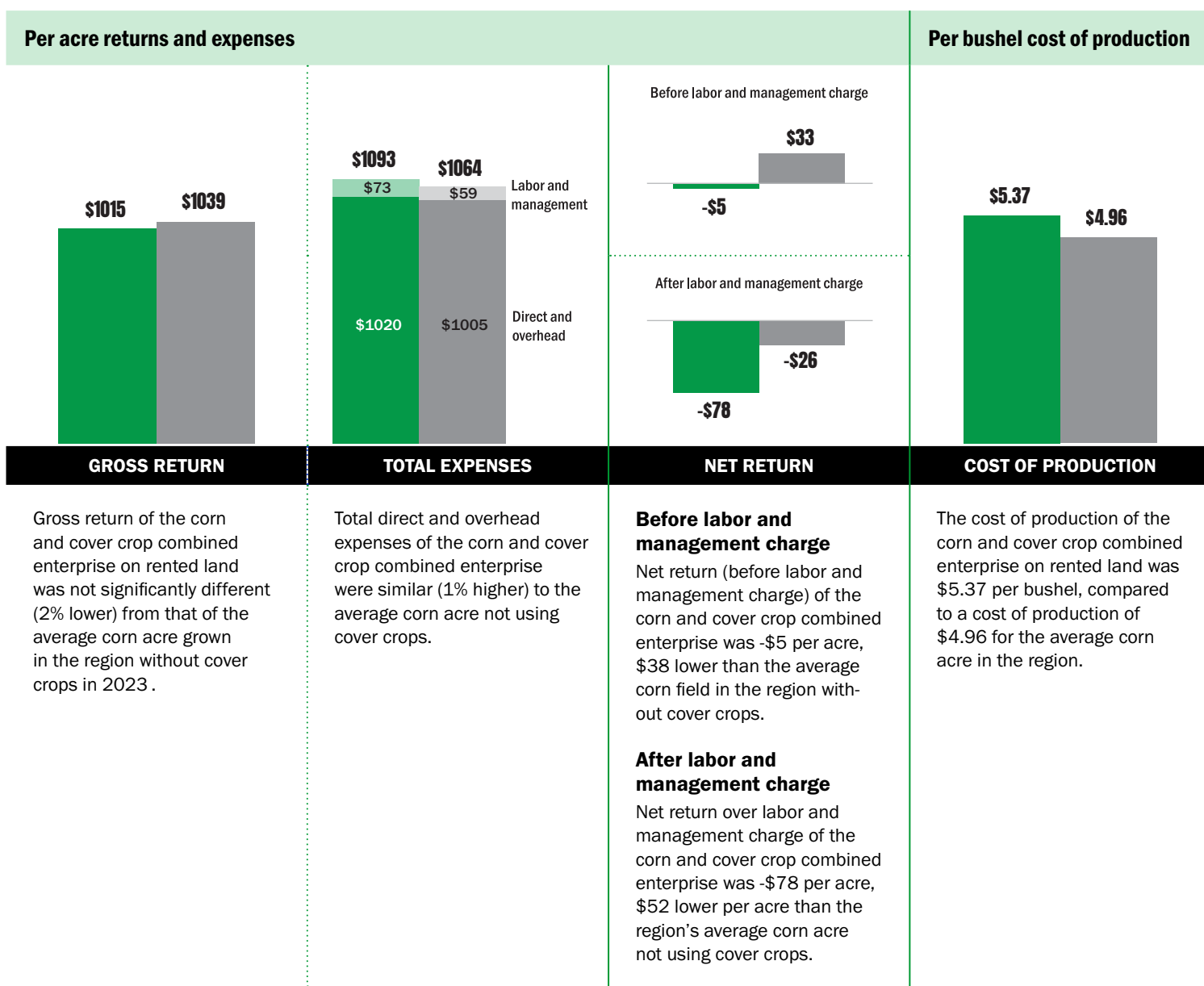



TABLE 4

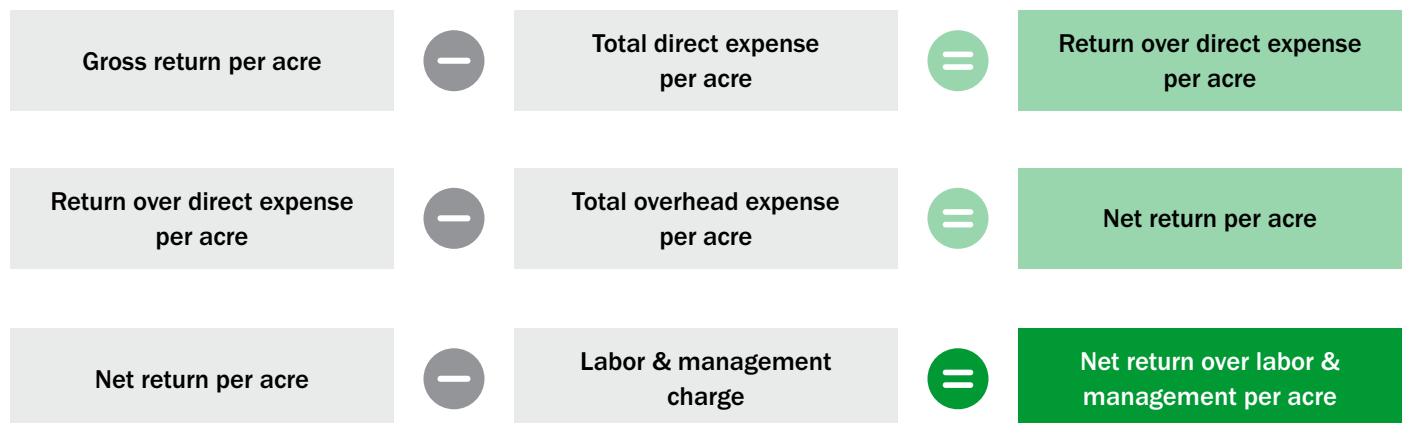
Southern Minnesota and Wisconsin corn enterprise analysis on rented land

Explore the full cost and return data table

|  | COVER CROP COHORT | | | | AREA AVERAGE |
|---|---------------------------------|---------------------------|---|--|--|
| | Corn grown after cover crop (1) | Cover crop enterprise (2) | Corn combined with cover crop (3)=(1)+(2) | Corn fields in cohort with no cover crop (4) | All corn fields without a cover crop (5) |
| Gross return per acre | \$1009 | \$5 | \$1015 | \$974 | \$1039 |
| Total direct expense per acre | \$829 | \$50 | \$878 | \$848 | \$883 |
| Return over direct expense per acre | \$181 | -\$44 | \$137 | \$126 | \$155 |
| Total overhead expense per acre | \$114 | \$28 | \$142 | \$110 | \$122 |
| Net return per acre | \$67 | -\$72 | -\$5 | \$17 | \$33 |
| Labor & management charge | \$58 | \$15 | \$73 | \$54 | \$59 |
| Net return over labor & management per acre | \$9 | -\$87 | -\$78 | -\$38 | -\$26 |

Values displayed may be affected by rounding.

Table formula



CORN IN NORTHERN MINNESOTA



Key results

FIGURE 5
Profitability comparisons



Corn combined with cover crop



All corn fields without a cover crop

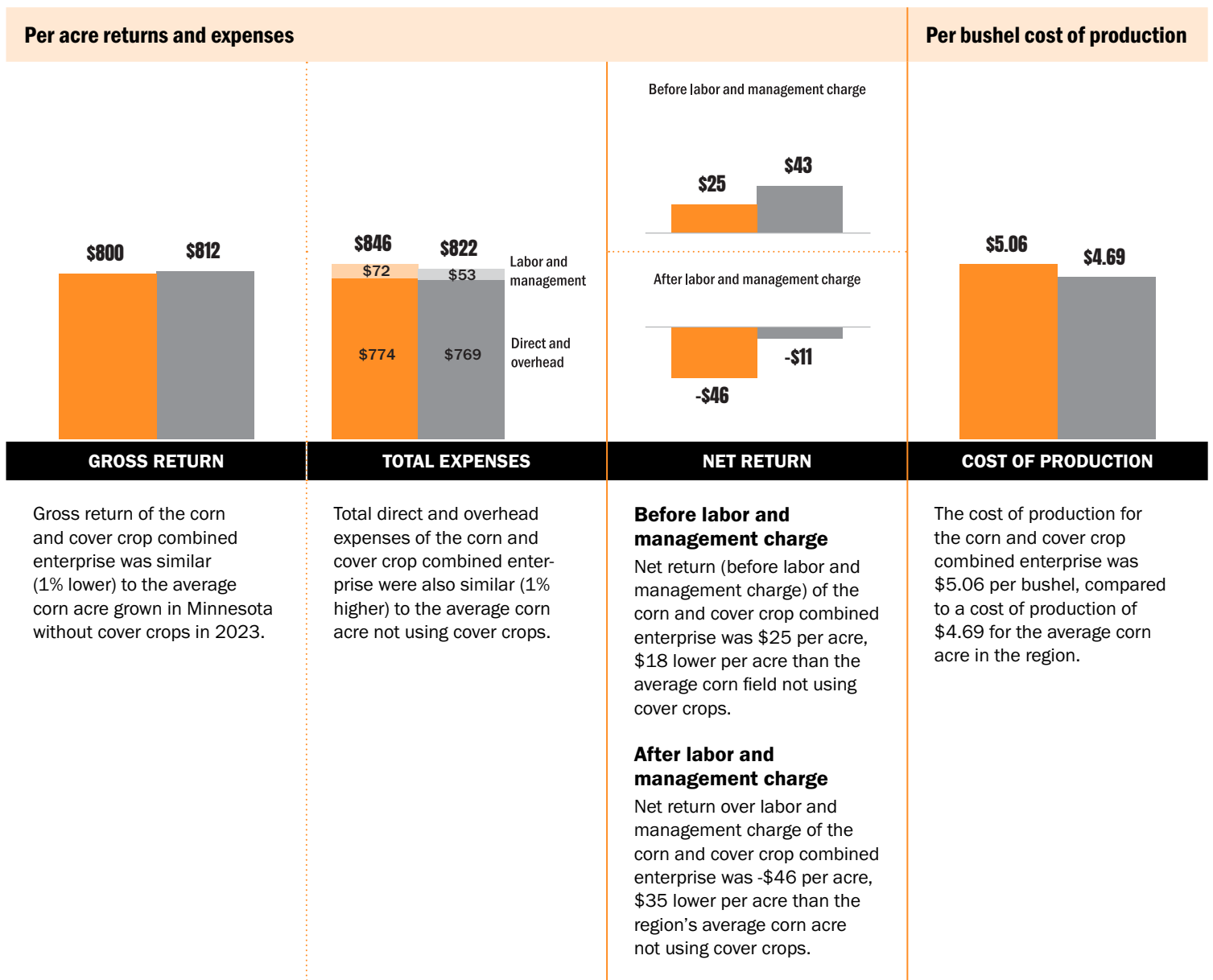


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DEMOGRAPHICS OF FARMS IN THIS REPORT



