

“PNW Grower Experiences in Implementing Managerial Accounting”

*by R. L. (Dick) Wittman
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Introduction

This publication summarizes grower experiences gained from test-driving implementation of a managerial accounting system. It covers how and why the project was undertaken and the teaching and learning process that took place while trying to implement these concepts. The publication also summarizes conclusions from farmers and teaching staff on the importance of this concept, how it can be taught, and strategies for expanding adoption of the concept in the agricultural industry. This publication is structured to aid:

1. Farm managers in learning more about the concepts of managerial accounting and how it can be implemented, and
2. Practitioners (accountants, consultants, and educators) who are interested in helping clients adopt professional managerial accounting systems.

Background

Few farmers understand cost structures and the strategic decisions that differentiate successful farms from those struggling financially. Traditional enterprise analysis hasn't provided answers growers need to determine what decisions are contributing to success or failure. Ratio analysis is not well understood and seldom connected to goal setting and decision-making. Growers also struggle with identifying links between financial analysis and strategic decision making. In 2001 the Farm Financial Standards Council (FFSC) addressed these challenges by developing guidelines for implementing professional managerial accounting systems its top priority to address these challenges.

In early 2002, a collaborative group of innovative producers, researchers and educators called the Clearwater Direct Seeders (CDS)¹ initiated a grant request for a training program to test-drive implementation of new managerial accounting guidelines under development by the FFSC. Members of the CDS were interested in improving skills in management information system design and strategic analysis. The grant project was not designed to simply teach farmers how to keep records. The goal was to drive to the heart of how a farm business should be managed in the new millennium. The manager of a family business today is often hiring or partnering with a team of highly skilled professionals. He or she must delegate authority and develop a management information system to give responsibility center managers quality feedback. The project's goal was to take producers beyond minimum record keeping required for tax preparation and arranging credit. Managerial accounting provides a vehicle for farm managers to dig below the surface of the business to determine which business decisions are leading to success and what activities or strategies need to be changed to remain viable.

¹ The CDS is a regional information exchange group consisting of 40 farmers plus educators and researchers from 10 counties in Idaho, Washington and Oregon, who have been engaged in the transition to direct seeding. After several years of meeting, the group has become an invaluable forum for accelerating the learning curve for adopting and refining farm management practices tailored to local environments. Meetings involve grower PowerPoint presentations to share production and management experiences as well as outside experts on various farm management issues. This group serves as a model for other information exchange groups forming in the Northwest.

This project was also designed to provide a feeding mechanism to regional educational efforts to improve farm management skills in the PNW. In retrospect this group also became a key resource for the FFSC Managerial Accounting Task Force; the CDS test-driving experiences provided many insights that had considerable influence on the final content and design of the Council's MA guidelines and development of national teaching strategies.

Funding and Project Administration

Funding for this project was provided by an RMA Risk Management Education Grant. Dick Wittman, Principal in Wittman Consulting Services and also a member of the Farm Financial Standards Council Task Force on Managerial Accounting, served as Project Leader. Other collaborators and assistants in the project included: Jon Farquharson, Farm Management Instructor, Blue Mountain Community College; David Barton & Ken Hart, University of Idaho Ag Extension faculty; Nathan Riggers, farmer; and Cori Wittman, Management and Human Resources student and project assistant.

Goals of the Project

The goals of the participants in this project were to:

- Become familiar with new initiatives and guidelines being developed by the Farm Financial Standards Council to implement professional managerial accounting systems in farm business operations
- Gain an improved understanding of the linkage between financial analysis and strategic decision making
- Increase the use of ratio analysis and the Dupont Model to evaluate whole farm business performance, and to assess the impact of alternative strategic shifts under consideration to improve operational efficiency, capital asset management, and use of debt leverage
- Become familiar with a broad range of technical issues and concepts that must be understood before managerial accounting can be successfully implemented
- Improve the design of record keeping and management information systems to mirror the management structure of the farm and allow performance of major responsibility centers to be tracked more clearly
- Improve ability and methodology for determining cost of production
- Gain access to a database of peer group production and financial performance data that allows benchmarking and performance comparisons.
- Be better positioned to optimize strategic decisions in such areas as: risk management/insurance; leasing vs. buying or joint-venturing, crop selection/rotation decisions, crop/pest management decisions; and f
- Facilitate marketing decisions based on a well-defined cost of production.

Chronology of Significant Activities & Milestones during the Project

The project began in early 2002 and concluded with activities in mid-2004. Key steps in the grant project included:

- January 2001 – Joint presentation on *Integrating Production and Financial Performance* to 800 growers at PNW Direct Seed Conference by Wittman, Riggers, and Craig Walters sparked grower interest in making performance measurement the top

