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Conventional and Organic Enterprise Net Returns

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Information pertaining to the relative profitability of conventional and organic production is often lacking. A previous article compared net returns for conventional and organic crop enterprises using FINBIN data from 2017 to 2021 (Langemeier, 2022). This article uses FINBIN data from 2018 to 2022 to update comparisons of crop yields, gross revenue, total expense, and net returns for conventional and organic alfalfa, corn, oats, soybeans, and winter wheat. The organic enterprise data represents farms that have already transitioned to organic production, and thus do not include information pertaining to the transition phase.

Crop Yields

Table 1 shows the average conventional and organic crop yields for alfalfa, corn, oats, soybeans, and winter wheat. The ratio illustrated in the last column of the table was computed by dividing the organic crop yield by the conventional crop yield. Alfalfa exhibited the smallest difference in crop yields (13 percent) between conventional and organic crops. The yield drags for corn, oats, soybeans, and winter wheat were 26 percent, 34 percent, 27 percent, and 41 percent, respectively.

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Table 1. Average Conventional and Organic Crop Enterprise Yields, 2018 to 2022

	Organic	Conventional	Ratio
Alfalfa (tons/acre)	3.89	4.45	0.874
Corn (bushels/acre)	136.0	183.7	0.741
Oats (bushels/acre)	45.5	68.5	0.664
Soybeans (bushels/acre)	34.8	47.6	0.732
Winter Wheat (bushels/acre)	36.2	61.5	0.588

Source: FINBIN Database

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Gross Revenue, Total Expense, and Net Return to Land

Gross revenue, total expense, and net return to land per unit (per acre) for alfalfa, corn, oats, soybeans, and winter wheat are presented in Table 2 (Table 3). Gross revenue includes crop revenue, crop insurance indemnity payments, government payments, and miscellaneous income. Total expenses include all cash and opportunity costs, other than those associated with owned farmland. Farmland costs included in the total expense reported in Table 2 and Table 3 were comprised of cash rent, real estate taxes, and interest, which would be lower than the full opportunity cost on owned land. Just to give the reader some idea as to how large this excluded cost may be, you would need to add an estimated \$0.28 per bushel (\$0.90 per bushel) to the total expense for conventional corn (conventional soybeans) if you wanted to account for the full opportunity cost on owned land. Also, note that the per unit and per acre net returns presented in Table 2 and Table 3 represent a net return to land rather than an economic profit.

Table 2. Average Conventional and Organic Gross Revenue and Total Expense per Unit, 2018 to 2022

	Gross Revenue	Total Expense	Net Return to Land
Alfalfa (\$ per ton)	153.36	107.73	67.30
Organic Alfalfa (\$ per ton)	173.68	121.19	70.97
Corn (\$ per bushel)	4.83	4.14	1.45
Organic Corn (\$ per bushel)	9.63	6.15	4.54
Oats (\$ per bushel)	4.73	4.27	1.25
Organic Oats (\$ per bushel)	7.33	7.70	1.46
Soybeans (\$ per bushel)	11.88	9.67	4.75
Organic Soybeans (\$ per bushel)	26.53	16.48	14.50
Winter Wheat (\$ per bushel)	6.37	6.44	0.84
Organic Winter Wheat (\$ per bushel)	11.41	13.43	0.35

Source: FINBIN Database

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Table 3. Average Conventional and Organic Gross Revenue and Total Expense per Acre, 2018 to 2022

	Gross Revenue	Total Expense	Net Return to Land
Alfalfa (\$ per acre)	682	479	300
Organic Alfalfa (\$ per acre)	676	471	276
Corn (\$ per acre)	887	761	267
Organic Corn (\$ per acre)	1,310	837	617
Oats (\$ per acre)	324	292	86
Organic Oats (\$ per acre)	333	350	66
Soybeans (\$ per acre)	565	460	226
Organic Soybeans (\$ per acre)	924	574	505
Winter Wheat (\$ per acre)	392	396	52
Organic Winter Wheat (\$ per acre)	413	486	12

Source: FINBIN Database

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Though conventional and organic crops face different market phenomena, it is common to compare conventional and organic gross revenue per unit and crop prices, and net return to land on a per acre basis. Comparing organic to conventional gross revenue per unit reported in Table 2, the smallest ratio of organic to conventional gross revenue per unit was for alfalfa (1.13) and the largest ratio (2.23) was for soybeans. Organic oats and winter wheat gross revenue per unit were 1.55 and 1.79 times their conventional counterparts, while the organic corn gross revenue per unit was approximately 1.99 times higher than the conventional corn gross revenue per unit. It is important to note that the gross revenue per unit ratios reported in Table 2 represent five-year averages. The gross revenue per unit and crop price ratios for individual crops vary from year to year. For example, during the 2018 to 2022 period, the corn price ratio ranged from 1.65 in 2021 to 2.70 in 2018, and soybean price ratio ranged from 1.81 in 2019 to 2.36 in 2021.