COMPARISON ACROSS COVER CROP TYPES



COVER CROP IMPACTS ON COMMODITY CROPS




COMPARISON ACROSS YEARS OF EXPERIENCE

TABLE 5

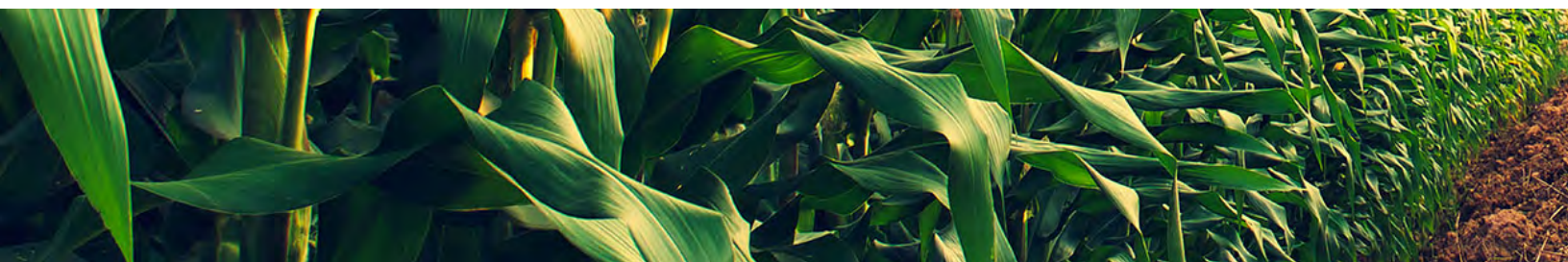
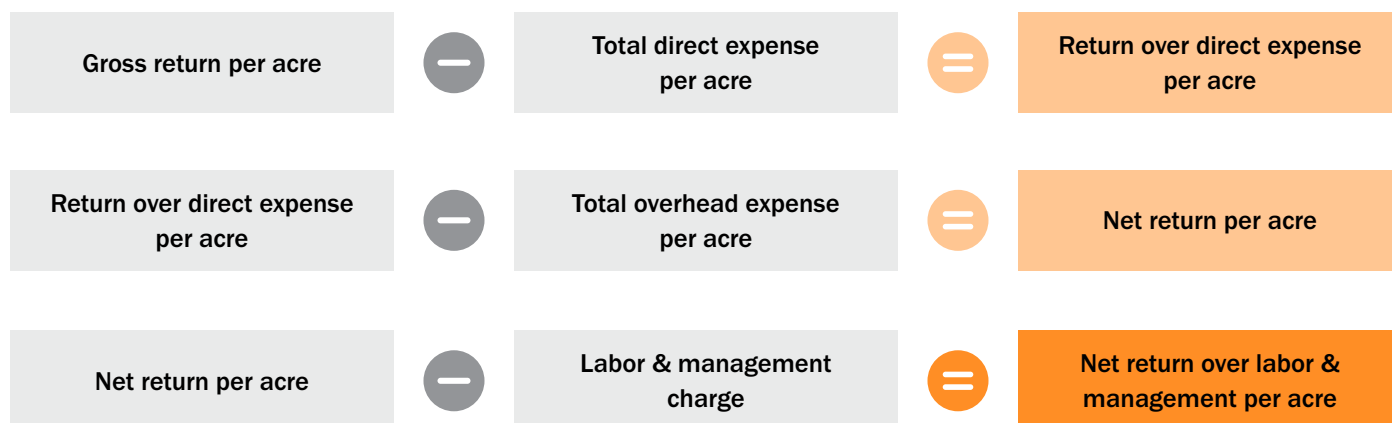
Northern Minnesota corn enterprise analysis (on owned and rented land combined)

[Explore the full cost and return data table](#)

|  | COVER CROP COHORT | | | | AREA AVERAGE |
|---|---------------------------------|---------------------------|---|--|--|
| | Corn grown after cover crop (1) | Cover crop enterprise (2) | Corn combined with cover crop (3)=(1)+(2) | Corn fields in cohort with no cover crop (4) | All corn fields without a cover crop (5) |
| Gross return per acre | \$789 | \$11 | \$800 | \$895 | \$812 |
| Total direct expense per acre | \$592 | \$55 | \$647 | \$628 | \$629 |
| Return over direct expense per acre | \$197 | -\$45 | \$153 | \$267 | \$183 |
| Total overhead expense per acre | \$105 | \$22 | \$127 | \$114 | \$140 |
| Net return per acre | \$92 | -\$67 | \$25 | \$154 | \$43 |
| Labor & management charge | \$58 | \$14 | \$72 | \$44 | \$53 |
| Net return over labor & management per acre | \$35 | -\$81 | -\$46 | \$109 | -\$11 |

Values displayed may be affected by rounding.

Table formula



CORN SILAGE IN SOUTHERN MINNESOTA AND WISCONSIN



Key results

FIGURE 6
Profitability comparisons


■ Corn silage combined with cover crop ■ All corn silage fields without a cover crop



TABLE 6

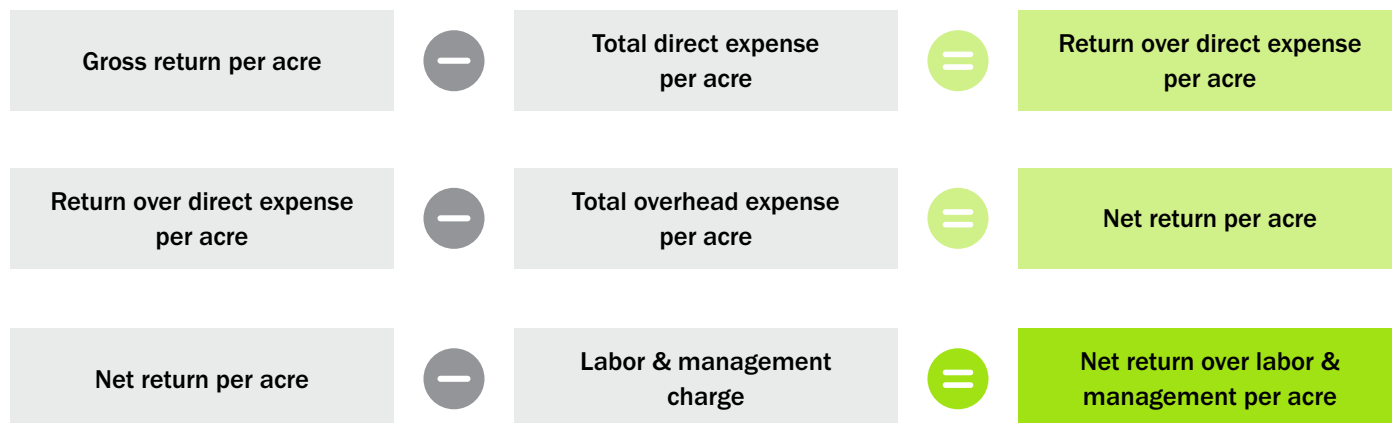
Southern Minnesota and Wisconsin corn silage enterprise analysis (on owned and rented land combined)

[Explore the full cost and return data table](#)

|  | COVER CROP COHORT | | | | AREA AVERAGE |
|---|--|---------------------------|--|---|---|
| | Corn silage grown after cover crop (1) | Cover crop enterprise (2) | Corn silage combined with cover crop (3)=(1)+(2) | Corn silage fields in cohort with no cover crop (4) | All corn silage fields without a cover crop (5) |
| Gross return per acre | \$1047 | \$46 | \$1092 | \$1065 | \$1080 |
| Total direct expense per acre | \$770 | \$88 | \$858 | \$732 | \$753 |
| Return over direct expense per acre | \$276 | -\$42 | \$235 | \$333 | \$328 |
| Total overhead expense per acre | \$129 | \$32 | \$161 | \$183 | \$166 |
| Net return per acre | \$147 | -\$74 | \$73 | \$150 | \$162 |
| Labor & management charge | \$54 | \$16 | \$70 | \$46 | \$46 |
| Net return over labor & management per acre | \$93 | -\$90 | \$3 | \$104 | \$116 |

Values displayed may be affected by rounding.

Table formula



SOYBEANS IN SOUTHERN MINNESOTA AND WISCONSIN ON OWNED LAND



Key results

FIGURE 7
Profitability comparisons


■ Soybeans combined with cover crop ■ All soybean fields without a cover crop



TABLE 7

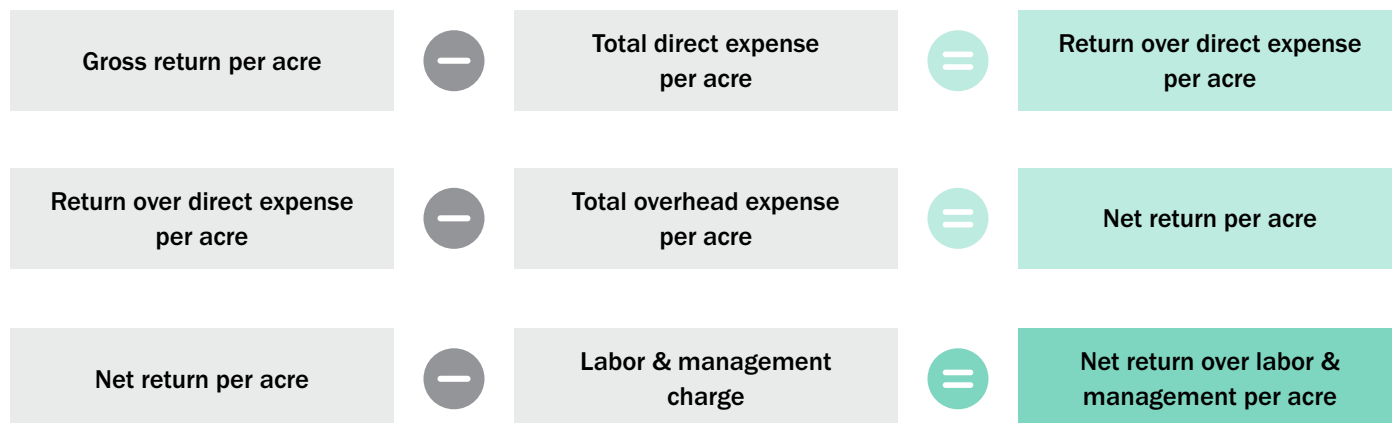
Southern Minnesota and Wisconsin soybean enterprise analysis on owned land

[Explore the full cost and return data table](#)

|  | COVER CROP COHORT | | | | AREA AVERAGE |
|---|-------------------------------------|---------------------------|---|---|---|
| | Soybeans grown after cover crop (1) | Cover crop enterprise (2) | Soybeans combined with cover crop (3) = (1) + (2) | Soybean fields in cohort with no cover crop (4) | All soybean fields without a cover crop (5) |
| Gross return per acre | \$718 | \$35 | \$753 | \$685 | \$746 |
| Total direct expense per acre | \$319 | \$55 | \$373 | \$305 | \$322 |
| Return over direct expense per acre | \$400 | -\$20 | \$380 | \$380 | \$424 |
| Total overhead expense per acre | \$176 | \$37 | \$212 | \$210 | \$224 |
| Net return per acre | \$224 | -\$56 | \$167 | \$169 | \$200 |
| Labor & management charge | \$48 | \$15 | \$63 | \$38 | \$44 |
| Net return over labor & management per acre | \$176 | -\$71 | \$105 | \$132 | \$156 |

Values displayed may be affected by rounding.