priority for 2002/2003 CDS meeting agendas

- Spring/Summer 2002 – grant preparation and approval by RMA
- Summer/Fall 2002 – assembled and trained project team; built grant administration plan
- September-November: Previewed MA Project at Idaho Grain Producers Convention seminar & Clearwater Direct Seed fall meetings to recruit grant program participants
- December 7, 2002 – Conducted Workshop #1 for CDS MA Grant Participants. This covered: introduction to MA Project; building a foundation for MA by reviewing basic financial analysis concepts; preview of core concepts of MA and case studies/guidelines to be used for guiding implementation. Workshop concluded with grower assignments to be completed in preparation for Workshop #2.
- January 10-13, 2003 – Presented grant project and grower experiences as part of Financial Analysis segment at the TEPAP Ag Executive Program, Austin, TX.
- February 01, 2003 – Conducted Workshop #2. This workshop covered implementation of technical concepts underpinning MA; case studies and procedures for handling unusual transactions; computer software simulation of *Spread-N-Grow Case Study* (a combination diversified crop and custom farming operation developed to lead growers through a real-life example of how to set up a Management Accounting system); reviewed special templates designed for growers to prepare cost/profit centers and reviewed procedures for growers to begin preparing data sets for comparative analysis and identification of strategic shifts to improve financial performance.
- March-Dec, 2003 – Grower test group developed Managerial Accounting data sets using standardized formats provided by facilitators.
- August, 2003 – Grower implementation experiences from the RME grant project were shared at FFSC Summer Symposium in St. Louis. This event marked a noticeable increase in interest nationally among accounting professionals, educators and farm business management instructors for finalizing guidelines for adopting MA.
- November 2003-Feb 2004 – Growers in CDS Breakfast Group identified Precision Farming Topics and measuring performance of cropping systems strategies as the main priority for the winter meeting schedule. In the concluding session growers reviewed specific strategies for improving cost management. This session reflected a significant mind-shift in problem solving process as result of the MA training experience.
- March 2004 – Presented results of MA experiences and comparative data from grower profit/cost center summaries at the FFSC Annual Meeting.
- June 2004 – Developed final conclusions from project and summarized results in preparation for printed publication.

Building a Foundation for MA – Skills Assessment and Review of Fundamental Financial Management Concepts

Before moving into technical concepts associated with Management Accounting, farm participants were led through a number of preparatory steps designed to: (1) assess skill levels and backgrounds, and (2) acquaint growers with basic data about their operations that would later have significance in implementing MA. To assess management skill levels growers were asked to complete a Farm Management Proficiency Test. This provided an excellent tool to identify “what we don’t know...or once knew, but have forgotten how to do and are not implementing now.” The responses from the Farm Management Proficiency Test closely

tracked similar scores obtained from administering this test to grower groups throughout the U.S. and Canada. The adoption of common managerial practices was at a very low level as reflected by the following scores:

- 11% define goals and have a strategic plan in place
- 22% conduct performance appraisals regularly
- 33% have written job descriptions or formal division of responsibility in place
- 39% have farm records that are shared on a regular basis with business partners
- 33% have balance sheets that reflect cost and market comparisons and address deferred tax on the difference between cost and market
- 22% calculate cash and accrual net income and track performance of profit and cost centers on at least an annual basis
- 6% calculate key financial performance ratios and review them annually
- 28% project inventory to be marketed in advance of marketing periods
- 17% establish marketing targets based on projected breakeven points, calculated cost of production and cash flow requirements

The participants humbly acknowledged they got a flunking grade in many key aspects of financial management. This realization sparked increased interest in improving (or relearning) skills in each of the above areas as the grant project helped them to make connections between management strategies and financial results.

Compensation Summary and Cost of Production Survey Form

Participants also completed a compensation worksheet to assess total cash and non-cash compensation the farm was paying for the principal operator’s labor and management. This analysis is a critical data element that becomes valuable in analyzing overhead costs. Results from this exercise tracked closely with a number of national surveys conducted using this same form. The following table summarizes the results of these surveys:

	Low	High	Average
Total Taxable Compensation	\$17,327	\$40,000	\$24,841
Total Non-taxable Compensation	\$8,800	\$57,084	\$27,798
Total Value of Compensation	\$32,800	\$81,000	\$52,639
% of Compensation – Nontaxable	23%	74%	53%
Average # of Days Worked/Year	270	300	290
Average # of Hours Worked/Year	3,000	3,000	3,000
Average Compensation/Day*	\$113.10	\$279.31	\$181.51
Average Compensation/Hour*	\$10.93	\$27.00	\$17.55
<i>* Assuming 290 days & 3,000 hrs/year</i>			

The number of growers who furnished data was not large enough to be statistically significant. However, the process of going through the survey generated an interesting response from the

participant group, many of whom had never measured their total compensation or how it was split between taxable and non-taxable components. This led to the first of many interactive discussions about strategies to improve cost efficiencies based on the knowledge of what these costs really were. Also enlightening was the analysis of cost per day or hour. Participants concluded that this was extremely valuable data for making decisions about in-sourcing versus out-sourcing labor intensive activities. If a farm manager can hire someone at \$10-12/hour to perform labor that the manager is costing the business \$27.00 to perform, there is potential for significant cost savings assuming the manager is fully employed.

Participants also completed a cost of production survey for all crops grown. Most attending the seminar confessed that any entry on this survey would be a guess at best. At the conclusion of the first seminar, the participants confirmed that even if they had calculated this information from data on their farms, the knowledge they gained from this first seminar revealed the data would have been erroneous due to the manner in which they traditionally organized enterprise data. This conclusion was similar to the responses at a Grain Producers convention a month before the first grant seminar. At the convention only 3 registrants of 147 were willing to write down their best estimates of costs per unit to produce each of the major crops they had harvested 2-3 months earlier. After a three hour program on *Managing Cost Structures – a Primer Course on Managerial Accounting*, the three individuals who ventured a guess admitted their numbers for cost of production were seriously flawed.

