



Weekly Farm Economics: The Rising Costs of Corn Production in Illinois

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Significant increases in production costs in recent years combined with expectations for lower commodity prices have resulted in much lower return expectations for 2023 and 2024 compared with the previous three years (see *farmdoc daily*, [August 29, 2023](#)). In today's article, we revisit trends in direct costs for corn production in Illinois over time (see *farmdoc daily*, [April 4, 2023](#) and [July 12, 2016](#), for previous articles). Since 2000, direct costs – which include production inputs – have risen at an average annualized rate of 7% per year. Individual components of direct costs, such as fertilizers, pesticides, and seeds, have all experienced similar average growth rates.

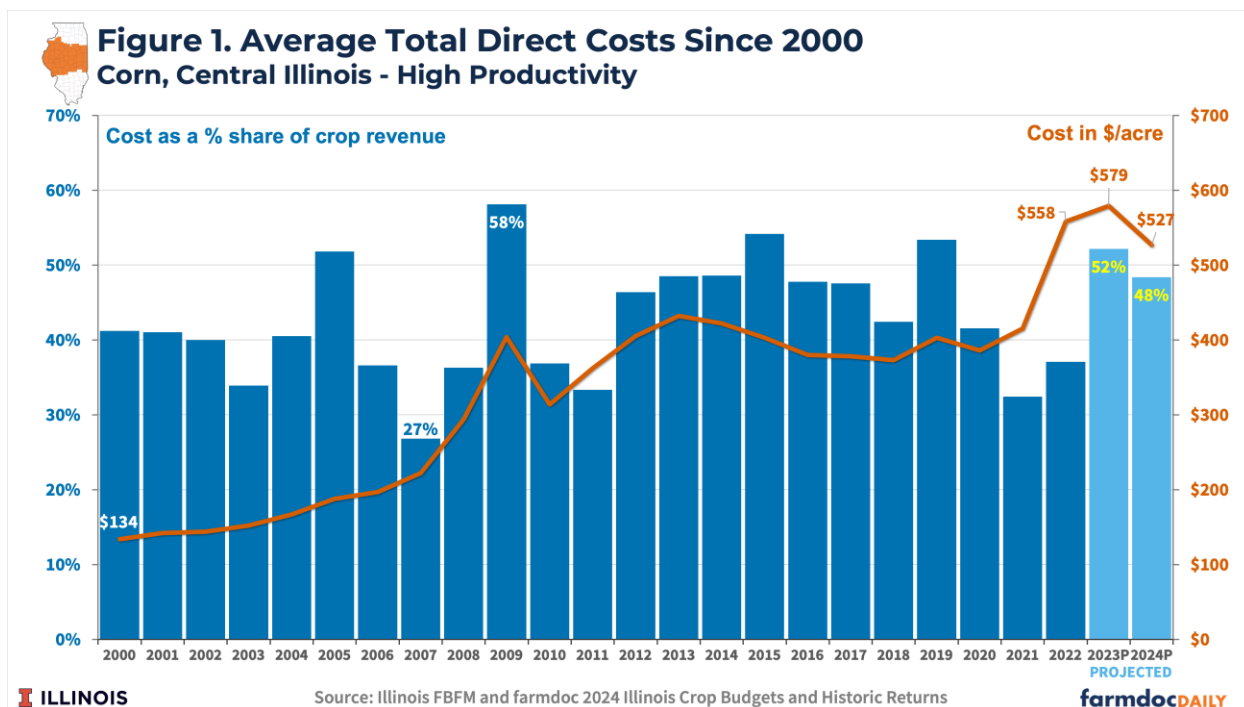
Total direct costs are projected to reach record levels for 2023 and are expected to experience only modest declines for 2024. Fertilizer costs are projected at record levels for 2023, but a fairly large decline is expected for 2024. Seed costs are projected at record levels for 2023 and remain constant in 2024. Pesticide costs are projected to be at record levels for 2023 and to further increase for 2024. In addition to viewing these costs on a \$ per acre basis, we also provide perspective on a share of revenue basis.