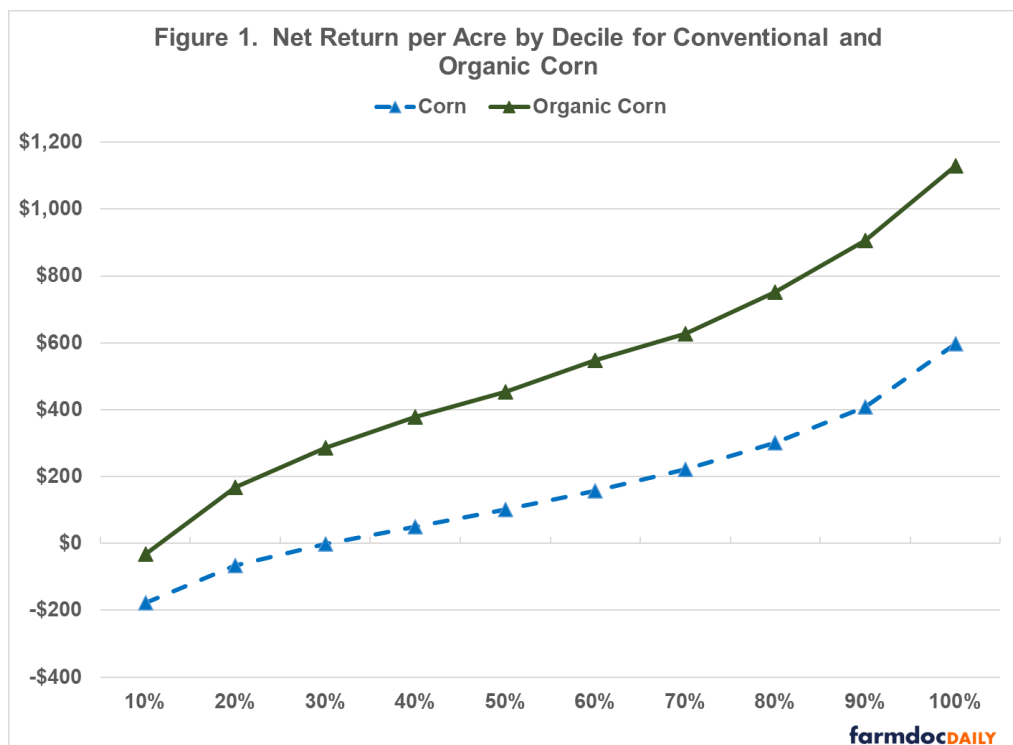
It is important to note that the net returns reported in Table 2 are on a per-unit basis. Given the differences in crop yields between conventional and organic crops, it is often more relevant to examine differences in per acre net returns than per-unit net returns. The average difference in net returns to land between the organic and conventional crops was \$110 per acre. The largest difference was \$350 per acre for corn. The difference for soybeans was \$279 per acre. The differences for alfalfa, oats, and winter wheat were -\$23, -\$19, and -\$39 per acre, respectively, indicating that the conventional alfalfa, oats, and winter wheat enterprises were more profitable than organic alfalfa, oats, and winter wheat. The lack of profits for the organic small grains and forages has important implications for organic crop rotations. Most organic crop rotations include a small grain or a forage such as alfalfa in the rotation. Market opportunities for organic small grains and forages vary substantially by region, and it can be difficult to find markets for these crops.

Difference in Net Returns Among Farms

The results above focus on differences in average net return to land. Economists have long pointed out the large differences in financial performance among farms. To account for the differences among farms, we used the FINBIN database to examine net returns for conventional and organic corn and soybean enterprises.