Using Financial Ratios, Trend Analysis and the Dupont Model as a Foundation for MA

Traditional financial analysis has focused on whole farm business analysis. This gives investors and lenders an indicator of overall business performance. But it doesn't reveal anything about what segments of the business are contributing to success or failure. It also leaves the farm manager at a loss as to how changes in strategies by individuals responsible for managing sub-segments of the business influence total business performance. In the opinion of this author, a key reason that growers don't engage in financial analysis is that they don't see the direct linkage between performance measurement and identification of operational or strategic shifts that can improve performance. (Note that only 6% of the group indicated they reviewed financial ratio measures on an annual basis.)

To prepare the group for moving into basic concepts of MA, the first seminar included an overview of basic financial ratios and five year trend analysis. The primary reference document used for this exercise was a booklet entitled *Understanding Key Financial Ratios and Benchmarks*². The group then worked through a case simulation exercise using the Dupont Financial Model. The Dupont Model does an excellent job of tying together the inter-relationships of various financial ratios and demonstrates how operational or strategic changes can influence four primary indicators of financial performance: asset turnover ratio (ATR); operating profit margin (OPM); return on assets (ROA); and return on equity (ROE).

Participants reviewed a base case and some alternative scenarios with resulting performance ratios computed in the Dupont Model format (see Exhibit I.a and I.b). The group was then

² Produced by Northwest Farm Credit Services and written by Dr. David Kohl and Troy Wilson. This publication highlights the "Sweet 16" financial ratios adopted by the Farm Financial Standards Council.

divided into small groups and each was given the assignment to identify a specific strategy to improve the business. They then attached numerical values to their strategic shift proposal and entered the revised numbers in the model to see how the four performance indicators changed. A wide array of strategies was simulated. The following illustrate some of the options simulated:

- a reduced input strategy for dealing with a drought contingency situation
- adding a custom no-till business to an existing operation
- pursuing an interest rate re-pricing strategy to re-price all term debt
- two neighbors sold older combines and shared ownership of a newer, more efficient machine

Participants were surprised to see how much variation there was from one idea to another in causing changes in financial performance. This exercise motivated many in the group to go back home and prepare trends and financial ratio analysis of their own operations. A key lesson learned from these combined exercises is that decisions that improve both operating profit margin (operating efficiency) and asset turnover ratio (capital asset use efficiency) have a compounding impact on improving return on assets and return on equity.

For example, a case study using actual farm data was conducted with a local grower to assess the impact of converting from conventional to direct seeding and instituting several other strategic shifts to improve efficiency. The information presented in a format consistent with new FFSC managerial accounting guidelines revealed the following comparisons in financial performance:

Financial Ratio	Conventional Tillage	Direct Seed System
Asset Turnover Ratio	.50 to 1	1.05 to 1
Operating Profit Margin	.13 to 1	.16 to 1
Return on Assets	6.5%	17.1%
Return on Equity	3.9%	22.6%

The case study observations motivated participants to search for high impact strategic shifts; this search continued throughout the next two years of grant project interaction.

Fundamental Concepts of Managerial Accounting

The group was then ready to tackle the technical concepts of managerial accounting. The following technical issues and concepts were covered in multiple workshops and one-on-one help sessions:

1. Types of performance analysis – cash, accrual, and economic
2. Defining unit cost of production (UCOP) and understanding why it is important for establishing a basis for inventory valuation and marketing goals
3. Standardizing definitions and terms: direct versus indirect costs; variable versus fixed costs
4. Identifying manageable segments – how do you define which profit and cost centers to track in a farm business?
5. Proper design formats for profit and cost center reports.
6. Capture periods for cost centers (What periods of time will be appropriate to capture transactional activity for specific centers of management activity; and how is this

impacted by production cycles that can be as short as a few months in a feedlot to as long as several years in a perennial crop or orchard situation?)

7. Handling unusual transactions that can seriously distort cost of production if improperly handled in the transactional accounting system. Is a transaction addressing revenue, cost, revenue adjustment, or cost adjustment?
8. Transfer pricing – what value should we use when inputs like raised crops are used for seed or fed in a livestock operation? What price or cost should be used in intra- and inter-entity transactions?
9. Alternatives for allocating indirect costs (i.e. overhead)
10. Proper procedures for valuing inventory
11. Handling equipment gains/losses, especially when tax and economic depreciation differ significantly

Standardized Cost and Profit Center Report and Inter-relationships

One of the early challenges for the FFSC was agreeing on a standardized format for the design of profit and cost center reports that should result from a managerial accounting program. Exhibit II includes a pro forma example of the Task Force’s recommended report format. Regardless of how growers accumulate data or what software program is used, this standardized report can be used as an effective guideline for designing reports to analyze the cost and profitability of various business management segments.

There are four general categories of cost centers, also known as responsibility centers or manageable segments: Support Centers; Production Cost Centers; Sales, General & Administrative (SGA); and Finance. The project used a Case Study called *Spread-N-Grow* to work through many of the concepts of the project. Exhibit III contains a flowchart showing how the various cost centers in *Spread-N-Grow* flow from support cost centers to production costs and ultimately through to either cost of goods sold in the Profit Center Reports or into Inventory Value at cost.

Grower Experiences in Completing Data Sets in MA Format

While the grant envisioned 20-40 people being involved in the formal workshops, it was expected that only a small portion of the participants would have the skills, financial information and commitment to actually work through preparation of actual MA data sets. Six growers actually completed the pre-designed set of MA worksheets distributed at the second workshop. All six growers were diversified dryland crop farmers using direct seeding.