Total Direct Costs

Direct costs include the cost of production inputs such as fertilizers, seeds, and pesticides (herbicides, pesticides, fungicides). Costs associated with drying, storage, and crop insurance are also included in the direct cost category. Total direct costs for corn production in central Illinois have increased over time from \$134 per acre in 2000 to \$558 in 2022 (see Figure 1), which implies an average annualized growth rate of 7% between 2000 and 2022. Direct costs for the 2023 crop year are projected at a record level of \$579 per acre, with a decline to \$527 per acre currently expected for the 2024 crop year based on recently released crop budgets (see *farmdoc daily*, [August 29, 2023](#) and [2024 Illinois Crop Budgets](#)).

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From 2000 to 2022, direct costs averaged 42% as a share of crop revenues (yield x price received). Direct costs were just 27% of revenues in 2007 when excellent yields and prices resulted in an increase in revenues with only a moderate increase in costs relative to the previous year. Direct costs reached 58% of revenues in 2009 due to a combination of a dip in revenues and increases in the costs of production inputs and drying relative to the previous year. The record costs projected for 2023 are well above average at 52% of expected revenues. Even with the decline in per acre direct costs budgeted for 2024, direct costs as a share of revenue are expected to reach 48%, above the historical average of 42% (see Figure 1).

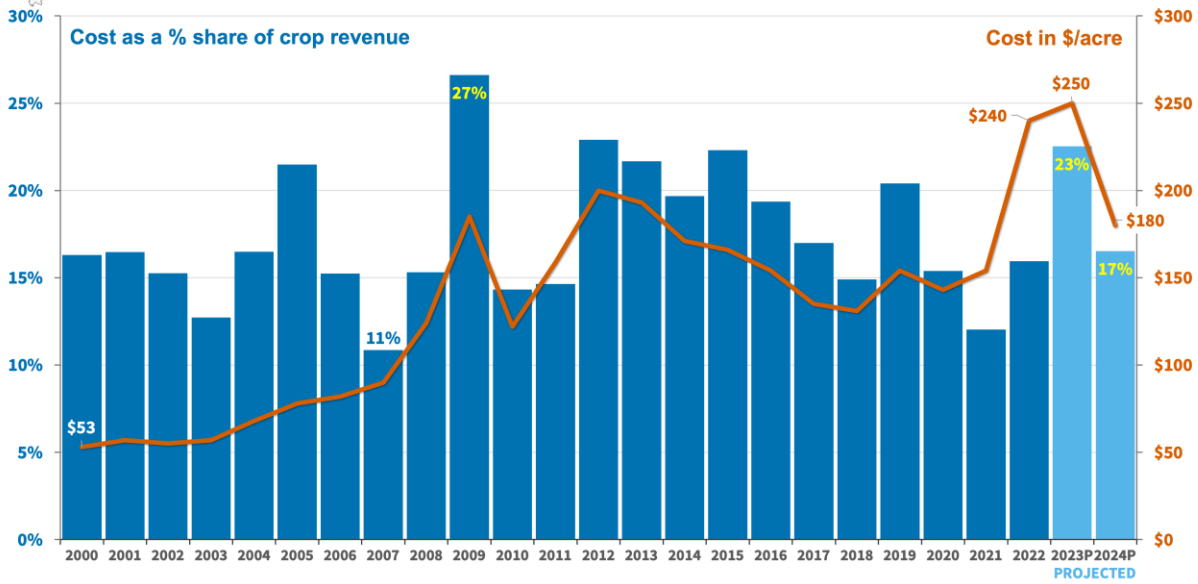


Fertilizer Costs

Fertilizer costs tend to experience more volatility than other direct cost categories as the prices for fertilizer products follow swings in both commodity and energy prices. Fertilizer costs for corn in central Illinois increased from \$53 per acre in 2000 to \$240 per acre in 2022, matching the average annualized growth of total direct costs at 7%. Fertilizer costs are projected to reach \$250 per acre for the 2023 crop but decline to \$180 per acre for 2024 due to lower prices for nitrogen fertilizer products.