Table formula



SOYBEANS IN SOUTHERN MINNESOTA AND WISCONSIN ON RENTED LAND



Key results

FIGURE 8
Profitability comparisons

■ Soybeans combined with cover crop ■ All soybean fields without a cover crop

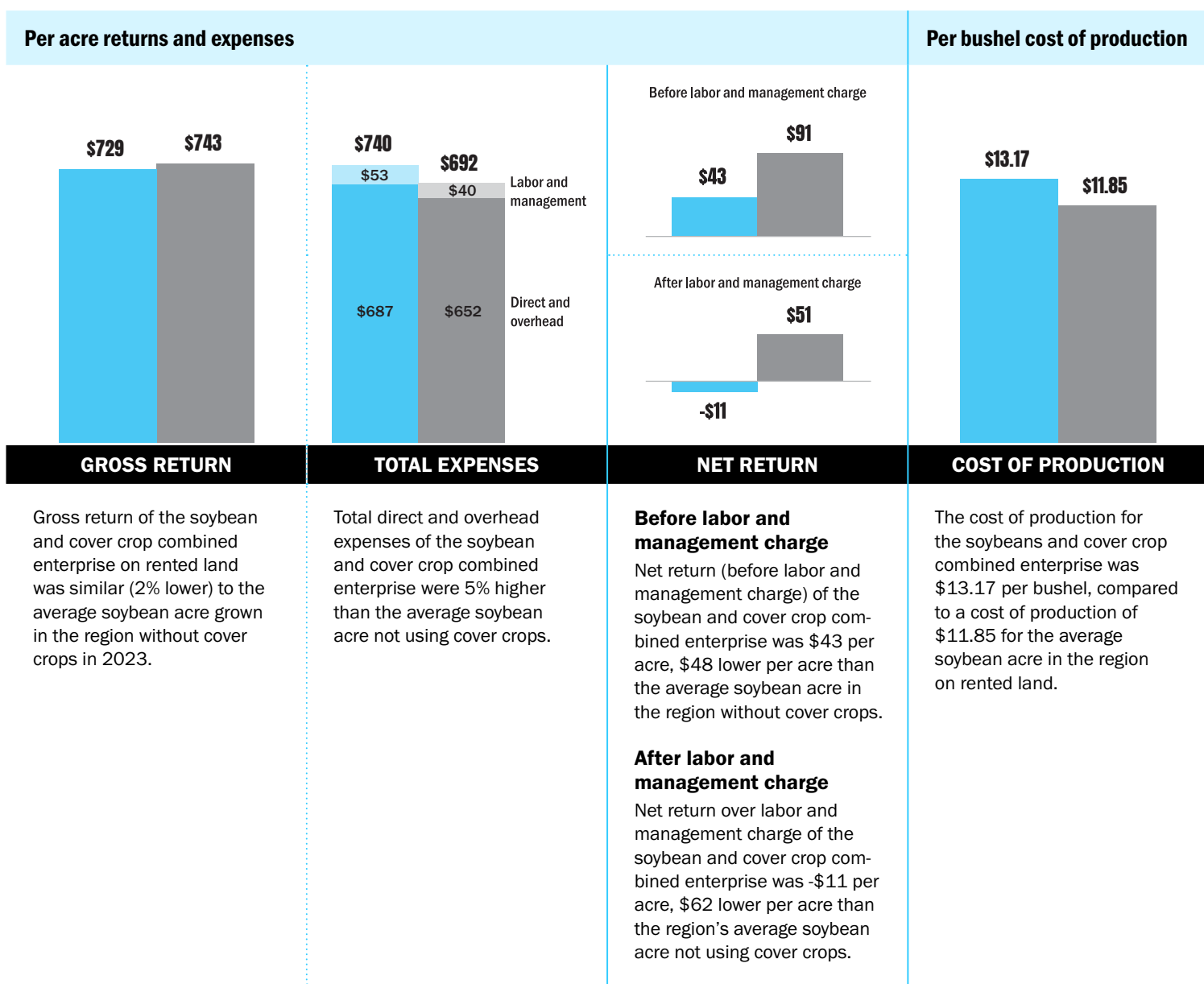



TABLE 8

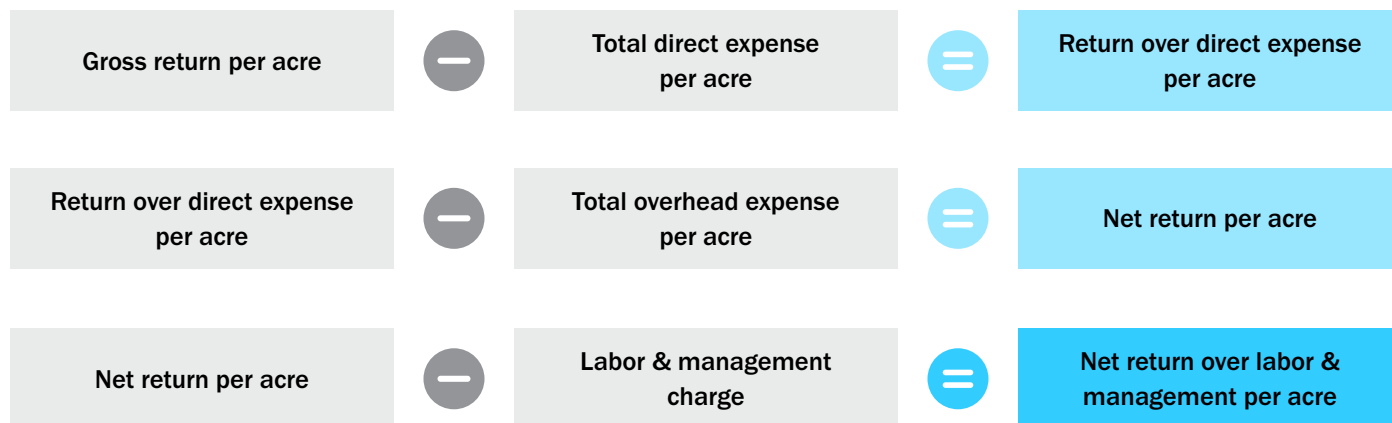
Southern Minnesota and Wisconsin soybean enterprise analysis on rented land

[Explore the full cost and return data table](#)

|  | COVER CROP COHORT | | | | AREA AVERAGE |
|---|-------------------------------------|--|---|---|---|
| | Soybeans grown after cover crop (1) | Cover crop enterprise (2) | Soybeans combined with cover crop (1) + (2) | Soybean fields in cohort with no cover crop | All soybean fields without a cover crop |
| Gross return per acre | \$715 | \$14 | \$729 | \$709 | \$743 |
| Total direct expense per acre | \$529 | \$49 | \$578 | \$581 | \$573 |
| Return over direct expense per acre | \$186 | -\$35 | \$151 | \$127 | \$170 |
| Total overhead expense per acre | \$79 | \$29 | \$109 | \$73 | \$79 |
| Net return per acre | \$107 | -\$64 | \$43 | \$54 | \$91 |
| Labor & management charge | \$39 | \$14 | \$53 | \$41 | \$40 |
| Net return over labor & management per acre | \$68 | -\$78 | -\$11 | \$14 | \$51 |

Values displayed may be affected by rounding.

Table formula



SOYBEANS IN NORTHERN MINNESOTA



Key results

FIGURE 9
Profitability comparisons

■ Soybeans combined with cover crop ■ All soybean fields without a cover crop

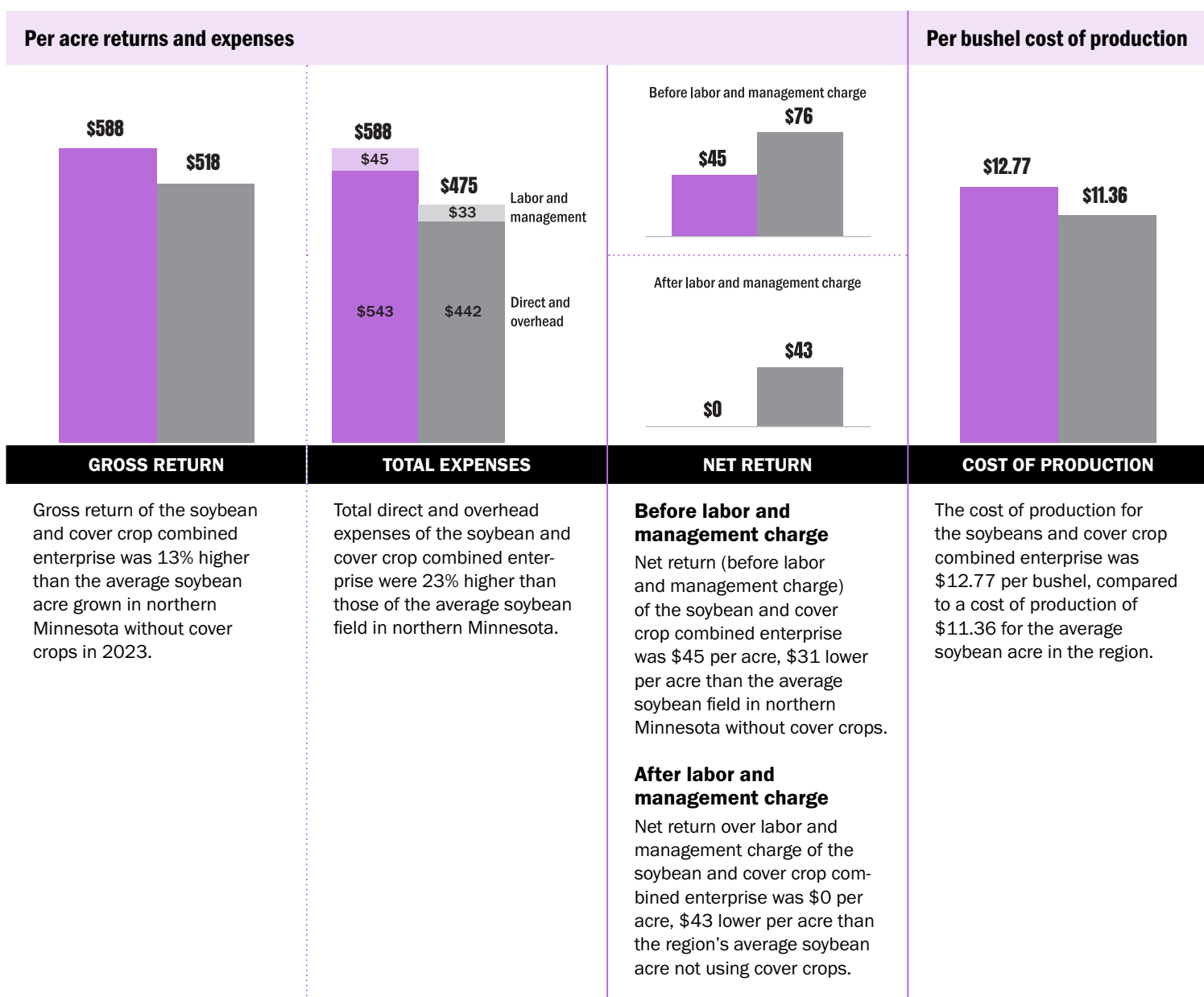



TABLE 9

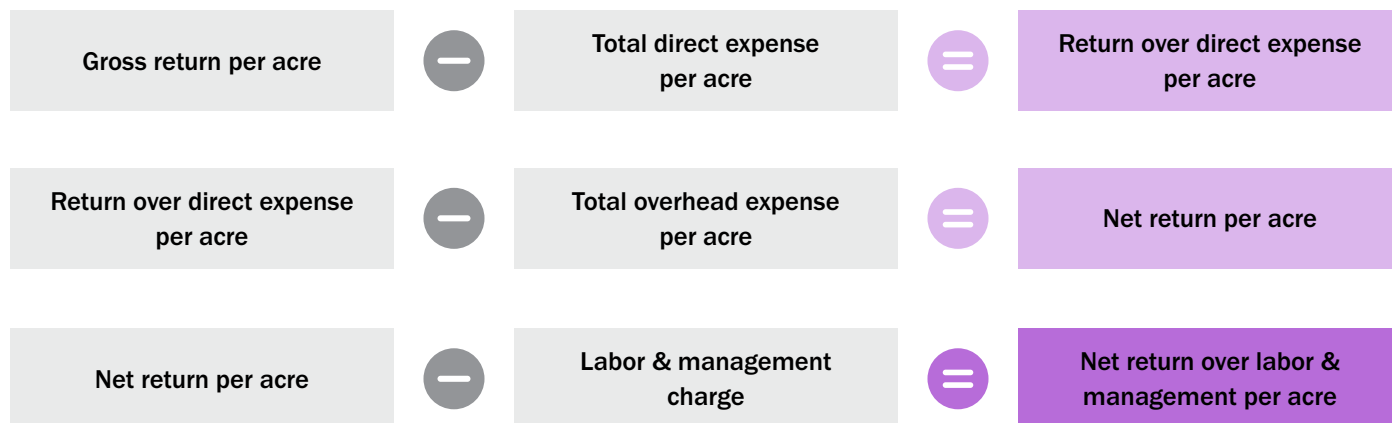
Northern Minnesota soybean enterprise analysis (on owned and rented land combined)

