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The Profit Potential of Certified Organic Field Crop Production

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What Is the Issue?

Certified organic crop acres more than doubled between 2002 and 2011, as acreage increased from 1.3 million acres to over 3 million acres. A large part of this growth was in major field crops—corn, soybeans, and wheat—where certified organic production increased about 264,000 acres. Despite this interest in organic agriculture and its potential to address environmental concerns, little information is available about the relative costs and returns of organic grain production on commercial farms. Most previous research is derived from results of long-term experimental field trials and offers limited economic analysis. Results of this study provide information about potential economic returns from organic field crop production on commercial farms and the additional costs incurred from producing organic.

What Did the Study Find?

This study of field crop production indicates a profit potential from organic systems that is primarily due to the significant price premiums paid for certified organic crops. Additional economic costs of organic versus conventional production were more than offset, on average, by higher returns from organic systems for corn and soybeans, although not for wheat. Other findings of this study:

- Organic field crop production was, on average, conducted on farms with less total acreage and less field crop acreage than conventional farms. Despite having fewer acres, producers of some organic field crops were less likely to work off-farm. These producers were also more likely to have attended college than conventional producers. Organic production more often occurred in northern States where pest pressures are less severe.
- Production practices used on organic and conventional field crop operations were quite different. Most conventional producers of corn and soybeans used genetically modified seed varieties not allowed for certified organic crop production. Most organic producers used mechanical practices, such as tillage and cultivating for weed control, while conventional producers rarely used a cultivator and relied mainly on chemical weed control. Organic corn and soybean producers more often rotated row crops with small grain and meadow crops and often included an idle year in the rotation. Conventional producers of these crops mainly used a rotation consisting of continuous row crops.
- Much of the experimental research on organic field crop production has found similar yields and lower per-acre costs from organic relative to conventional field crop production.

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However, the economic analysis used with the experimental research has primarily examined only operating or variable costs, excluding the economic costs of such resources as land, labor, and capital. Findings of this observational study of commercial organic and conventional field crop production found lower yields and mostly higher per-acre total economic costs from organic systems.

- As in much of the economic analyses using experimental data, per-bushel operating costs of organic relative to conventional systems were similar in this study. However, the per-bushel economic costs of organic production were significantly higher because of the higher per-acre costs and lower yields.
- The economic costs of organic compared with conventional production estimated in this study were roughly between \$83 and \$98 per acre higher for corn, \$55-\$62 per acre higher for wheat, and \$106-\$125 per acre higher for soybeans. These estimated cost differences are all higher than those suggested by the relative means.
- Results of this study imply that some conventional farms may be able to earn greater returns if transitioned to organic production. Nevertheless, adoption of the organic approach among U.S. field crop producers remains extremely low. Perhaps a key factor is that organic field crop production is particularly challenging compared with conventional production in achieving effective weed control and crop yields. Also, the processes involved with organic certification can be complex and time-consuming.

How Was the Study Conducted?

The profitability of organic field crop production was examined using Agricultural Resource Management Survey (ARMS) data from corn, wheat, and soybean producers that included targeted samples from organic growers. Two procedures were used to calculate the difference between conventional and organic crop production costs:

1. Propensity-score matching generated a sample of similar conventional and organic producers of each crop based on observed farm and operator characteristics from which to measure the difference in organic and conventional production costs.
2. Regression with endogenous treatment-effects was employed to describe this same difference in organic and conventional production costs, accounting for the impact of both observable and unobservable variables on crop production costs.

Results of these procedures were compared with the difference in mean cost-of-production estimates for organic and conventional producers. Estimated organic transition and certification costs were added to each result, and the cost differences between organic and conventional crop production systems were compared with historic price premiums paid for organic crops to evaluate the potential profitability of organic field crop production. Despite the detailed producer survey data used in this study, the limited time-series data dimension renders this study primarily one of association rather than causality.