The group was very diverse in size, rotational crops grown, methods of accessing equipment, leased versus owned real estate, and operating styles. The number of growers raising each crop type is as follows: Winter wheat (6), spring wheat (5), barley (4), canola (4), dry green peas (3), lentils (3), Austrian Winter peas (1), bluegrass (3), alfalfa (1), flax (1), and oats (1). Each grower averaged 5.7 crops per farm. Farm size ranged from 1,100 to 4,100 acres (average 2,449 acres).

The concepts of cost centers, profit centers and their inter-relationships were grasped quickly by the group. Most participants also had little problem assigning direct production costs (seed, fertilizer, chemicals, and crop insurance) to the appropriate production cost centers. The biggest

challenge came in allocating many of the overhead costs—especially where unusual transactions were involved. The project group reviewed a discussion draft on “**Handling Unusual Transactions**” and went through the mechanics of recording a variety of these unusual transactions in a financial accounting system using a Case Study Worksheet developed for the project. The best way to illustrate some of these challenges in handling unusual transactions is to take some of the specific responsibility center types and describe how growers handled data associated with select cost items.

Samples of the consolidated **Equipment Support Cost Center (ES)**, **General Farm Overhead Cost Center (GFOH)**, **Land Cost Center**, **Sales, General & Administrative (SGA)**, and **Finance** are included in Exhibits IV(a) through IV(e). Readers are cautioned to not draw significant conclusions from the actual numbers contained in these examples. The example represents only one year of data; the group size is very small; and there were significant differences in the way growers recorded data based on their limited understanding of how to assign information to one responsibility center or another. More important is to look at the format of the reports and the learning experiences that took place as growers worked through the process of organizing their data in this format.

The Equipment Support center is a very useful report to measure the impact of equipment procurement, operations and management strategies. All six growers had some form of Cost Recovery Revenue (custom seeding and farming, trucking, equipment rental, etc.) Three out five growers allocated a portion of their **General Farm Overhead Costs (GFOH)** (primarily labor) to Equipment Support. Others allocated the full amount of costs in GFOH directly to production cost centers. Allocating some of the labor to equipment support makes sense as a significant portion of labor outlays is often operating or maintaining equipment.

There were considerable differences in cost elements in the equipment support center depending on whether equipment was leased, rented, or owned. Also, some growers were inclined to place financial lease or equipment loan payments in this center as a production cost. The principal or capital portion of these payments is not an expense and should not be included in production costs. Of particular interest was the wide range in total cost of equipment support from grower to grower—costs ranged from \$25.24 to \$74.95 per acre. This data provided an invaluable baseline for growers to start re-examining alternative strategies for cost containment in the equipment arena.

Another challenge growers face is, “How do we handle government payments as well as other non-farm related income or expense? Non-commodity linked payments and other non-farm income should be aggregated in an **Other Income/Expense Center**. The sum of all other income & expense amounts can then be allocated for informational purposes to the various profit centers after the net margin calculation is made without distorting cost of production or revenue generated per base unit (acre) or production unit (i.e. bushel). On the other hand, commodity linked payments such as Loan Deficiency Payments and seed premiums are considered truly commodity linked revenue and would be appropriately included in the specific **Crop Profit Center Report** under Commodity Revenue. Payments received for cost share related to conservation programs are a “cost reduction” payment that would be included as “Cost Recovery Revenue” in either the **Equipment Support Center** or the **Land Cost Center**.

The **Land Cost Center** is a relatively new concept. Opinions still vary on whether the ideal approach is to have a Land Investment Center or a Land Cost Center. In this project growers tracked all costs associated with leasing, ownership, and maintenance of land and improvement in a Land Cost Center. This aggregates actual transactional costs related to land in one place. The analyst can then do opportunity cost or economic analysis once an actual accounting cost is defined.

The **SG&A** and **Finance Cost Centers** showed considerable variation from grower to grower. SG&A is a relatively new concept; many growers think they don't have much cost in this area. As businesses grow and management teams start truly analyzing how much time is spent on management, professional fees, office support, etc. they may find this cost to be a significant factor in the overall cost of production.

Growers completed a **Production Cost Center** and a **Profit Center** for each commodity raised on the farm. A sample of both a **Production Cost Center** and a **Profit Center** for Winter Wheat and Spring Lentils is included as Exhibits V(a) through V(d). These reports were all prepared after completion of the production and marketing cycle, so there was no remaining inventory. Consequently, total cost of production sold in the Profit Center reports was the same as the total production costs shown in the cost center reports. In a real-time managerial accounting system, the Work-in-process Inventory Accounts and the Finished Goods Inventory Accounts would show the accumulated cost value associated with all inventory still on hand. As inventory is sold, only the revenue and the cost of goods sold for the sold units would be reflected in the Profit Center Report.

Growers readily acknowledged that it is dangerous to look strictly at margins in the profit center reports for each commodity. Typically, winter wheat is the high margin crop, while alternative crops such as barley, peas, lentils, and canola often struggle to show a margin. It is critically important to look at the rotational mix in the **cropping system**, as well as the production costs and margins in each crop. Synergies and complementarity that occur between crops raised in a rotational system often mask the true costs and benefits that are attributable to a specific crop. For crop mix planning, performance needs to be measured on both a single crop basis as well as on a weighted average reflecting the rotational mix.