[Explore the full cost and return data table](#)

|  | COVER CROP COHORT | | | | AREA AVERAGE |
|---|-------------------------------------|---------------------------|---|---|---|
| | Soybeans grown after cover crop (1) | Cover crop enterprise (2) | Soybeans combined with cover crop (1) + (2) | Soybean fields in cohort with no cover crop | All soybean fields without a cover crop |
| Gross return per acre | \$581 | \$7 | \$588 | \$525 | \$518 |
| Total direct expense per acre | \$368 | \$49 | \$417 | \$369 | \$357 |
| Return over direct expense per acre | \$212 | -\$42 | \$171 | \$156 | \$161 |
| Total overhead expense per acre | \$97 | \$29 | \$126 | \$63 | \$85 |
| Net return per acre | \$115 | -\$70 | \$45 | \$93 | \$76 |
| Labor & management charge | \$32 | \$13 | \$45 | \$28 | \$33 |
| Net return over labor & management per acre | \$83 | -\$83 | \$0 | \$65 | \$43 |

Values displayed may be affected by rounding.

Table formula



WHEAT IN MINNESOTA



Key results

FIGURE 10
Profitability comparisons

Spring wheat combined with cover crop All spring wheat fields without a cover crop

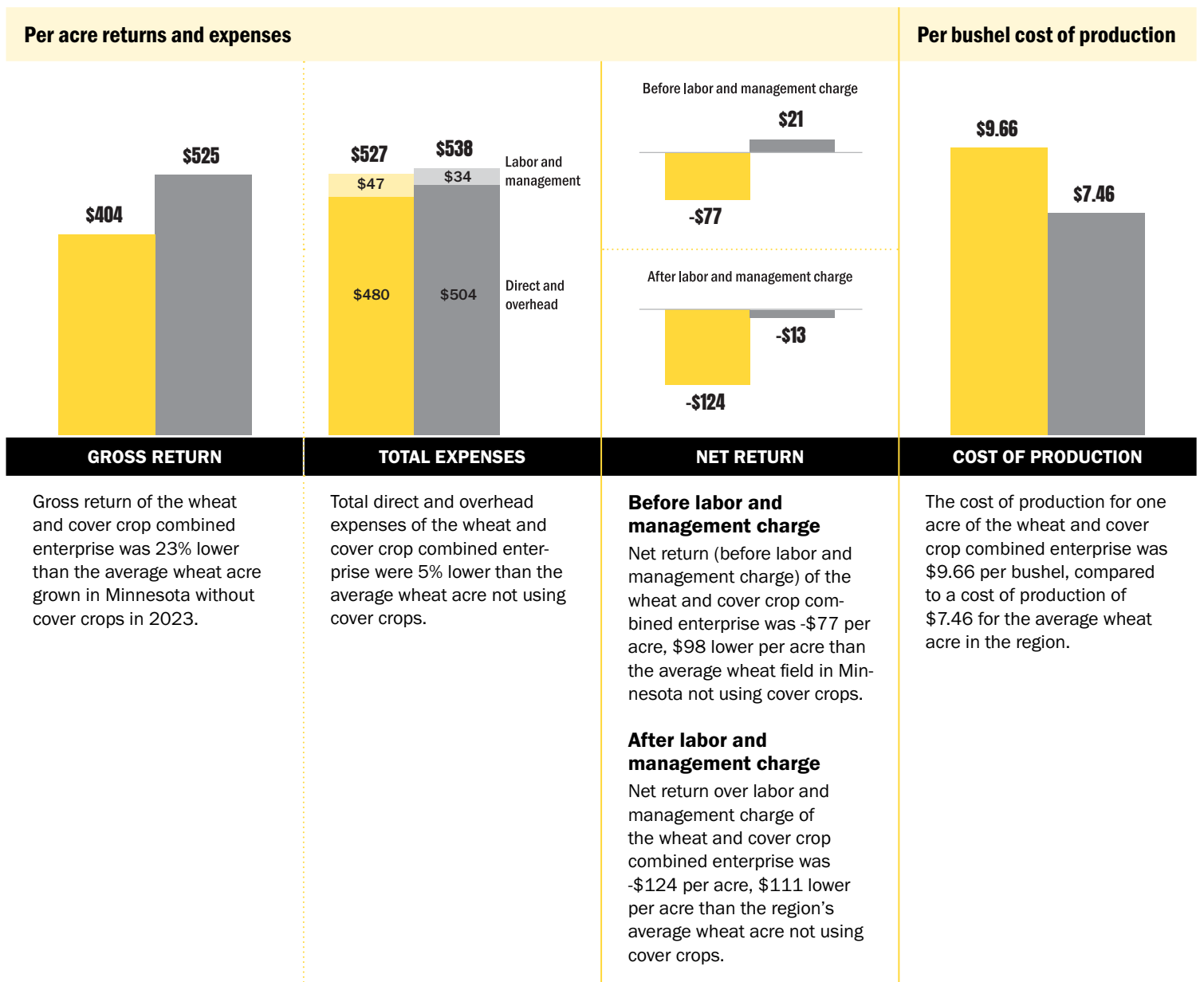



TABLE 10

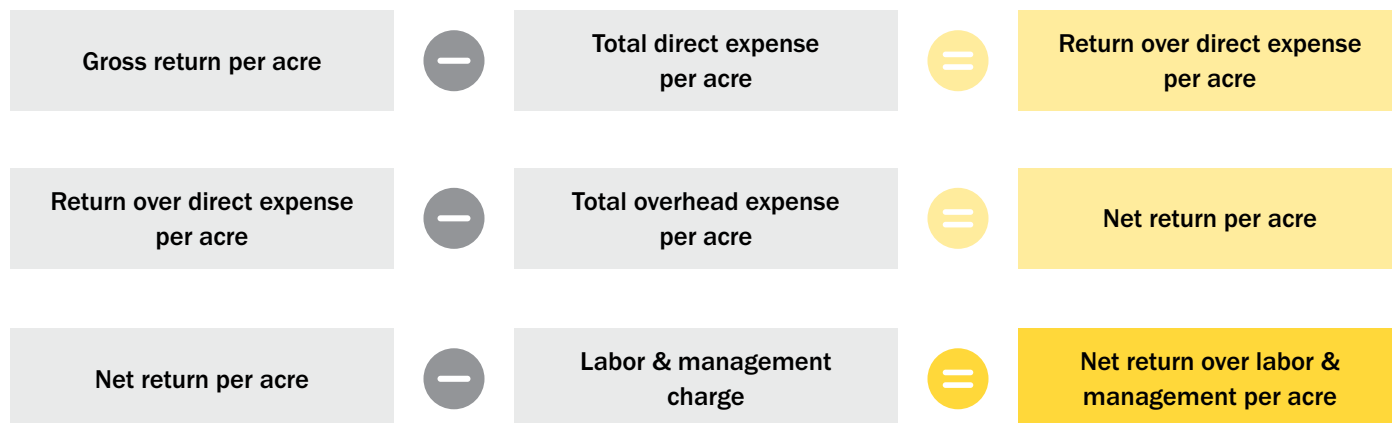
Minnesota statewide wheat enterprise analysis (on owned and rented land combined)

[Explore the full cost and return data table](#)

|  | COVER CROP COHORT | | | | AREA AVERAGE |
|---|---|---------------------------|---|--|--|
| | Spring wheat grown after cover crop (1) | Cover crop enterprise (2) | Spring wheat combined with cover crop (3) = (1) + (2) | Spring wheat fields in cohort with no cover crop (4) | All Spring wheat fields without a cover crop (5) |
| Gross return per acre | \$395 | \$9 | \$404 | \$609 | \$525 |
| Total direct expense per acre | \$346 | \$52 | \$398 | \$399 | \$414 |
| Return over direct expense per acre | \$49 | -\$44 | \$6 | \$210 | \$110 |
| Total overhead expense per acre | \$62 | \$21 | \$82 | \$96 | \$90 |
| Net return per acre | -\$12 | -\$64 | -\$77 | \$114 | \$21 |
| Labor & management charge | \$32 | \$15 | \$47 | \$27 | \$34 |
| Net return over labor & management per acre | -\$45 | -\$79 | -\$124 | \$87 | -\$13 |

Values displayed may be affected by rounding.

Table formula



COMPARISON ACROSS YEARS OF EXPERIENCE WITH COVER CROPS

Implementing a new management practice in a farm operation can involve a learning curve where farmers improve the cost-efficiency of the practice as they gain more experience. In this project we aim to evaluate if there is a cost-efficiency curve associated with the number of years of cover crop production experience. In this section, we explore the costs and returns of implementing cover crops across levels of producer experience, measured in years of planting cover crops, using data from the cover crop cohort in the 2023 FINBIN database.

The farms in the cover crop cohort have a wide range of years of production experience with growing cover crops (see Table 11). In the 2023 data, farms ranged between one and twenty-five years of cover crop production experience.

As shown in Figure 11, the average farm in the cover crop cohort incurred \$60 of cover crop expenses and received only \$26 of gross return from the cover crop. Across the three groups categorized by experience levels, the average costs and returns were not substantially different from the overall cohort average. However, when evaluating the median values for total direct expenses in Table 12, producers with more cover crop production experience had lower overall expenses in 2023 compared to those with fewer years of experience. The median total direct expenses for farmers with one to three years of cover crop experience was \$59 per acre while the median direct expenses for farmers with more than six years of experience dropped to \$44 per acre.