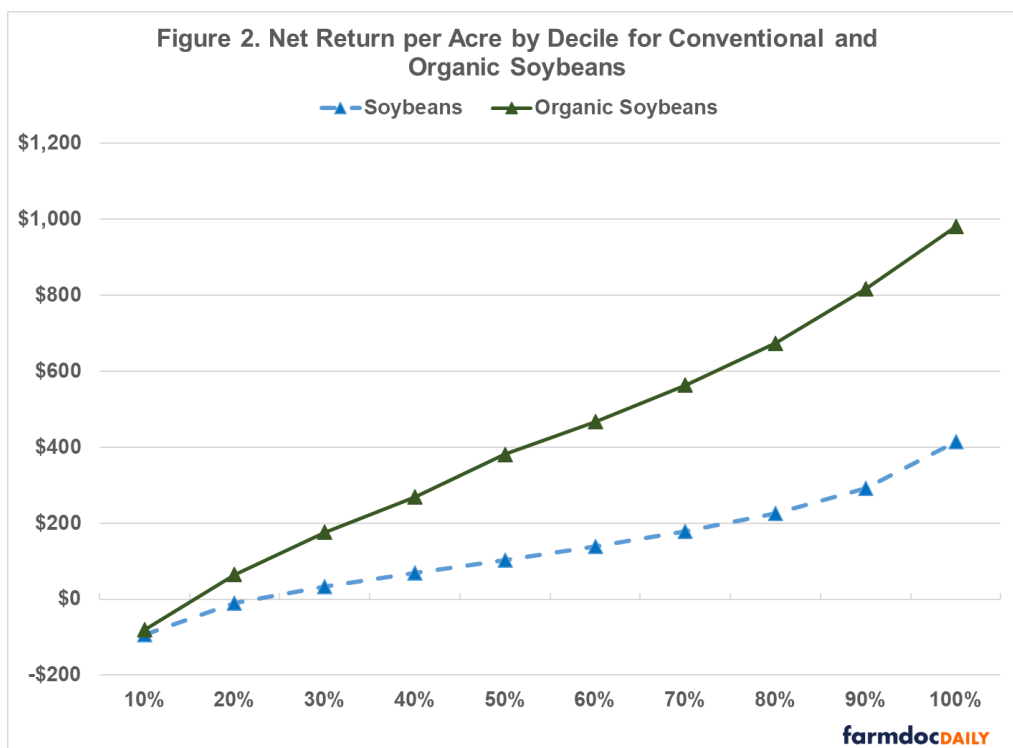
Figure 1 presents the comparisons among enterprise deciles (ten equal groups) for conventional and organic corn using 2018 to 2022 FINBIN data. Net return in this figure was computed by subtracting land

expenses from net return to land, and excluded government payments, operator labor, and a management charge. The median net returns per acre for conventional corn and organic corn were \$128 and \$495, respectively. The difference in net return per acre for the bottom and top deciles was \$775 for conventional corn and \$1,160 for organic corn. Despite the larger median net return, it is important to note that there were quite a few organic farms with lower net returns for corn than their conventional counterparts in the top deciles.



Comparisons among enterprise deciles for conventional and organic soybeans are presented in Figure 2. The median net returns using FINBIN data for the 2018 to 2022 period for conventional soybeans and organic soybeans were \$120 and \$429, respectively. The difference in net return per acre for the bottom and top deciles was \$508 for conventional soybeans and \$1,062 organic soybeans. Even though the median net return for organic soybeans is higher than the median net return for conventional soybeans, the organic producers in the lowest decile had net returns that were very similar to those for conventional soybean producers in the lowest decile.

What can we make of the results in figures 1 and 2? First, there is a larger difference in net returns between the organic producers than there is between the conventional producers. This result could be due to learning effects or the more complicated rotations associated with organic crop production. Second, obtaining a boost in net returns from organic soybean production appears to be much more difficult than it is for organic corn. This could be due to weed control issues often encountered when producing organic soybeans. The results in figures 1 and 2 stress the importance of examining the sensitivity of budgeted net returns for organic crops to changes in price, yield, and cost assumptions before transitioning acres.



Summary and Conclusions

This article compared crop yields, gross revenue, total expense, and net returns for conventional and organic corn and soybeans. FINBIN data (Center for Farm Financial Management, 2023) were used to make the comparisons in this article. Consistent with previous work, organic corn and soybean enterprises had lower crop yields, higher crop prices and gross revenue, and higher net returns. However, there was a much wider difference in enterprise net returns among organic corn and soybean enterprises than there was among conventional corn and soybean enterprises. It is also important to note that on average alfalfa, oats, and winter wheat grown conventionally had higher net returns than alfalfa, oats, and winter wheat grown using an organic cropping system.

This article summarized net returns for conventional and organic crop enterprises. It did not examine net returns during the transition period nor account for the fact that unlike many conventional rotations, organic crop rotations tend to include small grains and/or forages. Thus, it is very important to not just compare net returns for corn and soybeans grown conventionally and organically. For comparisons of conventional and organic crop rotations see Langemeier et al. (2020) and Langemeier and O'Donnell (2021).

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