Integration of Physical and Financial Performance – a Core Concept of MA

One of the core concepts of MA is that the manager is trying to integrate physical production activities and financial performance. Managers want to know how much production they have to sell and the per unit costs that must be exceeded to make a profit. To illustrate this integration concept, examine the winter wheat cost center. Cost data is shown on both a cost per acre (base unit of production) as well as a cost per bushel produced (marketing unit). Per acre calculations are useful for budgeting, input cost planning, and measuring the efficiency of input cost procurement. These numbers are seldom benchmarkable to a neighbor as there may be significant differences associated with soil types, nutrient levels, pest management challenges, and geographical risks (i.e. rainfall and hail experience impacts on insurance rates).

Costs per bushel are more useful for setting market targets and setting up crop insurance levels. Since we are all competing in the world arena on a cost basis, the per bushel cost is a number we

will ultimately have to keep competitive or fail. Have you ever been asked by your insurance agent, “What is your investment per acre or per bushel?” This number is a guess at best for most growers. Examining total cost compared to a peer group may be useful. But trying to compare cost segments like overhead, equipment support, finance, and land costs could be very confusing if there are significant differences in the way land and other resources are accessed (rented versus owned; outsourced versus in-sourced.)

Notice in the MA reports that only production available to sell is counted in arriving at cost per bushel. A practice often followed by growers is to “gross up” all production as revenue, including the landlord’s share (using an imputed economic price) and then “imputing” a land rental equal to the value of the landlord’s production in the expense section. Following this practice compromises the ability to arrive at an accurate production cost for the quantity of commodity the grower actually has to market.

Key Conclusions from Grower Efforts to Implement MA

The following conclusions were reached jointly by project administrators and grant participants.

Conclusion #1 – Implementation is a bigger job than most farmers realize; it will often require a Chief Financial Officer background and major revisions in software design and implementation.

Few farmers have an adequate foundation, either in skill base or proven experience in day-to-day practice to implement management accounting. Only 25-30% of farmers do ratio analysis, make cash to accrual calculations or prepare cost and market value balance sheet comparisons. Many participating in these training sessions acknowledge they have learned these concepts at some point in life. However, day to day farming duties, infrequent application of the concepts, and lack of experience in actually using the information to make better decisions has resulted in many simply putting these skills in the mental closet.

Farm managers have been exposed to whole farm business analysis and have had varying degrees of success continuing to do this on a fairly regular basis. Skills required to examine performance at individual cost or profit center level requires even more sophistication. Many concluded that full implementation of a managerial accounting system will likely involve:

1. Developing a skilled Chief Financial Officer (either internally on staff or outsourced)
2. A major change in accounting software design and implementation.
3. Re-training on fundamental financial analysis concepts.

Conclusion #2 – Management Accounting system design should mirror the business management structure.

A basic premise in management accounting is that management has a desire to measure performance by manageable segment, which really means measuring the people who oversee these segments. For this to happen:

1. The business has to have clearly defined business areas of responsibility
2. People in the business (particularly division or department managers) must have a clear identification of the roles and responsibilities for managing specific segments of the business; and

3. The design of the management information system and managerial accounting process has to fit with the people and responsibility assignments.

Growers attempting to design a MA system often realize there are major weaknesses in their basic business management structure. Particularly, accountability assignments are poorly delineated, or there is no correlation between areas individuals manage and analysis reports coming out of management reporting systems. After understanding the importance of having people, accountability and the reporting process all in alignment, participants are well positioned to go back to the drawing board and overhaul the management structure before trying to implement MA report design. This is a teachable concept that needs more emphasis in farm management training and educational programming.

Conclusion #3 - Peer group benchmarking is important...but it is only a secondary benefit of MA. The real value in benchmarking lies in comparison against oneself in terms of past and future performance.

Benchmarking is often billed going in as a key reason for implementing a managerial accounting approach to performance reporting. In practice, benchmarking loses its attractiveness as producers get into the process. Producers have significant variations in business operating structures, enterprises, geographical environments and methods of operations. Even highly homogenous groups like the CDS, who are attempting to implement a similar direct seed cropping system, have significant differences in each of the above areas that make much of their performance data (other than bottom line data) non-comparable.

The real value of MA arises, first, in a producers improved ability to more clearly analyze what components come together to build the total cost structure of the key commodities grown. And second, the grower now has baseline of performance data to assess how current performance compares to:

1. His or her own historical data under different operating strategies, as well as
2. How operating or strategic shifts in the business can enhance performance in the future.

For example a five year historical comparison can point out clearly how strategic shifts like growing the business size, sharing major equipment ownership or moving to reduced or no tillage systems is impacting General Farm Overhead Cost and Total Equipment Support Costs. In each of these scenarios the direct input costs per acre or production unit (seed, fertilizer, chemical, and crop insurance) probably do not change appreciably. It's the indirectly allocated costs like labor and equipment support that show big shifts in operating and capital use efficiency as different strategies are employed. This point leads directly into the next conclusion.

Conclusion #4 – The ability to analyze labor, equipment and other indirect overhead costs is one of the KEY Benefits of MA.

When analyzing production cost centers of competing farmers, the cost center report design segregates *direct* and *indirect production costs*. It is not uncommon to see the direct costs fairly similar for the same commodities. Most progressive farmers in a competing area have milked most of the savings that can be had out of fertilizer, chemical and seed input costs through self-service, internet or tailgate purchasing, precision farming, and other cost savings strategies. It is

the *indirect costs* where the real differences in production costs stand out. This is also oftentimes where the secret is unlocked to understanding where a serious problem exists in farm's economic viability.