There are 228 total enterprises analyzed here. Those producers with the fewest years of cover crop production experience planted an average of 0.9 cover crop fields per farm. Those with the middle level of cover crop production experience (4-5 years) planted an average of 1.6 cover crop fields per farm. Those producers with the most years of cover crop production experience planted an average

TABLE 11
Number of farms by years of cover crop production experience

| Years of production experience | # of farms | % of total |
|--------------------------------|------------|------------|
| 1 - 3 Years | 40 | 28% |
| 4 - 5 Years | 47 | 33% |
| 6+ Years | 54 | 38% |

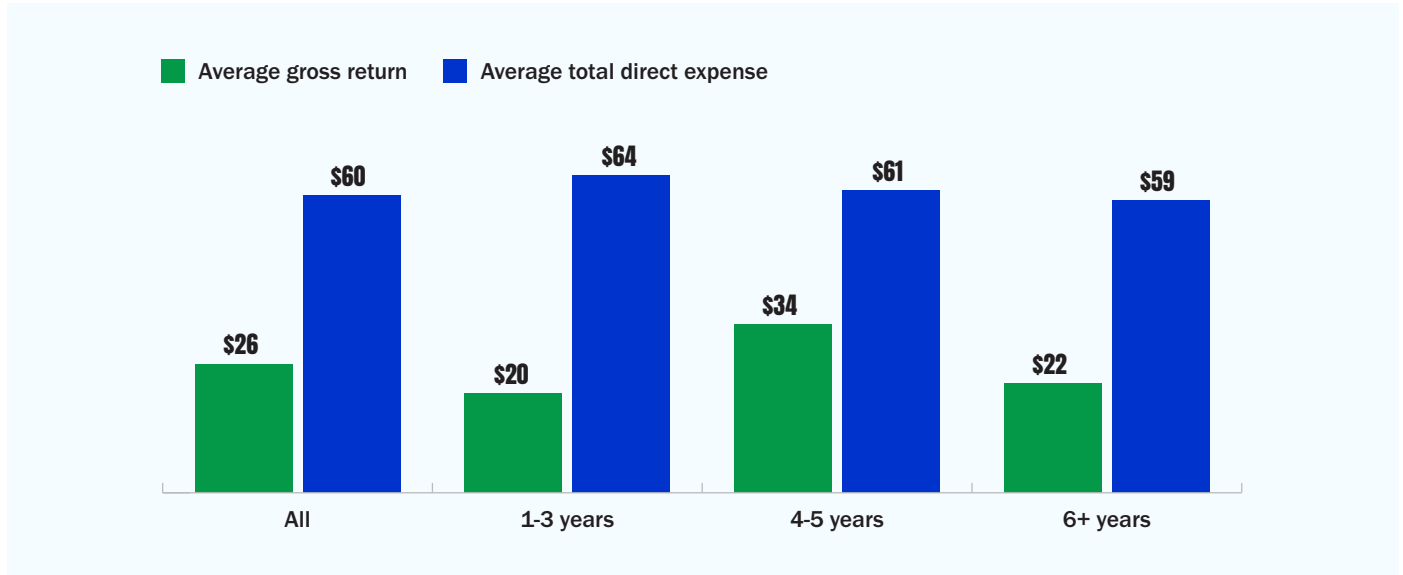
Percentages may not add to 100% due to rounding.



FIGURE 11

Comparing returns and expenses of cover crops in 2023 by years of cover crop experience

Data: Minnesota and Wisconsin, Owned and Rented, 2023



of 2.2 cover crop fields per farm. Therefore, those with more cover crop production experience used these practices on more fields than producers with fewer years of cover crop experience.

Table 12 shows a further breakdown of cover crop expenses by years of cover crop production experience by providing the minimum, maximum, median and average values for each expense category.

This report also includes a comparison of enterprise-level financial data of farms using cover crops by years of production experience implementing cover cropping practices (see Tables 13 and 14).

The data comparing experience level with cover cropping practices is a combined look of the Minnesota and Wisconsin farms included in this report. Additionally, only corn and soybean enterprises on owned and rented land combined are evaluated, as there was not a large enough sample size for evaluation otherwise.



TABLE 12

Cost comparison across cover crop enterprises in 2023 by years of cover crop production experience

| | All | 1 - 3 production years | 4 - 5 production years | 6+ production years |
|---------------------------------------|----------------|------------------------|------------------------|---------------------|
| Number of enterprises | 228 | 37 | 74 | 117 |
| % of all enterprises | 100% | 16% | 32% | 51% |
| Seed (\$/acre) | n = 228 | | | |
| Minimum | \$3 | \$10 | \$3 | \$7 |
| Maximum | \$74 | \$74 | \$56 | \$62 |
| Median | \$23 | \$26 | \$16 | \$24 |
| Average | \$24 | \$29 | \$20 | \$25 |
| Fertilizer (\$/acre) | n = 3 | | | |
| Minimum | \$0 | \$0 | \$0 | \$0 |
| Maximum | \$94 | \$0 | \$83 | \$94 |
| Median | \$0 | \$0 | \$0 | \$0 |
| Average | \$1 | \$0 | \$1 | \$2 |
| Chemical (\$/acre) | n = 18 | | | |
| Minimum | \$0 | \$0 | \$0 | \$0 |
| Maximum | \$31 | \$11 | \$13 | \$31 |
| Median | \$0 | \$0 | \$0 | \$0 |
| Average | \$1 | \$1 | \$0 | \$1 |
| Fuel & Oil (\$/acre) | n = 206 | | | |
| Minimum | \$0 | \$0 | \$0 | \$0 |
| Maximum | \$33 | \$27 | \$33 | \$32 |
| Median | \$6 | \$8 | \$8 | \$6 |
| Average | \$7 | \$8 | \$9 | \$6 |
| Repairs (\$/acre) | n = 219 | | | |
| Minimum | \$0 | \$0 | \$1 | \$0 |
| Maximum | \$79 | \$39 | \$79 | \$50 |
| Median | \$12 | \$9 | \$16 | \$12 |
| Average | \$16 | \$13 | \$21 | \$13 |
| Custom Hire (\$/acre) | n = 49 | | | |
| Minimum | \$0 | \$0 | \$0 | \$0 |
| Maximum | \$129 | \$80 | \$73 | \$129 |
| Median | \$0 | \$0 | \$0 | \$0 |
| Average | \$5 | \$8 | \$4 | \$5 |
| Total direct expense (\$/acre) | n = 228 | | | |
| Minimum | \$14 | \$16 | \$15 | \$14 |
| Maximum | \$285 | \$186 | \$231 | \$285 |
| Median | \$48 | \$59 | \$51 | \$44 |
| Average | \$60 | \$64 | \$61 | \$59 |

Corn grown after a cover crop by experience level

Key results

- Farms with more years of experience implementing cover crop practices incurred lower direct and overhead expenses.
- Gross return of the corn and cover crop combined enterprise was highest for farms with the least experience with cover crop production.
- Total direct and overhead expenses of the corn and cover crop combined enterprise were highest for farms with the least experience with cover crop production.
- The net return over labor and management charge of the corn and cover crop combined enterprise was highest for farms with the least experience with cover crop production.



TABLE 13 | MN and WI statewide corn grown after a cover crop (all tenures combined) by years of cover cropping production experience

[Explore the full data table](#)

| | 1 TO 3 YEARS OF EXPERIENCE | | | 4 TO 5 YEARS OF EXPERIENCE | | | 6 OR MORE YEARS OF EXPERIENCE | | |
|---|-----------------------------|-----------------------|-------------------------------|-----------------------------|-----------------------|-------------------------------|-------------------------------|-----------------------|-------------------------------|
| | Corn grown after cover crop | Cover crop enterprise | Corn combined with cover crop | Corn grown after cover crop | Cover crop enterprise | Corn combined with cover crop | Corn grown after cover crop | Cover crop enterprise | Corn combined with cover crop |
| Gross return per acre | \$1,107 | \$1 | \$1,107 | \$962 | \$5 | \$967 | \$969 | \$9 | \$979 |
| Total direct expense per acre | \$762 | \$74 | \$838 | \$788 | \$44 | \$832 | \$745 | \$51 | \$796 |
| Return over direct expense per acre | \$345 | -\$73 | \$269 | \$174 | -\$39 | \$135 | \$225 | -\$42 | \$183 |
| Total overhead expense per acre | \$143 | \$35 | \$177 | \$127 | \$31 | \$158 | \$113 | \$20 | \$134 |
| Net return per acre | \$202 | -\$108 | \$92 | \$47 | -\$70 | -\$23 | \$111 | -\$62 | \$49 |
| Labor & management charge | \$58 | \$21 | \$78 | \$43 | \$12 | \$54 | \$72 | \$16 | \$88 |
| Net return over labor & management per acre | \$144 | -\$129 | \$14 | \$5 | -\$82 | -\$77 | \$39 | -\$78 | -\$39 |



Soybeans grown after a cover crop by experience level

Key results

- Farms with six or more years of experience implementing cover crop practices incurred the lowest direct and overhead expenses.
- Gross return of the soybean and cover crop combined enterprise was highest for farms with the middle level of cover crop production experience.
- Total direct and overhead expenses of the soybean and cover crop combined enterprise were lowest for the most experienced group with cover crop production experience.
- Net return (before labor and management charge) was also highest for farms with the most experience with cover crop production.
- After accounting for labor and management charge, farms with the middle level of cover crop production experience reported the highest net return at \$27 per acre, followed closely by the most experienced group at \$24 per acre.



TABLE 14 | MN and WI statewide soybeans grown after a cover crop (all tenures combined) by years of cover cropping production experience

[Explore the full data table](#)

| | 1 TO 3 YEARS OF EXPERIENCE | | | 4 TO 5 YEARS OF EXPERIENCE | | | 6 OR MORE YEARS OF EXPERIENCE | | |
|---|---------------------------------|-----------------------|---------------------------------|---------------------------------|-----------------------|---------------------------------|---------------------------------|-----------------------|---------------------------------|
| | Soybeans grown after cover crop | Cover crop enterprise | Soybeans combined w/ cover crop | Soybeans grown after cover crop | Cover crop enterprise | Soybeans combined w/ cover crop | Soybeans grown after cover crop | Cover crop enterprise | Soybeans combined w/ cover crop |
| Gross return per acre | \$645 | \$25 | \$670 | \$740 | \$18 | \$758 | \$667 | \$12 | \$679 |
| Total direct expense per acre | \$469 | \$55 | \$524 | \$497 | \$50 | \$547 | \$430 | \$47 | \$477 |
| Return over direct expense per acre | \$176 | -\$30 | \$145 | \$243 | -\$32 | \$211 | \$237 | -\$35 | \$202 |
| Total overhead expense per acre | \$106 | \$26 | \$132 | \$102 | \$38 | \$140 | \$93 | \$25 | \$118 |
| Net return per acre | \$69 | -\$56 | \$14 | \$141 | -\$70 | \$71 | \$144 | -\$60 | \$84 |
| Labor & management charge | \$42 | \$12 | \$54 | \$31 | \$13 | \$44 | \$44 | \$15 | \$60 |
| Net return over labor & management per acre | \$28 | -\$68 | -\$40 | \$110 | -\$83 | \$27 | \$100 | -\$76 | \$24 |



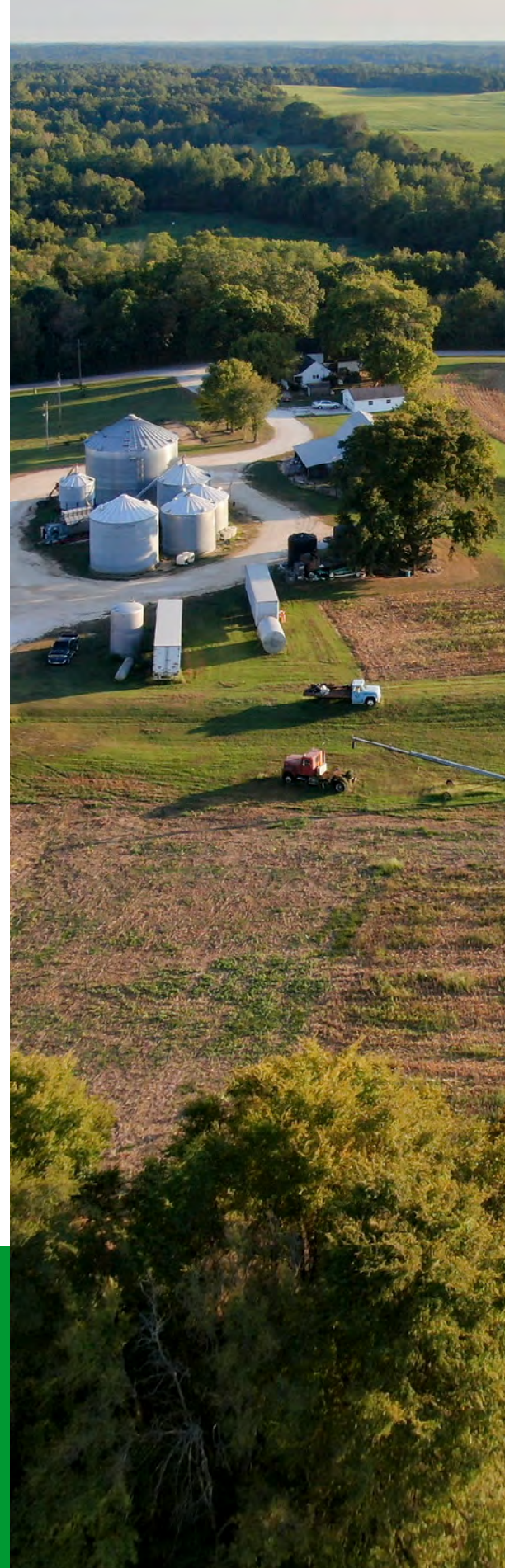
CONCLUSION

Only general observations can be made at this time since there are only two years of data. However, the 2022 and 2023 cover crop financial data gathered from farmers in Minnesota and Wisconsin points to preliminary insights that will continue to be evaluated in 2024.

