

Economics and Water Quality Effects of Installing Conservation Practices

- Michael Langemeier
 - September 1, 2009
 - Webinar

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Relative Efficiency of No-Till Production

- Central KFMA Farms
 - Detailed Cost Analysis (2008 data)
 - Crop cost comparisons on per harvested acre basis
 - Whole-Farm Data (2004-2008 data)
 - Farm size and type
 - Financial ratios and efficiency measures
 - Income shares (feed grains, hay and forage, oilseeds, small grains, beef, dairy)
 - Cost shares (labor, livestock, seed, fertilizer, chemicals, and capital)

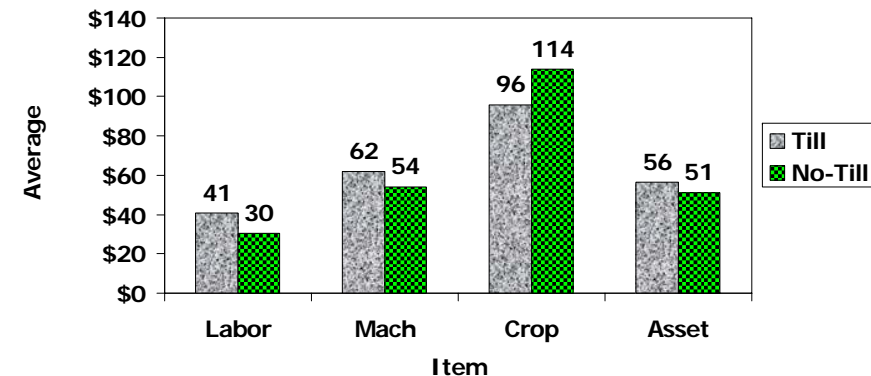
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Detailed Cost Comparisons

- KFMA Data, Central Kansas, 2008
 - Crop Cost Comparisons on a per Harvested Acre Basis
 - Labor
 - Hired labor and opportunity charges on operator and family labor
 - Machinery
 - Repairs on machinery and equipment, machine hire, gas, fuel, oil, and depreciation on machinery and equipment
 - Crop
 - Seed, crop insurance, fertilizer, herbicide, and miscellaneous costs such as irrigation energy, crop storage and marketing, and crop supplies
 - Improvements
 - Asset Charges
 - Other Expenses

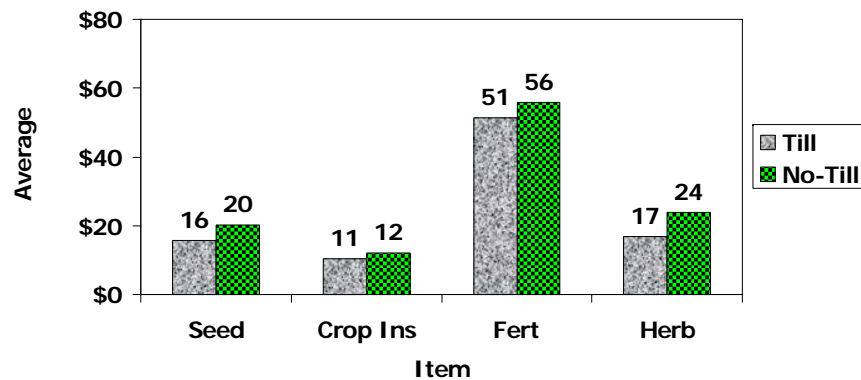
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Detailed Cost Analysis Cost Categories: NC KFMA, 2008



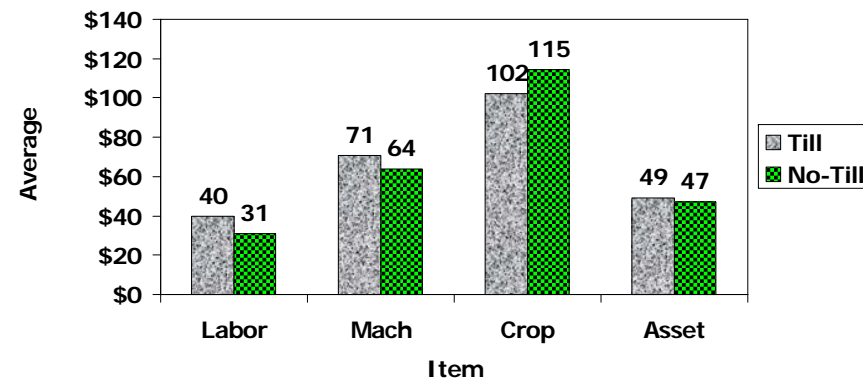
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Detailed Cost Analysis Crop Expense: NC KFMA, 2008