For example with shrinking margins and rising family living costs per acre, a farm may have reached the point where it cannot sustain a family unit profitably. Solutions may include farm growth, merging with a neighbor, or covering some of the overhead burden by seeking off farm income. The exercise of completing the Compensation Summary referenced earlier becomes invaluable at this point. On a 1,000 acre farm if total compensation for the principal operator is \$60,000, this amounts to \$60.00/acre overhead burden for the primary labor/manager. This operation may be competing with a neighboring partnership operating a 4,000 acre farm where labor and management overhead per acre is \$40.00—a \$20/acre competitive advantage. This doesn't even take into consideration other economies of scale that occur in equipment support costs due to increased utilization per dollar of capital investment.

One of the unfortunate negative side effects of improving technology is that it makes the productivity of the innovative producer more efficient allowing more acreage to be farmed with the same equipment. Or the same equipment can farm the existing unit in a fraction of the time leaving the operation in a less than fully employed status. Unless the operation grows, seeks out custom work or shares capital with a neighbor, it gradually falls behind in competing with others who are continually keeping the "production factory" operating at or near full capacity. Today we have a lot of "part-time farms" due to this technological revolution who don't realize what is happening in their overhead cost structure. They know the economics aren't there...but they don't know why. The common solution is to lobby for higher prices or subsidies to fill the void. Unfortunately, global competition and declining public support for farm subsidies will likely force these operations to either make strategic shifts to lower production costs or face a day of reckoning in the form of retirements, mergers, or sell-outs.

There were two very notable commentaries during the CDS grower meetings related to this project. One farmer in the data developer group made the observation that this exercise helped him to isolate where his competitive disadvantage existed. "Completing the MA report formats confirmed my thoughts that my fixed costs are too high for the number of acres that I farm...I am also making some changes based on the Dupont Analysis." A second farmer was quite shocked when he saw the change in performance achieved by a neighboring farmer after a long term transition to direct seeding. "When I saw their numbers, it scared me! No. 1, I couldn't get to those numbers if I wanted to. And No. 2, I would be afraid of what they'd be, if I could!" This individual later acknowledged that even if he didn't have the skills to do this kind of analysis, he was going to hire the talent necessary to assure he could determine exactly what it cost to produce a bushel of wheat!

Conclusion #5 – Cost management strategies often have greater opportunity for improving financial performance than revenue enhancing strategies.

Farm managers have historically looked to revenue enhancement to improve profitability. While there will continue to be opportunities to do this through genetic improvements that have yield or value-added traits, this cow has been milked 'til it is almost dry. The real opportunities for improving farm viability often lie in managing the cost side of the business. Focusing on whole

farm business analysis, where the bottom line was the only indicator doesn't tell us much about what problem is limiting performance. Separating cost structures into manageable segments facilitates identifying where the problems and opportunities are.

This conclusion was driven home clearly during the Dupont Model strategic simulation exercise. Participants were surprised that a strategy that decreases operating costs 10% improves ROA and ROE by a significantly larger margin than a strategy that grows farm size or throughput by 10%. To study these differences review the Dupont Model Simulation Exercise in Exhibit I(a). Compare the Baseline Case A versus Case B (increased throughput 10%) and Case C (decreased operating costs 10%).

Conclusion #6 – Proponents of MA Adoption need to define the real carrots to Managerial Accounting that will motivate producers to implement the concept – linking performance analysis to strategic improvement and building realistic inventory asset values.

...The carrot is NOT the erotic satisfaction of doing cost and profit center reports and the joy of learning how to handle WIP (Work-in-Process) accounting procedures! As revealed in the previous two conclusions, the first real carrot has to do with linking performance analysis and strategic change. Creating the ability to do performance analysis by management segment positions the firm to identify viable strategies that can enhance performance in those segments of the business. From an educator standpoint the Dupont Model is one of the most effective tools for demonstrating the connectivity of performance and strategic change.

A second major benefit lies in the capacity to build realistic inventory asset values on the balance sheet through Work-in-Process Accounting. One of the worst deficiencies of cash accounting systems, particularly for commodity producers, is that the month to month income statements and balance sheets are virtually meaningless for interpreting financial performance. By “expensing” input costs instead of recording these transactions as “investments in production cost,” the amounts reflected each month for Net Income and Net Worth bear no resemblance to reality. Under these systems farm managers only get to a meaningful income statement and balance sheet one time per year when cash to accrual adjustments are made and ending inventories are booked—usually at market value, not cost.

Table 1 shows a 12-month scenario based on a typical dryland crop operation. Note how net income and net worth are very erratic, but generally in a declining mode through July. Early in the year, investments are being made in manufacturing a new crop commodity, and the farm is also continuing to market grain carried over from the previous year. New crop input costs (which show no asset value on the balance sheet) substantially exceed values of old crop sold, leaving YTD net income in a steady decline. Some modest new crop sales occur in August through October as harvested crops are delivered under contract. November involves large outlays for fall crop fertilizer and interest on term loans. This sends net income to a year-to-date deficit, and net worth goes plunging well below the beginning of year position. Imagine what the banker is thinking by November: “This farm has lost 68% of its net worth...I better call in all my loans, quick!” Then *voila!* In December a flurry of crop sales has the farm operation ending up with a substantial net income for the year, and net worth ends up with a healthy 26% increase, based on a cash and inventory adjusted approach to arriving at accrual net income.