In the 2023 analysis, we observe that cover crops planted for feed purposes covered the cost of producing the cover crop and provided financial benefits to the farm. Furthermore, many operations implementing cover crops benefit from cost-share funds from both government and private sector sources, which can help offset a portion of the cost of cover crops. Nonetheless, the cover crop enterprise still needs to be effectively managed to result in positive returns.

When analyzing the impact of cover crops on primary commodity crops, many primary commodity enterprises that follow a cover crop show higher net returns than the primary crops that do not follow a cover crop (i.e., Column 1 is greater than Column 4 or Column 5). However, once the cover crop expense is accounted for on those acres, the net return falls below the net return of commodity crops planted without a preceding cover crop (i.e., Column 3 is less than Column 4 and Column 5). While our data is strictly financial, such observations raise important questions that require further research. It is crucial to understand the decision-making processes used by contributing farms when deciding to implement cover crops. Factors such as land productivity, growing conditions and management may significantly influence a farm's decision to implement cover crops, and their decisions regarding which fields to plant a cover crop on.

In the 2023 analysis, we observe that cover crops planted for feed purposes covered the cost of producing the cover crop and provided financial benefits to the farm.



Evaluating years of cover crop production experience was a new addition to this year's project analysis. Participating farms have a range of years of experience with cover cropping practices. Our analysis showed experience level may impact the cost of cover crop operations for a farm. Producers with more cover crop production experience had a lower median total direct expense in 2023 compared to those with fewer years of experience in the cohort. Additionally, producers with greater cover crop experience submitted more cover crop enterprises to the database than producers with less experience, showing that the number of fields farmers planted cover crops on increased with experience.

Our collaborative effort to gather in-depth financial data on cover crops in Minnesota and Wisconsin will continue in 2024 with the aim of answering questions farmers have about the profitability of implementing cover crops on their farms. In 2024, this project will continue exploring the relationship between fields planted with cover crops and commodity crop yields and profitability. It will also explore whether benefits associated with the cover crop offset its costs by enabling producers to reduce fertilizer, chemical and other direct expenses in their primary commodity crop enterprises.

As it advances, this project will aim to track individual fields using cover cropping practices over time in FINBIN, and work to add more farm-level enterprise data to further inform the project findings. Future analysis will also attempt to compare a producer's business acumen and their financial performance, with the intent of evaluating any differences that may be present for those producers implementing conservation practices, like cover crops, into their farming operations. Additionally, we aim to analyze the highest- and lowest-performing cover crop enterprises to understand differences in costs and returns and identify factors contributing to the profitability of a cover crop enterprise.

After gathering the third year of data, we plan to conduct a comprehensive benchmarking analysis of the cover crop cohort, analyzing trends and comparing the financial results over the three-year period.

You can stay up to date on the data reports and blogs about this project by visiting:

<https://business.edf.org/insights/financial-impacts-of-cover-crops-in-minnesota-and-wisconsin>



APPENDIX A.

TABLE 1A

Detailed farm demographic comparison

| | COVER CROP COHORT | MINNESOTA STATEWIDE |
|---|-------------------|---------------------|
| Number of farms | 141 | 2448 |
| Farm demographics | | |
| Total crop acres per farm | 822 | 794 |
| Total crop acres | 115,902 | 1,943,712 |
| Average operator age | 47 | 48 |
| Average years farming | 24 | 23 |
| Number of beginning farmers (have farmed 10 years or less) | 29 | 712 |
| Share of farmers that are beginning farmers | 21% | 29% |
| Farm type | | |
| Number of crop farms | 74 | 1,466 |
| Share of farms that are crop farms | 52% | 60% |
| Number of livestock farms | 25 | 348 |
| Share of farms that are livestock farms | 18% | 14% |
| Number of crop & livestock farms | 13 | 219 |
| Share of farms that are crop & livestock farms | 9% | 9% |
| Number of farms in other farm type | 22 | 407 |
| Share of farms that are other farm type | 16% | 17% |
| Farm income | | |
| Gross cash farm income | \$1,128,784 | \$1,121,988 |
| Gross crop income | \$440,089 | \$546,785 |
| Gross livestock income | \$443,823 | \$363,981 |
| Other income | \$227,933 | \$141,223 |
| Total cash farm expenses | \$933,937 | \$922,058 |
| Inventory change, depreciation, capital sales adjustments | \$(101,721) | \$(110,571) |
| Average net farm income | \$96,741 | \$89,359 |
| Median net farm income | \$68,846 | \$44,719 |



| Farm balance sheet | | |
|--|-------------|-------------|
| Total assets | \$3,961,367 | \$3,966,632 |
| Total liabilities | \$1,270,087 | \$1,212,321 |
| Net worth | \$2,691,280 | \$2,754,311 |
| Financial metrics | | |
| Working capital as a % of operating expense | 55% | 51% |
| Farm debt-to-asset ratio | 34% | 32% |
| Debt coverage ratio | 1.36 | 1.29 |
| Operating expense as a % of gross revenue (operating expense ratio) | 80% | 82% |



APPENDIX B.

TABLE 1B

Southern Minnesota and Wisconsin corn enterprise analysis on owned land




| | COVER CROP COHORT | | | | AREA AVERAGE |
|--|---------------------------------|---------------------------|--|----------------------------------|--------------------------------------|
| | Corn grown after cover crop (1) | Cover crop enterprise (2) | Corn & cover crop combined (3)=(1)+(2) | Corn fields w/ no cover crop (4) | All corn fields w/ no cover crop (5) |
| Number of enterprises | 17 | 17 | 17 | 42 | 791 |
| Return | | | | | |
| Yield (bushels per acre) | 187 | - | - | 196 | 203 |
| Value per bushel | \$4.74 | - | - | \$4.64 | \$4.78 |
| Product return per acre ¹ | \$897 | \$1 | \$898 | \$917 | \$970 |
| Crop insurance income per acre | \$74 | \$0 | \$74 | \$53 | \$61 |
| Government payment income per acre ² | \$0 | \$9 | \$9 | \$0 | \$0 |
| Other income per acre ³ | \$1 | \$0 | \$1 | \$4 | \$7 |
| Gross return per acre | \$972 | \$11 | \$982 | \$974 | \$1038 |
| Production expenses (\$ per acre) | | | | | |
| Seed | \$115 | \$22 | \$137 | \$114 | \$123 |
| Fertilizer | \$234 | \$0 | \$234 | \$201 | \$245 |
| Chemicals | \$61 | \$1 | \$62 | \$64 | \$62 |
| Crop insurance | \$30 | \$0 | \$30 | \$31 | \$33 |
| Machinery cost ⁴ | \$141 | \$28 | \$169 | \$200 | \$207 |
| Land ownership costs ⁵ | \$131 | \$0 | \$131 | \$138 | \$140 |
| Other expenses | \$84 | \$11 | \$95 | \$87 | \$110 |
| Total direct and overhead expense per acre | \$797 | \$62 | \$859 | \$836 | \$919 |
| Net return per acre | \$175 | -\$52 | \$124 | \$138 | \$119 |
| Labor and management charge per acre | \$62 | \$12 | \$75 | \$61 | \$66 |
| Net return over labor & management per acre | \$113 | -\$64 | \$49 | \$77 | \$53 |
| Cost of production w/ labor & management per bushel ⁸ | \$4.13 | - | \$4.48 | \$4.25 | \$4.51 |
| Net value per bushel ⁶ | \$4.74 | - | \$4.74 | \$4.64 | \$4.79 |

Values displayed may be affected by rounding.



TABLE 2B


Southern Minnesota and Wisconsin corn enterprise analysis on rented land

|  | COVER CROP COHORT | | | | AREA AVERAGE |
|---|---------------------------------|---------------------------|---|--|--|
| | Corn grown after cover crop (1) | Cover crop enterprise (2) | Corn combined with cover crop (3)=(1)+(2) | Corn fields in cohort with no cover crop (4) | All corn fields without a cover crop (5) |
| Number of enterprises | 29 | 29 | 29 | 70 | 1134 |
| Return | | | | | |
| Yield (bushels per acre) | 185 | - | - | 187 | 201 |
| Value per bushel | \$4.94 | - | - | \$4.69 | \$4.84 |
| Product return per acre ¹ | \$915 | \$0 | \$915 | \$884 | \$970 |
| Crop insurance income per acre | \$90 | \$0 | \$90 | \$82 | \$62 |
| Government payment income per acre ² | \$0 | \$5 | \$5 | \$0 | \$0 |
| Other income per acre ³ | \$5 | \$0 | \$5 | \$8 | \$6 |
| Gross return per acre | \$1009 | \$5 | \$1015 | \$974 | \$1039 |
| Production expenses (\$ per acre) | | | | | |
| Seed | \$108 | \$23 | \$131 | \$119 | \$122 |
| Fertilizer | \$210 | \$0 | \$210 | \$221 | \$243 |
| Chemicals | \$61 | \$1 | \$62 | \$64 | \$59 |
| Crop insurance | \$34 | \$0 | \$34 | \$32 | \$31 |
| Machinery cost ⁴ | \$180 | \$36 | \$216 | \$191 | \$186 |
| Land rental costs ⁷ | \$246 | \$0 | \$246 | \$243 | \$261 |
| Other expenses | \$104 | \$18 | \$121 | \$89 | \$103 |
| Total direct and overhead expense per acre | \$943 | \$78 | \$1020 | \$957 | \$1005 |
| Net return per acre | \$67 | -\$72 | -\$5 | \$17 | \$33 |
| Labor and management charge per acre | \$58 | \$15 | \$73 | \$54 | \$59 |
| Net return over labor & management per acre | \$9 | -\$87 | -\$78 | -\$38 | -\$26 |
| Cost of production w/ labor & management per bushel ⁸ | \$4.89 | - | \$5.37 | \$4.89 | \$4.96 |
| Net value per bushel ⁶ | \$4.94 | - | \$4.94 | \$4.70 | \$4.86 |

Values displayed may be affected by rounding.