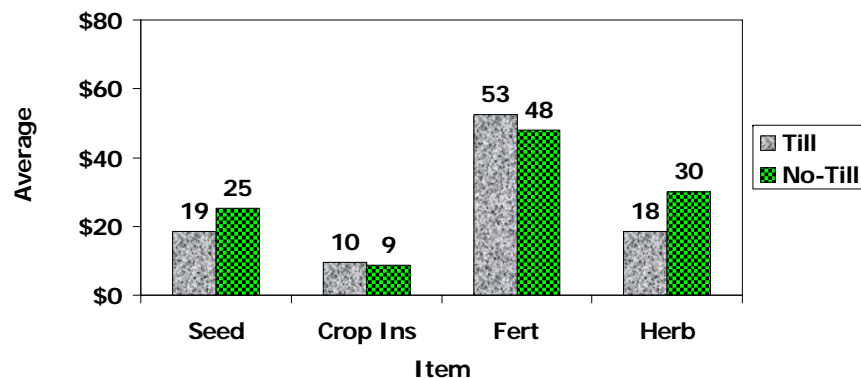
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Detailed Cost Analysis Cost Categories: SC KFMA, 2008



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Detailed Cost Analysis Crop Expense: SC KFMA, 2008



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Whole-Farm Data 5-Year Averages

- KFMA farms in central Kansas with continuous data from 2004 to 2008.
- To be classified as a “no-till” farm, a farm had to utilize a no-till production system for all of their crops.
- Number of Farms
 - 77 no-till farms
 - 234 mixed tillage farms

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Whole-Farm Data Definitions

- Value of Farm Production
 - Sum of livestock, crop, and other income computed on an accrual basis minus accrual feed purchased.
- Net Farm Income
 - Return to operator's labor, management, and equity (net worth) computed on an accrual basis.
- Less Tillage Index
 - Computed by dividing herbicide and insecticide cost by total crop machinery cost which includes repairs, fuel, auto expense, machinery and equipment depreciation, crop machine hire, and an opportunity interest charge on crop machinery and equipment investment.

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Whole-Farm Data Definitions

- Profit Margin
 - Computed by dividing net farm income plus cash interest paid minus opportunity charges on operator and family labor by value of farm production.
- Asset Turnover Ratio
 - Computed by dividing value of farm production by total farm assets.
- Technical Efficiency Index (ranges from 0 to 1)
 - Farms with an index of 1 are using the best available technologies and producing on the production frontier.
- Cost Efficiency Index (ranges from 0 to 1)
 - Farms with an index of 1 are producing at the lowest cost per unit of aggregate output.

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Comparison of Tillage and No-Till Farms, Central Kansas

Farm Characteristics	No-Till	Mixed Tillage
Value of Farm Production	\$468,629	\$324,832
Net Farm Income	\$108,467	\$71,510
Total Acres	2,173	1,780
Less Tillage Index	0.173	0.115

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Comparison of Tillage and No-Till Farms, Central Kansas

Financial Ratios and Efficiency	No-Till	Mixed Tillage
Profit Margin	0.1676	0.1233
Asset Turnover Ratio	0.4070	0.3199
Cost Efficiency	0.662	0.605
Note: Technical Efficiency was not significantly different between the two groups of farms.		

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Comparison of Tillage and No-Till Farms, Central Kansas

Income Shares	No-Till	Mixed Tillage
Feed Grains	0.2303	0.1805
Oilseeds	0.1687	0.1059
Small Grains	0.2271	0.3071
There was not a significant difference between hay and forage, beef, or dairy income shares.		

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Comparison of Tillage and No-Till Farms, Central Kansas

Cost Shares	No-Till	Mixed Tillage
Labor	0.1702	0.2299
Seed	0.0663	0.0534
Chemicals	0.0797	0.0552
Capital	0.5626	0.6695
There was not a significant difference between livestock and fertilizer cost shares.		

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Summary

- Current research efforts focus on the examination of the impact of tillage practices on cost efficiency, profitability (enterprise or crop rotation; whole-farm), and water quality.
- Other research efforts include technical and economic benchmarking, economies of scale, and divergence in farm performance.

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Contact Information

- Contributor Site – Langemeier
 - www.agmanager.info
- E-mail
 - mlange@agecon.ksu.edu
- Kansas Farm Management Association
 - www.agmanager.info/kfma

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Kansas Farm Management Associations