**Figure 2. Average Fertilizer Costs Since 2000
Corn, Central Illinois - High Productivity**



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Source: Illinois FBFM and farmdoc 2024 Illinois Crop Budgets and Historic Returns

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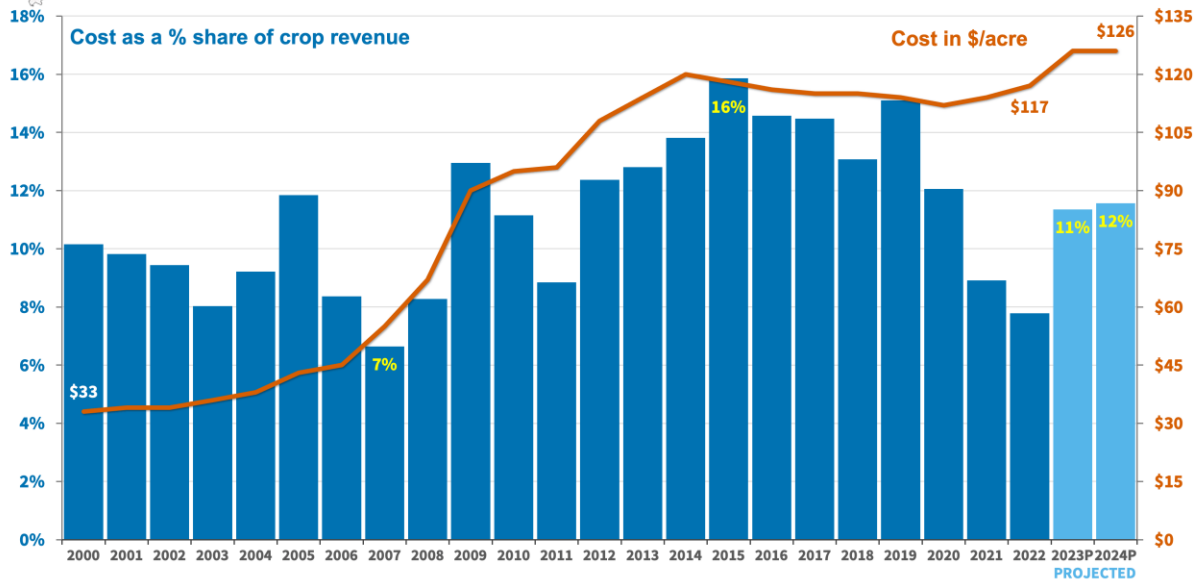
On a revenue share basis, fertilizer costs averaged 17% from 2000 to 2022. High prices for fertilizer used in 2023 result in a projected 23% revenue share, which is expected to decline back to the longer-term average of 17% of revenues for 2024. Like total direct costs, fertilizer costs as a share of revenue peaked at 27% in 2009 and were at a low point of 11% in 2007.

Seed Costs

Seed costs have increased from \$33 per acre in 2000 to \$117 per acre in 2022, averaging 6% in annualized growth. Seed costs are projected to reach a record \$126 per acre for both the 2023 and 2024 crop years. On a revenue share basis, seed costs hit 16% in 2015 and experienced a low of 7% in 2007. Projections for 2023 and 2024 have the seed cost share at 11% and 12% of crop revenues, respectively, which is near the average of 11% from 2000 to 2022.



**Figure 3. Average Seed Costs Since 2000
Corn, Central Illinois - High Productivity**



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Source: Illinois FBFM and farmdoc 2024 Illinois Crop Budgets and Historic Returns