TABLE 3B

Northern Minnesota corn enterprise analysis (on owned and rented land combined)


|  | COVER CROP COHORT | | | | AREA AVERAGE |
|---|---------------------------------|---------------------------|---|--|--|
| | Corn grown after cover crop (1) | Cover crop enterprise (2) | Corn combined with cover crop (3)=(1)+(2) | Corn fields in cohort with no cover crop (4) | All corn fields without a cover crop (5) |
| Number of enterprises | 9 | 9 | 9 | 25 | 381 |
| Return | | | | | |
| Yield (bushels per acre) | 150 | - | - | 157 | 162 |
| Value per bushel | \$4.76 | - | - | \$4.91 | \$4.62 |
| Product return per acre ¹ | \$714 | \$0 | \$714 | \$778 | \$752 |
| Crop insurance income per acre | \$71 | \$0 | \$71 | \$95 | \$56 |
| Government payment income per acre ² | \$0 | \$11 | \$11 | \$0 | \$0 |
| Other income per acre ³ | \$4 | \$0 | \$4 | \$22 | \$5 |
| Gross return per acre | \$789 | \$11 | \$800 | \$895 | \$812 |
| Production expenses (\$ per acre) | | | | | |
| Seed | \$92 | \$18 | \$110 | \$98 | \$102 |
| Fertilizer | \$172 | \$0 | \$172 | \$166 | \$188 |
| Chemicals | \$39 | \$0 | \$39 | \$40 | \$39 |
| Crop insurance | \$31 | \$0 | \$31 | \$35 | \$27 |
| Machinery cost ⁴ | \$159 | \$44 | \$203 | \$179 | \$183 |
| Land-related costs ⁷ | \$121 | \$0 | \$121 | \$149 | \$143 |
| Other expenses | \$84 | \$15 | \$99 | \$74 | \$87 |
| Total direct and overhead expense per acre | \$697 | \$78 | \$774 | \$741 | \$769 |
| Net return per acre | \$92 | -\$67 | \$25 | \$154 | \$43 |
| Labor and management charge per acre | \$58 | \$14 | \$72 | \$44 | \$53 |
| Net return over labor & management per acre | \$35 | -\$81 | -\$46 | \$109 | -\$11 |
| Cost of production w/ labor & management per bushel ⁸ | \$4.53 | - | \$5.06 | \$4.21 | \$4.69 |
| Net value per bushel ⁶ | \$4.78 | - | \$4.78 | \$5.01 | \$4.63 |

Values displayed may be affected by rounding.



TABLE 4B


Southern Minnesota and Wisconsin corn silage enterprise analysis (on owned and rented land combined)

|  | COVER CROP COHORT | | | | AREA AVERAGE |
|---|--|---------------------------|--|---|---|
| | Corn silage grown after cover crop (1) | Cover crop enterprise (2) | Corn silage combined with cover crop (3) = (1) + (2) | Corn silage fields in cohort with no cover crop (4) | All corn silage fields without a cover crop (5) |
| Number of enterprises | 17 | 17 | 17 | 32 | 235 |
| Return | | | | | |
| Yield (tons per acre) | 22 | - | - | 22 | 22 |
| Value per bushel | \$46.67 | - | - | \$43.78 | \$45.82 |
| Product return per acre ¹ | \$1013 | \$44 | \$1057 | \$980 | \$1009 |
| Crop insurance income per acre | \$33 | \$0 | \$33 | \$86 | \$72 |
| Government payment income per acre ² | \$0 | \$2 | \$2 | \$0 | \$0 |
| Other income per acre ³ | \$1 | \$0 | \$1 | \$0 | \$0 |
| Gross return per acre | \$1047 | \$46 | \$1092 | \$1065 | \$1080 |
| Production expenses (\$ per acre) | | | | | |
| Seed | \$115 | \$29 | \$145 | \$119 | \$123 |
| Fertilizer | \$195 | \$4 | \$199 | \$203 | \$168 |
| Chemicals | \$58 | \$0 | \$58 | \$54 | \$59 |
| Crop insurance | \$25 | \$0 | \$25 | \$25 | \$22 |
| Machinery cost ⁴ | \$217 | \$58 | \$275 | \$247 | \$260 |
| Land-related costs ⁷ | \$208 | \$2 | \$210 | \$179 | \$195 |
| Other expenses | \$82 | \$27 | \$109 | \$88 | \$92 |
| Total direct and overhead expense per acre | \$899 | \$120 | \$1019 | \$915 | \$919 |
| Net return per acre | \$147 | -\$74 | \$73 | \$150 | \$162 |
| Labor and management charge per acre | \$54 | \$16 | \$70 | \$46 | \$46 |
| Net return over labor & management per acre | \$93 | -\$90 | \$3 | \$104 | \$116 |
| Cost of production w/ labor & management per ton ⁸ | \$42.37 | - | \$46.18 | \$39.15 | \$40.55 |
| Net value per ton ⁶ | \$46.67 | - | \$46.32 | \$43.77 | \$45.80 |

Values displayed may be affected by rounding.

TABLE 5B


Southern Minnesota and Wisconsin soybean enterprise analysis on owned land

|  | COVER CROP COHORT | | | | AREA AVERAGE |
|---|-------------------------------------|---------------------------|---|---|--|
| | Soybeans grown after cover crop (1) | Cover crop enterprise (2) | Soybeans combined with cover crop (3) = (1) + (2) | Soybean fields in cohort with no cover crop (4) | All Soybeans fields without a cover crop (5) |
| Number of enterprises | 18 | 18 | 18 | 33 | 658 |
| Return | | | | | |
| Yield (bushels per acre) | 52 | - | - | 53 | 56 |
| Value per bushel | \$12.68 | - | - | \$12.43 | \$12.69 |
| Product return per acre ¹ | \$656 | \$23 | \$679 | \$660 | \$716 |
| Crop insurance income per acre | \$54 | \$0 | \$54 | \$25 | \$28 |
| Government payment income per acre ² | \$0 | \$12 | \$12 | \$0 | \$0 |
| Other income per acre ³ | \$8 | \$0 | \$8 | \$0 | \$2 |
| Gross return per acre | \$718 | \$35 | \$753 | \$685 | \$746 |
| Production expenses (\$ per acre) | | | | | |
| Seed | \$57 | \$24 | \$81 | \$63 | \$58 |
| Fertilizer | \$54 | \$0 | \$54 | \$44 | \$54 |
| Chemicals | \$81 | \$0 | \$81 | \$74 | \$74 |
| Crop Insurance | \$33 | \$0 | \$33 | \$24 | \$28 |
| Machinery cost ⁴ | \$116 | \$39 | \$155 | \$131 | \$138 |
| Land ownership costs ⁵ | \$104 | \$11 | \$116 | \$130 | \$132 |
| Other expenses | \$49 | \$17 | \$67 | \$50 | \$62 |
| Total direct and overhead expense per acre | \$495 | \$91 | \$586 | \$516 | \$546 |
| Net return per acre | \$224 | -\$56 | \$167 | \$169 | \$200 |
| Labor and management charge per acre | \$48 | \$15 | \$63 | \$38 | \$44 |
| Net return over labor & management per acre | \$176 | -\$71 | \$105 | \$132 | \$156 |
| Cost of production w/ labor & management per bushel ⁸ | \$9.28 | - | \$10.96 | \$9.95 | \$9.92 |
| Net value per bushel ⁶ | \$12.68 | - | \$12.96 | \$12.43 | \$12.70 |

Values displayed may be affected by rounding.

TABLE 6B

Southern Minnesota and Wisconsin soybean enterprise analysis on rented land


|  | COVER CROP COHORT | | | | AREA AVERAGE |
|---|-------------------------------------|---------------------------|---|---|---|
| | Soybeans grown after cover crop (1) | Cover crop enterprise (2) | Soybeans combined with cover crop (3) = (1) + (2) | Soybean fields in cohort with no cover crop (4) | All Soybean fields without a cover crop (5) |
| Number of enterprises | 32 | 32 | 32 | 59 | 1032 |
| Return | | | | | |
| Yield (bushels per acre) | 54 | - | - | 54 | 56 |
| Value per bushel | \$12.93 | - | - | \$12.80 | \$12.76 |
| Product return per acre ¹ | \$695 | \$3 | \$698 | \$685 | \$715 |
| Crop insurance income per acre | \$15 | \$0 | \$15 | \$20 | \$25 |
| Government payment income per acre ² | \$0 | \$11 | \$11 | \$0 | \$0 |
| Other income per acre ³ | \$5 | \$0 | \$5 | \$4 | \$3 |
| Gross return per acre | \$715 | \$14 | \$729 | \$709 | \$743 |
| Production expenses (\$ per acre) | | | | | |
| Seed | \$52 | \$23 | \$75 | \$58 | \$57 |
| Fertilizer | \$37 | \$0 | \$37 | \$71 | \$51 |
| Chemicals | \$69 | \$0 | \$69 | \$80 | \$72 |
| Crop Insurance | \$34 | \$0 | \$34 | \$27 | \$29 |
| Machinery cost ⁴ | \$116 | \$37 | \$153 | \$129 | \$125 |
| Land-rental costs ⁷ | \$237 | \$0 | \$237 | \$237 | \$260 |
| Other expenses | \$64 | \$18 | \$81 | \$53 | \$58 |
| Total direct and overhead expense per acre | \$608 | \$78 | \$686 | \$654 | \$652 |
| Net return per acre | \$107 | -\$64 | \$43 | \$54 | \$91 |
| Labor and management charge per acre | \$39 | \$14 | \$53 | \$41 | \$40 |
| Net return over labor & management per acre | \$68 | -\$78 | -\$11 | \$14 | \$51 |
| Cost of production w/ labor & management per bushel ⁸ | \$11.67 | - | \$13.17 | \$12.54 | \$11.85 |
| Net value per bushel ⁶ | \$12.93 | - | \$12.97 | \$12.79 | \$12.78 |

Values displayed may be affected by rounding.



TABLE 7B

Northern Minnesota soybean enterprise analysis (on owned and rented land combined)


|  | COVER CROP COHORT | | | | AREA AVERAGE |
|---|-------------------------------------|---------------------------|---|---|--|
| | Soybeans grown after cover crop (1) | Cover crop enterprise (2) | Soybeans combined with cover crop (3) = (1) + (2) | Soybean fields in cohort with no cover crop (4) | All Soybeans fields without a cover crop (5) |
| Number of enterprises | 11 | 11 | 11 | 20 | 387 |
| Return | | | | | |
| Yield (bushels per acre) | 42 | - | - | 39 | 40 |
| Value per bushel | \$12.74 | - | - | \$12.45 | \$12.45 |
| Product return per acre ¹ | \$536 | \$2 | \$538 | \$484 | \$497 |
| Crop insurance income per acre | \$29 | \$0 | \$29 | \$25 | \$17 |
| Government payment income per acre ² | \$0 | \$5 | \$5 | \$0 | \$0 |
| Other income per acre ³ | \$15 | \$0 | \$15 | \$16 | \$5 |
| Gross return per acre | \$581 | \$7 | \$588 | \$525 | \$518 |
| Production expenses (\$ per acre) | | | | | |
| Seed | \$62 | \$16 | \$78 | \$59 | \$63 |
| Fertilizer | \$47 | \$0 | \$47 | \$32 | \$38 |
| Chemicals | \$58 | \$0 | \$59 | \$48 | \$54 |
| Crop Insurance | \$28 | \$0 | \$28 | \$16 | \$20 |
| Machinery cost ⁴ | \$111 | \$47 | \$158 | \$103 | \$104 |
| Land-related costs ⁷ | \$119 | \$3 | \$121 | \$137 | \$118 |
| Other expenses | \$40 | \$12 | \$52 | \$36 | \$45 |
| Total direct and overhead expense per acre | \$465 | \$78 | \$543 | \$432 | \$442 |
| Net return per acre | \$115 | -\$70 | \$45 | \$93 | \$76 |
| Labor and management charge per acre | \$32 | \$13 | \$45 | \$28 | \$33 |
| Net return over labor & management per acre | \$83 | -\$83 | \$0 | \$65 | \$43 |
| Cost of production w/ labor & management per bushel ⁸ | \$10.76 | - | \$12.77 | \$10.77 | \$11.36 |
| Net value per bushel ⁶ | \$12.74 | - | \$12.77 | \$12.75 | \$12.48 |

Values displayed may be affected by rounding.