Table 1 - Monthly Illustration of Net Worth and Net Income - Cash & Inventory Approach

Month	Monthly Net Income	Year to Date Net Income	YTD NI as % of Tot Yr NI	Month End Net Worth	% Change from Beg NW
Beg of Yr				\$ 376,334	
January	\$ 22,419	\$ 22,419	23.6%	\$ 398,753	6.0%
February	\$ 25,205	\$ 47,624	50.1%	\$ 421,959	12.1%
March	\$ (28,781)	\$ 18,843	19.8%	\$ 393,177	4.5%
April	\$ (132,953)	\$ (114,111)	-120.1%	\$ 211,298	-43.9%
May	\$ (14,732)	\$ (128,842)	-135.6%	\$ 196,566	-47.8%
June	\$ (81,326)	\$ (210,168)	-221.2%	\$ 115,240	-69.4%
July	\$ (27,570)	\$ (237,738)	-250.2%	\$ 87,670	-76.7%
August	\$ 112,079	\$ (125,659)	-132.3%	\$ 199,749	-46.9%
September	\$ 151,387	\$ 25,727	27.1%	\$ 351,136	-6.7%
October	\$ 6,135	\$ 31,862	33.5%	\$ 357,271	-5.1%
November	\$ (230,138)	\$ (198,276)	-208.7%	\$ 122,133	-67.5%
December	\$ 293,283	\$ 95,007	100.0%	\$ 474,453	26.1%

The trends in commercial size farm operations continue to reflect larger and larger amounts of production cost inputs, with varied rotations, complex production cycles and often overlapping production year periods. Can a farm manager trying to manage finances really afford to only know what is happening once per year? A large potato grower was so panicked after sitting through a presentation covering management accounting that he went home and re-vamped his entire accounting software system to accommodate a more real time management information system. He commented, “I could have things going on where substantially increased production costs or changing market conditions are sowing serious seeds of financial destruction. I need to be able to identify those problems when they first develop...not several months after the fact.”

Conclusion #7 – It’s okay to be *half pregnant* in MA implementation

Accounting purists might take the position that MA is an “all or none” approach, where the primary accounting approach has to drive to accumulating inventory costs on the balance sheet through the transactional entry system. This is the ideal situation, but it is not the only worthwhile goal that can be achieved by farm managers who want to tap the benefits of managerial accounting.

In the experiences gained from this grant project, growers reaped considerable value without going all the way to full cost-based inventory accumulation. They realize that full implementation is most likely a long term transition process that has to be broken down into digestible chunks. The following is a partial listing of “doable steps” that farmers can start implementing to gain familiarity with managerial accounting:

1. Learning how to complete cost and profit center report using the FFSC standard format is

very useful, even if it means extracting data from their existing record keeping systems after the fact.

2. Learning to differentiate between direct and indirect costs and alternative ways to handle allocation systems is useful knowledge that can be put to immediate good use in addition to forming an important building block for converting to a full real time cost accounting system in the future.
3. Many growers can transition part way into a managerial accounting approach by at least accumulating direct input costs in a Work-in-process or WIP inventory type account (also commonly referred to as Investment in Production or Investment in Growing Crop). Once the production cycle is completed, the total WIP values can be rolled out of WIP and into cost of inventory. The main difference between this approach and a full cost accounting system approach is that under this scenario, the operation is still expensing all indirect production costs rather than including them in WIP.
4. The process of isolating manageable segments that people manage is a healthy exercise that often doesn't become clear until going through the effort to implement MA. This starts improving the ability of managers to place responsibility more clearly and to put in place accountability systems to measure performance of these responsibility center managers.

Transitioning to MA is a lot like trying to implement a Precision Farming System. Growers don't jump immediately into GPS controlled variable rate application. A more likely scenario is that a grower would transition to this goal over several years by implementing steps such as:

Step 1 - Purchase guidance system to become familiar with GPS and possibly start building some maps (at least boundary files) to begin building farm maps

Step 2 – Put yield and moisture monitors in combines to begin accumulating yield information.

Step 3 – Purchase a mapping software program to begin building farm maps

Step 4 – Import yield data into mapping program and begin forming conclusions about field variability and possible strategies for applying inputs differentially based on field production potential.

Step 5 – Invest in variable rate technology to be installed in application equipment (seeding or spraying equipment); build prescription files based on yield data; and begin applying inputs using VRT.

Any one who has gone through the above steps will probably acknowledge these are not “baby steps.” But we have to walk before we can run. MA is similar to Precision Farming in that it involves a high level of management sophistication in financial and accounting skills. But the rewards for fine tuning business performance are equally beneficial.

Conclusion #8 – Capture periods for indirect cost accumulation and allocation of indirect costs will be huge obstacles for diversified growers and multi-year production cycles.

A farm raising two spring seeded crops like corn and soybeans is fairly simple. The production cycle can start and conclude in the same calendar year. They can deal with indirect costs that occur in the same calendar year as the production cycle and have a reasonably uncomplicated process for implementing MA.

Operations with fall and spring seeded crops, perennials, and livestock/crop combinations face a tough challenge defining the beginning and ending dates that will be used for transaction capture. For example, assume a diversified operation has a fall wheat production cycle that begins in September 20X1 and concludes in August 20X2, while the spring grain cycle starts in the spring of 20X2 and ends in October or November of the same year. What capture period will be used to accumulate indirect costs such as labor, utilities, liability insurance and equipment expense? Do you use a “normal twelve month period” such as January to December...or September 20X1 through August 20X2...or some other period?