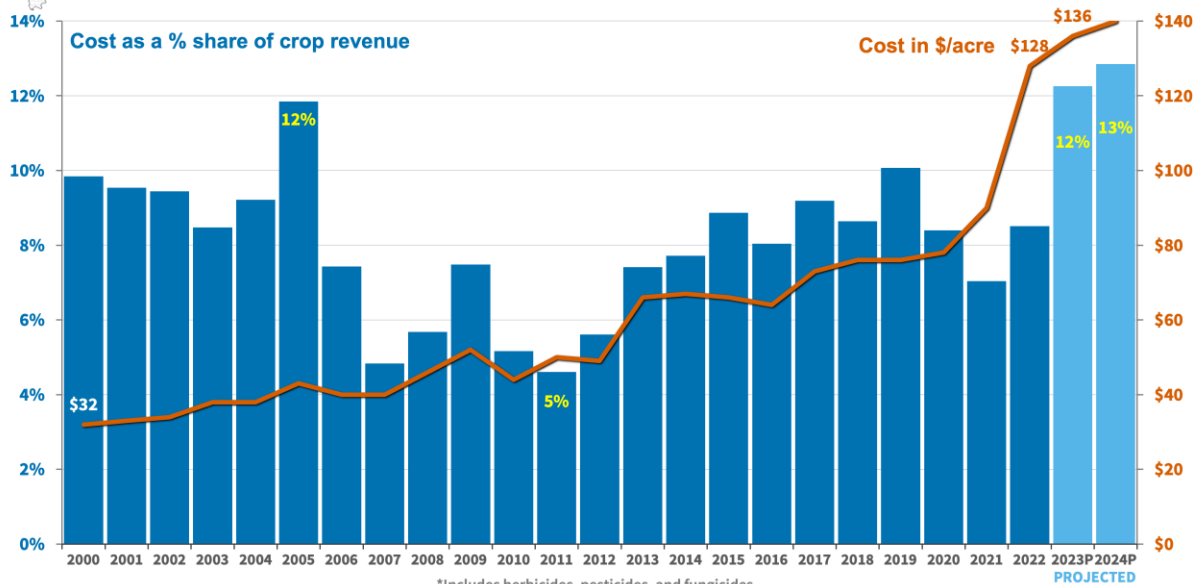
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Pesticide Costs

Pesticide costs have increased from \$32 per acre in 2000 to \$128 per acre in 2022, with expectations to reach \$140 per acre for the 2024 crop year. Annualized growth in pesticide costs from 2000 to 2022 averaged 7%, but a significant portion of the increase has occurred since 2020. Larger increases in pesticide costs in recent years are likely associated with developing weed resistance (see *farmdoc daily*, June 5, 2018) as well as higher corn prices, which provide a greater economic justification for the applications of chemical pest controls. Increased use of fungicides on corn acres over time have also contributed to higher pesticide costs. Results from the [USDA's Agricultural Chemical Use survey](#) indicate the percentage of corn acres to which fungicides were applied has increased from 8% in 2010 to 19% in 2021.



**Figure 4. Average Pesticide* Costs Since 2000
Corn, Central Illinois - High Productivity**



*Includes herbicides, pesticides, and fungicides

Source: Illinois FBFM and farmdoc 2024 Illinois Crop Budgets and Historic Returns

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Summary

The direct costs of corn production in Illinois have increased at an average rate of 7% per year since 2000. Total direct costs are projected to decline slightly from record levels in 2023 for the 2024 crop year, but remain at historically elevated levels as a share of expected crop revenue. The decline in total direct costs is led mainly by lower fertilizer costs projected for 2024. Seed costs are projected at their highest \$ per acre levels since 2000 for both 2023 and 2024. Pesticide costs have experienced the largest increase in most recent years and are also projected to be at record levels for 2024.

Changes in direct costs have generally followed changes in revenues and returns to crop production with a lag. Lower commodity prices for 2023 and 2024 will likely result in a slowing of the rate of direct cost increases. However, history suggests that significant cost reductions, in \$ per acre terms, are not likely to occur for most direct cost categories and addressing potential negative farm returns will also require adjustments in other areas.

Acknowledgment

The authors would like to acknowledge that data used in this study comes from farms across the State of Illinois enrolled in the Illinois Farm Business Farm Management (FBFM) Association. Without their cooperation, information as comprehensive and accurate as this would not be available for educational purposes. FBFM, which consists of 5,000 plus farmers and 65 professional field staff, is a not-for-profit organization open to all farm operators in Illinois. FBFM field staff provide on-farm counsel with computerized recordkeeping, farm financial management, business entity planning and income tax management. For more information, please contact the State Headquarters located at the University of Illinois Department of Agricultural and Consumer Economics at 217-333-8346 or visit the FBFM website at www.fbfm.org.

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