TABLE 8B

Minnesota statewide wheat enterprise analysis (on owned and rented land combined)

|  | COVER CROP COHORT | | | | AREA AVERAGE |
|---|---|---------------------------|---|--|--|
| | Spring wheat grown after cover crop (1) | Cover crop enterprise (2) | Spring wheat combined with cover crop (3) = (1) + (2) | Spring wheat fields in cohort with no cover crop (4) | All spring wheat fields without a cover crop (5) |
| Number of enterprises | 6 | 6 | 6 | 13 | 246 |
| Return | | | | | |
| Yield (bushels per acre) | 52 | - | - | 69 | 69 |
| Value per bushel | \$7.25 | - | - | \$7.77 | \$7.27 |
| Product return per acre ¹ | \$373 | \$0 | \$374 | \$538 | \$506 |
| Crop insurance income per acre | \$7 | \$0 | \$7 | \$6 | \$9 |
| Government payment income per acre ² | \$0 | \$8 | \$8 | \$0 | \$0 |
| Other income per acre ³ | \$14 | \$0 | \$14 | \$65 | \$9 |
| Gross return per acre | \$395 | \$9 | \$404 | \$609 | \$525 |
| Production expenses (\$ per acre) | | | | | |
| Seed | \$30 | \$14 | \$45 | \$32 | \$30 |
| Fertilizer | \$114 | \$0 | \$114 | \$140 | \$152 |
| Chemicals | \$37 | \$0 | \$37 | \$38 | \$44 |
| Crop Insurance | \$12 | \$0 | \$12 | \$15 | \$18 |
| Machinery cost ⁴ | \$75 | \$42 | \$117 | \$99 | \$101 |
| Land-related costs ⁷ | \$93 | \$0 | \$93 | \$128 | \$109 |
| Other expenses | \$46 | \$17 | \$63 | \$42 | \$49 |
| Total direct and overhead expense per acre | \$407 | \$73 | \$480 | \$495 | \$504 |
| Net return per acre | -\$12 | -\$64 | -\$77 | \$114 | \$21 |
| Labor and management charge per acre | \$32 | \$15 | \$47 | \$27 | \$34 |
| Net return over labor & management per acre | -\$45 | -\$79 | -\$124 | \$87 | -\$13 |
| Cost of production w/ labor & management per bushel ⁸ | \$8.12 | - | \$9.66 | \$6.52 | \$7.46 |
| Net value per bushel ⁶ | \$7.25 | - | \$7.26 | \$8.53 | \$7.31 |

Values displayed may be affected by rounding.



APPENDIX C.

TABLE 1C | MN and WI statewide corn grown after a cover crop (all tenures combined) by years of cover cropping production experience

| | 1 TO 3 YEARS OF EXPERIENCE | | | 4 TO 5 YEARS OF EXPERIENCE | | | 6 OR MORE YEARS OF EXPERIENCE | | |
|--|-----------------------------|-----------------------|-------------------------------|-----------------------------|-----------------------|-------------------------------|-------------------------------|-----------------------|-------------------------------|
| | Corn grown after cover crop | Cover crop enterprise | Corn combined with cover crop | Corn grown after cover crop | Cover crop enterprise | Corn combined with cover crop | Corn grown after cover crop | Cover crop enterprise | Corn combined with cover crop |
| Number of enterprises | 9 | 9 | 9 | 19 | 19 | 19 | 21 | 21 | 21 |
| Return | | | | | | | | | |
| Yield (bushels per acre) | 201 | - | - | 174 | - | - | 181 | - | - |
| Value per bushel | \$5.15 | - | - | \$5.19 | - | - | \$4.70 | - | - |
| Product return per acre ¹ | \$1,039 | \$1 | \$1,040 | \$903 | \$0 | \$903 | \$854 | \$0 | \$854 |
| Crop insurance income per acre | \$68 | \$0 | \$68 | \$57 | \$0 | \$57 | \$109 | \$0 | \$109 |
| Government payment income per acre ² | \$0 | \$0 | \$0 | \$0 | \$5 | \$5 | \$0 | \$9 | \$9 |
| Other income per acre ³ | \$0 | \$0 | \$0 | \$2 | \$0 | \$2 | \$7 | \$0 | \$7 |
| Gross return per acre | \$1,107 | \$1 | \$1,107 | \$962 | \$5 | \$967 | \$969 | \$9 | \$979 |
| Production expenses (\$ per acre) | | | | | | | | | |
| Seed | \$90 | \$29 | \$118 | \$107 | \$18 | \$125 | \$109 | \$23 | \$132 |
| Fertilizer | \$222 | \$0 | \$223 | \$236 | \$0 | \$236 | \$182 | \$0 | \$182 |
| Chemicals | \$84 | \$2 | \$86 | \$41 | \$0 | \$41 | \$63 | \$1 | \$64 |
| Crop insurance | \$27 | \$0 | \$27 | \$41 | \$0 | \$41 | \$29 | \$0 | \$29 |
| Machinery cost ⁴ | \$191 | \$60 | \$251 | \$152 | \$36 | \$187 | \$186 | \$34 | \$220 |
| Land-related costs ⁷ | \$215 | \$0 | \$217 | \$226 | \$0 | \$227 | \$204 | \$0 | \$205 |
| Other expenses | \$77 | \$19 | \$94 | \$112 | \$22 | \$132 | \$85 | \$13 | \$97 |
| Total direct and overhead expense per acre | \$905 | \$109 | \$1,015 | \$915 | \$75 | \$990 | \$858 | \$71 | \$930 |
| Net return per acre | \$202 | -\$108 | \$92 | \$47 | -\$70 | -\$23 | \$111 | -\$62 | \$49 |
| Labor and management charge per acre | \$58 | \$21 | \$78 | \$43 | \$12 | \$54 | \$72 | \$16 | \$88 |
| Net return over labor & management per acre | \$144 | -\$129 | \$14 | \$5 | -\$82 | -\$77 | \$39 | -\$78 | -\$39 |
| Cost of production w/ labor & management per bushel ⁸ | \$4.43 | - | \$5.08 | \$5.16 | - | \$5.63 | \$4.48 | - | \$4.91 |
| Net value per bushel ⁶ | \$5.15 | - | \$5.15 | \$5.19 | - | \$5.19 | \$4.70 | - | \$4.70 |

* Values displayed may be affected by rounding.



TABLE 2C | MN and WI statewide soybeans grown after a cover crop (all tenures combined) by years of cover cropping production experience

| | 1 TO 3 YEARS OF EXPERIENCE | | | 4 TO 5 YEARS OF EXPERIENCE | | | 6 OR MORE YEARS OF EXPERIENCE | | |
|--|---------------------------------|-----------------------|---------------------------------|---------------------------------|-----------------------|---------------------------------|---------------------------------|-----------------------|---------------------------------|
| | Soybeans grown after cover crop | Cover crop enterprise | Soybeans combined w/ cover crop | Soybeans grown after cover crop | Cover crop enterprise | Soybeans combined w/ cover crop | Soybeans grown after cover crop | Cover crop enterprise | Soybeans combined w/ cover crop |
| Number of enterprises | 12 | 12 | 12 | 20 | 20 | 20 | 19 | 19 | 19 |
| Return | | | | | | | | | |
| Yield (bushels per acre) | 47 | - | - | 53 | - | - | 51 | - | - |
| Value per bushel | \$12.62 | - | - | \$13.45 | - | - | \$12.44 | - | - |
| Product return per acre ¹ | \$594 | \$4 | \$598 | \$712 | \$12 | \$725 | \$639 | \$1 | \$640 |
| Crop insurance income per acre | \$20 | \$0 | \$20 | \$25 | \$0 | \$25 | \$27 | \$0 | \$27 |
| Government payment income per acre ² | \$0 | \$21 | \$21 | \$0 | \$6 | \$6 | \$0 | \$10 | \$10 |
| Other income per acre ³ | \$32 | \$0 | \$32 | \$3 | \$0 | \$3 | \$2 | \$0 | \$2 |
| Gross return per acre | \$645 | \$25 | \$670 | \$740 | \$18 | \$758 | \$667 | \$12 | \$679 |
| Production expenses (\$ per acre) | | | | | | | | | |
| Seed | \$63 | \$28 | \$92 | \$48 | \$18 | \$66 | \$57 | \$23 | \$81 |
| Fertilizer | \$37 | \$0 | \$37 | \$31 | \$0 | \$31 | \$51 | \$0 | \$52 |
| Chemicals | \$85 | \$1 | \$86 | \$57 | \$0 | \$57 | \$72 | \$0 | \$72 |
| Crop insurance | \$23 | \$0 | \$23 | \$40 | \$0 | \$40 | \$31 | \$0 | \$31 |
| Machinery cost ⁴ | \$137 | \$36 | \$173 | \$106 | \$42 | \$148 | \$114 | \$35 | \$150 |
| Land-related costs ⁷ | \$194 | \$0 | \$197 | \$26 | \$1 | \$33 | \$147 | \$0 | \$149 |
| Other expenses | \$36 | \$14 | \$48 | \$292 | \$31 | \$312 | \$50 | \$14 | \$61 |
| Total direct and overhead expense per acre | \$576 | \$80 | \$656 | \$599 | \$88 | \$687 | \$523 | \$72 | \$595 |
| Net return per acre | \$69 | -\$56 | \$14 | \$141 | -\$70 | \$71 | \$144 | -\$60 | \$84 |
| Labor and management charge per acre | \$42 | \$12 | \$54 | \$31 | \$13 | \$44 | \$44 | \$15 | \$60 |
| Net return over labor & management per acre | \$28 | -\$68 | -\$40 | \$110 | -\$83 | \$27 | \$100 | -\$76 | \$24 |
| Cost of production w/ labor & management per bushel ⁸ | \$12.03 | - | \$13.52 | \$11.37 | - | \$13.09 | \$10.49 | - | \$11.97 |
| Net value per bushel ⁶ | \$12.62 | - | \$12.67 | \$13.45 | - | \$13.60 | \$12.44 | - | \$12.45 |

* Values displayed may be affected by rounding.



ENDNOTES

- 1 Product return includes yield multiplied by value per unit for the primary commodity crop plus any secondary products, like straw or corn stalk bales. For cover crop enterprises, only a total production return value is provided. There is no yield detail as this is the average production for all cover crop enterprise, therefore varying production units are present.
- 2 Government payment income for the primary commodity crop includes ARC or PLC payments received during the year and any additional disaster or ad hoc payments related to the production year. For cover crop enterprises, government payment income are conservation and other support payments related to planting the cover crop.
- 3 Other crop income includes income from hedging gains or losses or other miscellaneous income for the enterprise.
- 4 Machinery cost includes fuel, repairs, custom hire, machinery lease expense, interest expense on intermediate term debts and machinery depreciation.
- 5 Land ownership costs include real estate taxes and interest on long term debts.
- 6 Net value per unit is the value per unit adjusted for hedging gains or losses.
- 7 Land-related costs include land rent, real estate taxes and interest on long-term debts for enterprise analysis tables that combine owned and rented land together.
- 8 Cost of production with labor and management is the breakeven price to provide a labor and management return for the operator(s). This calculation factors in government payments and any other income sources for the enterprise for the year, like crop insurance income, hedging gains and losses or other miscellaneous income.

