Profit and risk analysis of alternative no-till and conventional tillage
crop rotation systems in east central South Dakota

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Introduction
Crop rotations can serve as an important risk management strategy for producers. Lower returns from one crop can be offset by another crop. Producers face three major risks: yield risk, price risk, and input risk. Simetar® software was used to simulate data for the analysis of alternative crop rotations and tillage systems.

In this project, we seek:
1) Identify the profitability of various no-till rotations versus standard no-till corn-soybean rotation.
2) Implications of no-till farm management practices compared to conventional tillage practices
3) Differences in risk associated with each rotation.

Materials and methods
This study used twelve years (2001-2012) of data from field trials collected by the Agricultural Research Service (USDA-ARS). The focus of the study was to empirically analyze the performance of 10 different no-till crop rotations and two conventional tillage rotations that all include corn and soybeans within each rotation. CTM represents a conventional tillage medium fertilizer rate. CT-85% is 85 percent of the counties average yield. The information was used to construct a 1200 acre representative farm to analyze the returns to labor and management.

Results : Ranking Crop Rotations

When risk is not considered conventional tillage practices have the highest return to labor and management. However, both conventional systems have the largest standard deviations of net returns.

Conclusions
Conventional tillage systems had the highest average net (mean) returns. As risk aversion increases, no-till rotations with corn, soybeans, wheat, and another summer crop become more competitive with conventional tillage corn / soybean systems. No-till systems can provide additional agronomic and ecological benefits that were not captured in this study. Additional management practices such as installing drainage tile could help no-till systems become more competitive with conventional tillage in eastern South Dakota.

Future Directions
The final four years of data from the study will be key. The first two transition years of no-till management had negative returns. The returns from conventional tillage and no-till systems will likely see a convergence when more data is available.

References


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