



Measuring and Monitoring Financial Business Performance: Potential Impacts of Adopting Carbon Sequestration Practices on Individual Operations



Duane Griffith - Montana State University - griffith@montana.edu – (406) 994-2580

Introduction:

Many producers have already adopted best management practices to enhance carbon sequestration. For these producers, the marginal cost of participating in developing carbon markets will be relatively small.

Producers adopting no-till systems on Great Plains dryland operations are moving away from conventional drills and using air drills. This seemingly simple change usually requires changing a major portion of the machinery complement, so the entire machinery complement is "matched." The investment costs of this equipment can be considerable. While the purchase price of this equipment can be significant, research indicates that due to size and efficiency considerations, machinery costs per acre actually decrease. (Table 1) However, increased costs of chemical applications in a no-till cropping system offset costs reductions in machinery.

Estimating economic and financial costs of best management practices:

Tools for individual producers to analyze the economic and financial implications include whole farm enterprise budgeting and detailed financial statements. Enterprise budgets estimate income and expenses using economic cost calculations. An example is the opportunity costs of capital investments in machinery. The opportunity costs is usually referred to as interest in an economic analysis. Individuals should consider their opportunity costs but they must still pay cash principle and interest payments for financed capital assets. Principle payments are not included in economic calculations, but require a cash outflow from the operation for financed capital assets. In short, these two types of analysis generate two different sets of numbers.

Results:

Information used to develop the financial summary was taken from the enterprise budgets. Additional information such as asset values and liabilities, with a debt load (approximately 20%) were assigned to the operation. Withdrawals for family living are also considered in the financial analysis. Results shown in Figure 1 indicate the conventional till operation is profitable. Net Business Income, \$36,215, and Net Income after taxes, \$33,215, on the Income Statement was still adequate to cover owner withdrawals for family living (\$30,000 on the Cash Flow Statement), cover debt repayment needs (Cash Flow Statement) and provide for a small growth in net worth (\$3,215, on the balance sheet summaries).

The economic cost estimated in Table 1, \$20,587, of changing from a conventional to a no-till system was adjusted for a financial analysis and are shown in the Cash Flow Statement as \$26,000 under "Other Cash Business Expense." The change in the financial condition resulting from this increase in expenses indicates the long term stability of the operation may have been jeopardized. The Cash Flow Statement now indicates a negative cash flow, which generates an "Operating Loan Carryover" balance of \$5,045 on the ending Balance Sheet. Net Business Income is reduced to \$10,215 (Income Statement). The Balance Sheet indicates a negative net worth change of \$19,785. This negative change is the result of profitability falling below a level that meets the needs for principal payments on capital assets and family living withdrawals. While lenders will continue to work with this operation for a long time, as the operating loan carryover continues to build and net worth declines, this operation will become unviable unless others changes are made, off-farm income for example.

	Tillage System Utilized		
	Conventional	Minimum	No Till
Operating Inputs (Variable Costs)			
Additional Seed for Min Tillage	\$0	\$1,305	\$0
Other	\$0	\$6,350	\$0
Chemicals per summary data	\$0	\$578	\$38,556
Other	\$0	\$2,646	\$0
Additional Fertilizer for min tillage	\$0	\$11,745	\$0
Fertilizer Spreader Rental	\$1,800	\$0	\$0
Machinery Operating Cost	\$58,867	-\$6,174	-\$12,469
Calculated Interest (Opportunity Cost)	\$4,669	\$1,224	\$2,348
Total Operating (Variable) Costs	\$65,336	\$17,675	\$28,434
Ownership (Fixed) Costs			
Real Estate Taxes	\$9,000	\$0	\$0
Real Estate Insurance	\$1,125	\$0	\$0
Depreciation on real estate	\$0	\$0	\$0
Machinery Ownership Costs	\$71,420	-\$3,026	-\$7,577
Interest (Opportunity Costs)	\$107,896	\$0	\$0
Total Ownership (Fixed) Costs	\$189,440	-\$3,026	-\$7,577
Total Cost (Operating + Ownership)	\$254,776	\$14,649	\$20,857

Table 1. contains enterprise budgeting results from a 4500 acre conventional tillage operation and the estimated changes that would occur if moving to a minimum or no-till operation. These results indicate that while machinery costs per acre decrease, other input costs more than offset these decreases.

Conclusions:

- Producers must follow a rigorous process to measure the economic and financial implications of adopting tillage systems that sequester carbon.
- Producers that have already adopted best management practices for carbon sequestration can use this analysis process to measure what they want to ask as compensation for participating in carbon contracts.
- Enterprise budgeting uses economic estimates of income and expenses. Financial analysis incorporates both cash income and expenses and cash inflows and outflows that are neither an income or an expense but can have a significant impact on the firm's ability to survive.

Figure 1. is a summary of the financial analysis of the 4500 acre farm in the triangle area of Montana. Columns highlighted with a light blue background show the financial results from adopting a no-till system and are compared to the numbers in the column immediately to the left. Numbers of special interest in the blue columns are highlighted with a white background.