This gets even trickier if you are dealing with short cycles like a feedlot production cycle that may only run 120 days, or longer cycles like perennial bluegrass where it takes two years to produce the first crop. Systems that do full activity based accounting can help somewhat, but it is still very challenging to design a clean system for capturing and allocating indirect costs. The conclusion from the participants is that even though it is more complicated, growers faced with these situations have the most to gain by coming up with an approach that can be implemented. If they don't, they will never be able to get realistic cost of production data.

Conclusion #9 – Having a good MA system in place can significantly change marketing behavior and strategies.

A good MA system helps to more accurately identify cost of production. This allows producers to set market price targets and execute marketing strategies tied to specific profit margin objectives. The alternative is not very pretty. Growers who don't know their costs tend to follow a strategy of “hope and pray.” They hope that they hit the highest price, and pray that it is enough to cover costs when the tally is completed at the end of the year.

One seminar participant commented that he would never approach marketing the same after realizing the benefits that come from knowing cost of production. He planned to develop a chart that showed how his cost per bushel would vary based on alternative yield scenarios. And when the market started providing profit margins that met a goal of a 20% margin over costs, he was going to start marketing. There is one small problem with this approach: what happens when the market never gives you a chance to sell at a margin? The reality is that many producers would be more inclined to sell commodities when there is an opportunity to sell at a profitable margin. The reasons they don't are usually because (1) they don't know what total production level they are likely going to have to sell, and (2) they don't know the breakeven point to start selling at a margin.

Conclusion #10 – Developing adequate computer software is a critical component to efficiently implementing a managerial accounting system.

A handful of software vendors are actively engaged in building or enhancing the capacity of their programs to provide managerial accounting capabilities. This is an expensive process and at present there is a very limited market of users who have both the sophistication to run the software and the willingness to invest in the added cost of this capability.

Most producers surveyed after exposure to these MA concepts acknowledge that their present

software will be inadequate to do MA properly and efficiently. With good training many producers can supplement their existing accounting systems with external exporting of data to spreadsheet templates that can be useful in organizing their farm transactional data in a managerial accounting format. There is a great opportunity for software vendors to keep engaged in the both the development of guidelines and well as implementation software. Software developers will need to work closely with farm management and accounting practitioner training and education resources to accelerate the learning process before we can expect to see wide scale implementation of MA.

Using Managerial Accounting as a Foundation for Identifying Strategic Shifts to Improve Financial Performance

This is the ultimate goal of many farm managers. Growers don't accumulate operating and financial data just for the erotic satisfaction of gathering data. They want to either improve performance or maintain past trends of success. This is seldom achieved by maintaining the status quo.

The original grant project was to include a formal strategic planning workshop. The actual strategic planning component of the grant project evolved more informally as an integral agenda item during a series of winter breakfast meetings. The key focus of the CDS 2003-04 winter meeting discussions was Precision Farming and Measuring Performance of our cropping systems strategies. The final session focused on growers defining alternative strategic shifts that could lead to improved financial performance, primarily focused at lowering cost of production. The following list of strategies are now being evaluated and implemented by a significant number of the participants who worked in this project:

1. Fully converting to direct seed (no till) to streamline farm operating costs and lower capital equipment investment required per acre.
2. Evaluating buy vs. lease vs. custom hire options to optimize lowest cost procurement on large capital equipment items (such as combines, power units, trucks, seeding equipment, and sprayers).
3. Exploring off-farm revenue sources and forming joint venture arrangements to share equipment, labor and expertise as alternatives to getting larger in size.
4. Assessing impact of business growth and targeting optimal level of throughput to keep overhead costs on a competitive basis.
5. Pursuing value-added premiums for crops based on specific crop attributes and production systems. (Many in this group are receiving revenues from carbon sequestration and bonuses for grain produced under a Direct Seed System under certification with the Food Alliance, Salmon Safe and other certification entities.)

Conclusion

The grant project was admittedly ambitious in the original goals identified. However, many of these goals will eventually be accomplished if growers carry their initial enthusiasm for this project into their future management development strategies, and they continue to look for education opportunities to more fully implement the concept. Not completing all the planned activities did not detract from value of experience for all who participated. Some producers

completed the full scope of the grant activities including development of data sets and updating strategic plans. Others gained from general exposure to the concepts, identified what they didn't know, and through interaction with the more progressive producers, developed an appreciation for the learning path that would be required to adopt a comprehensive managerial accounting process.

All who participated in this project, including growers, facilitators, instructors and support personnel gained considerable knowledge in basic concepts of managerial accounting. They also achieved a significant milestone in gaining confidence that this is not just a bunch of accounting theory – it is a critical farm management tool that can be learned and implemented, and it will be an essential skill to have incorporated in the commercial farm business of the future.

After working on this project over a two year period and sharing the labor pains with growers, educators and practitioners, a common conclusion expressed was that Managerial Accounting may well be the “new frontier” in Farm Management Education. Getting this concept implemented on a broad basis in the industry will take a collaborative effort from professional educators, practitioners, consultants, and growers to learn the concepts and build effective training and implementation tools.

For Further Information on Managerial Accounting

Those interested in this concept can track the development of guidelines, resources and implementation tools by referencing the Farm Financial Standards Council's website at www.ffsc.org. The website contains information in various stages of completion including guidelines, discussion drafts and educational presentations made at various annual meetings and symposiums of the Council.